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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	6583-67
	Application Number	
Title of Invention	FULL-SCREEN ANNUNCIATOR	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Applicant Information:

Applicant 1 Remove

Applicant Authority ◉ Inventor ○ Legal Representative under 35 U.S.C. 117 ○ Party of Interest under 35 U.S.C. 118

Prefix	Given Name	Middle Name	Family Name	Suffix
	Sanjiv		Sirpal	

Residence Information (Select One) ○ US Residency ◉ Non US Residency ○ Active US Military Service

City	Oakville	Country Of Residence[i]	CA
Citizenship under 37 CFR 1.41(b)[i]	CA		

Mailing Address of Applicant:

Address 1	3264 Stocksbridge Avenue		
Address 2			
City	Oakville	State/Province	ON
Postal Code	L6M 0E3	Country[i]	CA

Applicant 2 Remove

Applicant Authority ◉ Inventor ○ Legal Representative under 35 U.S.C. 117 ○ Party of Interest under 35 U.S.C. 118

Prefix	Given Name	Middle Name	Family Name	Suffix
	Paul	Edward	Reeves	

Residence Information (Select One) ○ US Residency ◉ Non US Residency ○ Active US Military Service

City	Oakville	Country Of Residence[i]	CA
Citizenship under 37 CFR 1.41(b)[i]	CA		

Mailing Address of Applicant:

Address 1	1215 Riverbank Way,		
Address 2			
City	Oakville	State/Province	ON
Postal Code	L6H 6X4	Country[i]	CA

Applicant 3 Remove

Applicant Authority ◉ Inventor ○ Legal Representative under 35 U.S.C. 117 ○ Party of Interest under 35 U.S.C. 118

Prefix	Given Name	Middle Name	Family Name	Suffix
	Alexander		de Paz	

Residence Information (Select One) ○ US Residency ◉ Non US Residency ○ Active US Military Service

City	Burlington	Country Of Residence[i]	CA

GOOGLE EXHIBIT 1004

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	6583-67
	Application Number	
Title of Invention	FULL-SCREEN ANNUNCIATOR	

Citizenship under 37 CFR 1.41(b) i	CA				
Mailing Address of Applicant:					
Address 1	5444 Valleyhigh Drive				
Address 2					
City	Burlington	**State/Province**	ON		
Postal Code	L7L 6Z6	**Country**i	CA		

Applicant 4 Remove

Applicant Authority ◉ Inventor	○ Legal Representative under 35 U.S.C. 117	○ Party of Interest under 35 U.S.C. 118		
Prefix	**Given Name**	**Middle Name**	**Family Name**	**Suffix**
	Diego		Milano	

Residence Information (Select One) ○ US Residency ◉ Non US Residency ○ Active US Military Service					
City	Oakville	**Country Of Residence**i	CA		
Citizenship under 37 CFR 1.41(b) i	CA				
Mailing Address of Applicant:					
Address 1	629 Marley Road				
Address 2					
City	Oakville	**State/Province**	ON		
Postal Code	L6H 6X4	**Country**i	CA		

Applicant 5 Remove

Applicant Authority ◉ Inventor	○ Legal Representative under 35 U.S.C. 117	○ Party of Interest under 35 U.S.C. 118		
Prefix	**Given Name**	**Middle Name**	**Family Name**	**Suffix**
	Jared		Ficklin	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service					
City	Austin	**State/Province**	TX	**Country of Residence** i	US
Citizenship under 37 CFR 1.41(b) i	US				
Mailing Address of Applicant:					
Address 1	101 W. 6th Street				
Address 2					
City	Austin	**State/Province**	TX		
Postal Code	78701	**Country**i	US		

Applicant 6 Remove

Applicant Authority ◉ Inventor	○ Legal Representative under 35 U.S.C. 117	○ Party of Interest under 35 U.S.C. 118		
Prefix	**Given Name**	**Middle Name**	**Family Name**	**Suffix**
	Denise		Burton	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service					
City	Austin	**State/Province**	TX	**Country of Residence** i	US
Citizenship under 37 CFR 1.41(b) i	US				

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	6583-67
	Application Number	
Title of Invention	FULL-SCREEN ANNUNCIATOR	

Mailing Address of Applicant:					
Address 1	14816 Bear Creek Pass				
Address 2					
City	Austin		State/Province	TX	
Postal Code	78737	Country[i]	US		

Applicant 7 — Remove

Applicant Authority: (•) Inventor ( ) Legal Representative under 35 U.S.C. 117 ( ) Party of Interest under 35 U.S.C. 118

Prefix	Given Name	Middle Name	Family Name	Suffix
	Gregg		Wygonik	

Residence Information (Select One): (•) US Residency ( ) Non US Residency ( ) Active US Military Service

City	Austin	State/Province	TX	Country of Residence [i]	US
Citizenship under 37 CFR 1.41(b) [i]	US				

Mailing Address of Applicant:					
Address 1	101 West 6th Street, 2nd Floor				
Address 2					
City	Austin		State/Province	TX	
Postal Code	78701	Country[i]	US		

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. — Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a).

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number	22442		
Email Address	docketing@sheridanross.com	Add Email	Remove Email
Email Address	bjohnson@sheridanross.com	Add Email	Remove Email

Application Information:

Title of the Invention	FULL-SCREEN ANNUNCIATOR		
Attorney Docket Number	6583-67	Small Entity Status Claimed	☐
Application Type	Nonprovisional		
Subject Matter			
Suggested Class (if any)		Sub Class (if any)	
Suggested Technology Center (if any)			
Total Number of Drawing Sheets (if any)		Suggested Figure for Publication (if any)	

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	6583-67
	Application Number	
Title of Invention	FULL-SCREEN ANNUNCIATOR	

Publication Information:

☐	Request Early Publication (Fee required at time of Request 37 CFR 1.219)
☐	**Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S. C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Enter either Customer Number or complete the Representative Name section below. If both sections are completed the Customer Number will be used for the Representative Information during processing.

Please Select One:	◉ Customer Number	○ US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	22442		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78(a)(2) or CFR 1.78(a)(4), and need not otherwise be made part of the specification.

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	non provisional of	61539884	2011-09-27
Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	non provisional of	61458150	2010-11-17
Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	non provisional of	61389000	2010-10-01
Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	non provisional of	61389117	2010-10-01
Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	non provisional of	61389087	2010-10-01

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button. Add

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	6583-67
	Application Number	
Title of Invention	FULL-SCREEN ANNUNCIATOR	

Foreign Priority Information:

This section allows for the applicant to claim benefit of foreign priority and to identify any prior foreign application for which priority is not claimed. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(a).

Remove

Application Number	Country [i]	Parent Filing Date (YYYY-MM-DD)	Priority Claimed
			(•) Yes ( ) No

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button. Add

Assignee Information:

Providing this information in the application data sheet does not substitute for compliance with any requirement of part 3 of Title 37 of the CFR to have an assignment recorded in the Office.

Assignee 1 Remove

If the Assignee is an Organization check here. [X]

Organization Name	Imerj, LLC		
Mailing Address Information:			
Address 1	305 Interlocken Parkway		
Address 2			
City	Broomfield	**State/Province**	CO
Country [i] US		Postal Code	80021
Phone Number		Fax Number	
Email Address			

Additional Assignee Data may be generated within this form by selecting the **Add** button. Add

Signature:

A signature of the applicant or representative is required in accordance with 37 CFR 1.33 and 10.18. Please see 37 CFR 1.4(d) for the form of the signature.

Signature	/Brent P. Johnson/			Date (YYYY-MM-DD)	2011-09-28
First Name	Brent	Last Name	Johnson	Registration Number	38031

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

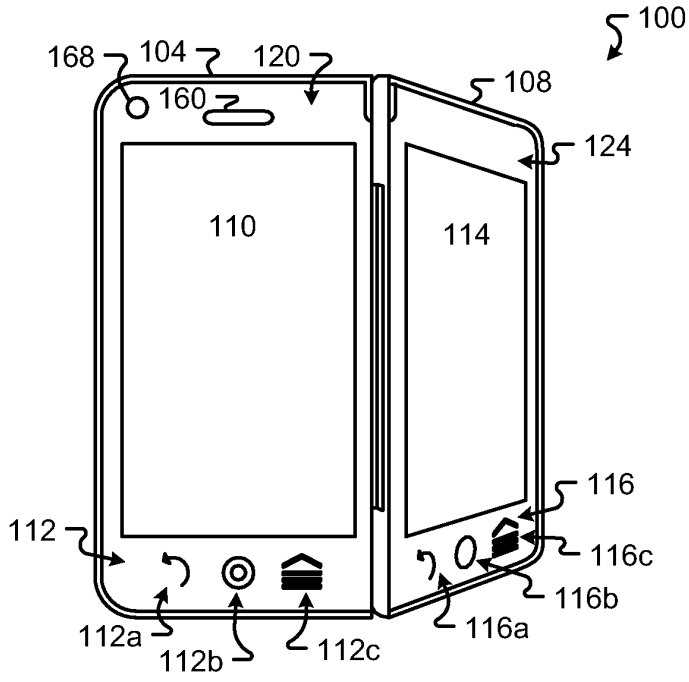

100
168
104
120
160
108
124
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114
116
112
116c
116b
116a
112a
112b
112c

FIG. 1A

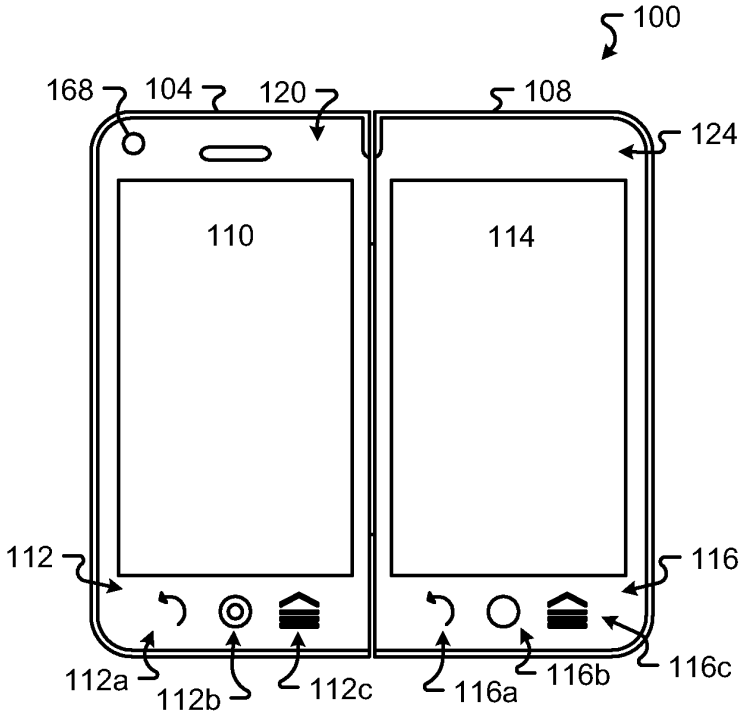

100
168
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120
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124
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112
116
112a
112b
112c
116a
116b
116c

FIG. 1B

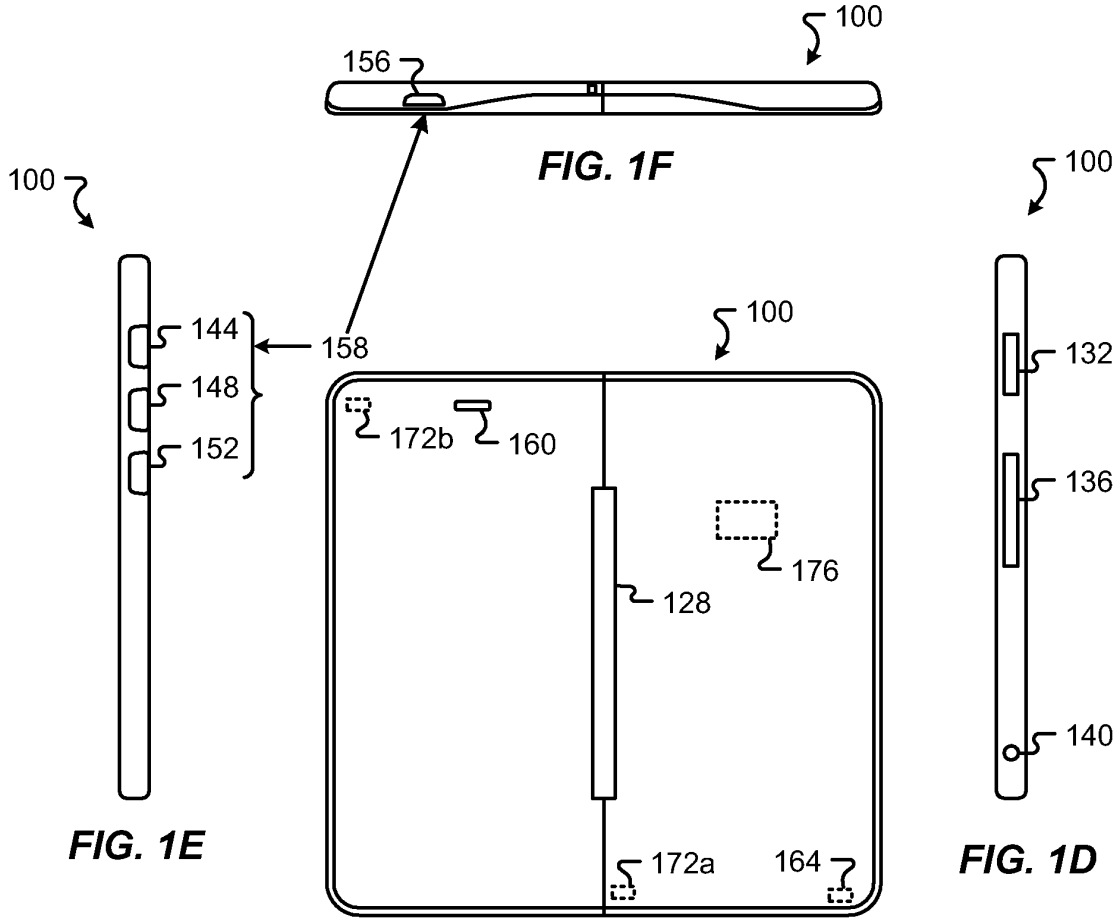


FIG. 1F

FIG. 1E

FIG. 1D

FIG. 1C

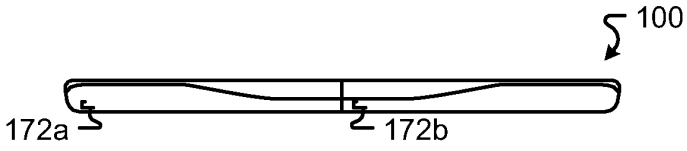


FIG. 1G

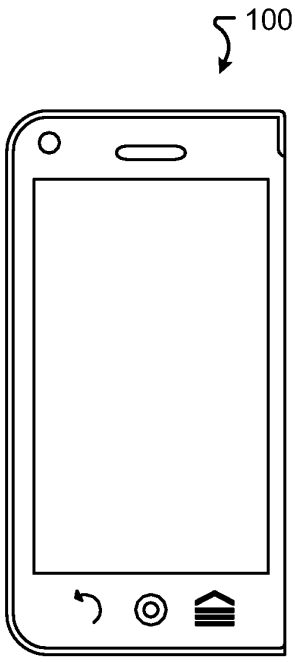


FIG. 1H

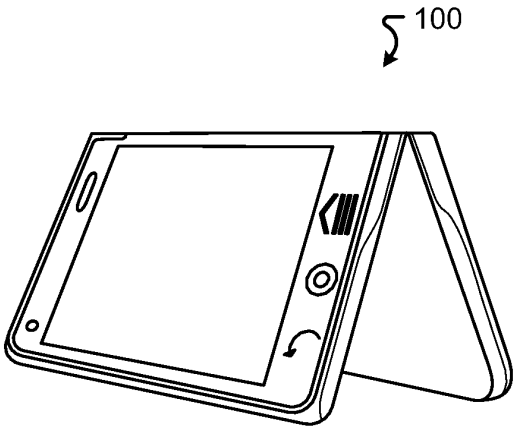


FIG. 1I

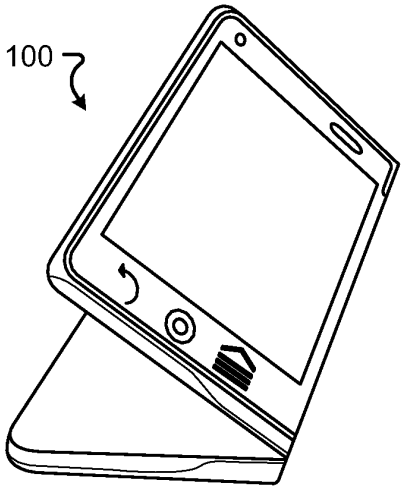


FIG. 1J

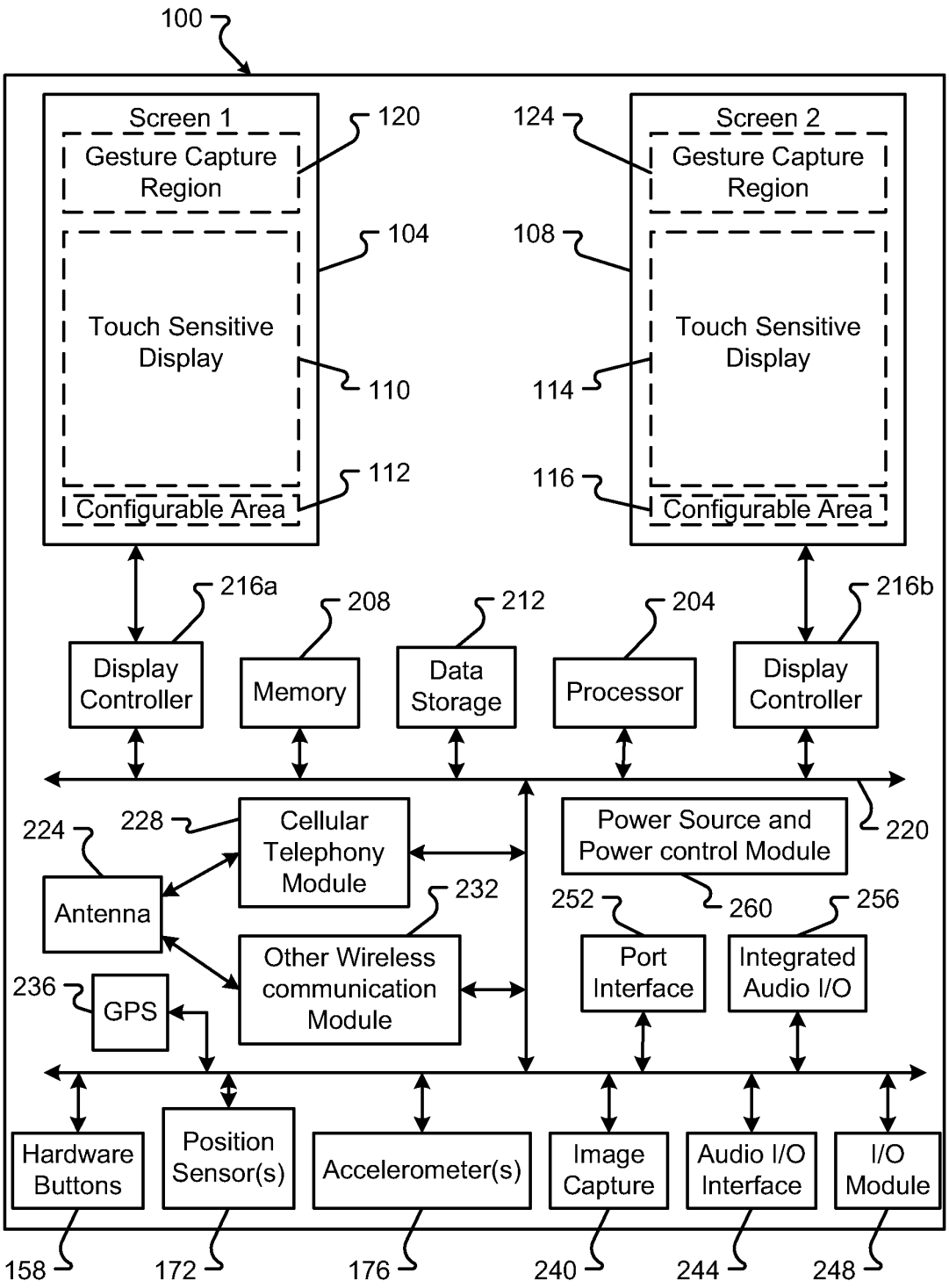

100
Screen 1
Gesture Capture Region
120
104
Touch Sensitive Display
110
112
Configurable Area
124
Screen 2
Gesture Capture Region
108
Touch Sensitive Display
114
116
Configurable Area
216a
208
212
204
216b
Display Controller
Memory
Data Storage
Processor
Display Controller
220
224
228
Cellular Telephony Module
Power Source and Power control Module
Antenna
232
252
260
256
Other Wireless communication Module
Port Interface
Integrated Audio I/O
236
GPS
Hardware Buttons
Position Sensor(s)
Accelerometer(s)
Image Capture
Audio I/O Interface
I/O Module
158
172
176
240
244
248

FIG. 2

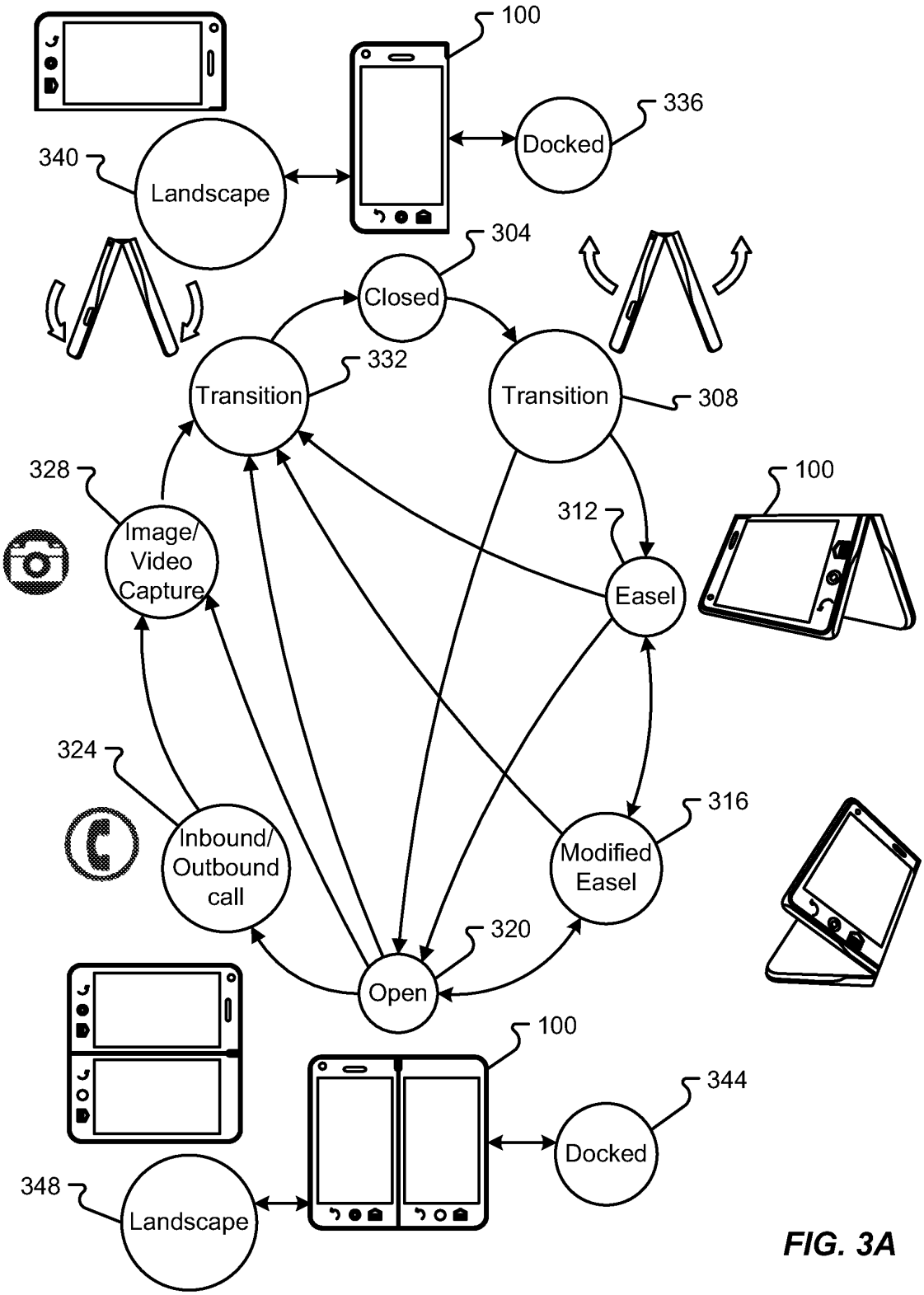
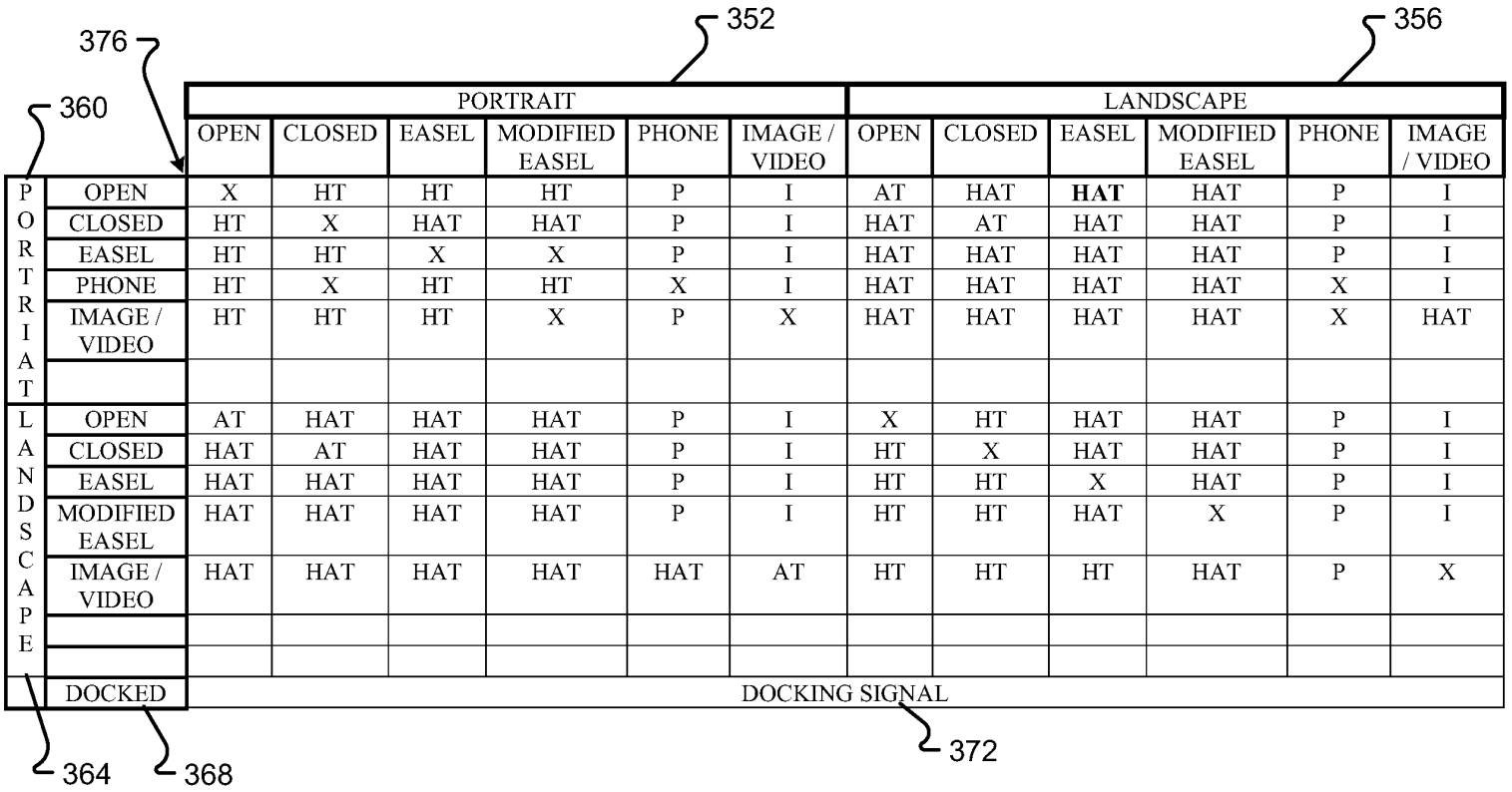

100
336
Docked
340
Landscape
304
Closed
332
Transition
Transition
308
328
Image/
Video
Capture
312
100
Easel
324
Inbound/
Outbound
call
316
Modified
Easel
320
Open
100
344
Docked
348
Landscape

FIG. 3A



Key:
H - Hall Effect Sensor(s)
a - accelerometer(s)
T- Timer
P – communications Trigger
I – Image / Video capture Request

FIG. 3B

Tap

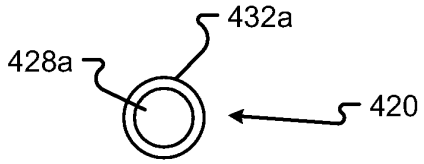


FIG. 4A

Long Press

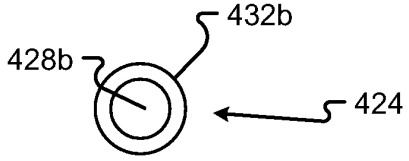


FIG. 4B

Drag

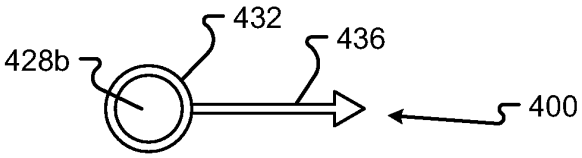


FIG. 4C

Flick

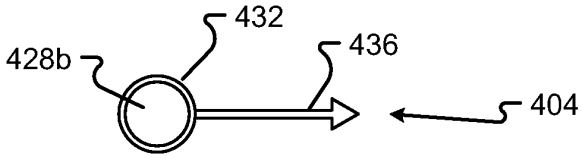


FIG. 4D

Pinch

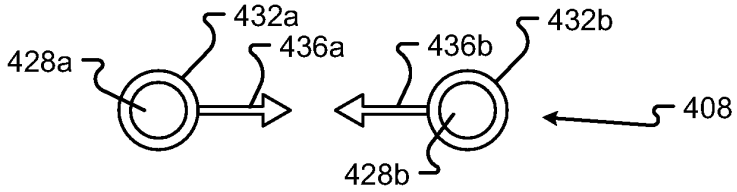


FIG. 4E

Spread

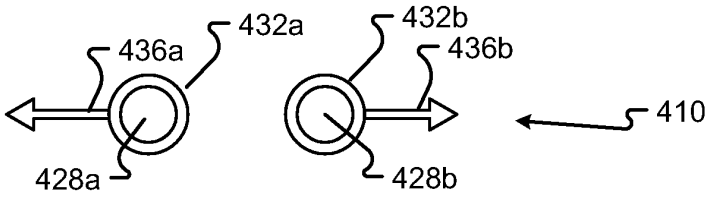


FIG. 4F

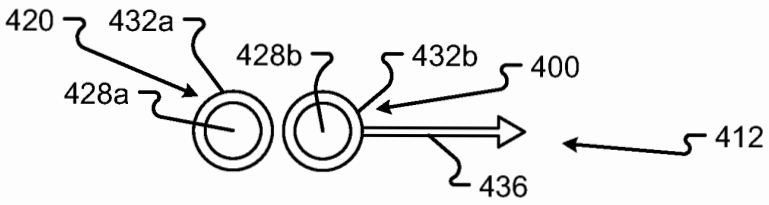

420
432a
428b
432b
400
428a
412
436

FIG. 4G

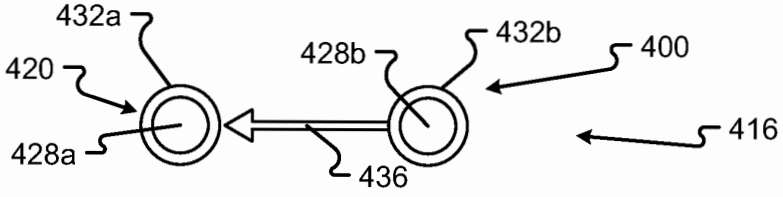

432a
420
428b
432b
400
428a
416
436

FIG. 4H

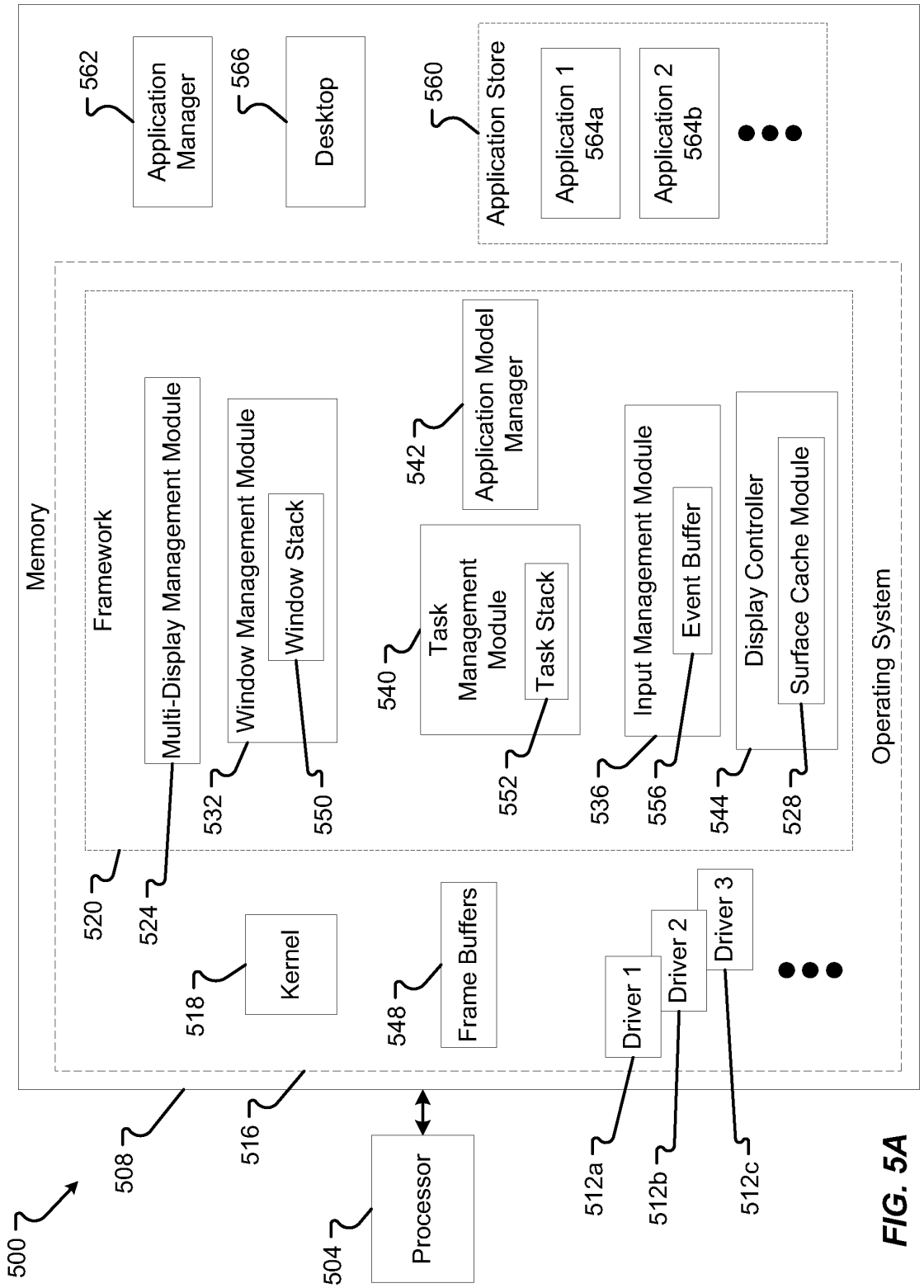

500
508
516
504
Processor
Memory
Operating System
Framework
520
524
Multi-Display Management Module
518
Kernel
532
Window Management Module
550
Window Stack
548
Frame Buffers
540
Task Management Module
552
Task Stack
542
Application Model Manager
536
Input Management Module
556
Event Buffer
544
Display Controller
528
Surface Cache Module
512a
Driver 1
512b
Driver 2
512c
Driver 3
562
Application Manager
566
Desktop
560
Application Store
Application 1 564a
Application 2 564b

FIG. 5A

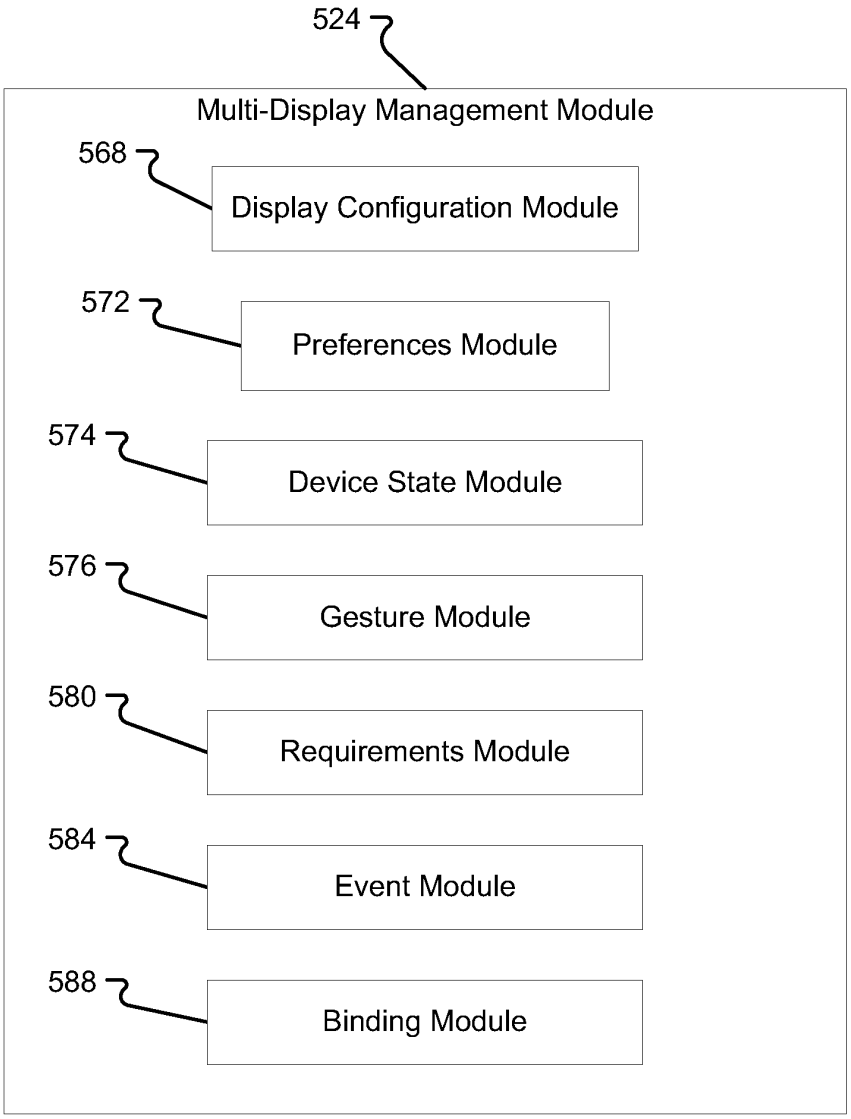

524
Multi-Display Management Module
568
Display Configuration Module
572
Preferences Module
574
Device State Module
576
Gesture Module
580
Requirements Module
584
Event Module
588
Binding Module

FIG. 5B

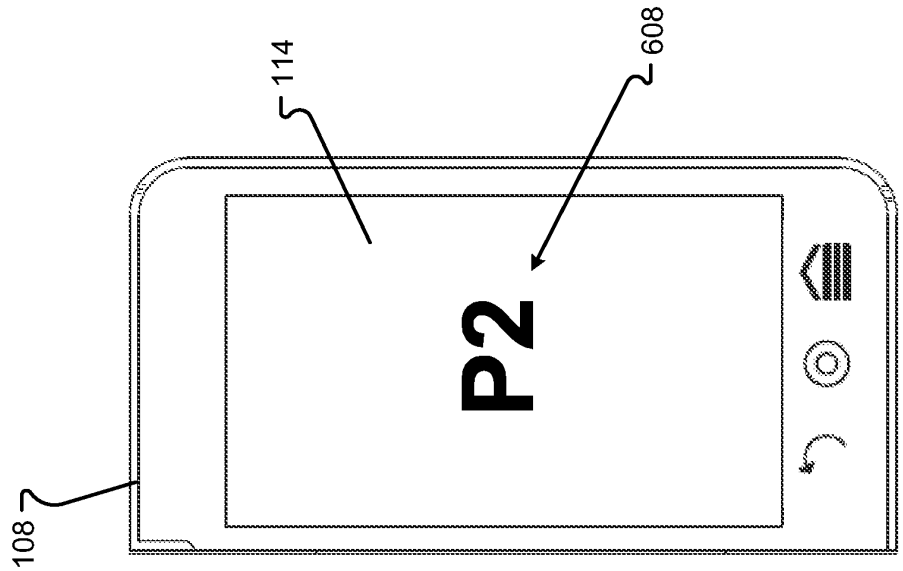


FIG. 6B

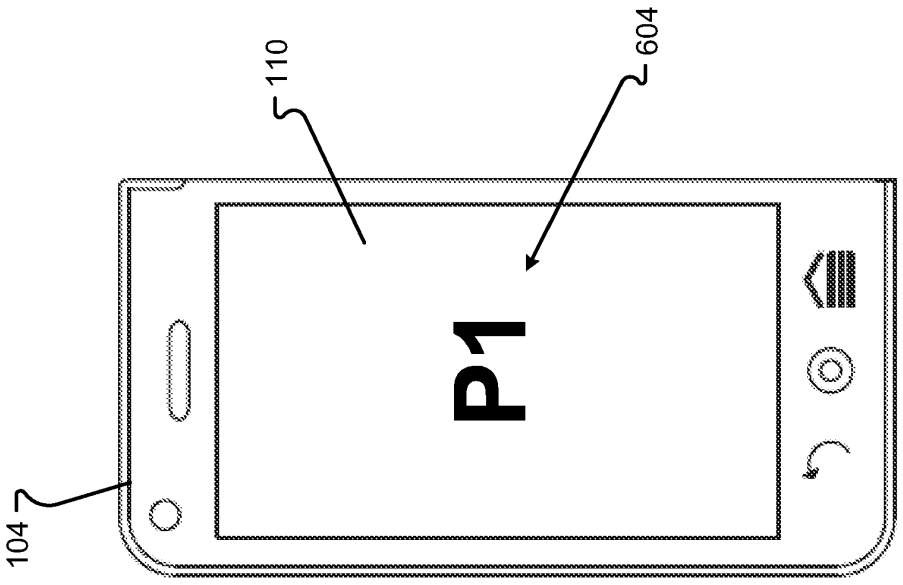


FIG. 6A

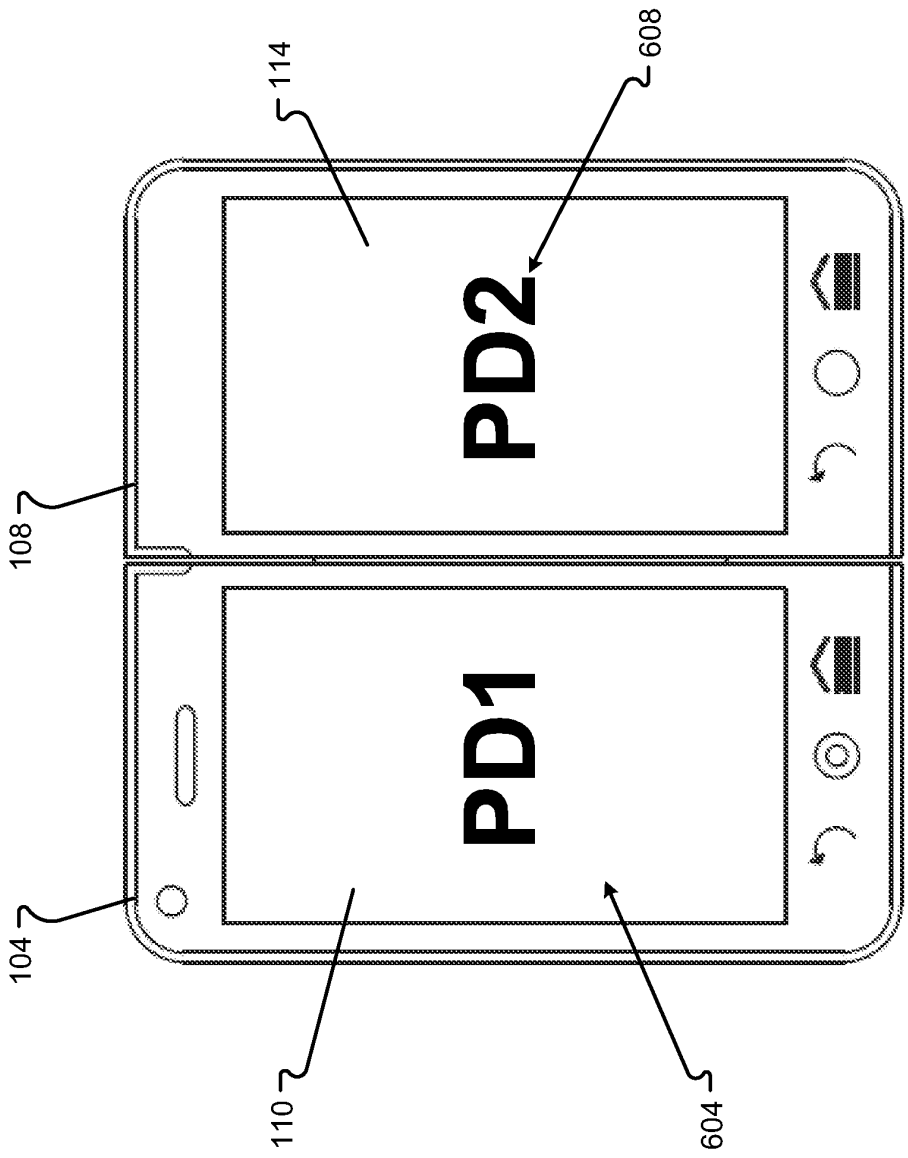


FIG. 6C

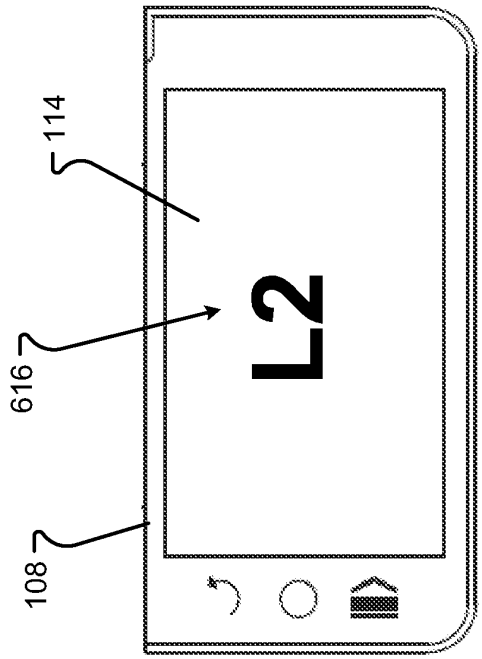


FIG. 6E

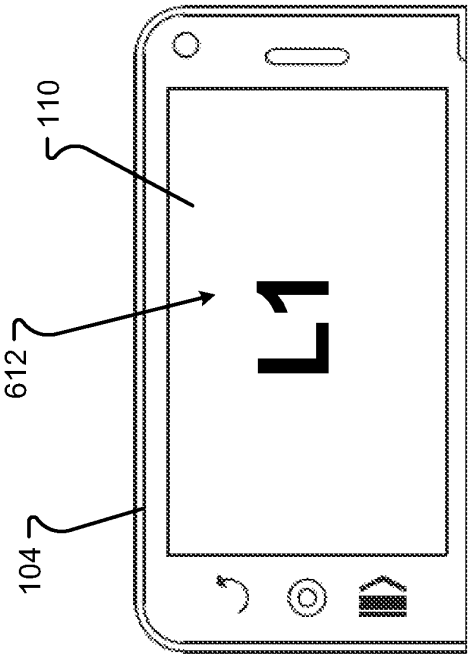


FIG. 6D

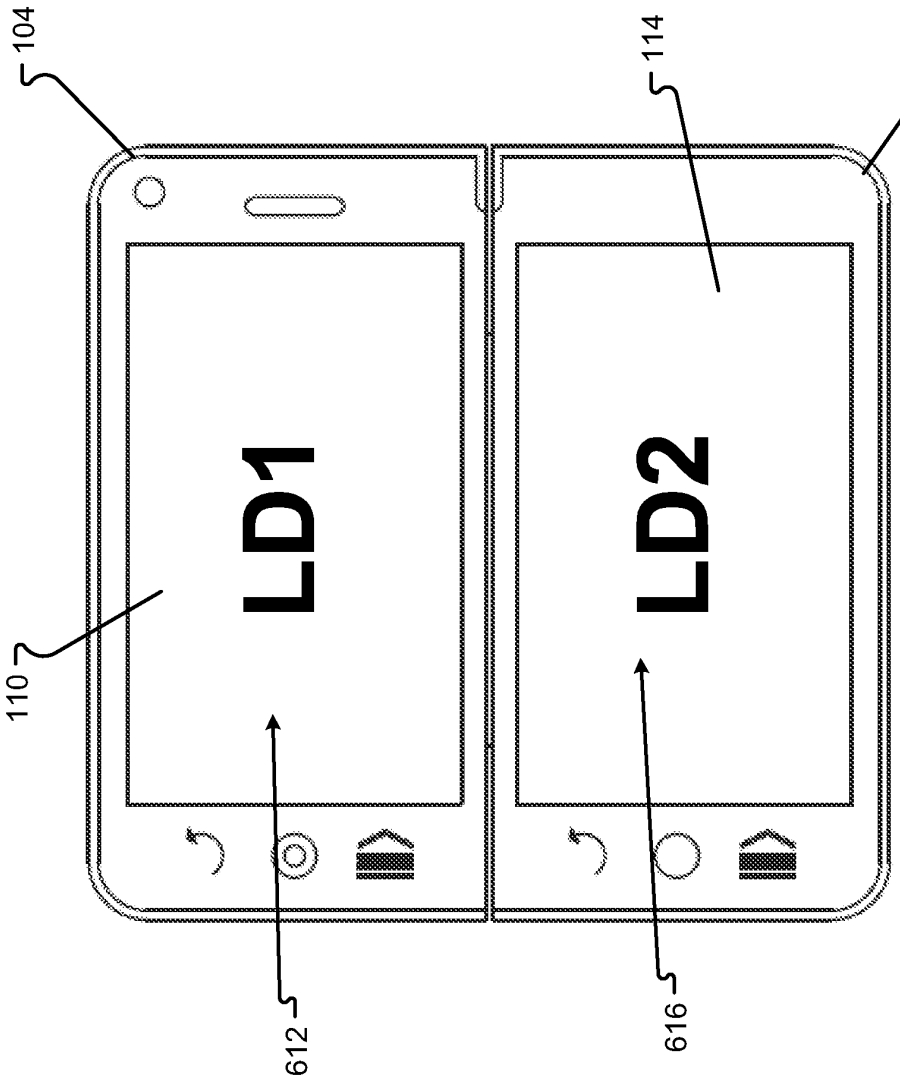


FIG. 6F

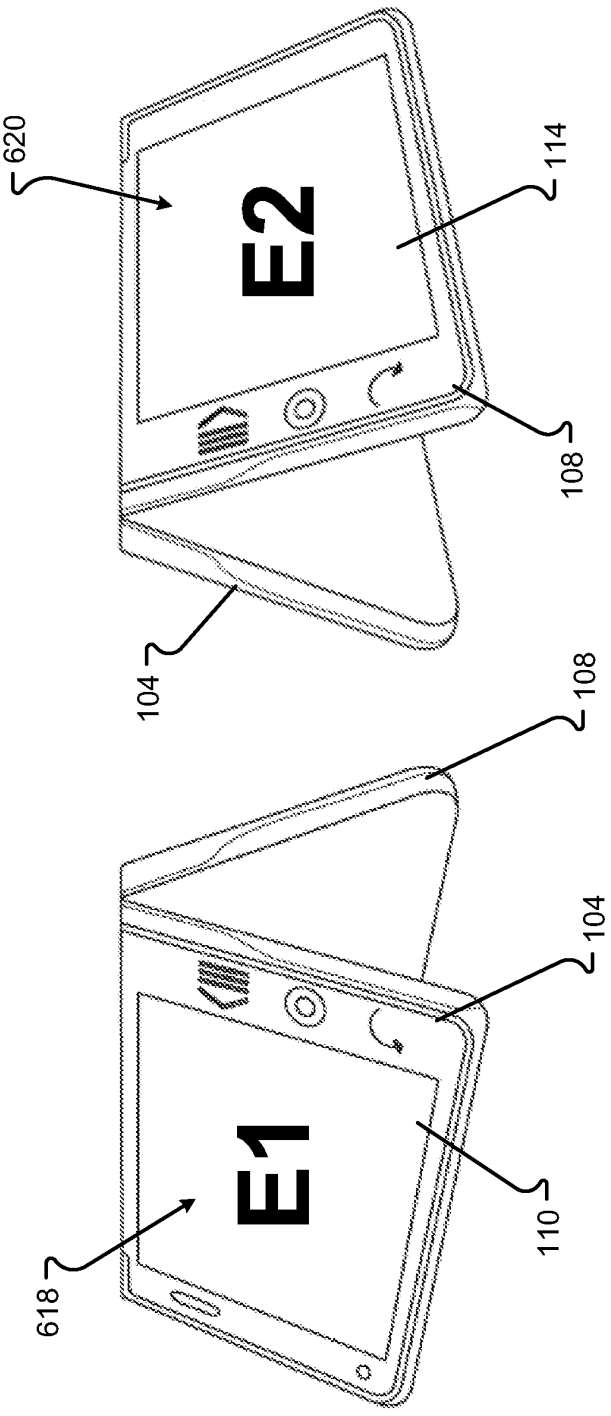


FIG. 6H

FIG. 6G

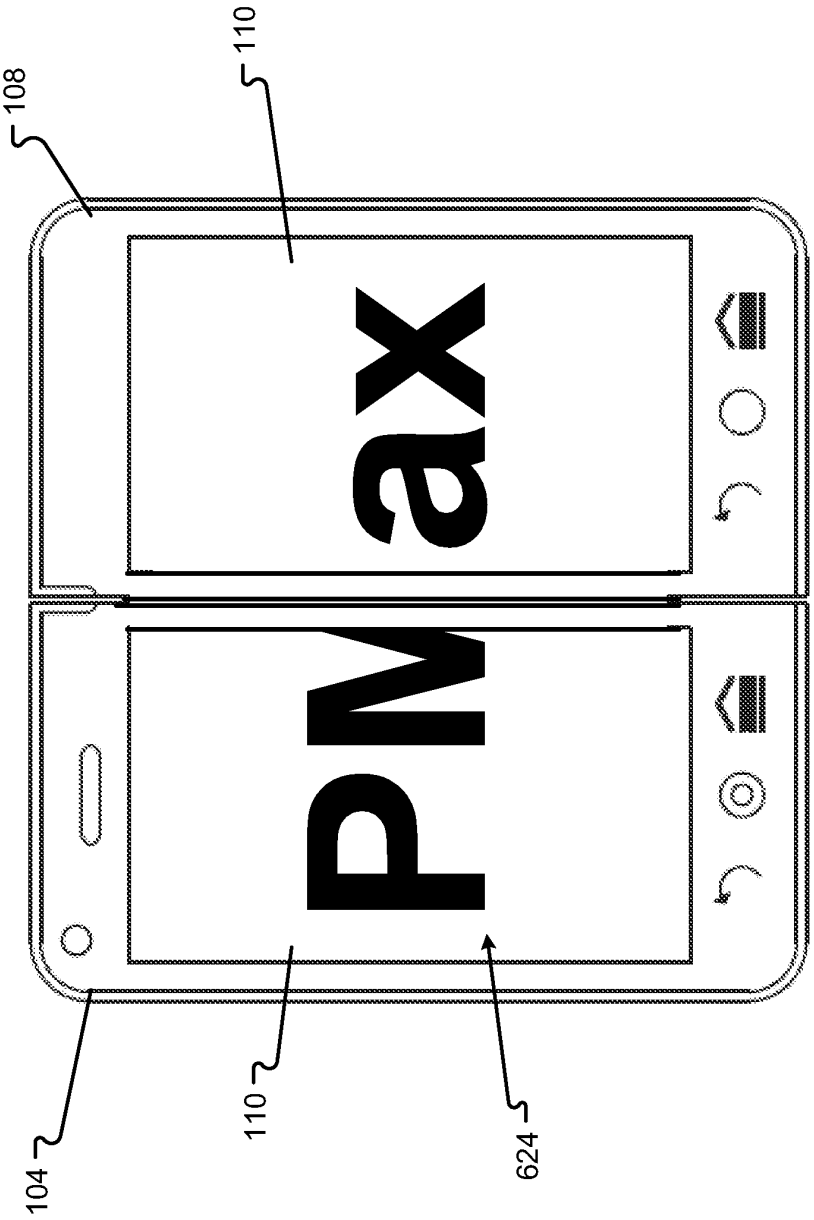


FIG. 6I

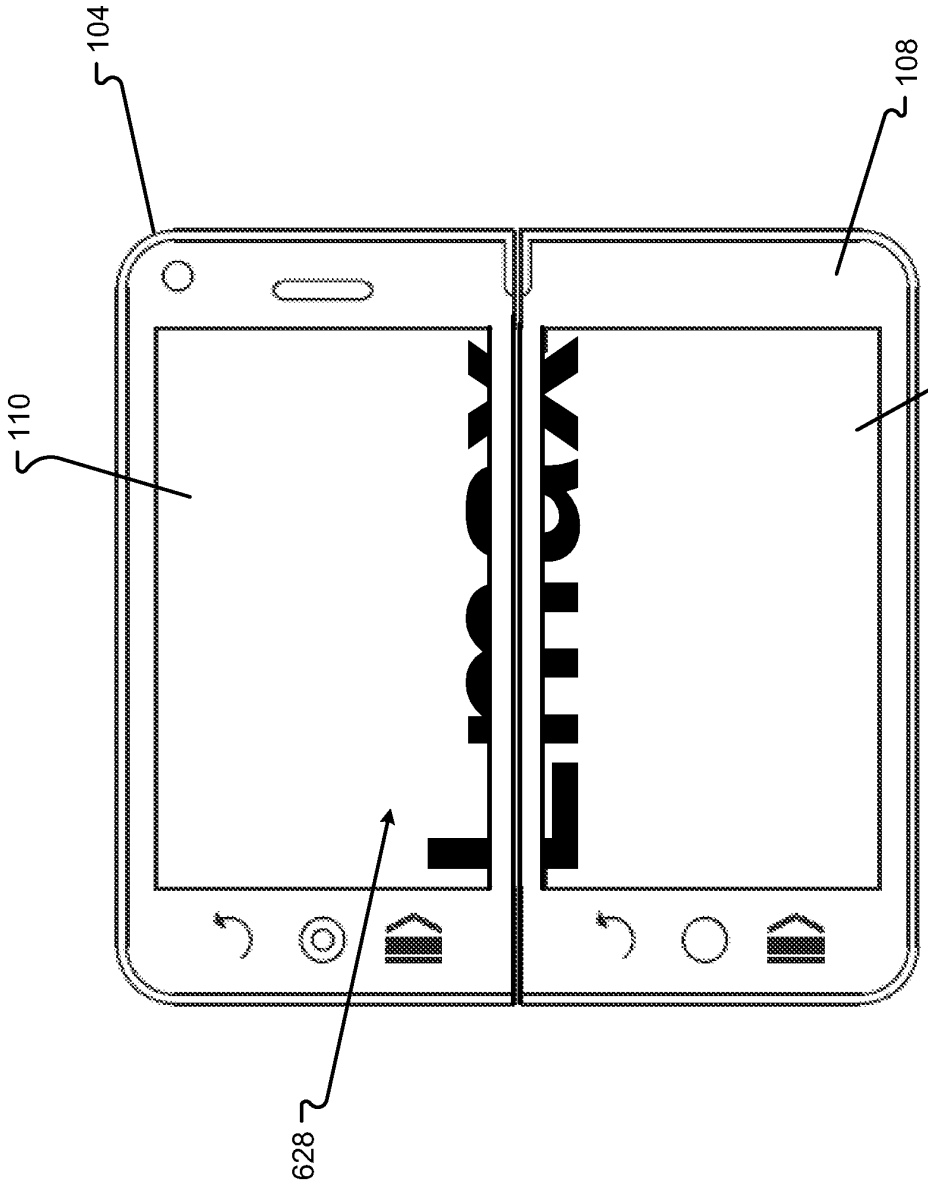


FIG. 6J

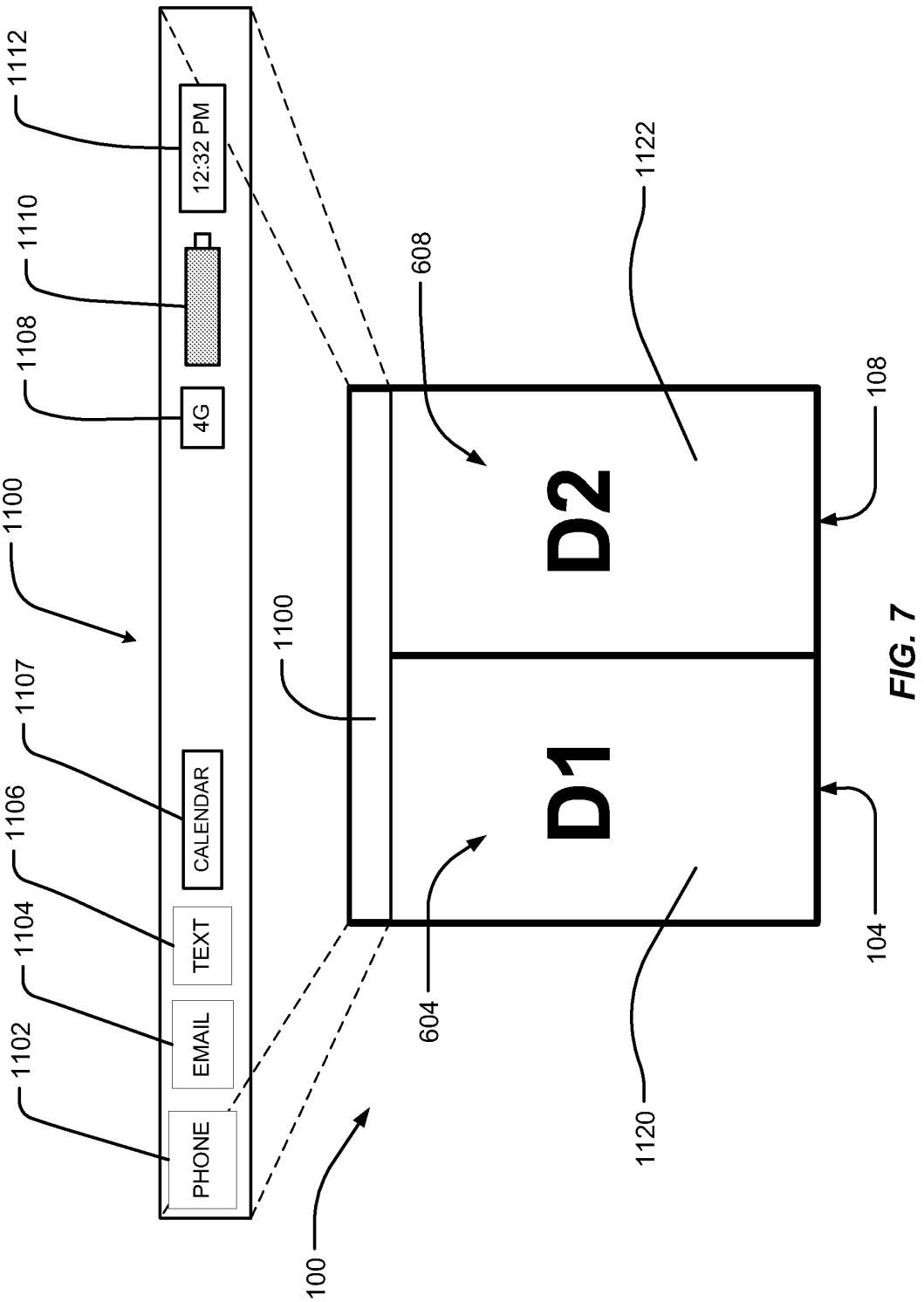

1112
12:32 PM
1110
1108
4G
1100
1107
CALENDAR
1106
TEXT
1104
EMAIL
1102
PHONE
100
608
1122
1100
D2
D1
604
1120
108
104

FIG. 7

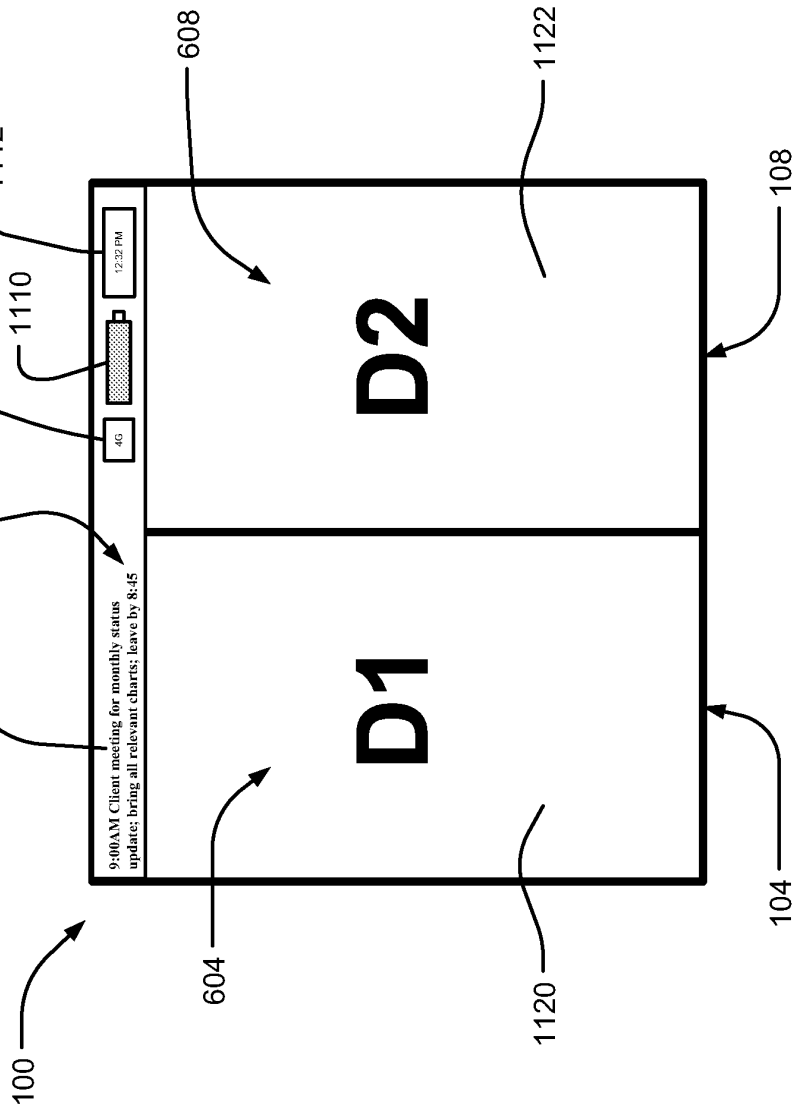

100
604
1120
104
108
1122
608
1112
1110
1108
1124
1100
D1
D2
12:32 PM
4G
9:00AM Client meeting for monthly status update: bring all relevant charts; leave by 8:45

FIG. 8

What is claimed is:

1. A method of displaying information on a multi-screen device including a plurality of desktops and/or applications each having at least one window, and an annunciator window, the method comprising:

receiving, by a processor, a first input that represents an instruction to reveal one of a desktop or application on a first display of the multi-screen device and selecting a first desktop or application to display on the first display;

receiving, by a processor, a second input that represents an instruction to reveal one of a desktop or application on a second display of the multi-screen device and selecting a second desktop or application to display on the second display;

displaying, by a processor, the selected first and second desktops or applications on the first and second displays;

displaying, by a processor, a pre-configured annunciator window having information therein showing at least one of a device status, a connectivity status, and a messaging status;

configuring by a processor, the annunciator window to extend across both said first and second displays;

modifying, by a processor, the display of the annunciator window in response to a changed state of at least one of said device status, a connectivity status, and messaging status; and

wherein the modified display of the annunciator window displays information selectively across substantially all or part of said annunciator window.

2. The method of claim 1, wherein said modifying step includes displaying the changed state including text corresponding to at least one of a phone message, email message, or text message.

3. The method of claim 1, wherein said modifying step includes displaying the changed state across a portion of said annunciator window and masking at least one icon representing said device status, a connectivity status, or messaging status.

4. The method of claim 1, wherein said modifying step includes displaying the changed state across substantially all of said annunciator window.

5. The method of claim 1, wherein said annunciator window is located across adjacent upper or lower edges of said first and second displays.

6. A non-transitory computer-readable medium having stored thereon instructions that cause a computing system to execute a method, the instructions comprising:

instructions configured to receive a first predetermined input that represents an instruction to determine and reveal a first desktop or application on a first display of the multi-screen device;

instructions configured to receive a second predetermined input that represents an instruction to determine and reveal a second desktop or application on a second display of the multi-screen device;

instructions configured to respond to the first and second predetermined inputs with outputs that cause the first desktop or application to be displayed on the first display and cause the second desktop or application to be displayed on the second display

instructions configured to receive a third predetermined input that represents an instruction to display a pre-configured annunciator window having information therein showing at least one of a device status, a connectivity status, and a messaging status; and

instructions configured to respond to the third predetermined input with an output that causes the annunciator window to be displayed in a configuration extending across both of said first and second displays.

7. The computer-readable medium of claim 6, further including:

instructions configured to receive a fourth input that represents instructions to display a changed state of said device including text corresponding to at least one of a phone message, email message, or text message; and

instructions configured to respond to the fourth input with an output that causes the annunciator window to be displayed in a changed configuration extending across both of said first and second displays.

8. The computer-readable medium of claim 7, wherein said instructions configured to respond to the fourth input cause a changed configuration to be displayed masking at least one icon representing said device status, a connectivity status, or messaging status.

9. The computer-readable medium of claim 7, wherein said instructions configured to respond to the third predetermined input causes said annunciator window to be displayed across adjacent upper or lower edges of said first and second displays.

10. A multi-screen user device, comprising:

a first display including a first display area;

a second display including a second display area;

a first user input gesture area of the first display;

a second user input gesture area of the second display, wherein the first and second user input gesture areas are configured to accept input from a user;

an annunciator display extending across said first and second display areas of said first and second displays for displaying at least one of a device status, a connectivity status, and a messaging status;

a computer-readable medium having instructions stored thereon that include:

a first set of instructions configured to determine a number and identity of desktops or applications selected to be run by a user; and

a second set of instructions configured to determine information to be displayed in said annunciator display based on selected user gestures and respective states of said device status, a connectivity status, and a messaging status;

11. The device of claim 10, wherein: the second set of instructions include information regarding a changed state of one of said statuses including text corresponding to at least one of a phone message, email message, or text message.

12. The device of claim 10, wherein said second set of instructions result in displaying a changed state of said annunciator window across a portion of said annunciator window and masking at least one icon representing said device status, a connectivity status, or messaging status.

13. The device of claim 10, wherein said second set of instructions result in displaying a changed state of said annunciator window across substantially all of said annunciator window.

14. The device of claim 10, wherein said second set of instructions result in displaying said annunciator window across adjacent upper or lower edges of said first and second displays.

FULL SCREEN ANNUNCIATOR

CROSS REFERENCE TO RELATED APPLICATION

[0001] The present application claims the benefits of and priority, under 35 U.S.C. § 119(e), to U.S. Provisional Application Serial Nos. 61/389,000, filed October 1, 2010, entitled "DUAL DISPLAY WINDOWING SYSTEM;" 61/389,117, filed October 1, 2010, entitled "MULTI-OPERATING SYSTEM PORTABLE DOCKETING DEVICE;" 61/389,087, filed October 1,2010, entitled "TABLET COMPUTING USER INTERFACE;"61/458,150, filed November 17, 2010, entitled "Dual Screen Email Client;" 61/539,884, filed September 27, 2011, entitled "MOBILE DEVICE." Each of the aforementioned documents is incorporated herein by this reference in their entirety for all that they teach and for all purposes.

BACKGROUND

[0002] A substantial number of handheld computing devices, such as cellular phones, tablets, and E-Readers, make use of a touch screen display not only to deliver display information to the user but also to receive inputs from user interface commands. While touch screen displays may increase the configurability of the handheld device and provide a wide variety of user interface options, this flexibility typically comes at a price. The dual use of the touch screen to provide content and receive user commands, while flexible for the user, may obfuscate the display and cause visual clutter, thereby leading to user frustration and loss of productivity.

[0003] The small form factor of handheld computing devices requires a careful balancing between the displayed graphics and the area provided for receiving inputs. On the one hand, the small display constrains the display space, which may increase the difficulty of interpreting actions or results. On the other, a virtual keypad or other user interface scheme is superimposed on or positioned adjacent to an executing application, requiring the application to be squeezed into an even smaller portion of the display.

[0004] This balancing act is particularly difficult for single display touch screen devices. Single display touch screen devices are crippled by their limited screen space. When users are entering information into the device, through the single display, the ability to interpret information in the display can be severely hampered, particularly when a complex interaction between display and interface is required.

SUMMARY

[0005] There is a need for a dual multi-display handheld computing device that provides for enhanced power and/or versatility compared to conventional single display handheld computing devices. These and other needs are addressed by the various aspects, embodiments, and/or configurations of the present disclosure. Also, while the disclosure is presented in terms of exemplary embodiments, it should be appreciated that individual aspects of the disclosure can be separately claimed.

[0006] Traditional dual display devices have the capability to display messages, alerts, and other annunciations on a single screen. When these devices are oriented in a portrait mode, this results in very small areas dedicated for annunciations. Therefore, the icons which may represent annunciations, as well as the actual annunciations themselves when displayed are difficult for a user to see due to their small size. For annunciations that display an abbreviated message or notification, these annunciations can be provided in very cryptic and otherwise user unfriendly formats. Therefore, annunciations can be easily missed or misinterpreted by the user.

[0007] In accordance with the present invention, an annunciator display or window is provided that spans across both the primary and secondary screens. Because of the increase in size of the annunciator window, annunciations are better displayed. Further, messages or alerts received through the annunciator window do not have to be abbreviated, as the expanded annunciator window acts as one continuous display surface across both of the primary and secondary screens. This improved annunciation capability does not sacrifice the overall display capability of the primary and secondary screens, since the annunciator window can be conveniently located along a selected edge of the primary and secondary screens, such as the upper or lower portions which typically do not have critical application or desktop information displayed in these areas.

[0008] In one aspect of the invention, it may include a method of displaying information on a multi-screen device including a plurality of desktops and/or applications each having at least one window, and an annunciator window, the method comprising: (i) receiving a first input that represents an instruction to reveal one of a desktop or application on a first screen of the multi-screen device and selecting a first desktop or application to display on the first screen; (ii) receiving a second input that represents an instruction to reveal one of a desktop or application on a second screen of the multi-screen device and selecting a second desktop or application to

display on the second screen; (iii) displaying the selected first and second desktops or applications on the first and second screens; (iv) displaying a pre-configured annunciator window having information therein showing at least one of a device status, a connectivity status, and a messaging status; (v) configuring the annunciator window to extend across both said first and second screens; (vi) modifying the display of the annunciator window in response to a changed state of at least one of said device status, a connectivity status, and messaging status; and wherein the modified display of the annunciator window displays information selectively across substantially all or part of said annunciator window.

[0009] In another aspect of the invention, it may include a non-transitory computer-readable medium having stored thereon instructions that cause a computing system to execute a method, the instructions comprising: (i) instructions configured to receive a first predetermined input that represents an instruction to determine and reveal a first desktop or application on a first screen of the multi-screen device; (ii) instructions configured to receive a second predetermined input that represents an instruction to determine and reveal a second desktop or application on a second screen of the multi-screen device; (iii) instructions configured to respond to the first and second predetermined inputs with outputs that cause the first desktop or application to be displayed on the first screen and cause the second desktop or application to be displayed on the second screen (iv) instructions configured to receive a third predetermined input that represents an instruction to display a pre-configured annunciator window having information therein showing at least one of a device status, a connectivity status, and a messaging status; and (v) instructions configured to respond to the third predetermined input with an output that causes the annunciator window to be displayed in a configuration extending across both of said first and second screens.

[0010] In yet another aspect of the invention, it may include a multi-screen user device comprising: (i) a first screen including a first display area; (ii) a second screen including a second display area; (iii) a first user input gesture area of the first screen; (iv) a second user input gesture area of the second screen, wherein the first and second user input gesture areas are configured to accept input from a user; (v) an annunciator display extending across said first and second display areas of said first and second screens for displaying at least one of a device status, a connectivity status, and a messaging status; (vi) a computer-readable medium having instructions stored thereon that include: (1) a first set of instructions configured to determine a number and identity of desktops or applications selected to be run by a user; and (2) a second set of

instructions configured to determine information to be displayed in said annunciator display based on selected user gestures and respective states of said device status, a connectivity status, and a messaging status;

[0011] The present disclosure can provide a number of advantages depending on the particular aspect, embodiment, and/or configuration. These and other advantages will be apparent from the disclosure.

[0012] The phrases "at least one", "one or more", and "and/or" are open-ended expressions that are both conjunctive and disjunctive in operation. For example, each of the expressions "at least one of A, B and C", "at least one of A, B, or C", "one or more of A, B, and C", "one or more of A, B, or C" and "A, B, and/or C" means A alone, B alone, C alone, A and B together, A and C together, B and C together, or A, B and C together.

[0013] The term "a" or "an" entity refers to one or more of that entity. As such, the terms "a" (or "an"), "one or more" and "at least one" can be used interchangeably herein. It is also to be noted that the terms "comprising", "including", and "having" can be used interchangeably.

[0014] The term "automatic" and variations thereof, as used herein, refers to any process or operation done without material human input when the process or operation is performed. However, a process or operation can be automatic, even though performance of the process or operation uses material or immaterial human input, if the input is received before performance of the process or operation. Human input is deemed to be material if such input influences how the process or operation will be performed. Human input that consents to the performance of the process or operation is not deemed to be "material".

[0015] The term "computer-readable medium" as used herein refers to any tangible storage and/or transmission medium that participate in providing instructions to a processor for execution. Such a medium may take many forms, including but not limited to, non-volatile media, volatile media, and transmission media. Non-volatile media includes, for example, NVRAM, or magnetic or optical disks. Volatile media includes dynamic memory, such as main memory. Common forms of computer-readable media include, for example, a floppy disk, a flexible disk, hard disk, magnetic tape, or any other magnetic medium, magneto-optical medium, a CD-ROM, any other optical medium, punch cards, paper tape, any other physical medium with patterns of holes, a RAM, a PROM, and EPROM, a FLASH-EPROM, a solid state medium like a memory card, any other memory chip or cartridge, a carrier wave as described hereinafter, or

any other medium from which a computer can read. A digital file attachment to e-mail or other self-contained information archive or set of archives is considered a distribution medium equivalent to a tangible storage medium. When the computer-readable media is configured as a database, it is to be understood that the database may be any type of database, such as relational, hierarchical, object-oriented, and/or the like. Accordingly, the disclosure is considered to include a tangible storage medium or distribution medium and prior art-recognized equivalents and successor media, in which the software implementations of the present disclosure are stored.

[0016] The term "desktop" refers to a metaphor used to portray systems. A desktop is generally considered a "surface" that typically includes pictures, called icons, widgets, folders, etc. that can activate show applications, windows, cabinets, files, folders, documents, and other graphical items. The icons are generally selectable to initiate a task through user interface interaction to allow a user to execute applications or conduct other operations.

[0017] The term "screen," "touch screen," or "touchscreen" refers to a physical structure that includes one or more hardware components that provide the device with the ability to render a user interface and/or receive user input. A screen can encompass any combination of gesture capture region, a touch sensitive display, and/or a configurable area. The device can have one or more physical screens embedded in the hardware. However a screen may also include an external peripheral device that may be attached and detached from the device. In embodiments, multiple external devices may be attached to the device. Thus, in embodiments, the screen can enable the user to interact with the device by touching areas on the screen and provides information to a user through a display. The touch screen may sense user contact in a number of different ways, such as by a change in an electrical parameter (e.g., resistance or capacitance), acoustic wave variations, infrared radiation proximity detection, light variation detection, and the like. In a resistive touch screen, for example, normally separated conductive and resistive metallic layers in the screen pass an electrical current. When a user touches the screen, the two layers make contact in the contacted location, whereby a change in electrical field is noted and the coordinates of the contacted location calculated. In a capacitive touch screen, a capacitive layer stores electrical charge, which is discharged to the user upon contact with the touch screen, causing a decrease in the charge of the capacitive layer. The decrease is measured, and the contacted location coordinates determined. In a surface acoustic wave touch screen, an acoustic wave is transmitted through the screen, and the acoustic wave is disturbed by user contact. A

receiving transducer detects the user contact instance and determines the contacted location coordinates.

[0018] The term "display" refers to a portion of one or more screens used to display the output of a computer to a user. A display may be a single-screen display or a multi-screen display, referred to as a composite display. A composite display can encompass the touch sensitive display of one or more screens. A single physical screen can include multiple displays that are managed as separate logical displays. Thus, different content can be displayed on the separate displays although part of the same physical screen.

[0019] The term "displayed image" refers to an image produced on the display. A typical displayed image is a window or desktop. The displayed image may occupy all or a portion of the display.

[0020] The term "display orientation" refers to the way in which a rectangular display is oriented by a user for viewing. The two most common types of display orientation are portrait and landscape. In landscape mode, the display is oriented such that the width of the display is greater than the height of the display (such as a 4:3 ratio, which is 4 units wide and 3 units tall, or a 16:9 ratio, which is 16 units wide and 9 units tall). Stated differently, the longer dimension of the display is oriented substantially horizontal in landscape mode while the shorter dimension of the display is oriented substantially vertical. In the portrait mode, by contrast, the display is oriented such that the width of the display is less than the height of the display. Stated differently, the shorter dimension of the display is oriented substantially horizontal in the portrait mode while the longer dimension of the display is oriented substantially vertical.

[0021] The term "composited display" refers to a logical structure that defines a display that can encompass one or more screens. A multi-screen display can be associated with a composite display that encompasses all the screens. The composite display can have different display characteristics based on the various orientations of the device.

[0022] The term "gesture" refers to a user action that expresses an intended idea, action, meaning, result, and/or outcome. The user action can include manipulating a device (e.g., opening or closing a device, changing a device orientation, moving a trackball or wheel, etc.), movement of a body part in relation to the device, movement of an implement or tool in relation to the device, audio inputs, etc. A gesture may be made on a device (such as on the screen) or with the device to interact with the device.

[0023] The term "module" as used herein refers to any known or later developed hardware, software, firmware, artificial intelligence, fuzzy logic, or combination of hardware and software that is capable of performing the functionality associated with that element.

[0024] The term "gesture capture" refers to a sense or otherwise a detection of an instance and/or type of user gesture. The gesture capture can occur in one or more areas of the screen, A gesture region can be on the display, where it may be referred to as a touch sensitive display or off the display where it may be referred to as a gesture capture area.

[0025] A "multi-screen application" refers to an application that is capable of multiple modes. The multi-screen application mode can include, but is not limited to, a single screen mode (where the application is displayed on a single screen) or a composite display mode (where the application is displayed on two or more screens). A multi-screen application can have different layouts optimized for the mode. Thus, the multi-screen application can have different layouts for a single screen or for a composite display that can encompass two or more screens. The different layouts may have different screen/display dimensions and/or configurations on which the user interfaces of the multi-screen applications can be rendered. The different layouts allow the application to optimize the application's user interface for the type of display, *e.g.,* single screen or multiple screens. In single screen mode, the multi-screen application may present one window pane of information. In a composite display mode, the multi-screen application may present multiple window panes of information or may provide a larger and a richer presentation because there is more space for the display contents. The multi-screen applications may be designed to adapt dynamically to changes in the device and the mode depending on which display (single or composite) the system assigns to the multi-screen application. In alternative embodiments, the user can use a gesture to request the application transition to a different mode, and, if a display is available for the requested mode, the device can allow the application to move to that display and transition modes.

[0026] A "single-screen application" refers to an application that is capable of single screen mode. Thus, the single-screen application can produce only one window and may not be capable of different modes or different display dimensions. A single-screen application is incapable of the several modes discussed with the multi-screen application.

[0027] The term "window" refers to a typically rectangular, displayed image on at least part of a display that contains or provides content different from the rest of the screen. The window may obscure the desktop.

[0028] The terms "determine", "calculate" and "compute," and variations thereof, as used herein, are used interchangeably and include any type of methodology, process, mathematical operation or technique.

[0029] It shall be understood that the term "means" as used herein shall be given its broadest possible interpretation in accordance with 35 U.S.C., Section 112, Paragraph 6. Accordingly, a claim incorporating the term "means" shall cover all structures, materials, or acts set forth herein, and all of the equivalents thereof. Further, the structures, materials or acts and the equivalents thereof shall include all those described in the summary of the invention, brief description of the drawings, detailed description, abstract, and claims themselves.

[0030] The preceding is a simplified summary of the disclosure to provide an understanding of some aspects of the disclosure. This summary is neither an extensive nor exhaustive overview of the disclosure and its various aspects, embodiments, and/or configurations. It is intended neither to identify key or critical elements of the disclosure nor to delineate the scope of the disclosure but to present selected concepts of the disclosure in a simplified form as an introduction to the more detailed description presented below. As will be appreciated, other aspects, embodiments, and/or configurations of the disclosure are possible utilizing, alone or in combination, one or more of the features set forth above or described in detail below.

BRIEF DESCRIPTION OF THE DRAWINGS

[0031] FIG. 1A includes a first view of an embodiment of a multi-screen user device;

[0032] FIG. 1B includes a second view of an embodiment of a multi-screen user device;

[0033] FIG. 1C includes a third view of an embodiment of a multi-screen user device;

[0034] FIG. 1D includes a fourth view of an embodiment of a multi-screen user device;

[0035] FIG. 1E includes a fifth view of an embodiment of a multi-screen user device;

[0036] FIG. 1F includes a sixth view of an embodiment of a multi-screen user device;

[0037] FIG. 1G includes a seventh view of an embodiment of a multi-screen user device;

[0038] FIG. 1H includes a eighth view of an embodiment of a multi-screen user device;

[0039] FIG. 1I includes a ninth view of an embodiment of a multi-screen user device;

[0040] FIG. 1J includes a tenth view of an embodiment of a multi-screen user device;

[0041] FIG. 2 is a block diagram of an embodiment of the hardware of the device;

[0042] FIG. 3A is a block diagram of an embodiment of the state model for the device based on the device's orientation and/or configuration;

[0043] FIG. 3B is a table of an embodiment of the state model for the device based on the device's orientation and/or configuration;

[0044] FIG. 4A is a first representation of an embodiment of user gesture received at a device;

[0045] FIG. 4B is a second representation of an embodiment of user gesture received at a device;

[0046] FIG. 4C is a third representation of an embodiment of user gesture received at a device;

[0047] FIG. 4D is a fourth representation of an embodiment of user gesture received at a device;

[0048] FIG. 4E is a fifth representation of an embodiment of user gesture received at a device;

[0049] FIG. 4F is a sixth representation of an embodiment of user gesture received at a device;

[0050] FIG. 4G is a seventh representation of an embodiment of user gesture received at a device;

[0051] FIG. 4H is a eighth representation of an embodiment of user gesture received at a device;

[0052] FIG. 5A is a block diagram of an embodiment of the device software and/or firmware;

[0053] FIG. 5B is a second block diagram of an embodiment of the device software and/or firmware;

[0054] FIG. 6A is a first representation of an embodiment of a device configuration generated in response to the device state;

[0055] FIG. 6B is a second representation of an embodiment of a device configuration generated in response to the device state;

[0056] FIG. 6C is a third representation of an embodiment of a device configuration generated in response to the device state;

[0057] FIG. 6D is a fourth representation of an embodiment of a device configuration generated in response to the device state;

[0058] FIG. 6E is a fifth representation of an embodiment of a device configuration generated in response to the device state;

[0059] FIG. 6F is a sixth representation of an embodiment of a device configuration generated in response to the device state;

[0060] FIG. 6G is a seventh representation of an embodiment of a device configuration generated in response to the device state;

[0061] FIG. 6H is a eighth representation of an embodiment of a device configuration generated in response to the device state;

[0062] FIG. 6I is a ninth representation of an embodiment of a device configuration generated in response to the device state;

[0063] FIG. 6J is a tenth representation of an embodiment of a device configuration generated in response to the device state;

[0064] FIG. 7 is a first representation of a preferred embodiment showing a device incorporating an annunciator window or display, and an enlarged exploded view of the annunciator window disposed above the device; and

[0065] FIG. 8 is another representation of the embodiment shown in FIG. 7 illustrating the annunciator window displaying an alarm or message.

[0066] In the appended figures, similar components and/or features may have the same reference label. Further, various components of the same type may be distinguished by following the reference label by a letter that distinguishes among the similar components. If only the first reference label is used in the specification, the description is applicable to any one of the similar components having the same first reference label irrespective of the second reference label.

DETAILED DESCRIPTION

[0067] Presented herein are embodiments of a device. The device can be a communications device, such as a cellular telephone, or other smart device. The device can include two screens that are oriented to provide several unique display configurations. Further, the device can receive user input in unique ways. The overall design and functionality of the device provides for an enhanced user experience making the device more useful and more efficient.

[0068] Mechanical Features:

[0069] Figs. 1A-1J illustrate a device 100 in accordance with embodiments of the present disclosure. As described in greater detail below, device 100 can be positioned in a number of different ways each of which provides different functionality to a user. The device 100 is a

multi-screen device that includes a primary screen 104 and a secondary screen 108, both of which are touch sensitive. In embodiments, the entire front surface of screens 104 and 108 may be touch sensitive and capable of receiving input by a user touching the front surface of the screens 104 and 108. Primary screen 104 includes touch sensitive display 110, which, in addition to being touch sensitive, also displays information to a user. Secondary screen 108 includes touch sensitive display 114, which also displays information to a user. In other embodiments, screens 104 and 108 may include more than one display area.

[0070] Primary screen 104 also includes a configurable area 112 that has been configured for specific inputs when the user touches portions of the configurable area 112. Secondary screen 108 also includes a configurable area 116 that has been configured for specific inputs. Areas 112a and 116a have been configured to receive a "back" input indicating that a user would like to view information previously displayed. Areas 112b and 116b have been configured to receive a "menu" input indicating that the user would like to view options from a menu. Areas 112c and 116c have been configured to receive a "home" input indicating that the user would like to view information associated with a "home" view. In other embodiments, areas 112a-c and 116a-c may be configured, in addition to the configurations described above, for other types of specific inputs including controlling features of device 100, some non-limiting examples including adjusting overall system power, adjusting the volume, adjusting the brightness, adjusting the vibration, selecting of displayed items (on either of screen 104 or 108), operating a camera, operating a microphone, and initiating/terminating of telephone calls. Also, in some embodiments, areas 112a-C and 116a-C may be configured for specific inputs depending upon the application running on device 100 and/or information displayed on touch sensitive displays 110 and/or 114.

[0071] In addition to touch sensing, primary screen 104 and secondary screen 108 may also include areas that receive input from a user without requiring the user to touch the display area of the screen. For example, primary screen 104 includes gesture capture area 120, and secondary screen 108 includes gesture capture area 124. These areas are able to receive input by recognizing gestures made by a user without the need for the user to actually touch the surface of the display area. In comparison to touch sensitive displays 110 and 114, the gesture capture areas 120 and 124 are commonly not capable of rendering a displayed image.

[0072] The two screens 104 and 108 are connected together with a hinge 128, shown clearly in Fig. 1C (illustrating a back view of device 100). Hinge 128, in the embodiment shown in Figs. 1A-1J, is a center hinge that connects screens 104 and 108 so that when the hinge is closed, screens 104 and 108 are juxtaposed (i.e., side-by-side) as shown in Fig. 1B (illustrating a front view of device 100). Hinge 128 can be opened to position the two screens 104 and 108 in different relative positions to each other. As described in greater detail below, the device 100 may have different functionalities depending on the relative positions of screens 104 and 108.

[0073] Fig. 1D illustrates the right side of device 100. As shown in Fig. 1D, secondary screen 108 also includes a card slot 132 and a port 136 on its side. Card slot 132 in embodiments, accommodates different types of cards including a subscriber identity module (SIM). Port 136 in embodiments is an input/output port (I/O port) that allows device 100 to be connected to other peripheral devices, such as a display, keyboard, or printing device. As can be appreciated, these are merely some examples and in other embodiments device 100 may include other slots and ports such as slots and ports for accommodating additional memory devices and/or for connecting other peripheral devices. Also shown in Fig. 1D is an audio jack 140 that accommodates a tip, ring, sleeve (TRS) connector for example to allow a user to utilize headphones or a headset.

[0074] Device 100 also includes a number of buttons 158. For example, Fig. 1E illustrates the left side of device 100. As shown in Fig. 1E, the side of primary screen 104 includes three buttons 144, 148, and 152, which can be configured for specific inputs. For example, buttons 144, 148, and 152 may be configured to, in combination or alone, control a number of aspects of device 100. Some non-limiting examples include overall system power, volume, brightness, vibration, selection of displayed items (on either of screen 104 or 108), a camera, a microphone, and initiation/termination of telephone calls. In some embodiments, instead of separate buttons two buttons may be combined into a rocker button. This arrangement is useful in situations where the buttons are configured to control features such as volume or brightness. In addition to buttons 144, 148, and 152, device 100 also includes a button 156, shown in Fig. 1F, which illustrates the top of device 100. In one embodiment, button 156 is configured as an on/off button used to control overall system power to device 100. In other embodiments, button 156 is configured to, in addition to or in lieu of controlling system power, control other aspects of device 100. In some embodiments, one or more of the buttons 144, 148, 152, and 156 are

capable of supporting different user commands. By way of example, a normal press has a duration commonly of less than about 1 second and resembles a quick tap. A medium press has a duration commonly of 1 second or more but less than about 12 seconds. A long press has a duration commonly of about 12 seconds or more. The function of the buttons is normally specific to the application that is currently in focus on the respective display 110 and 114. In a telephone application for instance and depending on the particular button, a normal, medium, or long press can mean end call, increase in call volume, decrease in call volume, and toggle microphone mute. In a camera or video application for instance and depending on the particular button, a normal, medium, or long press can mean increase zoom, decrease zoom, and take photograph or record video.

[0075] There are also a number of hardware components within device 100. As illustrated in Fig. 1C, device 100 includes a speaker 160 and a microphone 164. Device 100 also includes a camera 168 (Fig. 1B). Additionally, device 100 includes two position sensors 172A and 172B, which are used to determine the relative positions of screens 104 and 108. In one embodiment, position sensors 172A and 172B are Hall effect sensors. However, in other embodiments other sensors can be used in addition to or in lieu of the Hall effect sensors. An accelerometer 176 may also be included as part of device 100 to determine the orientation of the device 100 and/or the orientation of screens 104 and 108. Additional internal hardware components that may be included in device 100 are described below with respect to Fig. 2.

[0076] The overall design of device 100 allows it to provide additional functionality not available in other communication devices. Some of the functionality is based on the various positions and orientations that device 100 can have. As shown in Figs. 1B-1G, device 100 can be operated in an "open" position where screens 104 and 108 are juxtaposed. This position allows a large display area for displaying information to a user. When position sensors 172A and 172B determine that device 100 is in the open position, they can generate a signal that can be used to trigger different events such as displaying information on both screens 104 and 108. Additional events may be triggered if accelerometer 176 determines that device 100 is in a portrait position (Fig. 1B) as opposed to a landscape position (not shown).

[0077] In addition to the open position, device 100 may also have a "closed" position illustrated in Fig. 1H. Again, position sensors 172A and 172B can generate a signal indicating that device 100 is in the "closed" position. This can trigger an event that results in a change of

displayed information on screen 104 and/or 108. For example, device 100 may be programmed to stop displaying information on one of the screens, e.g., screen 108, since a user can only view one screen at a time when device 100 is in the "closed" position. In other embodiments, the signal generated by position sensors 172A and 172B, indicating that the device 100 is in the "closed" position, can trigger device 100 to answer an incoming telephone call. The "closed" position can also be a preferred position for utilizing the device 100 as a mobile phone.

[0078] Device 100 can also be used in an "easel" position which is illustrated in Fig. 1I. In the "easel" position, screens 104 and 108 are angled with respect to each other and facing outward with the edges of screens 104 and 108 substantially horizontal. In this position, device 100 can be configured to display information on both screens 104 and 108 to allow two users to simultaneously interact with device 100. When device 100 is in the "easel" position, sensors 172A and 172B generate a signal indicating that the screens 104 and 108 are positioned at an angle to each other, and the accelerometer 176 can generate a signal indicating that device 100 has been placed so that the edge of screens 104 and 108 are substantially horizontal. The signals can then be used in combination to generate events that trigger changes in the display of information on screens 104 and 108.

[0079] Fig. 1J illustrates device 100 in a "modified easel" position. In the "modified easel" position, one of screens 104 or 108 is used as a stand and is faced down on the surface of an object such as a table. This position provides a convenient way for information to be displayed to a user in landscape orientation. Similar to the easel position, when device 100 is in the "modified easel" position, position sensors 172A and 172B generate a signal indicating that the screens 104 and 108 are positioned at an angle to each other. The accelerometer 176 would generate a signal indicating that device 100 has been positioned so that one of screens 104 and 108 is faced downwardly and is substantially horizontal. The signals can then be used to generate events that trigger changes in the display of information of screens 104 and 108. For example, information may not be displayed on the screen that is face down since a user cannot see the screen.

[0080] Transitional states are also possible. When the position sensors 172A and B and/or accelerometer indicate that the screens are being closed or folded (from open), a closing transitional state is recognized. Conversely when the position sensors 172A and B indicate that the screens are being opened or folded (from closed), an opening transitional state is recognized.

The closing and opening transitional states are typically time-based, or have a maximum time duration from a sensed starting point. Normally, no user input is possible when one of the closing and opening states is in effect. In this manner, incidental user contact with a screen during the closing or opening function is not misinterpreted as user input. In embodiments, another transitional state is possible when the device 100 is closed. This additional transitional state allows the display to switch from one screen 104 to the second screen 108 when the device 100 is closed based on some user input, e.g., a double tap on the screen 110,114.

[0081] As can be appreciated, the description of device 100 is made for illustrative purposes only, and the embodiments are not limited to the specific mechanical features shown in Figs. 1A-1J and described above. In other embodiments, device 100 may include additional features, including one or more additional buttons, slots, display areas, hinges, and/or locking mechanisms. Additionally, in embodiments, the features described above may be located in different parts of device 100 and still provide similar functionality. Therefore, Figs. 1A-1J and the description provided above are nonlimiting.

[0082] Hardware Features:

[0083] Fig. 2 illustrates components of a device 100 in accordance with embodiments of the present disclosure. In general, the device 100 includes a primary screen 104 and a secondary screen 108. While the primary screen 104 and its components are normally enabled in both the opened and closed positions or states, the secondary screen 108 and its components are normally enabled in the opened state but disabled in the closed state. However, even when in the closed state a user or application triggered interrupt (such as in response to a phone application or camera application operation) can flip the active screen, or disable the primary screen 104 and enable the secondary screen 108, by a suitable command. Each screen 104, 108 can be touch sensitive and can include different operative areas. For example, a first operative area, within each touch sensitive screen 104 and 108, may comprise a touch sensitive display 110, 114. In general, the touch sensitive display 110, 114 may comprise a full color, touch sensitive display. A second area within each touch sensitive screen 104 and 108 may comprise a gesture capture region 120, 124. The gesture capture region 120, 124 may comprise an area or region that is outside of the touch sensitive display 110, 114 area, and that is capable of receiving input, for example in the form of gestures provided by a user. However, the gesture capture region 120, 124 does not include pixels that can perform a display function or capability.

[0084] A third region of the touch sensitive screens 104 and 108 may comprise a configurable area 112, 116. The configurable area 112, 116 is capable of receiving input and has display or limited display capabilities. In embodiments, the configurable area 112, 116 may present different input options to the user. For example, the configurable area 112, 116 may display buttons or other relatable items. Moreover, the identity of displayed buttons, or whether any buttons are displayed at all within the configurable area 112, 116 of a touch sensitive screen 104 or 108, may be determined from the context in which the device 100 is used and/or operated. In an exemplary embodiment, the touch sensitive screens 104 and 108 comprise liquid crystal display devices extending across at least those regions of the touch sensitive screens 104 and 108 that are capable of providing visual output to a user, and a capacitive input matrix over those regions of the touch sensitive screens 104 and 108 that are capable of receiving input from the user.

[0085] One or more display controllers 216a, 216b may be provided for controlling the operation of the touch sensitive screens 104 and 108, including input (touch sensing) and output (display) functions. In the exemplary embodiment illustrated in Fig. 2, a separate touch screen controller 216a or 216b is provided for each touch screen 104 and 108. In accordance with alternate embodiments, a common or shared touch screen controller 216 may be used to control each of the included touch sensitive screens 104 and 108. In accordance with still other embodiments, the functions of a touch screen controller 216 may be incorporated into other components, such as a processor 204.

[0086] The processor 204 may comprise a general purpose programmable processor or controller for executing application programming or instructions. In accordance with at least some embodiments, the processor 204 may include multiple processor cores, and/or implement multiple virtual processors. In accordance with still other embodiments, the processor 204 may include multiple physical processors. As a particular example, the processor 204 may comprise a specially configured application specific integrated circuit (ASIC) or other integrated circuit, a digital signal processor, a controller, a hardwired electronic or logic circuit, a programmable logic device or gate array, a special purpose computer, or the like. The processor 204 generally functions to run programming code or instructions implementing various functions of the device 100.

[0087] A communication device 100 may also include memory 208 for use in connection with the execution of application programming or instructions by the processor 204, and for the temporary or long term storage of program instructions and/or data. As examples, the memory 208 may comprise RAM, DRAM, SDRAM, or other solid state memory. Alternatively or in addition, data storage 212 may be provided. Like the memory 208, the data storage 212 may comprise a solid state memory device or devices. Alternatively or in addition, the data storage 212 may comprise a hard disk drive or other random access memory.

[0088] In support of communications functions or capabilities, the device 100 can include a cellular telephony module 228. As examples, the cellular telephony module 228 can comprise a GSM, CDMA, FDMA and/or analog cellular telephony transceiver capable of supporting voice, multimedia and/or data transfers over a cellular network. Alternatively or in addition, the device 100 can include an additional or other wireless communications module 232. As examples, the other wireless communications module 232 can comprise a Wi-Fi, BLUETOOTH TM, WiMax, infrared, or other wireless communications link. The cellular telephony module 228 and the other wireless communications module 232 can each be associated with a shared or a dedicated antenna 224.

[0089] A port interface 252 may be included. The port interface 252 may include proprietary or universal ports to support the interconnection of the device 100 to other devices or components, such as a dock, which may or may not include additional or different capabilities from those integral to the device 100. In addition to supporting an exchange of communication signals between the device 100 and another device or component, the docking port 136 and/or port interface 252 can support the supply of power to or from the device 100. The port interface 252 also comprises an intelligent element that comprises a docking module for controlling communications or other interactions between the device 100 and a connected device or component.

[0090] An input/output module 248 and associated ports may be included to support communications over wired networks or links, for example with other communication devices, server devices, and/or peripheral devices. Examples of an input/output module 248 include an Ethernet port, a Universal Serial Bus (USB) port, Institute of Electrical and Electronics Engineers (IEEE) 1394, or other interface.

[0091] An audio input/output interface/device(s) 244 can be included to provide analog audio to an interconnected speaker or other device, and to receive analog audio input from a connected microphone or other device. As an example, the audio input/output interface/device(s) 244 may comprise an associated amplifier and analog to digital converter. Alternatively or in addition, the device 100 can include an integrated audio input/output device 256 and/or an audio jack for interconnecting an external speaker or microphone. For example, an integrated speaker and an integrated microphone can be provided, to support near talk or speaker phone operations.

[0092] Hardware buttons 158 can be included for example for use in connection with certain control operations. Examples include a master power switch, volume control, etc., as described in conjunction with Figs. 1A through 1J. One or more image capture interfaces/devices 240, such as a camera, can be included for capturing still and/or video images. Alternatively or in addition, an image capture interface/device 240 can include a scanner or code reader. An image capture interface/device 240 can include or be associated with additional elements, such as a flash or other light source.

[0093] The device 100 can also include a global positioning system (GPS) receiver 236. In accordance with embodiments of the present invention, the GPS receiver 236 may further comprise a GPS module that is capable of providing absolute location information to other components of the device 100. An accelerometer(s) 176 may also be included. For example, in connection with the display of information to a user and/or other functions, a signal from the accelerometer 176 can be used to determine an orientation and/or format in which to display that information to the user.

[0094] Embodiments of the present invention can also include one or more position sensor(s) 172. The position sensor 172 can provide a signal indicating the position of the touch sensitive screens 104 and 108 relative to one another. This information can be provided as an input, for example to a user interface application, to determine an operating mode, characteristics of the touch sensitive displays 110, 114, and/or other device 100 operations. As examples, a screen position sensor 172 can comprise a series of Hall effect sensors, a multiple position switch, an optical switch, a Wheatstone bridge, a potentiometer, or other arrangement capable of providing a signal indicating of multiple relative positions the touch screens are in.

[0095] Communications between various components of the device 100 can be carried by one or more buses 222. In addition, power can be supplied to the components of the device 100 from

a power source and/or power control module 260. The power control module 260 can, for example, include a battery, an AC to DC converter, power control logic, and/or ports for interconnecting the device 100 to an external source of power.

[0096] Device State:

[0097] Figs. 3A and 3B represent illustrative states of device 100. While a number of illustrative states are shown, and transitions from a first state to a second state, it is to be appreciated that the illustrative state diagram may not encompass all possible states and/or all possible transitions from a first state to a second state. As illustrated in Fig. 3, the various arrows between the states (illustrated by the state represented in the circle) represent a physical change that occurs to the device 100, that is detected by one or more of hardware and software, the detection triggering one or more of a hardware and/or software interrupt that is used to control and/or manage one or more functions of device 100.

[0098] As illustrated in Fig. 3A, there are twelve exemplary "physical" states: closed 304, transition 308 (or opening transitional state), easel 312, modified easel 316, open 320, inbound/outbound call or communication 324, image/video capture 328, transition 332 (or closing transitional state), landscape 340, docked 336, docked 344 and landscape 348. Next to each illustrative state is a representation of the physical state of the device 100 with the exception of states 324 and 328, where the state is generally symbolized by the international icon for a telephone and the icon for a camera, respectfully.

[0099] In state 304, the device is in a closed state with the device 100 generally oriented in the portrait direction with the primary screen 104 and the secondary screen 108 back-to-back in different planes (see Fig. 1H). From the closed state, the device 100 can enter, for example, docked state 336, where the device 100 is coupled with a docking station, docking cable, or in general docked or associated with one or more other devices or peripherals, or the landscape state 340, where the device 100 is generally oriented with the primary screen 104 facing the user, and the primary screen 104 and the secondary screen 108 being back-to-back.

[00100] In the closed state, the device can also move to a transitional state where the device remains closed but the display is moved from one screen 104 to another screen 108 based on a user input, e.g., a double tap on the screen 110, 114. Still another embodiment includes a bilateral state. In the bilateral state, the device remains closed, but a single application displays at least one window on both the first display 110 and the second display 114. The windows

shown on the first and second display 110, 114 may be the same or different based on the application and the state of that application. For example, while acquiring an image with a camera, the device may display the view finder on the first display 110 and displays a preview for the photo subjects (full screen and mirrored left-to-right) on the second display 114.

[00101] In state 308, a transition state from the closed state 304 to the semi-open state or easel state 312, the device 100 is shown opening with the primary screen 104 and the secondary screen 108 being rotated around a point of axis coincidence with the hinge. Upon entering the easel state 312, the primary screen 104 and the secondary screen 108 are separated from one another such that, for example, the device 100 can sit in an easel-like configuration on a surface.

[0100] In state 316, known as the modified easel position, the device 100 has the primary screen 104 and the secondary screen 108 in a similar relative relationship to one another as in the easel state 312, with the difference being one of the primary screen 104 or the secondary screen 108 are placed on a surface as shown.

[0101] State 320 is the open state where the primary screen 104 and the secondary screen 108 are generally on the same plane. From the open state, the device 100 can transition to the docked state 344 or the open landscape state 348. In the open state 320, the primary screen 104 and the secondary screen 108 are generally in the portrait-like orientation while in landscaped state 348 the primary screen 104 and the secondary screen 108 are generally in a landscape-like orientation.

[0102] State 324 is illustrative of a communication state, such as when an inbound or outbound call is being received or placed, respectively, by the device 100. While not illustrated for clarity, it should be appreciated the device 100 can transition to the inbound/outbound call state 324 from any state illustrated in Fig. 3. In a similar manner, the image/video capture state 328 can be entered into from any other state in Fig. 3, with the image/video capture state 328 allowing the device 100 to take one or more images via a camera and/or videos with a video capture device 240.

[0103] Transition state 322 illustratively shows primary screen 104 and the secondary screen 108 being closed upon one another for entry into, for example, the closed state 304.

[0104] Fig. 3B illustrates, with reference to the key, the inputs that are received to detect a transition from a first state to a second state. In Fig. 3B, various combinations of states are shown with in general, a portion of the columns being directed toward a portrait state 352, a

landscape state 356, and a portion of the rows being directed to portrait state 360 and landscape state 364.

[0105] In Fig. 3B, the Key indicates that "H" represents an input from one or more Hall Effect sensors, "A" represents an input from one or more accelerometers, "T" represents an input from a timer, "P" represents a communications trigger input and "I" represents an image and/or video capture request input. Thus, in the center portion 376 of the chart, an input, or combination of inputs, are shown that represent how the device 100 detects a transition from a first physical state to a second physical state.

[0106] As discussed, in the center portion of the chart 376, the inputs that are received enable the detection of a transition from, for example, a portrait open state to a landscape easel state - shown in bold – "HAT." For this exemplary transition from the portrait open to the landscape easel state, a Hall Effect sensor ("H"), an accelerometer ("A") and a timer ("T") input may be needed. The timer input can be derived from, for example, a clock associated with the processor.

[0107] In addition to the portrait and landscape states, a docked state 368 is also shown that is triggered based on the receipt of a docking signal 372. As discussed above and in relation to Fig. 3, the docking signal can be triggered by the association of the device 100 with one or more other device 100s, accessories, peripherals, smart docks, or the like.

[0108] User Interaction:

[0109] Figs. 4A through 4H depict various graphical representations of gesture inputs that may be recognized by the screens 104, 108. The gestures may be performed not only by a user's body part, such as a digit, but also by other devices, such as a stylus, that may be sensed by the contact sensing portion(s) of a screen 104, 108. In general, gestures are interpreted differently, based on where the gestures are performed (either directly on the display 110, 114 or in the gesture capture region 120, 124). For example, gestures in the display 110,114 may be directed to a desktop or application, and gestures in the gesture capture region 120, 124 may be interpreted as for the system.

[0110] With reference to Figs. 4A-4H, a first type of gesture, a touch gesture 420, is substantially stationary on the screen 104,108 for a selected length of time. A circle 428 represents a touch or other contact type received at particular location of a contact sensing portion of the screen. The circle 428 may include a border 432, the thickness of which indicates a length of time that the contact is held substantially stationary at the contact location. For

instance, a tap 420 (or short press) has a thinner border 432a than the border 432b for a long press 424 (or for a normal press). The long press 424 may involve a contact that remains substantially stationary on the screen for longer time period than that of a tap 420. As will be appreciated, differently defined gestures may be registered depending upon the length of time that the touch remains stationary prior to contact cessation or movement on the screen.

[0111] With reference to Fig. 4C, a drag gesture 400 on the screen 104,108 is an initial contact (represented by circle 428) with contact movement 436 in a selected direction. The initial contact 428 may remain stationary on the screen 104,108 for a certain amount of time represented by the border 432. The drag gesture typically requires the user to contact an icon, window, or other displayed image at a first location followed by movement of the contact in a drag direction to a new second location desired for the selected displayed image. The contact movement need not be in a straight line but have any path of movement so long as the contact is substantially continuous from the first to the second locations.

[0112] With reference to Fig. 4D, a flick gesture 404 on the screen 104,108 is an initial contact (represented by circle 428) with truncated contact movement 436 (relative to a drag gesture) in a selected direction. In embodiments, a flick has a higher exit velocity for the last movement in the gesture compared to the drag gesture. The flick gesture can, for instance, be a finger snap following initial contact. Compared to a drag gesture, a flick gesture generally does not require continual contact with the screen 104,108 from the first location of a displayed image to a predetermined second location. The contacted displayed image is moved by the flick gesture in the direction of the flick gesture to the predetermined second location. Although both gestures commonly can move a displayed image from a first location to a second location, the temporal duration and distance of travel of the contact on the screen is generally less for a flick than for a drag gesture.

[0113] With reference to Fig. 4E, a pinch gesture 408 on the screen 104,108 is depicted. The pinch gesture 408 may be initiated by a first contact 428 to the screen 104,108 by, for example, a first digit and a second contact 428b to the screen 104,108 by, for example, a second digit. The first and second contacts 428a,b may be detected by a common contact sensing portion of a common screen 104,108, by different contact sensing portions of a common screen 104 or108, or by different contact sensing portions of different screens. The first contact 428a is held for a first amount of time, as represented by the border 432a, and the second contact 428b is held for a

second amount of time, as represented by the border 432b. The first and second amounts of time are generally substantially the same, and the first and second contacts 428 a, b generally occur substantially simultaneously. The first and second contacts 428 a, b generally also include corresponding first and second contact movements 436 a, b, respectively. The first and second contact movements 436 a, b are generally in opposing directions. Stated another way, the first contact movement 436a is towards the second contact 436b, and the second contact movement 436b is towards the first contact 436a. More simply stated, the pinch gesture 408 may be accomplished by a user's digits touching the screen 104,108 in a pinching motion.

[0114] With reference to Fig. 4F, a spread gesture 410 on the screen 104,108 is depicted. The spread gesture 410 may be initiated by a first contact 428a to the screen 104,108 by, for example, a first digit and a second contact 428b to the screen 104,108 by, for example, a second digit. The first and second contacts 428a,b may be detected by a common contact sensing portion of a common screen 104,108, by different contact sensing portions of a common screen 104,108, or by different contact sensing portions of different screens. The first contact 428a is held for a first amount of time, as represented by the border 432a, and the second contact 428b is held for a second amount of time, as represented by the border 432b. The first and second amounts of time are generally substantially the same, and the first and second contacts 428 a, b generally occur substantially simultaneously. The first and second contacts 428 a, b generally also include corresponding first and second contact movements 436a, b, respectively. The first and second contact movements 436 a, b are generally in a common direction. Stated another way, the first and second contact movements 436 a, b are away from the first and second contacts 428a, b. More simply stated, the spread gesture 410 may be accomplished by a user's digits touching the screen 104,108 in a spreading motion.

[0115] The above gestures may be combined in any manner, such as those shown by Figs. 4G and 4H, to produce a determined functional result. For example, in Fig. 4G a tap gesture 420 is combined with a drag or flick gesture 412 in a direction away from the tap gesture 420. In Fig. 4H, a tap gesture 420 is combined with a drag or flick gesture 412 in a direction towards the tap gesture 420.

[0116] The functional result of receiving a gesture can vary depending on a number of factors, including a state of the device 100, display 110, 114, or screen 104, 108, a context associated with the gesture, or sensed location of the gesture. The state of the device commonly refers to

one or more of a configuration of the device 100, a display orientation, and user and other inputs received by the device 100. Context commonly refers to one or more of the particular application(s) selected by the gesture and the portion(s) of the application currently executing, whether the application is a single- or multi-screen application, and whether the application is a multi-screen application displaying one or more windows in one or more screens or in one or more stacks. Sensed location of the gesture commonly refers to whether the sensed set(s) of gesture location coordinates are on a touch sensitive display 110, 114 or a gesture capture region 120, 124, whether the sensed set(s) of gesture location coordinates are associated with a common or different display or screen 104,108, and/or what portion of the gesture capture region contains the sensed set(s) of gesture location coordinates.

[0117] A tap, when received by an a touch sensitive display 110, 114, can be used, for instance, to select an icon to initiate or terminate execution of a corresponding application, to maximize or minimize a window, to reorder windows in a stack, and to provide user input such as by keyboard display or other displayed image. A drag, when received by a touch sensitive display 110, 114, can be used, for instance, to relocate an icon or window to a desired location within a display, to reorder a stack on a display, or to span both displays (such that the selected window occupies a portion of each display simultaneously). A flick, when received by a touch sensitive display 110, 114 or a gesture capture region 120, 124, can be used to relocate a window from a first display to a second display or to span both displays (such that the selected window occupies a portion of each display simultaneously). Unlike the drag gesture, however, the flick gesture is generally not used to move the displayed image to a specific user-selected location but to a default location that is not configurable by the user.

[0118] The pinch gesture, when received by a touch sensitive display 110, 114 or a gesture capture region 120, 124, can be used to minimize or otherwise increase the displayed area or size of a window (typically when received entirely by a common display), to switch windows displayed at the top of the stack on each display to the top of the stack of the other display (typically when received by different displays or screens), or to display an application manager (a "pop-up window" that displays the windows in the stack). The spread gesture, when received by a touch sensitive display 110, 114 or a gesture capture region 120, 124, can be used to maximize or otherwise decrease the displayed area or size of a window, to switch windows displayed at the top of the stack on each display to the top of the stack of the other display

(typically when received by different displays or screens), or to display an application manager (typically when received by an off-screen gesture capture region on the same or different screens).

[0119] The combined gestures of Fig. 4G, when received by a common display capture region in a common display or screen 104,108, can be used to hold a first window stack location in a first stack constant for a display receiving the gesture while reordering a second window stack location in a second window stack to include a window in the display receiving the gesture. The combined gestures of Fig. 4H, when received by different display capture regions in a common display or screen 104,108 or in different displays or screens, can be used to hold a first window stack location in a first window stack constant for a display receiving the tap part of the gesture while reordering a second window stack location in a second window stack to include a window in the display receiving the flick or drag gesture. Although specific gestures and gesture capture regions in the preceding examples have been associated with corresponding sets of functional results, it is to be appreciated that these associations can be redefined in any manner to produce differing associations between gestures and/or gesture capture regions and/or functional results.

[0120] Firmware and Software:

[0121] The memory 508 may store and the processor 504 may execute one or more software components. These components can include at least one operating system (OS) 516, an application manager 562, a desktop 566, and/or one or more applications 564a and/or 564b from an application store 560. The OS 516 can include a framework 520, one or more frame buffers 548, one or more drivers 512, previously described in conjunction with Fig. 2, and/or a kernel 518. The OS 516 can be any software, consisting of programs and data, which manages computer hardware resources and provides common services for the execution of various applications 564. The OS 516 can be any operating system and, at least in some embodiments, dedicated to mobile devices, including, but not limited to, Linux, ANDROID TM, iPhone OS (IOS TM), WINDOWS PHONE 7 TM, etc. The OS 516 is operable to provide functionality to the phone by executing one or more operations, as described herein.

[0122] The applications 564 can be any higher level software that executes particular functionality for the user. Applications 564 can include programs such as email clients, web browsers, texting applications, games, media players, office suites, etc. The applications 564 can be stored in an application store 560, which may represent any memory or data storage, and the

management software associated therewith, for storing the applications 564. Once executed, the applications 564 may be run in a different area of memory 508.

[0123] The framework 520 may be any software or data that allows the multiple tasks running on the device to interact. In embodiments, at least portions of the framework 520 and the discrete components described hereinafter may be considered part of the OS 516 or an application 564. However, these portions will be described as part of the framework 520, but those components are not so limited. The framework 520 can include, but is not limited to, a Multi-Display Management (MDM) module 524, a Surface Cache module 528, a Window Management module 532, an Input Management module 536, a Task Management module 540, an Application Model Manager 542, a Display Controller, one or more frame buffers 548, a task stack 552, one or more window stacks 550 (which is a logical arrangement of windows and/or desktops in a display area), and/or an event buffer 556.

[0124] The MDM module 524 includes one or more modules that are operable to manage the display of applications or other data on the screens of the device. An embodiment of the MDM module 524 is described in conjunction with Fig. 5B. In embodiments, the MDM module 524 receives inputs from the other OS 516 components, such as, the drivers 512, and from the applications 564 to determine continually the state of the device 100. The inputs assist the MDM module 524 in determining how to configure and allocate the displays according to the application's preferences and requirements, and the user's actions. Once a determination for display configurations is made, the MDM module 524 can bind the applications 564 to a display. The configuration may then be provided to one or more other components to generate a window with a display.

[0125] The Surface Cache module 528 includes any memory or storage and the software associated therewith to store or cache one or more images of windows. A series of active and/or non-active windows (or other display objects, such as, a desktop display) can be associated with each display. An active window (or other display object) is currently displayed. A non-active windows (or other display objects) were opened and, at some time, displayed but are now not displayed. To enhance the user experience, before a window transitions from an active state to an inactive state, a "screen shot" of a last generated image of the window (or other display object) can be stored. The Surface Cache module 528 may be operable to store a bitmap of the last active image of a window (or other display object) not currently displayed. Thus, the

Surface Cache module 528 stores the images of non-active windows (or other display objects) in a data store.

[0126] In embodiments, the Window Management module 532 is operable to manage the windows (or other display objects) that are active or not active on each of the displays. The Window Management module 532, based on information from the MDM module 524, the OS 516, or other components, determines when a window (or other display object) is visible or not active. The Window Management module 532 may then put a non-visible window (or other display object) in a "not active state" and, in conjunction with the Task Management module Task Management 540 suspends the application's operation. Further, the Window Management module 532 may assign, through collaborative interaction with the MDM module 524, a display identifier to the window (or other display object) or manage one or more other items of data associated with the window (or other display object). The Window Management module 532 may also provide the stored information to the application 564, the Task Management module 540, or other components interacting with or associated with the window (or other display object). The Window Management module 532 can also associate an input task with a window based on window focus and display coordinates within the motion space.

[0127] The Input Management module 536 is operable to manage events that occur with the device. An event is any input into the window environment, for example, a user interface interactions with a user. The Input Management module 536 receives the events and logically stores the events in an event buffer 556. Events can include such user interface interactions as a "down event," which occurs when a screen 104, 108 receives a touch signal from a user, a "move event," which occurs when the screen 104, 108 determines that a user's finger is moving across a screen(s), an "up event, which occurs when the screen 104, 108 determines that the user has stopped touching the screen 104, 108, etc. These events are received, stored, and forwarded to other modules by the Input Management module 536. The Input Management module 536 may also map screen inputs to a motion space which is the culmination of all physical and virtual display available on the device.

[0128] The motion space is a virtualized space that includes all touch sensitive displays 110,114 "tiled" together to mimic the physical dimensions of the device 100. For example, when the device 100 is unfolded, the motion space size may be 960x800, which may be the number of pixels in the combined display area for both touch sensitive displays 110, 114. If a user touches

on a first touch sensitive display 110 on location (40, 40), a full screen window can receive touch event with location (40, 40). If a user touches on a second touch sensitive display 114, with location (40, 40), the full screen window can receive touch event with location (520, 40), because the second touch sensitive display 114 is on the right side of the first touch sensitive display 110, so the device 100 can offset the touch by the first touch sensitive display's 110 width, which is 480 pixels. When a hardware event occurs with location info from a driver 512, the framework 520 can up-scale the physical location to the motion space because the location of the event may be different based on the device orientation and state. The motion space may be as described in U.S. Patent Application No. 13/187,026, filed July 20, 2011, entitled "Systems and Methods for Receiving Gesture Inputs Spanning Multiple Input Devices," which is hereby incorporated by reference in its entirety for all that it teaches and for all purposes.

[0129] A task can be an application and a sub-task can be an application component that provides a window with which users can interact to do something, such as dial the phone, take a photo, send an email, or view a map. Each task may be given a window in which to draw a user interface. The window typically fills a display (for example, touch sensitive display 110,114), but may be smaller than the display 110,114 and float on top of other windows. An application usually consists of multiple sub-tasks that are loosely bound to each other. Typically, one task in an application is specified as the "main" task, which is presented to the user when launching the application for the first time. Each task can then start another task or sub-task to perform different actions.

[0130] The Task Management module 540 is operable to manage the operation of one or more applications 564 that may be executed by the device. Thus, the Task Management module 540 can receive signals to launch, suspend, terminate, etc. an application or application sub-tasks stored in the application store 560. The Task Management module 540 may then instantiate one or more tasks or sub-tasks of the application 564 to begin operation of the application 564. Further, the Task Management Module 540 may launch, suspend, or terminate a task or sub-task as a result of user input or as a result of a signal from a collaborating framework 520 component. The Task Management Module 540 is responsible for managing the lifecycle of applications (tasks and sub-task) from when the application is launched to when the application is terminated.

[0131] The processing of the Task Management Module 540 is facilitated by a task stack 552, which is a logical structure associated with the Task Management Module 540. The task stack

552 maintains the state of all tasks and sub-tasks on the device 100. When some component of the operating system 516 requires a task or sub-task to transition in its lifecycle, the OS 516 component can notify the Task Management Module 540. The Task Management Module 540 may then locate the task or sub-task, using identification information, in the task stack 552, and send a signal to the task or sub-task indicating what kind of lifecycle transition the task needs to execute. Informing the task or sub-task of the transition allows the task or sub-task to prepare for the lifecycle state transition. The Task Management Module 540 can then execute the state transition for the task or sub-task. In embodiments, the state transition may entail triggering the OS kernel 518 to terminate the task when termination is required.

[0132] Further, the Task Management module 540 may suspend the application 564 based on information from the Window Management Module 532. Suspending the application 564 may maintain application data in memory but may limit or stop the application 564 from rendering a window or user interface. Once the application becomes active again, the Task Management module 540 can again trigger the application to render its user interface. In embodiments, if a task is suspended, the task may save the task's state in case the task is terminated. In the suspended state, the application task may not receive input because the application window is not visible to the user.

[0133] The frame buffer 548 is a logical structure(s) used to render the user interface. The frame buffer 548 can be created and destroyed by the OS kernel 518. However, the Display Controller 544 can write the image data, for the visible windows, into the frame buffer 548. A frame buffer 548 can be associated with one screen or multiple screens. The association of a frame buffer 548 with a screen can be controlled dynamically by interaction with the OS kernel 518. A composite display may be created by associating multiple screens with a single frame buffer 548. Graphical data used to render an application's window user interface may then be written to the single frame buffer 548, for the composite display, which is output to the multiple screens 104,108. The Display Controller 544 can direct an application's user interface to a portion of the frame buffer 548 that is mapped to a particular display 110,114, thus, displaying the user interface on only one screen 104 or 108. The Display Controller 544 can extend the control over user interfaces to multiple applications, controlling the user interfaces for as many displays as are associated with a frame buffer 548 or a portion thereof. This approach

compensates for the multiple physical screens 104,108 that are in use by the software component above the Display Controller 544.

[0134] The Application Manager 562 is an application that provides a presentation layer for the window environment. Thus, the Application Manager 562 provides the graphical model for rendering by the Task Management Module 540. Likewise, the Desktop 566 provides the presentation layer for the Application Store 560. Thus, the desktop provides a graphical model of a surface having selectable application icons for the Applications 564 in the Application Store 560 that can be provided to the Window Management Module 556 for rendering.

[0135] Further, the framework can include an Application Model Manager (AMM) 542. The Application Manager 562 may interface with the AMM 542. In embodiments, the AMM 542 receives state change information from the device 100 regarding the state of applications (which are running or suspended). The AMM 542 can associate bit map images from the Surface Cache Module 528 to the tasks that are alive (running or suspended). Further, the AMM 542 can convert the logical window stack maintained in the Task Manager Module 540 to a linear ("film strip" or "deck of cards") organization that the user perceives when the using the off gesture capture area 120 to sort through the windows. Further, the AMM 542 may provide a list of executing applications to the Application Manager 562.

[0136] An embodiment of the MDM module 524 is shown in Fig. 5B. The MDM module 524 is operable to determine the state of the environment for the device, including, but not limited to, the orientation of the device, whether the device 100 is opened or closed, what applications 564 are executing, how the applications 564 are to be displayed, what actions the user is conducting, the tasks being displayed, etc. To configure the display, the MDM module 524 interprets these environmental factors and determines a display configuration, as described in conjunction with Figs. 6A-6J. Then, the MDM module 524 can bind the applications 564 or other device components to the displays. The configuration may then be sent to the Display Controller 544 and/or the other components within the OS 516 to generate the display. The MDM module 524 can include one or more of, but is not limited to, a Display Configuration Module 568, a Preferences Module 572, a Device State Module 574, a Gesture Module 576, a Requirements Module 580, an Event Module 584, and/or a Binding Module 588.

[0137] The Display Configuration Module 568 determines the layout for the display. In embodiments, the Display Configuration Module 568 can determine the environmental factors.

The environmental factors may be received from one or more other MDM modules 524 or from other sources. The Display Configuration Module 568 can then determine from the list of factors the best configuration for the display. Some embodiments of the possible configurations and the factors associated therewith are described in conjunction with Figs. 6A-6F.

[0138] The Preferences Module 572 is operable to determine display preferences for an application 564 or other component. For example, an application can have a preference for Single or Dual displays. The Preferences Module 572 can determine an application's display preference (e.g., by inspecting the application's preference settings) and may allow the application 564 to change to a mode (e.g., single screen, dual screen, max, etc.) if the device 100 is in a state that can accommodate the preferred mode. However, some user interface policies may disallow a mode even if the mode is available. As the configuration of the device changes, the preferences may be reviewed to determine if a better display configuration can be achieved for an application 564.

[0139] The Device State Module 574 is operable to determine or receive the state of the device. The state of the device can be as described in conjunction with Figs. 3A and 3B. The state of the device can be used by the Display Configuration Module 568 to determine the configuration for the display. As such, the Device State Module 574 may receive inputs and interpret the state of the device. The state information is then provided to the Display Configuration Module 568.

[0140] The Gesture Module 576 is shown as part of the MDM module 524, but, in embodiments, the Gesture module 576 may be a separate Framework 520 component that is separate from the MDM module 524. In embodiments, the Gesture Module 576 is operable to determine if the user is conducting any actions on any part of the user interface. In alternative embodiments, the Gesture Module 576 receives user interface actions from the configurable area 112,116 only. The Gesture Module 576 can receive touch events that occur on the configurable area 112,116 (or possibly other user interface areas) by way of the Input Management Module 536 and may interpret the touch events (using direction, speed, distance, duration, and various other parameters) to determine what kind of gesture the user is performing. When a gesture is interpreted, the Gesture Module 576 can initiate the processing of the gesture and, by collaborating with other Framework 520 components, can manage the required window animation. The Gesture Module 576 collaborates with the Application Model Manager 542 to

collect state information with respect to which applications are running (active or paused) and the order in which applications must appear when a user gesture is performed. The Gesture Module 576 may also receive references to bitmaps (from the Surface Cache Module 528) and live windows so that when a gesture occurs it can instruct the Display Controller 544 how to move the window(s) across the display 110,114. Thus, suspended applications may appear to be running when those windows are moved across the display 110,114.

[0141] Further, the Gesture Module 576 can receive task information either from the Task Manage Module 540 or the Input Management module 536. The gestures may be as defined in conjunction with Figs. 4A through 4H. For example, moving a window causes the display to render a series of display frames that illustrate the window moving. The gesture associated with such user interface interaction can be received and interpreted by the Gesture Module 576. The information about the user gesture is then sent to the Task Management Module 540 to modify the display binding of the task.

[0142] The Requirements Module 580, similar to the Preferences Module 572, is operable to determine display requirements for an application 564 or other component. An application can have a set display requirement that must be observed. Some applications require a particular display orientation. For example, the application "Angry Birds" can only be displayed in landscape orientation. This type of display requirement can be determined or received, by the Requirements Module 580. As the orientation of the device changes, the Requirements Module 580 can reassert the display requirements for the application 564. The Display Configuration Module 568 can generate a display configuration that is in accordance with the application display requirements, as provided by the Requirements Module 580.

[0143] The Event Module 584, similar to the Gesture Module 576, is operable to determine one or more events occurring with an application or other component that can affect the user interface. Thus, the Event Module 584 can receive event information either from the event buffer 556 or the Task Management module 540. These events can change how the tasks are bound to the displays. The Event Module 584 can collect state change information from other Framework 520 components and act upon that state change information. In an example, when the phone is opened or closed or when an orientation change has occurred, a new message may be rendered in a secondary screen. The state change based on the event can be received and

interpreted by the Event Module 584. The information about the events then may be sent to the Display Configuration Module 568 to modify the configuration of the display.

[0144] The Binding Module 588 is operable to bind the applications 564 or the other components to the configuration determined by the Display Configuration Module 568. A binding associates, in memory, the display configuration for each application with the display and mode of the application. Thus, the Binding Module 588 can associate an application with a display configuration for the application (e.g. landscape, portrait, multi-screen, etc.). Then, the Binding Module 588 may assign a display identifier to the display. The display identifier associated the application with a particular display of the device 100. This binding is then stored and provided to the Display Controller 544, the other components of the OS 516, or other components to properly render the display. The binding is dynamic and can change or be updated based on configuration changes associated with events, gestures, state changes, application preferences or requirements, etc.

[0145] User Interface Configurations:

[0146] With reference now to Figs. 6A-J, various types of output configurations made possible by the device 100 will be described hereinafter.

[0147] Figs. 6A and 6B depict two different output configurations of the device 100 being in a first state. Specifically, Fig. 6A depicts the device 100 being in a closed portrait state 304 where the data is displayed on the primary screen 104. In this example, the device 100 displays data via the touch sensitive display 110 in a first portrait configuration 604. As can be appreciated, the first portrait configuration 604 may only display a desktop or operating system home screen. Alternatively, one or more windows may be presented in a portrait orientation while the device 100 is displaying data in the first portrait configuration 604.

[0148] Fig. 6B depicts the device 100 still being in the closed portrait state 304, but instead data is displayed on the secondary screen 108. In this example, the device 100 displays data via the touch sensitive display 114 in a second portrait configuration 608.

[0149] It may be possible to display similar or different data in either the first or second portrait configuration 604, 608. It may also be possible to transition between the first portrait configuration 604 and second portrait configuration 608 by providing the device 100 a user gesture (e.g., a double tap gesture), a menu selection, or other means. Other suitable gestures may also be employed to transition between configurations. Furthermore, it may also be possible

to transition the device 100 from the first or second portrait configuration 604, 608 to any other configuration described herein depending upon which state the device 100 is moved.

[0150] An alternative output configuration may be accommodated by the device 100 being in a second state. Specifically, Fig. 6C depicts a third portrait configuration where data is displayed simultaneously on both the primary screen 104 and the secondary screen 108. The third portrait configuration may be referred to as a Dual-Portrait (PD) output configuration. In the PD output configuration, the touch sensitive display 110 of the primary screen 104 depicts data in the first portrait configuration 604 while the touch sensitive display 114 of the secondary screen 108 depicts data in the second portrait configuration 608. The simultaneous presentation of the first portrait configuration 604 and the second portrait configuration 608 may occur when the device 100 is in an open portrait state 320. In this configuration, the device 100 may display one application window in one display 110 or 114, two application windows (one in each display 110 and 114), one application window and one desktop, or one desktop. Other configurations may be possible. It should be appreciated that it may also be possible to transition the device 100 from the simultaneous display of configurations 604, 608 to any other configuration described herein depending upon which state the device 100 is moved. Furthermore, while in this state, an application's display preference may place the device into bilateral mode, in which both displays are active to display different windows in the same application. For example, a Camera application may display a viewfinder and controls on one side, while the other side displays a mirrored preview that can be seen by the photo subjects. Games involving simultaneous play by two players may also take advantage of bilateral mode.

[0151] Figs. 6D and 6E depicts two further output configurations of the device 100 being in a third state. Specifically, Fig. 6D depicts the device 100 being in a closed landscape state 340 where the data is displayed on the primary screen 104. In this example, the device 100 displays data via the touch sensitive display 110 in a first landscape configuration 612. Much like the other configurations described herein, the first landscape configuration 612 may display a desktop, a home screen, one or more windows displaying application data, or the like.

[0152] Fig. 6E depicts the device 100 still being in the closed landscape state 340, but instead data is displayed on the secondary screen 108. In this example, the device 100 displays data via the touch sensitive display 114 in a second landscape configuration 616. It may be possible to display similar or different data in either the first or second portrait configuration 612, 616. It

may also be possible to transition between the first landscape configuration 612 and second landscape configuration 616 by providing the device 100 with one or both of a twist and tap gesture or a flip and slide gesture. Other suitable gestures may also be employed to transition between configurations. Furthermore, it may also be possible to transition the device 100 from the first or second landscape configuration 612, 616 to any other configuration described herein depending upon which state the device 100 is moved.

[0153] Fig. 6F depicts a third landscape configuration where data is displayed simultaneously on both the primary screen 104 and the secondary screen 108. The third landscape configuration may be referred to as a Dual-Landscape (LD) output configuration. In the LD output configuration, the touch sensitive display 110 of the primary screen 104 depicts data in the first landscape configuration 612 while the touch sensitive display 114 of the secondary screen 108 depicts data in the second landscape configuration 616. The simultaneous presentation of the first landscape configuration 612 and the second landscape configuration 616 may occur when the device 100 is in an open landscape state 340. It should be appreciated that it may also be possible to transition the device 100 from the simultaneous display of configurations 612, 616 to any other configuration described herein depending upon which state the device 100 is moved.

[0154] Figs. 6G and 6H depict two views of a device 100 being in yet another state. Specifically, the device 100 is depicted as being in an easel state 312. Fig. 6G shows that a first easel output configuration 618 may be displayed on the touch sensitive display 110. Fig. 6H shows that a second easel output configuration 620 may be displayed on the touch sensitive display 114. The device 100 may be configured to depict either the first easel output configuration 618 or the second easel output configuration 620 individually. Alternatively, both the easel output configurations 618, 620 may be presented simultaneously. In some embodiments, the easel output configurations 618, 620 may be similar or identical to the landscape output configurations 612, 616. The device 100 may also be configured to display one or both of the easel output configurations 618, 620 while in a modified easel state 316. It should be appreciated that simultaneous utilization of the easel output configurations 618, 620 may facilitate two-person games (e.g., Battleship®, chess, checkers, etc.), multi-user conferences where two or more users share the same device 100, and other applications. As can be appreciated, it may also be possible to transition the device 100 from the display of one or both

configurations 618, 620 to any other configuration described herein depending upon which state the device 100 is moved.

[0155] Fig. 6I depicts yet another output configuration that may be accommodated while the device 100 is in an open portrait state 320. Specifically, the device 100 may be configured to present a single continuous image across both touch sensitive displays 110, 114 in a portrait configuration referred to herein as a Portrait-Max (PMax) configuration 624. In this configuration, data (e.g., a single image, application, window, icon, video, etc.) may be split and displayed partially on one of the touch sensitive displays while the other portion of the data is displayed on the other touch sensitive display. The Pmax configuration 624 may facilitate a larger display and/or better resolution for displaying a particular image on the device 100. Similar to other output configurations, it may be possible to transition the device 100 from the Pmax configuration 624 to any other output configuration described herein depending upon which state the device 100 is moved.

[0156] Fig. 6J depicts still another output configuration that may be accommodated while the device 100 is in an open landscape state 348. Specifically, the device 100 may be configured to present a single continuous image across both touch sensitive displays 110, 114 in a landscape configuration referred to herein as a Landscape-Max (LMax) configuration 628. In this configuration, data (e.g., a single image, application, window, icon, video, etc.) may be split and displayed partially on one of the touch sensitive displays while the other portion of the data is displayed on the other touch sensitive display. The Lmax configuration 628 may facilitate a larger display and/or better resolution for displaying a particular image on the device 100. Similar to other output configurations, it may be possible to transition the device 100 from the Lmax configuration 628 to any other output configuration described herein depending upon which state the device 100 is moved.

[0157] Referring to Fig. 7, the device 100 is depicted with the primary screen 104 and the secondary screen 108 displaying desk tops D1 and D2 on pages 1120 and 1122, respectively. Fig. 7 also illustrates the device in which both screens are in the portrait mode 604 and 608. An annunciator display or window 1100 is shown as extending continuously across both of the screens 104 and 108. The annunciator window is further illustrated as being a unitary display window or display, as opposed to being a separate display on each screen. This annunciator window 1100 can serve many purposes to include the display of messages, alerts, statuses of the

device, and other information. In an embodiment, the annunciator display extends across the display areas of said first and second screens for displaying at least one of a device status, a connectivity status, and a messaging status;

[0158] The annunciator window 1100 is provided in the expanded dual screen configuration in order to better view information provided within the window 1100. For annunciator notifications, these may include icons that indicate an event has taken place with respect to a particular function of the device. The Fig. 7 graphically displays boxes 1102, 1104, 1106 and 1107 which can be reserved for receiving and displaying notifications such as incoming phone calls, emails, text messages, and calendar items, respectively. For example, for an incoming call, the phone icon 1102 could flash, change color or otherwise change its visual appearance to signify that an incoming call has been received. One preferred arrangement for the annunciator window 1100 is to align the notifications or messaging statuses over the primary screen 104 as shown. Fig. 7 illustrates other example annunciations displayed in the annunciation window 1100.

[0159] These include, for example, an icon 1108 representing the type of wireless data being exchanged at the time, (such as 3G, 4G, etc.), icon 1110 representing the battery power level, and icon 1112 representing a day and time indicator. Because of the space provided in the annunciator window 1100, a number of other notifications can be represented with appropriate icons in a manner that are clearly visible for the user.

[0160] Now referring to Fig. 8, the device 100 of Fig. 7 is shown when it displays an example notification 1124, such as a notification for a calendar item 1107 having a fairly lengthy text content displayed directly within the window 1100. Other of the annunciator icons are still displayed, such as the wireless data icon 1108, power level 110 and date/time indicator 1112. In another aspect of the invention, it is also contemplated that a longer alert or message having greater text or data content can span across the entire annunciator window 1100, thereby temporarily masking or covering the other icons for a period of time until the alert or message is cleared by the user.

[0161] Therefore, it is apparent from the Figs. 7 and 8 that alerts, messages, statuses, and other annunciations are capable of spanning across both screens simultaneously, thereby providing more information to the user. Because of the increased area dedicated for the various annunciations, this helps ensure the user is better able to view the annunciations, thereby making

the device more user friendly and efficient. The annunciated window can be provided without materially degrading the presentation of displayed information on the primary and secondary screens, since the annunciator window can be placed near the top or bottom edges of the device where typically critical data/images are not displayed.

[0162] The exemplary systems and methods of this disclosure have been described in relation to one or more preferred embodiments; however, to avoid unnecessarily obscuring the present disclosure, the preceding description omits a number of known structures and devices. This omission is not to be construed as a limitation of the scopes of the claims. Specific details are set forth to provide an understanding of the present disclosure. It should however be appreciated that the present disclosure may be practiced in a variety of ways beyond the specific detail set forth herein.

[0163] Furthermore, while the exemplary aspects, embodiments, and/or configurations illustrated herein show the various components of the system collocated, certain components of the system can be located remotely, at distant portions of a distributed network, such as a LAN and/or the Internet, or within a dedicated system. Thus, it should be appreciated, that the components of the system can be combined in to one or more separate devices, or collocated on a particular node of a distributed network, such as an analog and/or digital telecommunications network, a packet-switch network, or a circuit-switched network. It will be appreciated from the preceding description, and for reasons of computational efficiency, that the components of the system can be arranged at any location within a distributed network of components without affecting the operation of the system. For example, the various components can be located in a switch such as a PBX and media server, gateway, in one or more communications devices, at one or more users' premises, or some combination thereof. Similarly, one or more functional portions of the system could be distributed between a telecommunications device(s) and an associated computing device.

[0164] Furthermore, it should be appreciated that the various links connecting the elements can be wired or wireless links, or any combination thereof, or any other known or later developed element(s) that is capable of supplying and/or communicating data to and from the connected elements. These wired or wireless links can also be secure links and may be capable of communicating encrypted information. Transmission media used as links, for example, can be any suitable carrier for electrical signals, including coaxial cables, copper wire and fiber optics,

and may take the form of acoustic or light waves, such as those generated during radio-wave and infra-red data communications.

[0165] Also, while the flowcharts have been discussed and illustrated in relation to a particular sequence of events, it should be appreciated that changes, additions, and omissions to this sequence can occur without materially affecting the operation of the disclosed embodiments, configuration, and aspects.

[0166] A number of variations and modifications of the disclosure can be used. It would be possible to provide for some features of the disclosure without providing others.

[0167] In yet another embodiment, the systems and methods of this disclosure can be implemented in conjunction with a special purpose computer, a programmed microprocessor or microcontroller and peripheral integrated circuit element(s), an ASIC or other integrated circuit, a digital signal processor, a hard-wired electronic or logic circuit such as discrete element circuit, a programmable logic device or gate array such as PLD, PLA, FPGA, PAL, special purpose computer, any comparable means, or the like. In general, any device(s) or means capable of implementing the methodology illustrated herein can be used to implement the various aspects of this disclosure. Exemplary hardware that can be used for the disclosed embodiments, configurations and aspects includes computers, handheld devices, telephones (e.g., cellular, Internet enabled, digital, analog, hybrids, and others), and other hardware known in the art. Some of these devices include processors (e.g., a single or multiple microprocessors), memory, nonvolatile storage, input devices, and output devices. Furthermore, alternative software implementations including, but not limited to, distributed processing or component/object distributed processing, parallel processing, or virtual machine processing can also be constructed to implement the methods described herein.

[0168] In yet another embodiment, the disclosed methods may be readily implemented in conjunction with software using object or object-oriented software development environments that provide portable source code that can be used on a variety of computer or workstation platforms. Alternatively, the disclosed system may be implemented partially or fully in hardware using standard logic circuits or VLSI design. Whether software or hardware is used to implement the systems in accordance with this disclosure is dependent on the speed and/or efficiency requirements of the system, the particular function, and the particular software or hardware systems or microprocessor or microcomputer systems being utilized.

[0169] In yet another embodiment, the disclosed methods may be partially implemented in software that can be stored on a storage medium, executed on programmed general-purpose computer with the cooperation of a controller and memory, a special purpose computer, a microprocessor, or the like. In these instances, the systems and methods of this disclosure can be implemented as program embedded on personal computer such as an applet, JAVA® or CGI script, as a resource residing on a server or computer workstation, as a routine embedded in a dedicated measurement system, system component, or the like. The system can also be implemented by physically incorporating the system and/or method into a software and/or hardware system.

[0170] Although the present disclosure describes components and functions implemented in the aspects, embodiments, and/or configurations with reference to particular standards and protocols, the aspects, embodiments, and/or configurations are not limited to such standards and protocols. Other similar standards and protocols not mentioned herein are in existence and are considered to be included in the present disclosure. Moreover, the standards and protocols mentioned herein and other similar standards and protocols not mentioned herein are periodically superseded by faster or more effective equivalents having essentially the same functions. Such replacement standards and protocols having the same functions are considered equivalents included in the present disclosure.

[0171] The present disclosure, in various aspects, embodiments, and/or configurations, includes components, methods, processes, systems and/or apparatus substantially as depicted and described herein, including various aspects, embodiments, configurations embodiments, subcombinations, and/or subsets thereof. Those of skill in the art will understand how to make and use the disclosed aspects, embodiments, and/or configurations after understanding the present disclosure. The present disclosure, in various aspects, embodiments, and/or configurations, includes providing devices and processes in the absence of items not depicted and/or described herein or in various aspects, embodiments, and/or configurations hereof, including in the absence of such items as may have been used in previous devices or processes, e.g., for improving performance, achieving ease and\or reducing cost of implementation.

[0172] The foregoing discussion has been presented for purposes of illustration and description. The foregoing is not intended to limit the disclosure to the form or forms disclosed herein. In the foregoing Detailed Description for example, various features of the disclosure are

grouped together in one or more aspects, embodiments, and/or configurations for the purpose of streamlining the disclosure. The features of the aspects, embodiments, and/or configurations of the disclosure may be combined in alternate aspects, embodiments, and/or configurations other than those discussed above. This method of disclosure is not to be interpreted as reflecting an intention that the claims require more features than are expressly recited in each claim. Rather, as the following claims reflect, inventive aspects lie in less than all features of a single foregoing disclosed aspect, embodiment, and/or configuration. Thus, the following claims are hereby incorporated into this Detailed Description, with each claim standing on its own as a separate preferred embodiment of the disclosure.

[0173] Moreover, though the description has included description of one or more aspects, embodiments, and/or configurations and certain variations and modifications, other variations, combinations, and modifications are within the scope of the disclosure, e.g., as may be within the skill and knowledge of those in the art, after understanding the present disclosure. It is intended to obtain rights which include alternative aspects, embodiments, and/or configurations to the extent permitted, including alternate, interchangeable and/or equivalent structures, functions, ranges or steps to those claimed, whether or not such alternate, interchangeable and/or equivalent structures, functions, ranges or steps are disclosed herein, and without intending to publicly dedicate any patentable subject matter.

ABSTRACT

A dual-screen user device and methods for revealing a combination of desktops on single and multiple screens are disclosed. Selected desktops and/or running applications are displayed on dual screen displays. Desktops and applications can be shifted between screens by user gestures, and/or moved off of the screens and therefore hidden. Hidden desktops and screens can be re-displayed by yet other gestures. The desktops and applications are arranged in a window stack that represents a logical order of the desktops and applications providing a user with an intuitive ability to manage multiple applications/desktops running simultaneously. User gestures can rearrange the order of all of the applications and desktops in the window stack. One embodiment provides an annunciator display or window extending across both screens in a dual screen configuration of the device. The annunciator window provides alerts, notifications, and statuses of the device in an increased area thereby enhancing viewability of the information in the window.

Electronic Patent Application Fee Transmittal	
Application Number:	
Filing Date:	
Title of Invention:	FULL-SCREEN ANNUNCIATOR
First Named Inventor/Applicant Name:	SANJIV SIRPAL
Filer:	Brent Philip Johnson/Joy Roe-Pachirat
Attorney Docket Number:	6583-67
Filed as Large Entity	

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Utility application filing	1011	1	380	380
Utility Search Fee	1111	1	620	620
Utility Examination Fee	1311	1	250	250
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**1250**

Electronic Acknowledgement Receipt	
EFS ID:	11071788
Application Number:	13247708
International Application Number:	
Confirmation Number:	8636
Title of Invention:	FULL-SCREEN ANNUNCIATOR
First Named Inventor/Applicant Name:	SANJIV SIRPAL
Customer Number:	22442
Filer:	Brent Philip Johnson/Joy Roe-Pachirat
Filer Authorized By:	Brent Philip Johnson
Attorney Docket Number:	6583-67
Receipt Date:	28-SEP-2011
Filing Date:	
Time Stamp:	17:49:18
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$1250
RAM confirmation Number	4653
Deposit Account	191970
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees) Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)	

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Application Data Sheet	ADS_6583_67.pdf	1427040 69906132d28f90cab536596647a01f02f90ac0ac	no	6
Warnings:					
Information:					
2	Drawings-only black and white line drawings	FIGURES_for_6583_67_Full_Screen_Annunciator_Final.pdf	185263 563877e1f51f412d3e7247ff5ac2c9d9492efd3b	no	19
Warnings:					
Information:					
3		App_for_SR_6583_67_Full_Screen_Annunciator_Final.pdf	234985 862f326910626f1fdbc0d118a685f2da2b8299a8	yes	46

Multipart Description/PDF files in .zip description

Document Description	Start	End
Specification	1	41
Claims	42	45
Abstract	46	46

Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	32574 964265560fdd433894cb8dcf2cbc3a33bb78b209	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	1879862		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
13/247,708	09/28/2011	2172	1250	6583-67	14	3

CONFIRMATION NO. 8636

22442
SHERIDAN ROSS PC
1560 BROADWAY
SUITE 1200
DENVER, CO 80202

FILING RECEIPT

OC000000050350537

Date Mailed: 10/19/2011

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Applicant(s)

Sanjiv Sirpal, Oakville, CANADA;
Paul Edward Reeves, Oakville, CANADA;
Alexander de Paz, Burlington, CANADA;
Diego Milano, Oakville, CANADA;
Jared Ficklin, Austin, TX;
Denise Burton, Austin, TX;
Gregg Wygonik, Austin, TX;

Assignment For Published Patent Application

IMERJ, LLC, Broomfield, CO

Power of Attorney: None

Domestic Priority data as claimed by applicant

This appln claims benefit of 61/539,884 09/27/2011
and claims benefit of 61/458,150 11/17/2010
and claims benefit of 61/389,000 10/01/2010
and claims benefit of 61/389,117 10/01/2010
and claims benefit of 61/389,087 10/01/2010

Foreign Applications (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.)

If Required, Foreign Filing License Granted: 10/13/2011

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 13/247,708**

Projected Publication Date: To Be Determined - pending completion of Missing Parts

Non-Publication Request: No

Early Publication Request: No

Title

FULL-SCREEN ANNUNCIATOR

Preliminary Class

715

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/247,708	09/28/2011	Sanjiv Sirpal	6583-67

CONFIRMATION NO. 8636

22442
SHERIDAN ROSS PC
1560 BROADWAY
SUITE 1200
DENVER, CO 80202

FORMALITIES LETTER

OC000000050350538

Date Mailed: 10/19/2011

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

Filing Date Granted

Items Required To Avoid Abandonment:

An application number and filing date have been accorded to this application. The item(s) indicated below, however, are missing. Applicant is given **TWO MONTHS** from the date of this Notice within which to file all required items below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- The oath or declaration is missing.
  A properly signed oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Application Number and Filing Date, is required.
  Note: If a petition under 37 CFR 1.47 is being filed, an oath or declaration in compliance with 37 CFR 1.63 signed by all available joint inventors, or if no inventor is available by a party with sufficient proprietary interest, is required.

The application is informal since it does not comply with the regulations for the reason(s) indicated below.

The required item(s) identified below must be timely submitted to avoid abandonment:

- A replacement abstract not exceeding 150 words in length and commencing on a separate sheet in compliance with 37 CFR 1.72(b) and 37 CFR 1.121 is required.

Applicant is cautioned that correction of the above items may cause the specification and drawings page count to exceed 100 pages. If the specification and drawings exceed 100 pages, applicant will need to submit the required application size fee.

The applicant needs to satisfy supplemental fees problems indicated below.

The required item(s) identified below must be timely submitted to avoid abandonment:

- A surcharge (for late submission of filing fee, search fee, examination fee or oath or declaration) as set forth in 37 CFR 1.16(f) of $**130** for a non-small entity, must be submitted.

SUMMARY OF FEES DUE:

Total fee(s) required within **TWO MONTHS** from the date of this Notice is $**130** for a non-small entity
- $**130** Surcharge.

Replies should be mailed to:

Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

Registered users of EFS-Web may alternatively submit their reply to this notice via EFS-Web.
https://sportal.uspto.gov/authenticate/AuthenticateUserLocalEPF.html

For more information about EFS-Web please call the USPTO Electronic Business Center at **1-866-217-9197** or visit our website at http://www.uspto.gov/ebc.

If you are not using EFS-Web to submit your reply, you must include a copy of this notice.

/hnguyen/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 13/247,708

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	380
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	620
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	250
TOTAL CLAIMS (37 CFR 1.16(i))	14 minus 20 =	*			OR	x 60 =	0.00
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3 minus 3 =	*				x 250 =	0.00
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						0.00
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							0.00
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	1250

APPLICATION AS AMENDED - PART II

AMENDMENT A

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
Application Size Fee (37 CFR 1.16(s))									
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

AMENDMENT B

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
Application Size Fee (37 CFR 1.16(s))									
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

Electronic Acknowledgement Receipt	
EFS ID:	11609690
Application Number:	13247708
International Application Number:	
Confirmation Number:	8636
Title of Invention:	FULL-SCREEN ANNUNCIATOR
First Named Inventor/Applicant Name:	Sanjiv Sirpal
Customer Number:	22442
Filer:	Brent Philip Johnson/Joy Roe-Pachirat
Filer Authorized By:	Brent Philip Johnson
Attorney Docket Number:	6583-67
Receipt Date:	13-DEC-2011
Filing Date:	28-SEP-2011
Time Stamp:	17:54:55
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$130
RAM confirmation Number	5373
Deposit Account	191970
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees) Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)	

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Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Applicant Response to Pre-Exam Formalities Notice	Response_to_Notice_To_File_MP.pdf	83176 77316d3a14f85a4266f8a29594ac4b2f189914d4	no	1
Warnings:					
Information:					
2	Oath or Declaration filed	EXECUTED_OATH_FINAL.pdf	1085719 3a68aece5040f701f5fdfbcfbdd29040e80dfa2d	no	7
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	29754 186982844377de0d9338e1fe367d39c7424d1942	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	1198649		

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National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/01A (01-09)
Approved for use through 01/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	Full Screen Annunciator

As the below named inventor(s), I/we declare that:

This declaration is directed to:

- ☐ The attached application, or
- ☑ United States application or PCT international application number 13/247,708
  filed on September 28, 2011
- ☐ As amended on _____ (if applicable);

I/we believe that I/we am/are the original and first inventor(s) of the subject matter which is claimed and for which a patent is sought;

I/we have reviewed and understand the contents of the above-identified application, including the claims, as amended by any amendment specifically referred to above;

I/we acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me/us to be material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

WARNING:

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FULL NAME OF INVENTOR(S)

Inventor one: Jared Ficklin Date: 12/13/2011

Signature: _____ Citizen of: USA

Inventor two: Denise Burton Date: _____

Signature: _____ Citizen of: USA

☐ Additional inventors or a legal representative are being named on _____ additional form(s) attached hereto.

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6583-67

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DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	Full Screen Annunciator

As the below named inventor(s), I/we declare that:

This declaration is directed to:

☐ The attached application, or

☑ United States application or PCT international application number 13/247,708

filed on September 28, 2011

☐ As amended on _____ (if applicable);

I/we believe that I/we am/are the original and first inventor(s) of the subject matter which is claimed and for which a patent is sought;

I/we have reviewed and understand the contents of the above-identified application, including the claims, as amended by any amendment specifically referred to above;

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FULL NAME OF INVENTOR(S)

Inventor one: Sanjiv Sirpal Date: _____

Signature: _____ Citizen of: CA

Inventor two: Paul E. Reeves Date: 21-OCT-2011

Signature: _____ Citizen of: CA

☐ Additional inventors or a legal representative are being named on _____ additional form(s) attached hereto.

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FULL NAME OF INVENTOR(S)

Inventor one: Sanjiv Sirpal Date: Oct 11 2011

Signature: Sanjiv Sirpal Citizen of: CA

Inventor two: Paul E. Reeves Date: _____

Signature: _____ Citizen of: CA

☐ Additional inventors or a legal representative are being named on _____ additional form(s) attached hereto.

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FULL NAME OF INVENTOR(S)

Inventor one: Alexander de Paz Date: Oct 12 2011

Signature: _____ Citizen of: CA

Inventor two: Eduardo Diego Torres Milano Date: _____

Signature: _____ Citizen of: AR

☐ Additional inventors or a legal representative are being named on _____ additional form(s) attached hereto.

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FULL NAME OF INVENTOR(S)

Inventor one: Alexander de Paz Date: _____

Signature: _____ Citizen of: CA

Inventor two: Eduardo Diego Torres Milano Date: 11-OCT-11

Signature: _____ Citizen of: AR

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FULL NAME OF INVENTOR(S)

Inventor one: Jared Ficklin Date: _____

Signature: _____ Citizen of: USA

Inventor two: Denise Burton Date: NOV 19 2011

Signature: Denise Burton Citizen of: USA

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FULL NAME OF INVENTOR(S)

Inventor one: Gregg Wygonik Date: 10/24/11

Signature: _____ Citizen of: USA

Inventor two: _____ Date: _____

Signature: _____ Citizen of: _____

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Sanjiv Sirpal Application No.: 13/247,708 Filed: September 28, 2011 Attorney Docket No.: 6583-67 For: "FULL SCREEN ANNUNCIATOR"	Group Art Unit: 2172 Examiner: Not Yet Assigned Confirmation No.: 8636 RESPONSE TO NOTICE TO FILE MISSING PARTS ***Submitted Via Electronic Filing***

Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

Dear Sir:

In response to the Notice to File Missing Parts (the "Notice") mailed October 14, 2011 for the above-identified application, enclosed is the Declaration. The applicable fee in the amount of $130.00 is also being submitted. Please credit any overpayment or debit any underpayment to Deposit Account No. 19-1970.

This response is believed to address all issues noted in the Notice. For any questions, please contact the undersigned.

Respectfully submitted,

SHERIDAN ROSS P.C.

By: /Brent P. Johnson/
Brent P. Johnson
Registration No. 38031
1560 Broadway, Suite 1200
Denver, Colorado 80202-5141
(303) 863-9700

Date: December 13, 2011

Electronic Patent Application Fee Transmittal

Application Number:	13247708
Filing Date:	28-Sep-2011
Title of Invention:	FULL-SCREEN ANNUNCIATOR
First Named Inventor/Applicant Name:	Sanjiv Sirpal
Filer:	Brent Philip Johnson/Joy Roe-Pachirat
Attorney Docket Number:	6583-67

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Late filing fee for oath or declaration	1051	1	130	130
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
			Total in USD ($)	**130**

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/247,708	09/28/2011	Sanjiv Sirpal	6583-67

CONFIRMATION NO. 8636

22442
SHERIDAN ROSS PC
1560 BROADWAY
SUITE 1200
DENVER, CO 80202

FORMALITIES LETTER

OC000000051534985

Date Mailed: 12/20/2011

NOTICE OF INCOMPLETE REPLY (NONPROVISIONAL)

Filing Date Granted

The U.S. Patent and Trademark Office has received your reply on 12/13/2011 to the Notice to File Missing Parts (Notice) mailed 10/19/2011 and it has been entered into the nonprovisional application. The reply, however, does not include the following items required in the Notice. A complete reply must be timely filed to prevent ABANDONMENT of the above-identified application. Replies should be mailed to: Mail Stop Missing Parts, Commissioner for Patents, P.O. Box 1450, Alexandria VA 22313-1450.

Applicant is given **TWO MONTHS** from the date of the Notice to File Missing Parts (Notice) mailed 10/19/2011 within which to file all required items and pay any fees required below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

Items Required to Avoid Abandonment:

The required items noted below SHOULD be filed along with any items required above. The filing date of this nonprovisional application will be the date of receipt of the items required above.

The application is informal since it does not comply with the regulations for the reason(s) indicated below.

The required item(s) identified below must be timely submitted to avoid abandonment:

- A replacement abstract not exceeding 150 words in length and commencing on a separate sheet in compliance with 37 CFR 1.72(b) and 37 CFR 1.121 is required.

Applicant is cautioned that correction of the above items may cause the specification and drawings page count to exceed 100 pages. If the specification and drawings exceed 100 pages, applicant will need to submit the required application size fee.

Replies should be mailed to:

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Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

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https://sportal.uspto.gov/authenticate/AuthenticateUserLocalEPF.html

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/nhassani/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 13/247,708

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	380
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	620
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	250
TOTAL CLAIMS (37 CFR 1.16(i))	14 minus 20 =	*			OR	x 60 =	0.00
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3 minus 3 =	*				x 250 =	0.00
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						0.00
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							0.00
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	1250

APPLICATION AS AMENDED - PART II

AMENDMENT A

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
Application Size Fee (37 CFR 1.16(s))									
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

AMENDMENT B

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE($)	ADDITIONAL FEE($)		RATE($)	ADDITIONAL FEE($)
Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
Application Size Fee (37 CFR 1.16(s))									
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

REPLACEMENT ABSTRACT

A dual-screen user device and methods for revealing a combination of desktops on single and multiple screens are disclosed. Selected desktops and/or running applications are displayed on dual screen displays. Desktops and applications can be shifted between screens by user gestures, and/or moved off of the screens and therefore hidden. Hidden desktops and screens can be re-displayed by other gestures. The desktops and applications are arranged in a window stack that represents a logical order of the desktops and applications providing a user with an intuitive ability to manage multiple applications/desktops running simultaneously. User gestures rearrange the order of the applications and desktops in the window stack. One embodiment provides an annunciator display or window extending across both screens in a dual screen configuration of the device. The annunciator window provides alerts, notifications, and statuses of the device in an increased area thereby enhancing viewability of information in the window.

Electronic Acknowledgement Receipt	
EFS ID:	11915807
Application Number:	13247708
International Application Number:	
Confirmation Number:	8636
Title of Invention:	FULL-SCREEN ANNUNCIATOR
First Named Inventor/Applicant Name:	Sanjiv Sirpal
Customer Number:	22442
Filer:	Brent Philip Johnson/Joy Roe-Pachirat
Filer Authorized By:	Brent Philip Johnson
Attorney Docket Number:	6583-67
Receipt Date:	25-JAN-2012
Filing Date:	28-SEP-2011
Time Stamp:	13:09:34
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$560
RAM confirmation Number	22951
Deposit Account	191970
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees) Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)	

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Applicant Response to Pre-Exam Formalities Notice	Response_to_Notice_of_Incomplete_Reply.pdf	84920 6c676f458f6ede48ae1699e99c4065263918db8a	no	2
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30213 19d97f2d7367402093deb98fed3277de853a3ee4	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	115133		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Sanjiv Sirpal Application No.: 13/247,708 Filed: September 28, 2011 Attorney Docket No.: 6583-67 For: "FULL-SCREEN ANNUNCIATOR"	Group Art Unit: 2172 Examiner: Not Yet Assigned Confirmation No.: 8636 RESPONSE TO THE NOTICE OF INCOMPLETE REPLY ***Submitted Via Electronic Filing***

Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

Dear Sir:

In response to the Notice of Incomplete Reply (the "Notice") mailed December 19, 2011 for the above-identified application, enclosed is a Replacement Abstract not exceeding 150 words in length and commencing on a separate sheet in compliance with 37 CFR 1.72(b) and 34 CFR 1.121. A Request for Extension of Time extending the time to respond by two months along with the applicable fee is also being submitted herewith. Please credit any overpayment or debit any underpayment to Deposit Account No. 19-1970.

This response is believed to address all issues noted in the Notice. For any questions, please contact the undersigned.

Respectfully submitted,

SHERIDAN ROSS P.C.

By: /Brent P. Johnson/
Brent P. Johnson
Registration No. 38031
1560 Broadway, Suite 1200
Denver, Colorado 80202-5141
(303) 863-9700

Date: January 25, 2012

Electronic Patent Application Fee Transmittal

Application Number:	13247708
Filing Date:	28-Sep-2011
Title of Invention:	FULL-SCREEN ANNUNCIATOR
First Named Inventor/Applicant Name:	Sanjiv Sirpal
Filer:	Brent Philip Johnson/Joy Roe-Pachirat
Attorney Docket Number:	6583-67
Filed as Large Entity	

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Extension - 2 months with $0 paid	1252	1	560	560

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
			Total in USD ($)	**560**

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
13/247,708	09/28/2011	2172	1380	6583-67	14	3

CONFIRMATION NO. 8636

UPDATED FILING RECEIPT

22442
SHERIDAN ROSS PC
1560 BROADWAY
SUITE 1200
DENVER, CO 80202

OC000000052335007

Date Mailed: 02/02/2012

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Applicant(s)

Sanjiv Sirpal, Oakville, CANADA;
Paul E. Reeves, Oakville, CANADA;
Alexander de Paz, Burlington, CANADA;
Eduardo Diego Torres Milano, Oakville, CANADA;
Jared Ficklin, Austin, TX;
Denise Burton, Austin, TX;
Gregg Wygonik, Austin, TX;

Assignment For Published Patent Application

IMERJ, LLC, Broomfield, CO

Power of Attorney: None

Domestic Priority data as claimed by applicant

This appln claims benefit of 61/539,884 09/27/2011
and claims benefit of 61/458,150 11/17/2010
and claims benefit of 61/389,000 10/01/2010
and claims benefit of 61/389,117 10/01/2010
and claims benefit of 61/389,087 10/01/2010

Foreign Applications (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.)

If Required, Foreign Filing License Granted: 10/13/2011

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 13/247,708**

Projected Publication Date: Perfected

Non-Publication Request: No

Early Publication Request: No

Title

FULL-SCREEN ANNUNCIATOR

Preliminary Class

715

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

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Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

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This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 13/247,708

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	380
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	620
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	250
TOTAL CLAIMS (37 CFR 1.16(i))	14 minus 20 =	*			OR	x 60 =	0.00
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3 minus 3 =	*				x 250 =	0.00
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						0.00
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							0.00
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	1250

APPLICATION AS AMENDED - PART II

AMENDMENT A

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
Application Size Fee (37 CFR 1.16(s))									
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

AMENDMENT B

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE($)	ADDITIONAL FEE($)		RATE($)	ADDITIONAL FEE($)
Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
Application Size Fee (37 CFR 1.16(s))									
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

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*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
13/247,708	09/28/2011	2172	1380	6583-67	14	3

CONFIRMATION NO. 8636

UPDATED FILING RECEIPT

22442
SHERIDAN ROSS PC
1560 BROADWAY
SUITE 1200
DENVER, CO 80202

OC000000052335007

Date Mailed: 02/08/2012

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Gregg Wygonik, Austin, TX;

Assignment For Published Patent Application

IMERJ, LLC, Broomfield, CO

Power of Attorney: None

Domestic Priority data as claimed by applicant

This appln claims benefit of 61/539,884 09/27/2011
and claims benefit of 61/458,150 11/17/2010
and claims benefit of 61/389,000 10/01/2010
and claims benefit of 61/389,117 10/01/2010
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If Required, Foreign Filing License Granted: 10/13/2011

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 13/247,708**

Projected Publication Date: 05/17/2012

Non-Publication Request: No

Early Publication Request: No

Title

FULL-SCREEN ANNUNCIATOR

Preliminary Class

715

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Title 37, Code of Federal Regulations, 5.11 & 5.15

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This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 13/247,708

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	380
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	620
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	250
TOTAL CLAIMS (37 CFR 1.16(i))	14 minus 20 =	*			OR	x 60 =	0.00
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3 minus 3 =	*				x 250 =	0.00
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						0.00
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							0.00
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	1250

APPLICATION AS AMENDED - PART II

AMENDMENT A

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
Application Size Fee (37 CFR 1.16(s))									
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

AMENDMENT B

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
Application Size Fee (37 CFR 1.16(s))									
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

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NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently http://www.uspto.gov/patft/.

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[Continued on next page]

(54) Title: SINGLE- SCREEN VIEW IN RESPONSE TO ROTATION

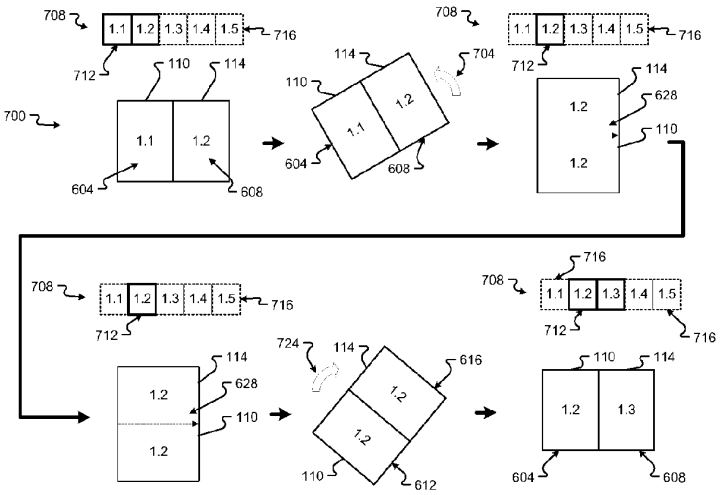


Fig. 7

(57) Abstract: A multi-screen user device and methods for controlling data displayed thereby are disclosed. Specifically, a gesture sequence is disclosed which enables a user to toggle or shift though applications that are displayed by the multi-screen user device. The gesture sequence may correspond to various rotation or partial rotations of the multi-screen user device.

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SINGLE-SCREEN VIEW IN RESPONSE TO ROTATION

CROSS REFERENCE TO RELATED APPLICATION

[0001] The present application claims the benefits of and priority, under 35 U.S.C. § 119(e), to U.S. Provisional Application Serial Nos. 61/389,000, filed October 1, 2010, entitled "DUAL DISPLAY WINDOWING SYSTEM;" 61/389,117, filed October 1, 2010, entitled "MULTI-OPERATING SYSTEM PORTABLE DOCKETING DEVICE;" 61/389,087, filed October 1,2010, entitled "TABLET COMPUTING USER INTERFACE;"61/458,150, filed November 17, 2010, entitled "Dual Screen Email Client;" XX/XXXXXX, filed September XX, 2011, entitled "MOBILE DEVICE." Each of the aforementioned documents is incorporated herein by this reference in their entirety for all that they teach and for all purposes.

BACKGROUND

[0002] A substantial number of handheld computing devices, such as cellular phones, tablets, and E-Readers, make use of a touch screen display not only to deliver display information to the user but also to receive inputs from user interface commands. While touch screen displays may increase the configurability of the handheld device and provide a wide variety of user interface options, this flexibility typically comes at a price. The dual use of the touch screen to provide content and receive user commands, while flexible for the user, may obfuscate the display and cause visual clutter, thereby leading to user frustration and loss of productivity.

[0003] The small form factor of handheld computing devices requires a careful balancing between the displayed graphics and the area provided for receiving inputs. On the one hand, the small display constrains the display space, which may increase the difficulty of interpreting actions or results. On the other, a virtual keypad or other user interface scheme is superimposed on or positioned adjacent to an executing application, requiring the application to be squeezed into an even smaller portion of the display.

[0004] This balancing act is particularly difficult for single display touch screen devices. Single display touch screen devices are crippled by their limited screen space. When users are entering information into the device, through the single display, the ability to interpret information in the display can be severely hampered, particularly when a complex interaction between display and interface is required.

SUMMARY

[0005] There is a need for a multi-display handheld computing device that provides for enhanced power and/or versatility compared to conventional single display handheld computing devices. These and other needs are addressed by the various aspects, embodiments, and/or configurations of the present disclosure. Also, while the disclosure is presented in terms of exemplary embodiments, it should be appreciated that individual aspects of the disclosure can be separately claimed.

[0006] In some embodiments, a method of controlling data displayed by a multi-screen device is provided, the method comprising:

receiving a first rotation input, the first rotation input corresponding to an indication that the multi-screen device has been rotated a first time from a first open state to a different second open state, wherein data from a first application is displayed while the device is in the first open state on a first screen of the device and not on a second screen of the device, and wherein data from the first application is displayed on the first and second screens of the device in the second open state;

receiving a second rotation input, the second rotation input corresponding to an indication that the device has been rotated a second time after the first time;

after receiving the second rotation input, referencing display rules for the first application; and

displaying the first application on one of the first and second screens according to the display rules for the first application.

[0007] The phrases "at least one", "one or more", and "and/or" are open-ended expressions that are both conjunctive and disjunctive in operation. For example, each of the expressions "at least one of A, B and C", "at least one of A, B, or C", "one or more of A, B, and C", "one or more of A, B, or C" and "A, B, and/or C" means A alone, B alone, C alone, A and B together, A and C together, B and C together, or A, B and C together.

[0008] The term "a" or "an" entity refers to one or more of that entity. As such, the terms "a" (or "an"), "one or more" and "at least one" can be used interchangeably herein. It is also to be noted that the terms "comprising", "including", and "having" can be used interchangeably.

[0009] The term "automatic" and variations thereof, as used herein, refers to any process or operation done without material human input when the process or operation is performed. However, a process or operation can be automatic, even though performance of the process or operation uses material or immaterial human input, if the input is

received before performance of the process or operation. Human input is deemed to be material if such input influences how the process or operation will be performed. Human input that consents to the performance of the process or operation is not deemed to be "material".

[0010] The term "computer-readable medium" as used herein refers to any tangible storage and/or transmission medium that participate in providing instructions to a processor for execution. Such a medium may take many forms, including but not limited to, non-volatile media, volatile media, and transmission media. Non-volatile media includes, for example, NVRAM, or magnetic or optical disks. Volatile media includes dynamic memory, such as main memory. Common forms of computer-readable media include, for example, a floppy disk, a flexible disk, hard disk, magnetic tape, or any other magnetic medium, magneto-optical medium, a CD-ROM, any other optical medium, punch cards, paper tape, any other physical medium with patterns of holes, a RAM, a PROM, and EPROM, a FLASH-EPROM, a solid state medium like a memory card, any other memory chip or cartridge, a carrier wave as described hereinafter, or any other medium from which a computer can read. A digital file attachment to e-mail or other self-contained information archive or set of archives is considered a distribution medium equivalent to a tangible storage medium. When the computer-readable media is configured as a database, it is to be understood that the database may be any type of database, such as relational, hierarchical, object-oriented, and/or the like. Accordingly, the disclosure is considered to include a tangible storage medium or distribution medium and prior art-recognized equivalents and successor media, in which the software implementations of the present disclosure are stored.

[0011] The term "desktop" refers to a metaphor used to portray systems. A desktop is generally considered a "surface" that typically includes pictures, called icons, widgets, folders, etc. that can activate show applications, windows, cabinets, files, folders, documents, and other graphical items. The icons are generally selectable to initiate a task through user interface interaction to allow a user to execute applications or conduct other operations.

[0012] The term "screen," "touch screen," or "touchscreen" refers to a physical structure that includes one or more hardware components that provide the device with the ability to render a user interface and/or receive user input. A screen can encompass any combination of gesture capture region, a touch sensitive display, and/or a configurable area. The device can have one or more physical screens embedded in the hardware. However a screen may

also include an external peripheral device that may be attached and detached from the device. In embodiments, multiple external devices may be attached to the device. Thus, in embodiments, the screen can enable the user to interact with the device by touching areas on the screen and provides information to a user through a display. The touch screen may sense user contact in a number of different ways, such as by a change in an electrical parameter (e.g., resistance or capacitance), acoustic wave variations, infrared radiation proximity detection, light variation detection, and the like. In a resistive touch screen, for example, normally separated conductive and resistive metallic layers in the screen pass an electrical current. When a user touches the screen, the two layers make contact in the contacted location, whereby a change in electrical field is noted and the coordinates of the contacted location calculated. In a capacitive touch screen, a capacitive layer stores electrical charge, which is discharged to the user upon contact with the touch screen, causing a decrease in the charge of the capacitive layer. The decrease is measured, and the contacted location coordinates determined. In a surface acoustic wave touch screen, an acoustic wave is transmitted through the screen, and the acoustic wave is disturbed by user contact. A receiving transducer detects the user contact instance and determines the contacted location coordinates.

[0013] The term "display" refers to a portion of one or more screens used to display the output of a computer to a user. A display may be a single-screen display or a multi-screen display, referred to as a composite display. A composite display can encompass the touch sensitive display of one or more screens. A single physical screen can include multiple displays that are managed as separate logical displays. Thus, different content can be displayed on the separate displays although part of the same physical screen.

[0014] The term "displayed image" refers to an image produced on the display. A typical displayed image is a window or desktop. The displayed image may occupy all or a portion of the display.

[0015] The term "display orientation" refers to the way in which a rectangular display is oriented by a user for viewing. The two most common types of display orientation are portrait and landscape. In landscape mode, the display is oriented such that the width of the display is greater than the height of the display (such as a 4:3 ratio, which is 4 units wide and 3 units tall, or a 16:9 ratio, which is 16 units wide and 9 units tall). Stated differently, the longer dimension of the display is oriented substantially horizontal in landscape mode while the shorter dimension of the display is oriented substantially vertical. In the portrait mode, by contrast, the display is oriented such that the width of the

display is less than the height of the display. Stated differently, the shorter dimension of the display is oriented substantially horizontal in the portrait mode while the longer dimension of the display is oriented substantially vertical.

[0016] The term "composited display" refers to a logical structure that defines a display that can encompass one or more screens. A multi-screen display can be associated with a composite display that encompasses all the screens. The composite display can have different display characteristics based on the various orientations of the device.

[0017] The term "gesture" refers to a user action that expresses an intended idea, action, meaning, result, and/or outcome. The user action can include manipulating a device (e.g., opening or closing a device, changing a device orientation, moving a trackball or wheel, etc.), movement of a body part in relation to the device, movement of an implement or tool in relation to the device, audio inputs, etc. A gesture may be made on a device (such as on the screen) or with the device to interact with the device.

[0018] The term "module" as used herein refers to any known or later developed hardware, software, firmware, artificial intelligence, fuzzy logic, or combination of hardware and software that is capable of performing the functionality associated with that element.

[0019] The term "gesture capture" refers to a sense or otherwise a detection of an instance and/or type of user gesture. The gesture capture can occur in one or more areas of the screen, A gesture region can be on the display, where it may be referred to as a touch sensitive display or off the display where it may be referred to as a gesture capture area.

[0020] A "multi-screen application" refers to an application that is capable of multiple modes. The multi-screen application mode can include, but is not limited to, a single screen mode (where the application is displayed on a single screen) or a composite display mode (where the application is displayed on two or more screens). A multi-screen application can have different layouts optimized for the mode. Thus, the multi-screen application can have different layouts for a single screen or for a composite display that can encompass two or more screens. The different layouts may have different screen/display dimensions and/or configurations on which the user interfaces of the multi-screen applications can be rendered. The different layouts allow the application to optimize the application's user interface for the type of display, *e.g.,* single screen or multiple screens. In single screen mode, the multi-screen application may present one window pane of information. In a composite display mode, the multi-screen application

may present multiple window panes of information or may provide a larger and a richer presentation because there is more space for the display contents. The multi-screen applications may be designed to adapt dynamically to changes in the device and the mode depending on which display (single or composite) the system assigns to the multi-screen application. In alternative embodiments, the user can use a gesture to request the application transition to a different mode, and, if a display is available for the requested mode, the device can allow the application to move to that display and transition modes.

[0021] A "single-screen application" refers to an application that is capable of single screen mode. Thus, the single-screen application can produce only one window and may not be capable of different modes or different display dimensions. A single-screen application is incapable of the several modes discussed with the multi-screen application.

[0022] The term "window" refers to a, typically rectangular, displayed image on at least part of a display that contains or provides content different from the rest of the screen. The window may obscure the desktop.

[0023] The terms "determine", "calculate" and "compute," and variations thereof, as used herein, are used interchangeably and include any type of methodology, process, mathematical operation or technique.

[0024] It shall be understood that the term "means" as used herein shall be given its broadest possible interpretation in accordance with 35 U.S.C., Section 112, Paragraph 6. Accordingly, a claim incorporating the term "means" shall cover all structures, materials, or acts set forth herein, and all of the equivalents thereof. Further, the structures, materials or acts and the equivalents thereof shall include all those described in the summary of the invention, brief description of the drawings, detailed description, abstract, and claims themselves.

[0025] The preceding is a simplified summary of the disclosure to provide an understanding of some aspects of the disclosure. This summary is neither an extensive nor exhaustive overview of the disclosure and its various aspects, embodiments, and/or configurations. It is intended neither to identify key or critical elements of the disclosure nor to delineate the scope of the disclosure but to present selected concepts of the disclosure in a simplified form as an introduction to the more detailed description presented below. As will be appreciated, other aspects, embodiments, and/or configurations of the disclosure are possible utilizing, alone or in combination, one or more of the features set forth above or described in detail below.

BRIEF DESCRIPTION OF THE DRAWINGS

[0026] FIG. 1A includes a first view of an embodiment of a multi-screen user device;

[0027] FIG. 1B includes a second view of an embodiment of a multi-screen user device;

[0028] FIG. 1C includes a third view of an embodiment of a multi-screen user device;

[0029] FIG. 1D includes a fourth view of an embodiment of a multi-screen user device;

[0030] FIG. 1E includes a fifth view of an embodiment of a multi-screen user device;

[0031] FIG. 1F includes a sixth view of an embodiment of a multi-screen user device;

[0032] FIG. 1G includes a seventh view of an embodiment of a multi-screen user device;

[0033] FIG. 1H includes a eighth view of an embodiment of a multi-screen user device;

[0034] FIG. 1I includes a ninth view of an embodiment of a multi-screen user device;

[0035] FIG. 1J includes a tenth view of an embodiment of a multi-screen user device;

[0036] FIG. 2 is a block diagram of an embodiment of the hardware of the device;

[0037] FIG. 3A is a block diagram of an embodiment of the state model for the device based on the device's orientation and/or configuration;

[0038] FIG. 3B is a table of an embodiment of the state model for the device based on the device's orientation and/or configuration;

[0039] FIG. 4A is a first representation of an embodiment of user gesture received at a device;

[0040] FIG. 4B is a second representation of an embodiment of user gesture received at a device;

[0041] FIG. 4C is a third representation of an embodiment of user gesture received at a device;

[0042] FIG. 4D is a fourth representation of an embodiment of user gesture received at a device;

[0043] FIG. 4E is a fifth representation of an embodiment of user gesture received at a device;

[0044] FIG. 4F is a sixth representation of an embodiment of user gesture received at a device;

[0045] FIG. 4G is a seventh representation of an embodiment of user gesture received at a device;

[0046] FIG. 4H is a eighth representation of an embodiment of user gesture received at a device;

[0047] FIG. 5A is a block diagram of an embodiment of the device software and/or firmware;

[0048] FIG. 5B is a second block diagram of an embodiment of the device software and/or firmware;

[0049] FIG. 6A is a first representation of an embodiment of a device configuration generated in response to the device state;

[0050] FIG. 6B is a second representation of an embodiment of a device configuration generated in response to the device state;

[0051] FIG. 6C is a third representation of an embodiment of a device configuration generated in response to the device state;

[0052] FIG. 6D is a fourth representation of an embodiment of a device configuration generated in response to the device state;

[0053] FIG. 6E is a fifth representation of an embodiment of a device configuration generated in response to the device state;

[0054] FIG. 6F is a sixth representation of an embodiment of a device configuration generated in response to the device state;

[0055] FIG. 6G is a seventh representation of an embodiment of a device configuration generated in response to the device state;

[0056] FIG. 6H is a eighth representation of an embodiment of a device configuration generated in response to the device state;

[0057] FIG. 6I is a ninth representation of an embodiment of a device configuration generated in response to the device state;

[0058] FIG. 6J is a tenth representation of an embodiment of a device configuration generated in response to the device state;

[0059] Fig. 7A depicts a first sequence of gestures to invoke a first display action in accordance with embodiments of the present disclosure;

[0060] Fig. 7B depicts a second sequence of gestures to invoke a second display action in accordance with embodiments of the present disclosure;

[0061] Fig. 7C depicts a third sequence of gestures to invoke a third display action in accordance with embodiments of the present disclosure;

[0062] Fig. 7D depicts a fourth sequence of gestures to invoke a fourth display action in accordance with embodiments of the present disclosure; and

[0063] Fig. 8 is a flow diagram depicting a display control method in accordance with embodiments of the present disclosure.

[0064] In the appended figures, similar components and/or features may have the same reference label. Further, various components of the same type may be distinguished by

following the reference label by a letter that distinguishes among the similar components. If only the first reference label is used in the specification, the description is applicable to any one of the similar components having the same first reference label irrespective of the second reference label.

DETAILED DESCRIPTION

[0065] Presented herein are embodiments of a device. The device can be a communications device, such as a cellular telephone, or other smart device. The device can include two screens that are oriented to provide several unique display configurations. Further, the device can receive user input in unique ways. The overall design and functionality of the device provides for an enhanced user experience making the device more useful and more efficient.

[0066] Mechanical Features:

[0067] Figs. 1A-1J illustrate a device 100 in accordance with embodiments of the present disclosure. As described in greater detail below, device 100 can be positioned in a number of different ways each of which provides different functionality to a user. The device 100 is a multi-screen device that includes a primary screen 104 and a secondary screen 108, both of which are touch sensitive. In embodiments, the entire front surface of screens 104 and 108 may be touch sensitive and capable of receiving input by a user touching the front surface of the screens 104 and 108. Primary screen 104 includes touch sensitive display 110, which, in addition to being touch sensitive, also displays information to a user. Secondary screen 108 includes touch sensitive display 114, which also displays information to a user. In other embodiments, screens 104 and 108 may include more than one display area.

[0068] Primary screen 104 also includes a configurable area 112 that has been configured for specific inputs when the user touches portions of the configurable area 112. Secondary screen 108 also includes a configurable area 116 that has been configured for specific inputs. Areas 112a and 116a have been configured to receive a "back" input indicating that a user would like to view information previously displayed. Areas 112b and 116b have been configured to receive a "menu" input indicating that the user would like to view options from a menu. Areas 112c and 116c have been configured to receive a "home" input indicating that the user would like to view information associated with a "home" view. In other embodiments, areas 112a-c and 116a-c may be configured, in addition to the configurations described above, for other types of specific inputs including controlling features of device 100, some non-limiting examples including adjusting overall

system power, adjusting the volume, adjusting the brightness, adjusting the vibration, selecting of displayed items (on either of screen 104 or 108), operating a camera, operating a microphone, and initiating/terminating of telephone calls. Also, in some embodiments, areas 112a-C and 116a-C may be configured for specific inputs depending upon the application running on device 100 and/or information displayed on touch sensitive displays 110 and/or 114.

[0069] In addition to touch sensing, primary screen 104 and secondary screen 108 may also include areas that receive input from a user without requiring the user to touch the display area of the screen. For example, primary screen 104 includes gesture capture area 120, and secondary screen 108 includes gesture capture area 124. These areas are able to receive input by recognizing gestures made by a user without the need for the user to actually touch the surface of the display area. In comparison to touch sensitive displays 110 and 114, the gesture capture areas 120 and 124 are commonly not capable of rendering a displayed image.

[0070] The two screens 104 and 108 are connected together with a hinge 128, shown clearly in Fig. 1C (illustrating a back view of device 100). Hinge 128, in the embodiment shown in Figs. 1A-1J, is a center hinge that connects screens 104 and 108 so that when the hinge is closed, screens 104 and 108 are juxtaposed (i.e., side-by-side) as shown in Fig. 1B (illustrating a front view of device 100). Hinge 128 can be opened to position the two screens 104 and 108 in different relative positions to each other. As described in greater detail below, the device 100 may have different functionalities depending on the relative positions of screens 104 and 108.

[0071] Fig. 1D illustrates the right side of device 100. As shown in Fig. 1D, secondary screen 108 also includes a card slot 132 and a port 136 on its side. Card slot 132 in embodiments, accommodates different types of cards including a subscriber identity module (SIM). Port 136 in embodiments is an input/output port (I/O port) that allows device 100 to be connected to other peripheral devices, such as a display, keyboard, or printing device. As can be appreciated, these are merely some examples and in other embodiments device 100 may include other slots and ports such as slots and ports for accommodating additional memory devices and/or for connecting other peripheral devices. Also shown in Fig. 1D is an audio jack 140 that accommodates a tip, ring, sleeve (TRS) connector for example to allow a user to utilize headphones or a headset.

[0072] Device 100 also includes a number of buttons 158. For example, Fig. 1E illustrates the left side of device 100. As shown in Fig. 1E, the side of primary screen 104

includes three buttons 144, 148, and 152, which can be configured for specific inputs. For example, buttons 144, 148, and 152 may be configured to, in combination or alone, control a number of aspects of device 100. Some non-limiting examples include overall system power, volume, brightness, vibration, selection of displayed items (on either of screen 104 or 108), a camera, a microphone, and initiation/termination of telephone calls. In some embodiments, instead of separate buttons two buttons may be combined into a rocker button. This arrangement is useful in situations where the buttons are configured to control features such as volume or brightness. In addition to buttons 144, 148, and 152, device 100 also includes a button 156, shown in Fig. 1F, which illustrates the top of device 100. In one embodiment, button 156 is configured as an on/off button used to control overall system power to device 100. In other embodiments, button 156 is configured to, in addition to or in lieu of controlling system power, control other aspects of device 100. In some embodiments, one or more of the buttons 144, 148, 152, and 156 are capable of supporting different user commands. By way of example, a normal press has a duration commonly of less than about 1 second and resembles a quick tap. A medium press has a duration commonly of 1 second or more but less than about 12 seconds. A long press has a duration commonly of about 12 seconds or more. The function of the buttons is normally specific to the application that is currently in focus on the respective display 110 and 114. In a telephone application for instance and depending on the particular button, a normal, medium, or long press can mean end call, increase in call volume, decrease in call volume, and toggle microphone mute. In a camera or video application for instance and depending on the particular button, a normal, medium, or long press can mean increase zoom, decrease zoom, and take photograph or record video.

[0073] There are also a number of hardware components within device 100. As illustrated in Fig. 1C, device 100 includes a speaker 160 and a microphone 164. Device 100 also includes a camera 168 (Fig. 1B). Additionally, device 100 includes two position sensors 172A and 172B, which are used to determine the relative positions of screens 104 and 108. In one embodiment, position sensors 172A and 172B are Hall effect sensors. However, in other embodiments other sensors can be used in addition to or in lieu of the Hall effect sensors. An accelerometer 176 may also be included as part of device 100 to determine the orientation of the device 100 and/or the orientation of screens 104 and 108. Additional internal hardware components that may be included in device 100 are described below with respect to Fig. 2.

[0074] The overall design of device 100 allows it to provide additional functionality not available in other communication devices. Some of the functionality is based on the various positions and orientations that device 100 can have. As shown in Figs. 1B-1G, device 100 can be operated in an "open" position where screens 104 and 108 are juxtaposed. This position allows a large display area for displaying information to a user. When position sensors 172A and 172B determine that device 100 is in the open position, they can generate a signal that can be used to trigger different events such as displaying information on both screens 104 and 108. Additional events may be triggered if accelerometer 176 determines that device 100 is in a portrait position (Fig. 1B) as opposed to a landscape position (not shown).

[0075] In addition to the open position, device 100 may also have a "closed" position illustrated in Fig. 1H. Again, position sensors 172A and 172B can generate a signal indicating that device 100 is in the "closed" position. This can trigger an event that results in a change of displayed information on screen 104 and/or 108. For example, device 100 may be programmed to stop displaying information on one of the screens, e.g., screen 108, since a user can only view one screen at a time when device 100 is in the "closed" position. In other embodiments, the signal generated by position sensors 172A and 172B, indicating that the device 100 is in the "closed" position, can trigger device 100 to answer an incoming telephone call. The "closed" position can also be a preferred position for utilizing the device 100 as a mobile phone.

[0076] Device 100 can also be used in an "easel" position which is illustrated in Fig. 1I. In the "easel" position, screens 104 and 108 are angled with respect to each other and facing outward with the edges of screens 104 and 108 substantially horizontal. In this position, device 100 can be configured to display information on both screens 104 and 108 to allow two users to simultaneously interact with device 100. When device 100 is in the "easel" position, sensors 172A and 172B generate a signal indicating that the screens 104 and 108 are positioned at an angle to each other, and the accelerometer 176 can generate a signal indicating that device 100 has been placed so that the edge of screens 104 and 108 are substantially horizontal. The signals can then be used in combination to generate events that trigger changes in the display of information on screens 104 and 108.

[0077] Fig. 1J illustrates device 100 in a "modified easel" position. In the "modified easel" position, one of screens 104 or 108 is used as a stand and is faced down on the surface of an object such as a table. This position provides a convenient way for information to be displayed to a user in landscape orientation. Similar to the easel

position, when device 100 is in the "modified easel" position, position sensors 172A and 172B generate a signal indicating that the screens 104 and 108 are positioned at an angle to each other. The accelerometer 176 would generate a signal indicating that device 100 has been positioned so that one of screens 104 and 108 is faced downwardly and is substantially horizontal. The signals can then be used to generate events that trigger changes in the display of information of screens 104 and 108. For example, information may not be displayed on the screen that is face down since a user cannot see the screen.

[0078] Transitional states are also possible. When the position sensors 172A and B and/or accelerometer indicate that the screens are being closed or folded (from open), a closing transitional state is recognized. Conversely when the position sensors 172A and B indicate that the screens are being opened or folded (from closed), an opening transitional state is recognized. The closing and opening transitional states are typically time-based, or have a maximum time duration from a sensed starting point. Normally, no user input is possible when one of the closing and opening states is in effect. In this manner, incidental user contact with a screen during the closing or opening function is not misinterpreted as user input. In embodiments, another transitional state is possible when the device 100 is closed. This additional transitional state allows the display to switch from one screen 104 to the second screen 108 when the device 100 is closed based on some user input, e.g., a double tap on the screen 110,114.

[0079] As can be appreciated, the description of device 100 is made for illustrative purposes only, and the embodiments are not limited to the specific mechanical features shown in Figs. 1A-1J and described above. In other embodiments, device 100 may include additional features, including one or more additional buttons, slots, display areas, hinges, and/or locking mechanisms. Additionally, in embodiments, the features described above may be located in different parts of device 100 and still provide similar functionality. Therefore, Figs. 1A-1J and the description provided above are nonlimiting.

[0080] Hardware Features:

[0081] Fig. 2 illustrates components of a device 100 in accordance with embodiments of the present disclosure. In general, the device 100 includes a primary screen 104 and a secondary screen 108. While the primary screen 104 and its components are normally enabled in both the opened and closed positions or states, the secondary screen 108 and its components are normally enabled in the opened state but disabled in the closed state. However, even when in the closed state a user or application triggered interrupt (such as in response to a phone application or camera application operation) can flip the active screen,

or disable the primary screen 104 and enable the secondary screen 108, by a suitable command. Each screen 104, 108 can be touch sensitive and can include different operative areas. For example, a first operative area, within each touch sensitive screen 104 and 108, may comprise a touch sensitive display 110, 114. In general, the touch sensitive display 110, 114 may comprise a full color, touch sensitive display. A second area within each touch sensitive screen 104 and 108 may comprise a gesture capture region 120, 124. The gesture capture region 120, 124 may comprise an area or region that is outside of the touch sensitive display 110, 114 area, and that is capable of receiving input, for example in the form of gestures provided by a user. However, the gesture capture region 120, 124 does not include pixels that can perform a display function or capability.

[0082] A third region of the touch sensitive screens 104 and 108 may comprise a configurable area 112, 116. The configurable area 112, 116 is capable of receiving input and has display or limited display capabilities. In embodiments, the configurable area 112, 116 may present different input options to the user. For example, the configurable area 112, 116 may display buttons or other relatable items. Moreover, the identity of displayed buttons, or whether any buttons are displayed at all within the configurable area 112, 116 of a touch sensitive screen 104 or 108, may be determined from the context in which the device 100 is used and/or operated. In an exemplary embodiment, the touch sensitive screens 104 and 108 comprise liquid crystal display devices extending across at least those regions of the touch sensitive screens 104 and 108 that are capable of providing visual output to a user, and a capacitive input matrix over those regions of the touch sensitive screens 104 and 108 that are capable of receiving input from the user.

[0083] One or more display controllers 216a, 216b may be provided for controlling the operation of the touch sensitive screens 104 and 108, including input (touch sensing) and output (display) functions. In the exemplary embodiment illustrated in Fig. 2, a separate touch screen controller 216a or 216b is provided for each touch screen 104 and 108. In accordance with alternate embodiments, a common or shared touch screen controller 216 may be used to control each of the included touch sensitive screens 104 and 108. In accordance with still other embodiments, the functions of a touch screen controller 216 may be incorporated into other components, such as a processor 204.

[0084] The processor 204 may comprise a general purpose programmable processor or controller for executing application programming or instructions. In accordance with at least some embodiments, the processor 204 may include multiple processor cores, and/or implement multiple virtual processors. In accordance with still other embodiments, the

processor 204 may include multiple physical processors. As a particular example, the processor 204 may comprise a specially configured application specific integrated circuit (ASIC) or other integrated circuit, a digital signal processor, a controller, a hardwired electronic or logic circuit, a programmable logic device or gate array, a special purpose computer, or the like. The processor 204 generally functions to run programming code or instructions implementing various functions of the device 100.

[0085] A communication device 100 may also include memory 208 for use in connection with the execution of application programming or instructions by the processor 204, and for the temporary or long term storage of program instructions and/or data. As examples, the memory 208 may comprise RAM, DRAM, SDRAM, or other solid state memory. Alternatively or in addition, data storage 212 may be provided. Like the memory 208, the data storage 212 may comprise a solid state memory device or devices. Alternatively or in addition, the data storage 212 may comprise a hard disk drive or other random access memory.

[0086] In support of communications functions or capabilities, the device 100 can include a cellular telephony module 228. As examples, the cellular telephony module 228 can comprise a GSM, CDMA, FDMA and/or analog cellular telephony transceiver capable of supporting voice, multimedia and/or data transfers over a cellular network. Alternatively or in addition, the device 100 can include an additional or other wireless communications module 232. As examples, the other wireless communications module 232 can comprise a Wi-Fi, BLUETOOTH TM, WiMax, infrared, or other wireless communications link. The cellular telephony module 228 and the other wireless communications module 232 can each be associated with a shared or a dedicated antenna 224.

[0087] A port interface 252 may be included. The port interface 252 may include proprietary or universal ports to support the interconnection of the device 100 to other devices or components, such as a dock, which may or may not include additional or different capabilities from those integral to the device 100. In addition to supporting an exchange of communication signals between the device 100 and another device or component, the docking port 136 and/or port interface 252 can support the supply of power to or from the device 100. The port interface 252 also comprises an intelligent element that comprises a docking module for controlling communications or other interactions between the device 100 and a connected device or component.

[0088] An input/output module 248 and associated ports may be included to support communications over wired networks or links, for example with other communication devices, server devices, and/or peripheral devices. Examples of an input/output module 248 include an Ethernet port, a Universal Serial Bus (USB) port, Institute of Electrical and Electronics Engineers (IEEE) 1394, or other interface.

[0089] An audio input/output interface/device(s) 244 can be included to provide analog audio to an interconnected speaker or other device, and to receive analog audio input from a connected microphone or other device. As an example, the audio input/output interface/device(s) 244 may comprise an associated amplifier and analog to digital converter. Alternatively or in addition, the device 100 can include an integrated audio input/output device 256 and/or an audio jack for interconnecting an external speaker or microphone. For example, an integrated speaker and an integrated microphone can be provided, to support near talk or speaker phone operations.

[0090] Hardware buttons 158 can be included for example for use in connection with certain control operations. Examples include a master power switch, volume control, etc., as described in conjunction with Figs. 1A through 1J. One or more image capture interfaces/devices 240, such as a camera, can be included for capturing still and/or video images. Alternatively or in addition, an image capture interface/device 240 can include a scanner or code reader. An image capture interface/device 240 can include or be associated with additional elements, such as a flash or other light source.

[0091] The device 100 can also include a global positioning system (GPS) receiver 236. In accordance with embodiments of the present invention, the GPS receiver 236 may further comprise a GPS module that is capable of providing absolute location information to other components of the device 100. An accelerometer(s) 176 may also be included. For example, in connection with the display of information to a user and/or other functions, a signal from the accelerometer 176 can be used to determine an orientation and/or format in which to display that information to the user.

[0092] Embodiments of the present invention can also include one or more position sensor(s) 172. The position sensor 172 can provide a signal indicating the position of the touch sensitive screens 104 and 108 relative to one another. This information can be provided as an input, for example to a user interface application, to determine an operating mode, characteristics of the touch sensitive displays 110, 114, and/or other device 100 operations. As examples, a screen position sensor 172 can comprise a series of Hall effect sensors, a multiple position switch, an optical switch, a Wheatstone bridge, a

potentiometer, or other arrangement capable of providing a signal indicating of multiple relative positions the touch screens are in.

[0093] Communications between various components of the device 100 can be carried by one or more buses 222. In addition, power can be supplied to the components of the device 100 from a power source and/or power control module 260. The power control module 260 can, for example, include a battery, an AC to DC converter, power control logic, and/or ports for interconnecting the device 100 to an external source of power.

[0094] Device State:

[0095] Figs. 3A and 3B represent illustrative states of device 100. While a number of illustrative states are shown, and transitions from a first state to a second state, it is to be appreciated that the illustrative state diagram may not encompass all possible states and/or all possible transitions from a first state to a second state. As illustrated in Fig. 3, the various arrows between the states (illustrated by the state represented in the circle) represent a physical change that occurs to the device 100, that is detected by one or more of hardware and software, the detection triggering one or more of a hardware and/or software interrupt that is used to control and/or manage one or more functions of device 100.

[0096] As illustrated in Fig. 3A, there are twelve exemplary "physical" states: closed 304, transition 308 (or opening transitional state), easel 312, modified easel 316, open 320, inbound/outbound call or communication 324, image/video capture 328, transition 332 (or closing transitional state), landscape 340, docked 336, docked 344 and landscape 348. Next to each illustrative state is a representation of the physical state of the device 100 with the exception of states 324 and 328, where the state is generally symbolized by the international icon for a telephone and the icon for a camera, respectfully.

[0097] In state 304, the device is in a closed state with the device 100 generally oriented in the portrait direction with the primary screen 104 and the secondary screen 108 back-to-back in different planes (see Fig. 1H). From the closed state, the device 100 can enter, for example, docked state 336, where the device 100 is coupled with a docking station, docking cable, or in general docked or associated with one or more other devices or peripherals, or the landscape state 340, where the device 100 is generally oriented with the primary screen 104 facing the user, and the primary screen 104 and the secondary screen 108 being back-to-back.

[0098] In the closed state, the device can also move to a transitional state where the device remains closed but the display is moved from one screen 104 to another screen 108

based on a user input, e.g., a double tap on the screen 110, 114. Still another embodiment includes a bilateral state. In the bilateral state, the device remains closed, but a single application displays at least one window on both the first display 110 and the second display 114. The windows shown on the first and second display 110, 114 may be the same or different based on the application and the state of that application. For example, while acquiring an image with a camera, the device may display the view finder on the first display 110 and displays a preview for the photo subjects (full screen and mirrored left-to-right) on the second display 114.

[0099] In state 308, a transition state from the closed state 304 to the semi-open state or easel state 312, the device 100 is shown opening with the primary screen 104 and the secondary screen 108 being rotated around a point of axis coincidence with the hinge. Upon entering the easel state 312, the primary screen 104 and the secondary screen 108 are separated from one another such that, for example, the device 100 can sit in an easel-like configuration on a surface.

[0100] In state 316, known as the modified easel position, the device 100 has the primary screen 104 and the secondary screen 108 in a similar relative relationship to one another as in the easel state 312, with the difference being one of the primary screen 104 or the secondary screen 108 are placed on a surface as shown.

[0101] State 320 is the open state where the primary screen 104 and the secondary screen 108 are generally on the same plane. From the open state, the device 100 can transition to the docked state 344 or the open landscape state 348. In the open state 320, the primary screen 104 and the secondary screen 108 are generally in the portrait-like orientation while in landscaped state 348 the primary screen 104 and the secondary screen 108 are generally in a landscape-like orientation.

[0102] State 324 is illustrative of a communication state, such as when an inbound or outbound call is being received or placed, respectively, by the device 100. While not illustrated for clarity, it should be appreciated the device 100 can transition to the inbound/outbound call state 324 from any state illustrated in Fig. 3. In a similar manner, the image/video capture state 328 can be entered into from any other state in Fig. 3, with the image/video capture state 328 allowing the device 100 to take one or more images via a camera and/or videos with a video capture device 240.

[0103] Transition state 322 illustratively shows primary screen 104 and the secondary screen 108 being closed upon one another for entry into, for example, the closed state 304.

[0104] Fig. 3B illustrates, with reference to the key, the inputs that are received to detect a transition from a first state to a second state. In Fig. 3B, various combinations of states are shown with in general, a portion of the columns being directed toward a portrait state 352, a landscape state 356, and a portion of the rows being directed to portrait state 360 and landscape state 364.

[0105] In Fig. 3B, the Key indicates that "H" represents an input from one or more Hall Effect sensors, "A" represents an input from one or more accelerometers, "T" represents an input from a timer, "P" represents a communications trigger input and "I" represents an image and/or video capture request input. Thus, in the center portion 376 of the chart, an input, or combination of inputs, are shown that represent how the device 100 detects a transition from a first physical state to a second physical state.

[0106] As discussed, in the center portion of the chart 376, the inputs that are received enable the detection of a transition from, for example, a portrait open state to a landscape easel state - shown in bold – "HAT." For this exemplary transition from the portrait open to the landscape easel state, a Hall Effect sensor ("H"), an accelerometer ("A") and a timer ("T") input may be needed. The timer input can be derived from, for example, a clock associated with the processor.

[0107] In addition to the portrait and landscape states, a docked state 368 is also shown that is triggered based on the receipt of a docking signal 372. As discussed above and in relation to Fig. 3, the docking signal can be triggered by the association of the device 100 with one or more other device 100s, accessories, peripherals, smart docks, or the like.

[0108] User Interaction:

[0109] Figs. 4A through 4H depict various graphical representations of gesture inputs that may be recognized by the screens 104, 108. The gestures may be performed not only by a user's body part, such as a digit, but also by other devices, such as a stylus, that may be sensed by the contact sensing portion(s) of a screen 104, 108. In general, gestures are interpreted differently, based on where the gestures are performed (either directly on the display 110, 114 or in the gesture capture region 120, 124). For example, gestures in the display 110,114 may be directed to a desktop or application, and gestures in the gesture capture region 120, 124 may be interpreted as for the system.

[0110] With reference to Figs. 4A-4H, a first type of gesture, a touch gesture 420, is substantially stationary on the screen 104,108 for a selected length of time. A circle 428 represents a touch or other contact type received at particular location of a contact sensing portion of the screen. The circle 428 may include a border 432, the thickness of which

indicates a length of time that the contact is held substantially stationary at the contact location. For instance, a tap 420 (or short press) has a thinner border 432a than the border 432b for a long press 424 (or for a normal press). The long press 424 may involve a contact that remains substantially stationary on the screen for longer time period than that of a tap 420. As will be appreciated, differently defined gestures may be registered depending upon the length of time that the touch remains stationary prior to contact cessation or movement on the screen.

[0111] With reference to Fig. 4C, a drag gesture 400 on the screen 104,108 is an initial contact (represented by circle 428) with contact movement 436 in a selected direction. The initial contact 428 may remain stationary on the screen 104,108 for a certain amount of time represented by the border 432. The drag gesture typically requires the user to contact an icon, window, or other displayed image at a first location followed by movement of the contact in a drag direction to a new second location desired for the selected displayed image. The contact movement need not be in a straight line but have any path of movement so long as the contact is substantially continuous from the first to the second locations.

[0112] With reference to Fig. 4D, a flick gesture 404 on the screen 104,108 is an initial contact (represented by circle 428) with truncated contact movement 436 (relative to a drag gesture) in a selected direction. In embodiments, a flick has a higher exit velocity for the last movement in the gesture compared to the drag gesture. The flick gesture can, for instance, be a finger snap following initial contact. Compared to a drag gesture, a flick gesture generally does not require continual contact with the screen 104,108 from the first location of a displayed image to a predetermined second location. The contacted displayed image is moved by the flick gesture in the direction of the flick gesture to the predetermined second location. Although both gestures commonly can move a displayed image from a first location to a second location, the temporal duration and distance of travel of the contact on the screen is generally less for a flick than for a drag gesture.

[0113] With reference to Fig. 4E, a pinch gesture 408 on the screen 104,108 is depicted. The pinch gesture 408 may be initiated by a first contact 428 to the screen 104,108 by, for example, a first digit and a second contact 428b to the screen 104,108 by, for example, a second digit. The first and second contacts 428a,b may be detected by a common contact sensing portion of a common screen 104,108, by different contact sensing portions of a common screen 104 or108, or by different contact sensing portions of different screens. The first contact 428a is held for a first amount of time, as represented by the border 432a,

and the second contact 428b is held for a second amount of time, as represented by the border 432b. The first and second amounts of time are generally substantially the same, and the first and second contacts 428 a, b generally occur substantially simultaneously. The first and second contacts 428 a, b generally also include corresponding first and second contact movements 436 a, b, respectively. The first and second contact movements 436 a, b are generally in opposing directions. Stated another way, the first contact movement 436a is towards the second contact 436b, and the second contact movement 436b is towards the first contact 436a. More simply stated, the pinch gesture 408 may be accomplished by a user's digits touching the screen 104,108 in a pinching motion.

[0114] With reference to Fig. 4F, a spread gesture 410 on the screen 104,108 is depicted. The spread gesture 410 may be initiated by a first contact 428a to the screen 104,108 by, for example, a first digit and a second contact 428b to the screen 104,108 by, for example, a second digit. The first and second contacts 428a,b may be detected by a common contact sensing portion of a common screen 104,108, by different contact sensing portions of a common screen 104,108, or by different contact sensing portions of different screens. The first contact 428a is held for a first amount of time, as represented by the border 432a, and the second contact 428b is held for a second amount of time, as represented by the border 432b. The first and second amounts of time are generally substantially the same, and the first and second contacts 428 a, b generally occur substantially simultaneously. The first and second contacts 428 a, b generally also include corresponding first and second contact movements 436a, b, respectively. The first and second contact movements 436 a, b are generally in a common direction. Stated another way, the first and second contact movements 436 a, b are away from the first and second contacts 428a, b. More simply stated, the spread gesture 410 may be accomplished by a user's digits touching the screen 104,108 in a spreading motion.

[0115] The above gestures may be combined in any manner, such as those shown by Figs. 4G and 4H, to produce a determined functional result. For example, in Fig. 4G a tap gesture 420 is combined with a drag or flick gesture 412 in a direction away from the tap gesture 420. In Fig. 4H, a tap gesture 420 is combined with a drag or flick gesture 412 in a direction towards the tap gesture 420.

[0116] The functional result of receiving a gesture can vary depending on a number of factors, including a state of the device 100, display 110, 114, or screen 104, 108, a context associated with the gesture, or sensed location of the gesture. The state of the device commonly refers to one or more of a configuration of the device 100, a display orientation,

and user and other inputs received by the device 100. Context commonly refers to one or more of the particular application(s) selected by the gesture and the portion(s) of the application currently executing, whether the application is a single- or multi-screen application, and whether the application is a multi-screen application displaying one or more windows in one or more screens or in one or more stacks. Sensed location of the gesture commonly refers to whether the sensed set(s) of gesture location coordinates are on a touch sensitive display 110, 114 or a gesture capture region 120, 124, whether the sensed set(s) of gesture location coordinates are associated with a common or different display or screen 104,108, and/or what portion of the gesture capture region contains the sensed set(s) of gesture location coordinates.

[0117] A tap, when received by an a touch sensitive display 110, 114, can be used, for instance, to select an icon to initiate or terminate execution of a corresponding application, to maximize or minimize a window, to reorder windows in a stack, and to provide user input such as by keyboard display or other displayed image. A drag, when received by a touch sensitive display 110, 114, can be used, for instance, to relocate an icon or window to a desired location within a display, to reorder a stack on a display, or to span both displays (such that the selected window occupies a portion of each display simultaneously). A flick, when received by a touch sensitive display 110, 114 or a gesture capture region 120, 124, can be used to relocate a window from a first display to a second display or to span both displays (such that the selected window occupies a portion of each display simultaneously). Unlike the drag gesture, however, the flick gesture is generally not used to move the displayed image to a specific user-selected location but to a default location that is not configurable by the user.

[0118] The pinch gesture, when received by a touch sensitive display 110, 114 or a gesture capture region 120, 124, can be used to minimize or otherwise increase the displayed area or size of a window (typically when received entirely by a common display), to switch windows displayed at the top of the stack on each display to the top of the stack of the other display (typically when received by different displays or screens), or to display an application manager (a "pop-up window" that displays the windows in the stack). The spread gesture, when received by a touch sensitive display 110, 114 or a gesture capture region 120, 124, can be used to maximize or otherwise decrease the displayed area or size of a window, to switch windows displayed at the top of the stack on each display to the top of the stack of the other display (typically when received by

different displays or screens), or to display an application manager (typically when received by an off-screen gesture capture region on the same or different screens).

[0119] The combined gestures of Fig. 4G, when received by a common display capture region in a common display or screen 104,108, can be used to hold a first window stack location in a first stack constant for a display receiving the gesture while reordering a second window stack location in a second window stack to include a window in the display receiving the gesture. The combined gestures of Fig. 4H, when received by different display capture regions in a common display or screen 104,108 or in different displays or screens, can be used to hold a first window stack location in a first window stack constant for a display receiving the tap part of the gesture while reordering a second window stack location in a second window stack to include a window in the display receiving the flick or drag gesture. Although specific gestures and gesture capture regions in the preceding examples have been associated with corresponding sets of functional results, it is to be appreciated that these associations can be redefined in any manner to produce differing associations between gestures and/or gesture capture regions and/or functional results.

[0120] Firmware and Software:

[0121] The memory 508 may store and the processor 504 may execute one or more software components. These components can include at least one operating system (OS) 516, an application manager 562, a desktop 566, and/or one or more applications 564a and/or 564b from an application store 560. The OS 516 can include a framework 520, one or more frame buffers 548, one or more drivers 512, previously described in conjunction with Fig. 2, and/or a kernel 518. The OS 516 can be any software, consisting of programs and data, which manages computer hardware resources and provides common services for the execution of various applications 564. The OS 516 can be any operating system and, at least in some embodiments, dedicated to mobile devices, including, but not limited to, Linux, ANDROID TM, iPhone OS (IOS TM), WINDOWS PHONE 7 TM, etc. The OS 516 is operable to provide functionality to the phone by executing one or more operations, as described herein.

[0122] The applications 564 can be any higher level software that executes particular functionality for the user. Applications 564 can include programs such as email clients, web browsers, texting applications, games, media players, office suites, etc. The applications 564 can be stored in an application store 560, which may represent any memory or data storage, and the management software associated therewith, for storing

the applications 564. Once executed, the applications 564 may be run in a different area of memory 508.

[0123] The framework 520 may be any software or data that allows the multiple tasks running on the device to interact. In embodiments, at least portions of the framework 520 and the discrete components described hereinafter may be considered part of the OS 516 or an application 564. However, these portions will be described as part of the framework 520, but those components are not so limited. The framework 520 can include, but is not limited to, a Multi-Display Management (MDM) module 524, a Surface Cache module 528, a Window Management module 532, an Input Management module 536, a Task Management module 540, an Application Model Manager 542, a Display Controller, one or more frame buffers 548, a task stack 552, one or more window stacks 550 (which is a logical arrangement of windows and/or desktops in a display area), and/or an event buffer 556.

[0124] The MDM module 524 includes one or more modules that are operable to manage the display of applications or other data on the screens of the device. An embodiment of the MDM module 524 is described in conjunction with Fig. 5B. In embodiments, the MDM module 524 receives inputs from the other OS 516 components, such as, the drivers 512, and from the applications 564 to determine continually the state of the device 100. The inputs assist the MDM module 524 in determining how to configure and allocate the displays according to the application's preferences and requirements, and the user's actions. Once a determination for display configurations is made, the MDM module 524 can bind the applications 564 to a display. The configuration may then be provided to one or more other components to generate a window with a display.

[0125] The Surface Cache module 528 includes any memory or storage and the software associated therewith to store or cache one or more images of windows. A series of active and/or non-active windows (or other display objects, such as, a desktop display) can be associated with each display. An active window (or other display object) is currently displayed. A non-active windows (or other display objects) were opened and, at some time, displayed but are now not displayed. To enhance the user experience, before a window transitions from an active state to an inactive state, a "screen shot" of a last generated image of the window (or other display object) can be stored. The Surface Cache module 528 may be operable to store a bitmap of the last active image of a window (or

other display object) not currently displayed. Thus, the Surface Cache module 528 stores the images of non-active windows (or other display objects) in a data store.

[0126] In embodiments, the Window Management module 532 is operable to manage the windows (or other display objects) that are active or not active on each of the displays. The Window Management module 532, based on information from the MDM module 524, the OS 516, or other components, determines when a window (or other display object) is visible or not active. The Window Management module 532 may then put a non-visible window (or other display object) in a "not active state" and, in conjunction with the Task Management module Task Management 540 suspends the application's operation. Further, the Window Management module 532 may assign, through collaborative interaction with the MDM module 524, a display identifier to the window (or other display object) or manage one or more other items of data associated with the window (or other display object). The Window Management module 532 may also provide the stored information to the application 564, the Task Management module 540, or other components interacting with or associated with the window (or other display object). The Window Management module 532 can also associate an input task with a window based on window focus and display coordinates within the motion space.

[0127] The Input Management module 536 is operable to manage events that occur with the device. An event is any input into the window environment, for example, a user interface interactions with a user. The Input Management module 536 receives the events and logically stores the events in an event buffer 556. Events can include such user interface interactions as a "down event," which occurs when a screen 104, 108 receives a touch signal from a user, a "move event," which occurs when the screen 104, 108 determines that a user's finger is moving across a screen(s), an "up event, which occurs when the screen 104, 108 determines that the user has stopped touching the screen 104, 108, etc. These events are received, stored, and forwarded to other modules by the Input Management module 536. The Input Management module 536 may also map screen inputs to a motion space which is the culmination of all physical and virtual display available on the device.

[0128] The motion space is a virtualized space that includes all touch sensitive displays 110,114 "tiled" together to mimic the physical dimensions of the device 100. For example, when the device 100 is unfolded, the motion space size may be 960x800, which may be the number of pixels in the combined display area for both touch sensitive displays 110, 114. If a user touches on a first touch sensitive display 110 on location (40, 40), a full

screen window can receive touch event with location (40, 40). If a user touches on a second touch sensitive display 114, with location (40, 40), the full screen window can receive touch event with location (520, 40), because the second touch sensitive display 114 is on the right side of the first touch sensitive display 110, so the device 100 can offset the touch by the first touch sensitive display's 110 width, which is 480 pixels. When a hardware event occurs with location info from a driver 512, the framework 520 can up-scale the physical location to the motion space because the location of the event may be different based on the device orientation and state. The motion space may be as described in U.S. Patent Application No. 13/187,026, filed July 20, 2011, entitled "Systems and Methods for Receiving Gesture Inputs Spanning Multiple Input Devices," which is hereby incorporated by reference in its entirety for all that it teaches and for all purposes.

[0129] A task can be an application and a sub-task can be an application component that provides a window with which users can interact to do something, such as dial the phone, take a photo, send an email, or view a map. Each task may be given a window in which to draw a user interface. The window typically fills a display (for example, touch sensitive display 110,114), but may be smaller than the display 110,114 and float on top of other windows. An application usually consists of multiple sub-tasks that are loosely bound to each other. Typically, one task in an application is specified as the "main" task, which is presented to the user when launching the application for the first time. Each task can then start another task or sub-task to perform different actions.

[0130] The Task Management module 540 is operable to manage the operation of one or more applications 564 that may be executed by the device. Thus, the Task Management module 540 can receive signals to launch, suspend, terminate, etc. an application or application sub-tasks stored in the application store 560. The Task Management module 540 may then instantiate one or more tasks or sub-tasks of the application 564 to begin operation of the application 564. Further, the Task Management Module 540 may launch, suspend, or terminate a task or sub-task as a result of user input or as a result of a signal from a collaborating framework 520 component. The Task Management Module 540 is responsible for managing the lifecycle of applications (tasks and sub-task) from when the application is launched to when the application is terminated.

[0131] The processing of the Task Management Module 540 is facilitated by a task stack 552, which is a logical structure associated with the Task Management Module 540. The task stack 552 maintains the state of all tasks and sub-tasks on the device 100. When some component of the operating system 516 requires a task or sub-task to transition in its

lifecycle, the OS 516 component can notify the Task Management Module 540. The Task Management Module 540 may then locate the task or sub-task, using identification information, in the task stack 552, and send a signal to the task or sub-task indicating what kind of lifecycle transition the task needs to execute. Informing the task or sub-task of the transition allows the task or sub-task to prepare for the lifecycle state transition. The Task Management Module 540 can then execute the state transition for the task or sub-task. In embodiments, the state transition may entail triggering the OS kernel 518 to terminate the task when termination is required.

[0132] Further, the Task Management module 540 may suspend the application 564 based on information from the Window Management Module 532. Suspending the application 564 may maintain application data in memory but may limit or stop the application 564 from rendering a window or user interface. Once the application becomes active again, the Task Management module 540 can again trigger the application to render its user interface. In embodiments, if a task is suspended, the task may save the task's state in case the task is terminated. In the suspended state, the application task may not receive input because the application window is not visible to the user.

[0133] The frame buffer 548 is a logical structure(s) used to render the user interface. The frame buffer 548 can be created and destroyed by the OS kernel 518. However, the Display Controller 544 can write the image data, for the visible windows, into the frame buffer 548. A frame buffer 548 can be associated with one screen or multiple screens. The association of a frame buffer 548 with a screen can be controlled dynamically by interaction with the OS kernel 518. A composite display may be created by associating multiple screens with a single frame buffer 548. Graphical data used to render an application's window user interface may then be written to the single frame buffer 548, for the composite display, which is output to the multiple screens 104,108. The Display Controller 544 can direct an application's user interface to a portion of the frame buffer 548 that is mapped to a particular display 110,114, thus, displaying the user interface on only one screen 104 or 108. The Display Controller 544 can extend the control over user interfaces to multiple applications, controlling the user interfaces for as many displays as are associated with a frame buffer 548 or a portion thereof. This approach compensates for the multiple physical screens 104,108 that are in use by the software component above the Display Controller 544.

[0134] The Application Manager 562 is an application that provides a presentation layer for the window environment. Thus, the Application Manager 562 provides the graphical

model for rendering by the Task Management Module 540. Likewise, the Desktop 566 provides the presentation layer for the Application Store 560. Thus, the desktop provides a graphical model of a surface having selectable application icons for the Applications 564 in the Application Store 560 that can be provided to the Window Management Module 556 for rendering.

[0135] Further, the framework can include an Application Model Manager (AMM) 542. The Application Manager 562 may interface with the AMM 542. In embodiments, the AMM 542 receives state change information from the device 100 regarding the state of applications (which are running or suspended). The AMM 542 can associate bit map images from the Surface Cache Module 528 to the tasks that are alive (running or suspended). Further, the AMM 542 can convert the logical window stack maintained in the Task Manager Module 540 to a linear ("film strip" or "deck of cards") organization that the user perceives when the using the off gesture capture area 120 to sort through the windows. Further, the AMM 542 may provide a list of executing applications to the Application Manager 562.

[0136] An embodiment of the MDM module 524 is shown in Fig. 5B. The MDM module 524 is operable to determine the state of the environment for the device, including, but not limited to, the orientation of the device, whether the device 100 is opened or closed, what applications 564 are executing, how the applications 564 are to be displayed, what actions the user is conducting, the tasks being displayed, etc. To configure the display, the MDM module 524 interprets these environmental factors and determines a display configuration, as described in conjunction with Figs. 6A-6J. Then, the MDM module 524 can bind the applications 564 or other device components to the displays. The configuration may then be sent to the Display Controller 544 and/or the other components within the OS 516 to generate the display. The MDM module 524 can include one or more of, but is not limited to, a Display Configuration Module 568, a Preferences Module 572, a Device State Module 574, a Gesture Module 576, a Requirements Module 580, an Event Module 584, and/or a Binding Module 588.

[0137] The Display Configuration Module 568 determines the layout for the display. In embodiments, the Display Configuration Module 568 can determine the environmental factors. The environmental factors may be received from one or more other MDM modules 524 or from other sources. The Display Configuration Module 568 can then determine from the list of factors the best configuration for the display. Some

embodiments of the possible configurations and the factors associated therewith are described in conjunction with Figs. 6A-6F.

[0138] The Preferences Module 572 is operable to determine display preferences for an application 564 or other component. For example, an application can have a preference for Single or Dual displays. The Preferences Module 572 can determine an application's display preference (e.g., by inspecting the application's preference settings) and may allow the application 564 to change to a mode (e.g., single screen, dual screen, max, etc.) if the device 100 is in a state that can accommodate the preferred mode. However, some user interface policies may disallow a mode even if the mode is available. As the configuration of the device changes, the preferences may be reviewed to determine if a better display configuration can be achieved for an application 564.

[0139] The Device State Module 574 is operable to determine or receive the state of the device. The state of the device can be as described in conjunction with Figs. 3A and 3B. The state of the device can be used by the Display Configuration Module 568 to determine the configuration for the display. As such, the Device State Module 574 may receive inputs and interpret the state of the device. The state information is then provided to the Display Configuration Module 568.

[0140] The Gesture Module 576 is shown as part of the MDM module 524, but, in embodiments, the Gesture module 576 may be a separate Framework 520 component that is separate from the MDM module 524. In embodiments, the Gesture Module 576 is operable to determine if the user is conducting any actions on any part of the user interface. In alternative embodiments, the Gesture Module 576 receives user interface actions from the configurable area 112,116 only. The Gesture Module 576 can receive touch events that occur on the configurable area 112,116 (or possibly other user interface areas) by way of the Input Management Module 536 and may interpret the touch events (using direction, speed, distance, duration, and various other parameters) to determine what kind of gesture the user is performing. When a gesture is interpreted, the Gesture Module 576 can initiate the processing of the gesture and, by collaborating with other Framework 520 components, can manage the required window animation. The Gesture Module 576 collaborates with the Application Model Manager 542 to collect state information with respect to which applications are running (active or paused) and the order in which applications must appear when a user gesture is performed. The Gesture Module 576 may also receive references to bitmaps (from the Surface Cache Module 528) and live windows so that when a gesture occurs it can instruct the Display Controller 544 how to

move the window(s) across the display 110,114. Thus, suspended applications may appear to be running when those windows are moved across the display 110,114.

[0141] Further, the Gesture Module 576 can receive task information either from the Task Manage Module 540 or the Input Management module 536. The gestures may be as defined in conjunction with Figs. 4A through 4H. For example, moving a window causes the display to render a series of display frames that illustrate the window moving. The gesture associated with such user interface interaction can be received and interpreted by the Gesture Module 576. The information about the user gesture is then sent to the Task Management Module 540 to modify the display binding of the task.

[0142] The Requirements Module 580, similar to the Preferences Module 572, is operable to determine display requirements for an application 564 or other component. An application can have a set display requirement that must be observed. Some applications require a particular display orientation. For example, the application "Angry Birds" can only be displayed in landscape orientation. This type of display requirement can be determined or received, by the Requirements Module 580. As the orientation of the device changes, the Requirements Module 580 can reassert the display requirements for the application 564. The Display Configuration Module 568 can generate a display configuration that is in accordance with the application display requirements, as provided by the Requirements Module 580.

[0143] The Event Module 584, similar to the Gesture Module 576, is operable to determine one or more events occurring with an application or other component that can affect the user interface. Thus, the Event Module 584 can receive event information either from the event buffer 556 or the Task Management module 540. These events can change how the tasks are bound to the displays. The Event Module 584 can collect state change information from other Framework 520 components and act upon that state change information. In an example, when the phone is opened or closed or when an orientation change has occurred, a new message may be rendered in a secondary screen. The state change based on the event can be received and interpreted by the Event Module 584. The information about the events then may be sent to the Display Configuration Module 568 to modify the configuration of the display.

[0144] The Binding Module 588 is operable to bind the applications 564 or the other components to the configuration determined by the Display Configuration Module 568. A binding associates, in memory, the display configuration for each application with the display and mode of the application. Thus, the Binding Module 588 can associate an

application with a display configuration for the application (e.g. landscape, portrait, multi-screen, etc.). Then, the Binding Module 588 may assign a display identifier to the display. The display identifier associated the application with a particular display of the device 100. This binding is then stored and provided to the Display Controller 544, the other components of the OS 516, or other components to properly render the display. The binding is dynamic and can change or be updated based on configuration changes associated with events, gestures, state changes, application preferences or requirements, etc.

[0145] User Interface Configurations:

[0146] With reference now to Figs. 6A-J, various types of output configurations made possible by the device 100 will be described hereinafter.

[0147] Figs. 6A and 6B depict two different output configurations of the device 100 being in a first state. Specifically, Fig. 6A depicts the device 100 being in a closed portrait state 304 where the data is displayed on the primary screen 104. In this example, the device 100 displays data via the touch sensitive display 110 in a first portrait configuration 604. As can be appreciated, the first portrait configuration 604 may only display a desktop or operating system home screen. Alternatively, one or more windows may be presented in a portrait orientation while the device 100 is displaying data in the first portrait configuration 604.

[0148] Fig. 6B depicts the device 100 still being in the closed portrait state 304, but instead data is displayed on the secondary screen 108. In this example, the device 100 displays data via the touch sensitive display 114 in a second portrait configuration 608.

[0149] It may be possible to display similar or different data in either the first or second portrait configuration 604, 608. It may also be possible to transition between the first portrait configuration 604 and second portrait configuration 608 by providing the device 100 a user gesture (e.g., a double tap gesture), a menu selection, or other means. Other suitable gestures may also be employed to transition between configurations. Furthermore, it may also be possible to transition the device 100 from the first or second portrait configuration 604, 608 to any other configuration described herein depending upon which state the device 100 is moved.

[0150] An alternative output configuration may be accommodated by the device 100 being in a second state. Specifically, Fig. 6C depicts a third portrait configuration where data is displayed simultaneously on both the primary screen 104 and the secondary screen 108. The third portrait configuration may be referred to as a Dual-Portrait (PD) output

configuration. In the PD output configuration, the touch sensitive display 110 of the primary screen 104 depicts data in the first portrait configuration 604 while the touch sensitive display 114 of the secondary screen 108 depicts data in the second portrait configuration 608. The simultaneous presentation of the first portrait configuration 604 and the second portrait configuration 608 may occur when the device 100 is in an open portrait state 320. In this configuration, the device 100 may display one application window in one display 110 or 114, two application windows (one in each display 110 and 114), one application window and one desktop, or one desktop. Other configurations may be possible. It should be appreciated that it may also be possible to transition the device 100 from the simultaneous display of configurations 604, 608 to any other configuration described herein depending upon which state the device 100 is moved. Furthermore, while in this state, an application's display preference may place the device into bilateral mode, in which both displays are active to display different windows in the same application. For example, a Camera application may display a viewfinder and controls on one side, while the other side displays a mirrored preview that can be seen by the photo subjects. Games involving simultaneous play by two players may also take advantage of bilateral mode.

[0151] Figs. 6D and 6E depicts two further output configurations of the device 100 being in a third state. Specifically, Fig. 6D depicts the device 100 being in a closed landscape state 340 where the data is displayed on the primary screen 104. In this example, the device 100 displays data via the touch sensitive display 110 in a first landscape configuration 612. Much like the other configurations described herein, the first landscape configuration 612 may display a desktop, a home screen, one or more windows displaying application data, or the like.

[0152] Fig. 6E depicts the device 100 still being in the closed landscape state 340, but instead data is displayed on the secondary screen 108. In this example, the device 100 displays data via the touch sensitive display 114 in a second landscape configuration 616. It may be possible to display similar or different data in either the first or second portrait configuration 612, 616. It may also be possible to transition between the first landscape configuration 612 and second landscape configuration 616 by providing the device 100 with one or both of a twist and tap gesture or a flip and slide gesture. Other suitable gestures may also be employed to transition between configurations. Furthermore, it may also be possible to transition the device 100 from the first or second landscape

configuration 612, 616 to any other configuration described herein depending upon which state the device 100 is moved.

[0153] Fig. 6F depicts a third landscape configuration where data is displayed simultaneously on both the primary screen 104 and the secondary screen 108. The third landscape configuration may be referred to as a Dual-Landscape (LD) output configuration. In the LD output configuration, the touch sensitive display 110 of the primary screen 104 depicts data in the first landscape configuration 612 while the touch sensitive display 114 of the secondary screen 108 depicts data in the second landscape configuration 616. The simultaneous presentation of the first landscape configuration 612 and the second landscape configuration 616 may occur when the device 100 is in an open landscape state 340. It should be appreciated that it may also be possible to transition the device 100 from the simultaneous display of configurations 612, 616 to any other configuration described herein depending upon which state the device 100 is moved.

[0154] Figs. 6G and 6H depict two views of a device 100 being in yet another state. Specifically, the device 100 is depicted as being in an easel state 312. Fig. 6G shows that a first easel output configuration 618 may be displayed on the touch sensitive display 110. Fig. 6H shows that a second easel output configuration 620 may be displayed on the touch sensitive display 114. The device 100 may be configured to depict either the first easel output configuration 618 or the second easel output configuration 620 individually. Alternatively, both the easel output configurations 618, 620 may be presented simultaneously. In some embodiments, the easel output configurations 618, 620 may be similar or identical to the landscape output configurations 612, 616. The device 100 may also be configured to display one or both of the easel output configurations 618, 620 while in a modified easel state 316. It should be appreciated that simultaneous utilization of the easel output configurations 618, 620 may facilitate two-person games (e.g., Battleship®, chess, checkers, etc.), multi-user conferences where two or more users share the same device 100, and other applications. As can be appreciated, it may also be possible to transition the device 100 from the display of one or both configurations 618, 620 to any other configuration described herein depending upon which state the device 100 is moved.

[0155] Fig. 6I depicts yet another output configuration that may be accommodated while the device 100 is in an open portrait state 320. Specifically, the device 100 may be configured to present a single continuous image across both touch sensitive displays 110, 114 in a portrait configuration referred to herein as a Portrait-Max (PMax) configuration 624. In this configuration, data (e.g., a single image, application, window, icon, video,

etc.) may be split and displayed partially on one of the touch sensitive displays while the other portion of the data is displayed on the other touch sensitive display. The Pmax configuration 624 may facilitate a larger display and/or better resolution for displaying a particular image on the device 100. Similar to other output configurations, it may be possible to transition the device 100 from the Pmax configuration 624 to any other output configuration described herein depending upon which state the device 100 is moved.

[0156] Fig. 6J depicts still another output configuration that may be accommodated while the device 100 is in an open landscape state 348. Specifically, the device 100 may be configured to present a single continuous image across both touch sensitive displays 110, 114 in a landscape configuration referred to herein as a Landscape-Max (LMax) configuration 628. In this configuration, data (e.g., a single image, application, window, icon, video, etc.) may be split and displayed partially on one of the touch sensitive displays while the other portion of the data is displayed on the other touch sensitive display. The Lmax configuration 628 may facilitate a larger display and/or better resolution for displaying a particular image on the device 100. Similar to other output configurations, it may be possible to transition the device 100 from the Lmax configuration 628 to any other output configuration described herein depending upon which state the device 100 is moved.

[0157] Display Controls:

[0158] Figs. 7A-D depict several examples of gesture sequences that can cause the device 100 to alter the display of data thereon. Although the sequences and display actions are depicted as being performed on the touch sensitive displays 110, 114, it should be appreciated that any of the display actions can alternatively, or additionally, be performed on other parts of the primary screen 104 and/or secondary screen 108.

[0159] Referring initially to Fig. 7A, a first gesture sequence 700 begins when the device 100 is in an open portrait state 320. While in this state, the device 100 displays data on both its displays 110, 114. In some embodiments, the device 100 may display application data from a first application 1.1 on one of its displays 110 and data from a first desktop D1 on the other of its displays 114. In the depicted example, a first set of data from a first application 1.1 may initially be displayed in a first portrait configuration 604 and a second set of data from a first desktop D1 may be initially displayed in a second portrait configuration 608. In other words, the first and second displays 110, 114 may depict data from both an application and a desktop in a PD output configuration. It should be appreciated, however, that both of the displays may be depicting data from an

application rather than the first desktop D1. In some embodiments, data from the first application 1.1 is in a minimized state and, therefore, is only displayed on one of the displays 110.

[0160] The gesture sequence 700 continues when a first user input 704 is received that causes the device 100 to rotate. In some embodiments, the device 100 may be rotated in a clockwise direction by a predetermined amount (e.g., 90 degrees), although such a rotation is not required. Rather, a counter-clockwise rotation by 90 degrees or any rotation by a predetermined amount greater than or less than 90 degrees may also qualify as the first user input 704. The rotation of the device 100 may be detected, in some embodiments, by registering a rotation event with the task management module 540 which subsequently informs the MDM module 524 of the rotation. In some embodiments, the rotation event is registered by receiving one or more inputs from the accelerometer 176. During the rotation, the displays 110, 114 may continue to display the same data as before the first input 704 was received.

[0161] After the rotation event has ended, the device 100 may be oriented in an open landscape state 348. At this point, the MDM module 524 may determine the relative position of the displays 110, 114 (e.g., determine which display or screen 104, 108 is above the other) and based on the relative position of the displays in the final orientation, the MDM module 524 may instruct the window management module 532 to cause data from the first application 1.1 in the upper display (display 110 in this example) to "drop" down onto the lower display (display 114 in this example). In this example, data from the first application 1.1 may be automatically maximized across both displays 110, 114. Specifically, the data from the application that is displayed on the upper display 110 is the application which has its data automatically dropped onto the lower display 114. This automated dropping of the data from the upper display may be referred to as a gravity drop of the data displayed because the data is "dropped" under the force of gravity as detected by the accelerometer 176.

[0162] As discussed above, the data originally displayed by the display that eventually becomes the upper display 110 may be obtained from the first application 1.1. In some embodiments, the data from the first application 1.1 may be automatically maximized into an Lmax output configuration 628. It may also be possible that data from the first application 1.1 is displayed in an LD output configuration.

[0163] Fig. 7B depicts a second gesture sequence 708, which may be a continuation of the first gesture sequence 700 or a stand-alone sequence. Where the second gesture

sequence 708 is a continuation of the first gesture sequence 700, the device 100 is rotated back from the open landscape state 348. A second user input 712 is received which results in the device 100 being rotated back to the open portrait state 320. In some embodiments, the second user input 712 may correspond to an input that is opposite to the first user input 704 (e.g., an input which reverses and undoes the first user input 704). Accordingly, if the first user input 704 corresponds to a clockwise rotation of the device 100 by 90 degrees, then the second user input 712 may correspond to a counter-clockwise rotation of the device 100 by 90 degrees. Of course, the second user input 712 may correspond to any other rotational input such as a rotation of the device 100 in the same direction as the first user input 704 by 90 degrees or 270 degrees. In any event, the second user input 712 may correspond to any input or combination of inputs that causes the device 100 to end up in an open portrait state 320.

[0164] When rotating back to the open portrait state 320, the original state of the first application 1.1 (e.g., the display state of the first application 1.1 prior to receiving the first user input 704) is retained. This means that the first application 1.1 is now minimized back to the single display 110. This also means that the first desktop D1 may be displayed on the other display 114. The first application 1.1 may be displayed in a first portrait configuration 604 and the first desktop D1 may be displayed in a second portrait configuration 608.

[0165] It should be noted, however, if any manual minimization of the first application 1.1 or navigation in the gesture capture regions 120, 124 is detected between the first user input 704 and second user input 712, then the original state of the first application 1.1 need not be maintained (although it may). For example, minimizing the first application 1.1 to the bottom display 114 while the device is in the open landscape state 348 and then rotating the device 100 back to the open portrait state 320 would result in the first application 1.1 being displayed according to minimization display rules on the second display 114 (and not the first display 110). If this manual minimization occurred, then the first desktop D1 or some other application may be displayed on the first display 110 in lieu of the first application 1.1.

[0166] The rotation inputs 704 and/or 712 of the device 100 may be detected, in some embodiments, by registering a rotation event with the task management module 540 which subsequently informs the MDM module 524 of the rotation. In some embodiments, the rotation event is registered by receiving one or more inputs from the accelerometer 176.

During the rotation, the displays 110, 114 may continue to display the same data as before the inputs 704 and/or 712 were received.

[0167] Referring now to Fig. 7C, a third gesture sequence 716 begins when the device 100 is in an open portrait state 320. While in this state, the device 100 displays data on both its displays 110, 114. In some embodiments, the device 100 may display application data from a first application 1.1 on one of its displays 114 and data from a first desktop D1 on the other of its displays 110. In the depicted example, a first set of data from a first application 1.1 may initially be displayed in a second portrait configuration 608 and a second set of data from a first desktop D1 may be initially displayed in a first portrait configuration 604. In other words, the first and second displays 110, 114 may depict data from both an application and a desktop in a PD output configuration. It should be appreciated, however, that both of the displays may be depicting data from an application rather than the first desktop D1. In some embodiments, data from the first application 1.1 is in a minimized state and, therefore, is only displayed on one of the displays 110.

[0168] The gesture sequence 716 continues when a third user input 720 is received that causes the device 100 to rotate. In some embodiments, the third user input 720 is identical but opposite the first user input 704. In some embodiments, the device 100 may be rotated in a counter-clockwise direction by a predetermined amount (e.g., 90 degrees), although such a rotation is not required. Rather, a clockwise rotation by 90 degrees or any rotation by a predetermined amount greater than or less than 90 degrees may also qualify as the third user input 720. The rotation of the device 100 may be detected, in some embodiments, by registering a rotation event with the task management module 540 which subsequently informs the MDM module 524 of the rotation. In some embodiments, the rotation event is registered by receiving one or more inputs from the accelerometer 176. During the rotation, the displays 110, 114 may continue to display the same data as before the third input 720 was received.

[0169] After the rotation event has ended, the device 100 may be oriented in an open landscape state 348. At this point, the MDM module 524 may determine the relative position of the displays 110, 114 (e.g., determine which display or screen 104, 108 is above the other) and based on the relative position of the displays in the final orientation, the MDM module 524 may instruct the window management module 532 to cause data from the first application 1.1 in the upper display (display 114 in this example) to "drop" down onto the lower display (display 110 in this example). In this example, data from the first application 1.1 may be automatically maximized across both displays 110, 114.

Specifically, the data from the application that is displayed on the upper display 114 is the application which has its data automatically dropped onto the lower display 110. This automated dropping of the data from the upper display may be referred to as a gravity drop of the data displayed because the data is "dropped" under the force of gravity as detected by the accelerometer 176.

[0170] As discussed above, the data originally displayed by the display that eventually becomes the upper display 114 may be obtained from the first application 1.1. In some embodiments, the data from the first application 1.1 may be automatically maximized into an Lmax output configuration 628. It may also be possible that data from the first application 1.1 is displayed in an LD output configuration.

[0171] Fig. 7D depicts a fourth gesture sequence 724, which may be a continuation of the third gesture sequence 716 or a stand-alone sequence. Where the fourth gesture sequence 724 is a continuation of the third gesture sequence 716, the device 100 is rotated back from the open landscape state 348. A fourth user input 728 is received which results in the device 100 being rotated back to the open portrait state 320. In some embodiments, the fourth user input 728 may correspond to an input that is opposite to the third user input 720 (e.g., an input which reverses and undoes the third user input 720). Accordingly, if the third user input 720 corresponds to a clockwise rotation of the device 100 by 90 degrees, then the fourth user input 728 may correspond to a clockwise rotation of the device 100 by 90 degrees. Of course, the fourth user input 728 may correspond to any other rotational input such as a rotation of the device 100 in the same direction as the third user input 720 by 90 degrees or 270 degrees. In any event, the fourth user input 728 may correspond to any input or combination of inputs that causes the device 100 to end up in an open portrait state 320.

[0172] When rotating back to the open portrait state 320, the original state of the first application 1.1 (e.g., the display state of the first application 1.1 prior to receiving the third user input 720) is retained. This means that the first application 1.1 is now minimized back to the single display 114. This also means that the first desktop D1 may be displayed on the other display 110. The first application 1.1 may be displayed in a second portrait configuration 608 and the first desktop D1 may be displayed in a first portrait configuration 604.

[0173] It should be noted, however, if any manual minimization of the first application 1.1 or navigation in the gesture capture regions 120, 124 is detected between the third user input 720 and fourth user input 728, then the original state of the first application 1.1 need

not be maintained (although it may). For example, minimizing the first application 1.1 to the bottom display 110 while the device is in the open landscape state 348 and then rotating the device 100 back to the open portrait state 320 would result in the first application 1.1 being displayed according to minimization display rules on the first display 114 (and not the second display 114). If this manual minimization occurred, then the first desktop D1 or some other application may be displayed on the second display 114 in lieu of the first application 1.1.

[0174] The rotation inputs 720 and/or 728 of the device 100 may be detected, in some embodiments, by registering a rotation event with the task management module 540 which subsequently informs the MDM module 524 of the rotation. In some embodiments, the rotation event is registered by receiving one or more inputs from the accelerometer 176. During the rotation, the displays 110, 114 may continue to display the same data as before the inputs 720 and/or 728 were received.

[0175] Referring now to Fig. 8, a display control method 800 will be described in accordance with at least some embodiments of the present disclosure. The method 800 is initiated at step 804. Specifically, a device 100 may be initially in an open portrait state 320. In this state, data from a first application 1.1 may be displayed on one display of the device 100 and data from something other than the first application 1.1 (e.g., another application or a desktop) may be displayed on the other display. The data from the application and the other data may be displayed in a PD output configuration.

[0176] The method continues when the rotation of the device 100 is detected (step 808). Specifically, the transition of the device 100 from an open portrait state 320 to an open landscape state 348 may be detected in step 808.

[0177] The method continues with the MDM module 524 and/or window management module 532 storing information about the display characteristics of the first application prior to receiving the rotation input (step 812). The MDM module 524 and/or window management module 532 may also store the information regarding the data that was displayed on the other display of the device 100.

[0178] Thereafter, or simultaneously, the MDM module 524 and/or window management module 532 may cause data from the first application 1.1 to be automatically depicted across both displays 110, 114 (step 816). The manner in which the first application 1.1 is displayed may be controlled by landscape maximization output rules for the first application 1.1. All the while, the minimization output rules for the first application 1.1 are maintained. Specifically, the window management module 532 may

reference display rules to decide how to automatically re-render the display of the application in the open landscape state 348. Even more specifically, the window management module 532 may execute a gravity drop and automatically maximize data from the upper display across both displays in an Lmax output configuration 628.

[0179] Thereafter, the MDM module 524 will check to determine if a stack-altering input has been received (step 820). A stack-altering input may correspond to any input which causes the device 100 to no longer save the display configurations of the first application 1.1 prior to receiving the rotation input. Specific examples of a stack-altering input include, without limitation, a manual instruction to minimize the first application 1.1 or a navigation input received at one or both of the gesture capture regions 120, 124.

[0180] If any stack-altering input is received, then the MDM module 524 and/or window management module 532 can delete the previously-stored display configurations of the first application 1.1 (step 824). Specifically, because a stack-altering input was received, the MDM module 524 and/or window management module 532 determines that the data stored in step 812 is no longer necessary and such data is discarded or ignored.

[0181] The device 100 will also wait to receive another rotation input (step 828). Once another rotation event is detected (e.g. corresponding to the second or fourth user input), the MDM module 524 may instruct the window management module 532 that the data from the first application needs to be re-rendered.

[0182] In particular, the window management module 532 may refer to currently-stored display orientation rules for the first application 1.1 and render a display of the first application 1.1 according to such rules (steps 832, 836). If a stack-altering input was received prior to the rotation input at step 828, then the window management module 532 will display the first application 1.1 according to default display configurations. If, however, no stack-altering input was received, then the window management module 532 will refer to the display configurations stored in step 812 to re-display the first application 1.1 in the same way that is was displayed prior to receiving the first rotation input.

[0183] The exemplary systems and methods of this disclosure have been described in relation to display control mechanisms. However, to avoid unnecessarily obscuring the present disclosure, the preceding description omits a number of known structures and devices. This omission is not to be construed as a limitation of the scopes of the claims. Specific details are set forth to provide an understanding of the present disclosure. It should however be appreciated that the present disclosure may be practiced in a variety of ways beyond the specific detail set forth herein.

[0184] Furthermore, while the exemplary aspects, embodiments, and/or configurations illustrated herein show the various components of the system collocated, certain components of the system can be located remotely, at distant portions of a distributed network, such as a LAN and/or the Internet, or within a dedicated system. Thus, it should be appreciated, that the components of the system can be combined in to one or more devices, such as a computer, laptop, netbook, smart phone, mobile device, etc., or collocated on a particular node of a distributed network, such as an analog and/or digital telecommunications network, a packet-switch network, or a circuit-switched network. It will be appreciated from the preceding description, and for reasons of computational efficiency, that the components of the system can be arranged at any location within a distributed network of components without affecting the operation of the system. For example, the various components can be located in a switch such as a PBX and media server, gateway, in one or more communications devices, at one or more users' premises, or some combination thereof. Similarly, one or more functional portions of the system could be distributed between a telecommunications device(s) and an associated computing device.

[0185] Furthermore, it should be appreciated that the various links connecting the elements can be wired or wireless links, or any combination thereof, or any other known or later developed element(s) that is capable of supplying and/or communicating data to and from the connected elements. These wired or wireless links can also be secure links and may be capable of communicating encrypted information. Transmission media used as links, for example, can be any suitable carrier for electrical signals, including coaxial cables, copper wire and fiber optics, and may take the form of acoustic or light waves, such as those generated during radio-wave and infra-red data communications.

[0186] Also, while the flowcharts have been discussed and illustrated in relation to a particular sequence of events, it should be appreciated that changes, additions, and omissions to this sequence can occur without materially affecting the operation of the disclosed embodiments, configuration, and aspects.

[0187] A number of variations and modifications of the disclosure can be used. It would be possible to provide for some features of the disclosure without providing others.

[0188] In yet another embodiment, the systems and methods of this disclosure can be implemented in conjunction with a special purpose computer, a programmed microprocessor or microcontroller and peripheral integrated circuit element(s), an ASIC or other integrated circuit, a digital signal processor, a hard-wired electronic or logic circuit

such as discrete element circuit, a programmable logic device or gate array such as PLD, PLA, FPGA, PAL, special purpose computer, any comparable means, or the like. In general, any device(s) or means capable of implementing the methodology illustrated herein can be used to implement the various aspects of this disclosure. Exemplary hardware that can be used for the disclosed embodiments, configurations and aspects includes computers, handheld devices, telephones (e.g., cellular, Internet enabled, digital, analog, hybrids, and others), and other hardware known in the art. Some of these devices include processors (e.g., a single or multiple microprocessors), memory, nonvolatile storage, input devices, and output devices. Furthermore, alternative software implementations including, but not limited to, distributed processing or component/object distributed processing, parallel processing, or virtual machine processing can also be constructed to implement the methods described herein.

[0189] In yet another embodiment, the disclosed methods may be readily implemented in conjunction with software using object or object-oriented software development environments that provide portable source code that can be used on a variety of computer or workstation platforms. Alternatively, the disclosed system may be implemented partially or fully in hardware using standard logic circuits or VLSI design. Whether software or hardware is used to implement the systems in accordance with this disclosure is dependent on the speed and/or efficiency requirements of the system, the particular function, and the particular software or hardware systems or microprocessor or microcomputer systems being utilized.

[0190] In yet another embodiment, the disclosed methods may be partially implemented in software that can be stored on a storage medium, executed on programmed general-purpose computer with the cooperation of a controller and memory, a special purpose computer, a microprocessor, or the like. In these instances, the systems and methods of this disclosure can be implemented as program embedded on personal computer such as an applet, JAVA® or CGI script, as a resource residing on a server or computer workstation, as a routine embedded in a dedicated measurement system, system component, or the like. The system can also be implemented by physically incorporating the system and/or method into a software and/or hardware system.

[0191] Although the present disclosure describes components and functions implemented in the aspects, embodiments, and/or configurations with reference to particular standards and protocols, the aspects, embodiments, and/or configurations are not limited to such standards and protocols. Other similar standards and protocols not

mentioned herein are in existence and are considered to be included in the present disclosure. Moreover, the standards and protocols mentioned herein and other similar standards and protocols not mentioned herein are periodically superseded by faster or more effective equivalents having essentially the same functions. Such replacement standards and protocols having the same functions are considered equivalents included in the present disclosure.

[0192] The present disclosure, in various aspects, embodiments, and/or configurations, includes components, methods, processes, systems and/or apparatus substantially as depicted and described herein, including various aspects, embodiments, configurations embodiments, subcombinations, and/or subsets thereof. Those of skill in the art will understand how to make and use the disclosed aspects, embodiments, and/or configurations after understanding the present disclosure. The present disclosure, in various aspects, embodiments, and/or configurations, includes providing devices and processes in the absence of items not depicted and/or described herein or in various aspects, embodiments, and/or configurations hereof, including in the absence of such items as may have been used in previous devices or processes, e.g., for improving performance, achieving ease and\or reducing cost of implementation.

[0193] The foregoing discussion has been presented for purposes of illustration and description. The foregoing is not intended to limit the disclosure to the form or forms disclosed herein. In the foregoing Detailed Description for example, various features of the disclosure are grouped together in one or more aspects, embodiments, and/or configurations for the purpose of streamlining the disclosure. The features of the aspects, embodiments, and/or configurations of the disclosure may be combined in alternate aspects, embodiments, and/or configurations other than those discussed above. This method of disclosure is not to be interpreted as reflecting an intention that the claims require more features than are expressly recited in each claim. Rather, as the following claims reflect, inventive aspects lie in less than all features of a single foregoing disclosed aspect, embodiment, and/or configuration. Thus, the following claims are hereby incorporated into this Detailed Description, with each claim standing on its own as a separate preferred embodiment of the disclosure.

[0194] Moreover, though the description has included description of one or more aspects, embodiments, and/or configurations and certain variations and modifications, other variations, combinations, and modifications are within the scope of the disclosure, e.g., as may be within the skill and knowledge of those in the art, after understanding the

present disclosure. It is intended to obtain rights which include alternative aspects, embodiments, and/or configurations to the extent permitted, including alternate, interchangeable and/or equivalent structures, functions, ranges or steps to those claimed, whether or not such alternate, interchangeable and/or equivalent structures, functions, ranges or steps are disclosed herein, and without intending to publicly dedicate any patentable subject matter.

What is claimed is:

1. A method of controlling data displayed by a multi-screen device, comprising:

receiving a first rotation input, the first rotation input corresponding to an indication that the multi-screen device has been rotated a first time from a first open state to a different second open state, wherein data from a first application is displayed while the device is in the first open state on a first screen of the device and not on a second screen of the device, and wherein data from the first application is displayed on the first and second screens of the device in the second open state;

receiving a second rotation input, the second rotation input corresponding to an indication that the device has been rotated a second time after the first time;

after receiving the second rotation input, referencing display rules for the first application; and

displaying the first application on one of the first and second screens according to the display rules for the first application.

2. The method of claim 1, wherein the display rules for the first application are stored prior to receiving the second rotation input and correspond to a display configuration of the first application when the device is in the first open state prior to receiving the first rotation input.

3. The method of claim 2, wherein the display rules for the first application indicate that the data from the first application is presented substantially identically to the way in which the data from the first application is presented prior to receiving the first rotation input.

4. The method of claim 1, wherein at least one of the first and second rotation inputs are received from an accelerometer.

5. The method of claim 1, further comprising:

receiving a first stack-altering input after the first rotation input but before the second rotation input; and

updating the display rules for the first application to correspond to display rules that are different from display rules for the first application prior to receiving the first rotation input.

6. The method of claim 5, wherein the first stack-altering input corresponds to at least one of a minimization instruction for the first application and an application-navigation instruction.

7. The method of claim 1, wherein data from a first desktop is displayed on the second screen prior to receiving the first rotation input, wherein the data from the first desktop is not displayed after receiving the first rotation input but before receiving the second rotation input, and wherein the data from the first desktop is re-displayed on the second screen after receiving the second rotation input.

8. The method of claim 7, wherein the data from the first application is automatically maximized and displayed across both the first and second screens after receiving the first rotation input.

9. The method of claim 1, wherein the first rotation input corresponds to a rotation of the device by about 90 degrees in a first direction and wherein the second rotation input corresponds to a rotation of the device by about 90 degrees in a second direction that is opposite the first direction.

10. A non-transitory computer-readable medium having stored thereon instructions that cause a computing system to execute a method, the instructions comprising:

instructions configured to receive a first rotation input, the first rotation input corresponding to an indication that the multi-screen device has been rotated a first time from a first open state to a different second open state, wherein data from a first application is displayed while the device is in the first open state on a first screen of the device and not on a second screen of the device, and wherein data from the first application is displayed on the first and second screens of the device in the second open state;

instructions configured to receive a second rotation input, the second rotation input corresponding to an indication that the device has been rotated a second time after the first time;

instructions configured to reference display rules for the first application after receiving the second rotation input; and

instructions configured to render a display of the first application on one of the first and second screens according to the display rules for the first application.

11. The computer-readable medium of claim 10, wherein the display rules for the first application are stored prior to receiving the second rotation input and correspond to a display configuration of the first application when the device is in the first open state prior to receiving the first rotation input.

12. The method of claim 11, wherein the display rules for the first application indicate that the data from the first application is presented substantially identically to the way in which the data from the first application is presented prior to receiving the first rotation input.

13. The computer-readable medium of claim 10, wherein at least one of the first and second rotation inputs are received from an accelerometer.

14. The computer-readable medium of claim 10, further comprising:

instructions configured to receive a first stack-altering input after the first rotation input but before the second rotation input; and

instructions configured to update the display rules for the first application to correspond to display rules that are different from display rules for the first application prior to receiving the first rotation input.

15. The computer-readable medium of claim 14, wherein the first stack-altering input corresponds to at least one of a minimization instruction for the first application and an application-navigation instruction.

16. The computer-readable medium of claim 10, wherein data from a first desktop is displayed on the second screen prior to receiving the first rotation input, wherein the data from the first desktop is not displayed after receiving the first rotation input but before receiving the second rotation input, wherein the data from the first desktop is re-displayed on the second screen after receiving the second rotation input, and wherein the data from the first application is automatically maximized and displayed across both the first and second screens after receiving the first rotation input.

17. A multi-screen user device, comprising:

a first screen including a first display area;

a second screen including a second display area;

a sensor configured to produce an electrical signal indicative of a rotation of the user device; and

a computer-readable medium having instructions stored thereon that include:

a first set of instructions configured to receive a first rotation input, the first rotation input corresponding to an indication that the multi-screen device has been rotated a first time from a first open state to a different second open state, wherein data from a first application is displayed while the device is in the first open state on a first screen of the device and not on a second screen of the device, and wherein data from the first

application is displayed on the first and second screens of the device in the second open state;

a second set of instructions configured to receive a second rotation input, the second rotation input corresponding to an indication that the device has been rotated a second time after the first time;

a third set of instructions configured to reference display rules for the first application after receiving the second rotation input; and

a fourth instructions configured to render a display of the first application on one of the first and second screens according to the display rules for the first application.

18. The device of claim 17, wherein the display rules for the first application are stored prior to receiving the second rotation input and correspond to a display configuration of the first application when the device is in the first open state prior to receiving the first rotation input and wherein the display rules for the first application indicate that the data from the first application is presented substantially identically to the way in which the data from the first application is presented prior to receiving the first rotation input.

19. The device of claim 17, wherein the first open state corresponds to an open portrait state and wherein the second state corresponds to an open landscape state.

20. The device of claim 19, wherein the data from the first application is automatically maximized across both the first and second screens in response to receiving the first rotation input.

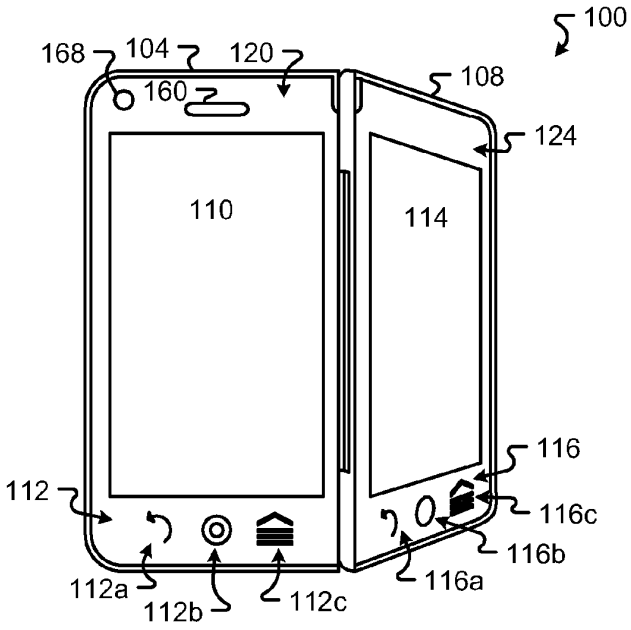

100
168
104
120
160
108
124
110
114
116
112
116c
116b
112a
112b
112c
116a

Fig. 1A

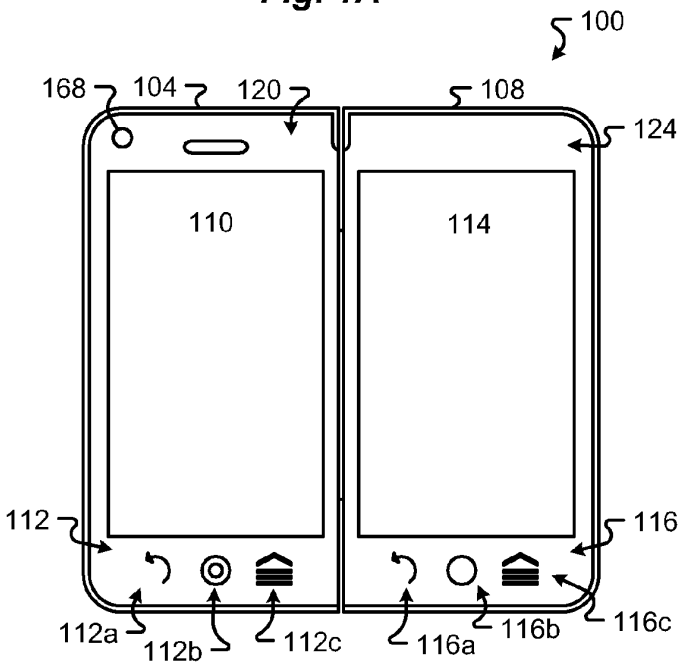

100
168
104
120
108
124
110
114
112
116
112a
112b
112c
116a
116b
116c

Fig. 1B

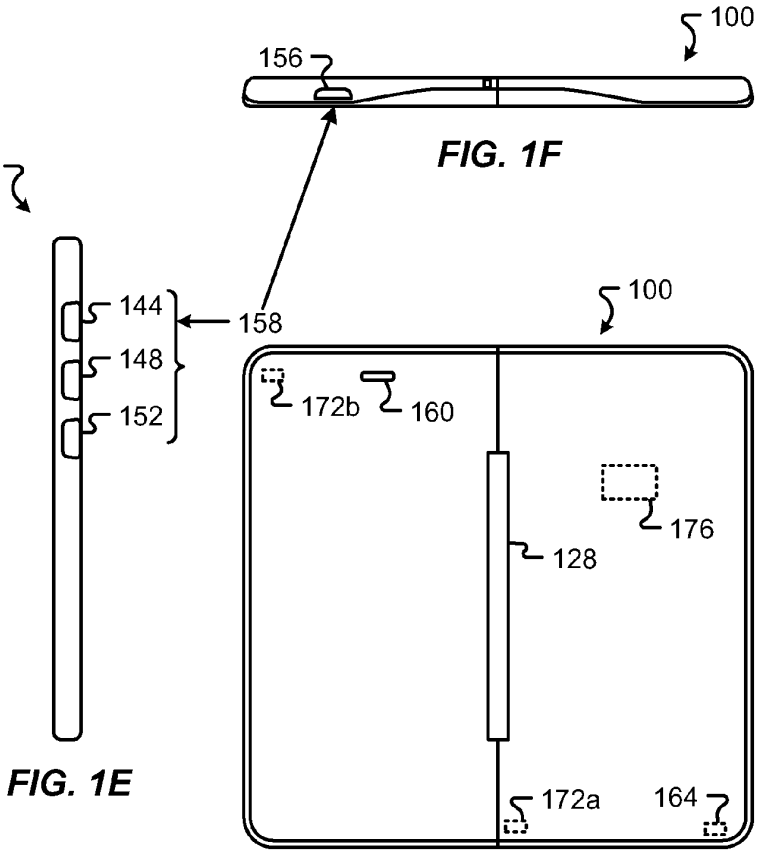


FIG. 1F

FIG. 1E

FIG. 1D

FIG. 1C

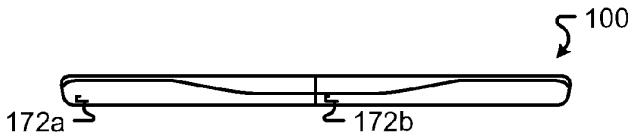


FIG. 1G

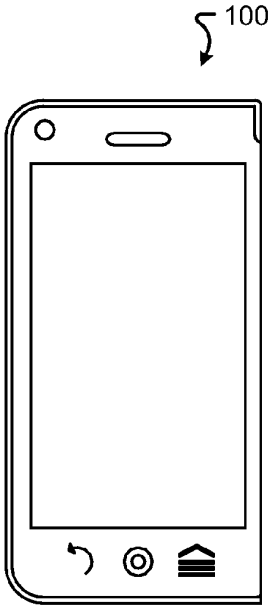


FIG. 1H

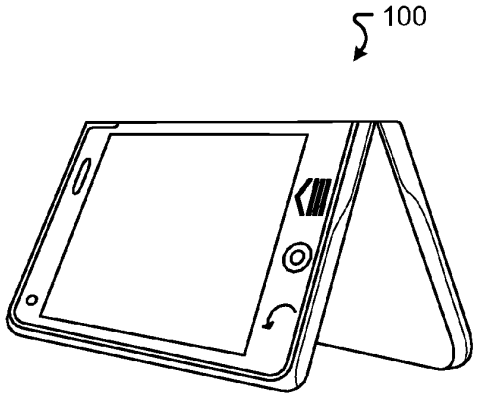


FIG. 1I

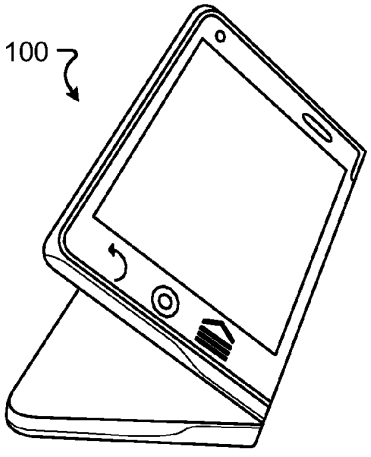


FIG. 1J

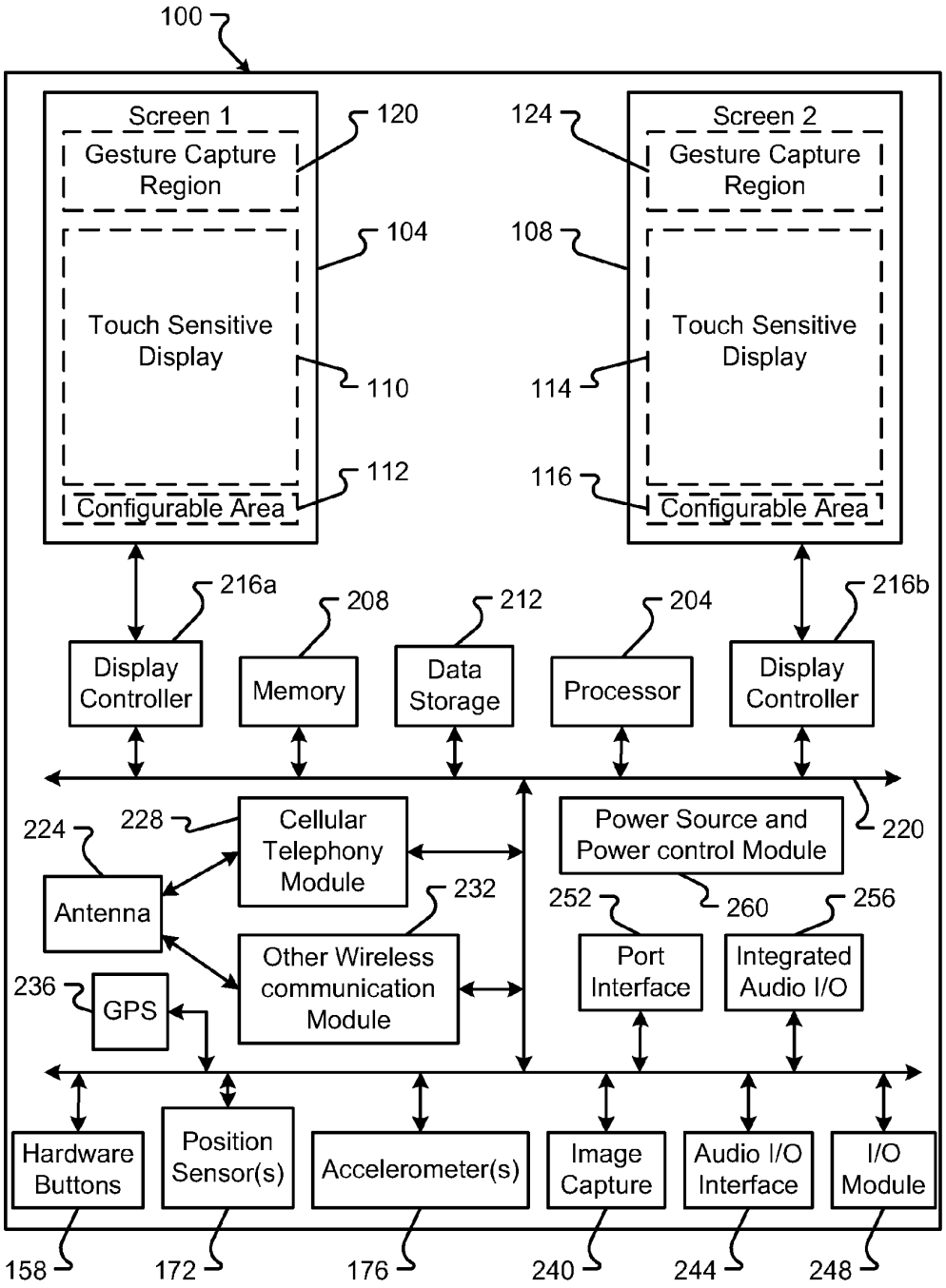

100
Screen 1
Gesture Capture Region
120
104
Touch Sensitive Display
110
112
Configurable Area
124
Screen 2
Gesture Capture Region
108
Touch Sensitive Display
114
116
Configurable Area
216a
208
212
204
216b
Display Controller
Memory
Data Storage
Processor
Display Controller
220
224
228
Cellular Telephony Module
Power Source and Power control Module
Antenna
232
252
260
256
Other Wireless communication Module
Port Interface
Integrated Audio I/O
236
GPS
Hardware Buttons
Position Sensor(s)
Accelerometer(s)
Image Capture
Audio I/O Interface
I/O Module
158
172
176
240
244
248

Fig. 2

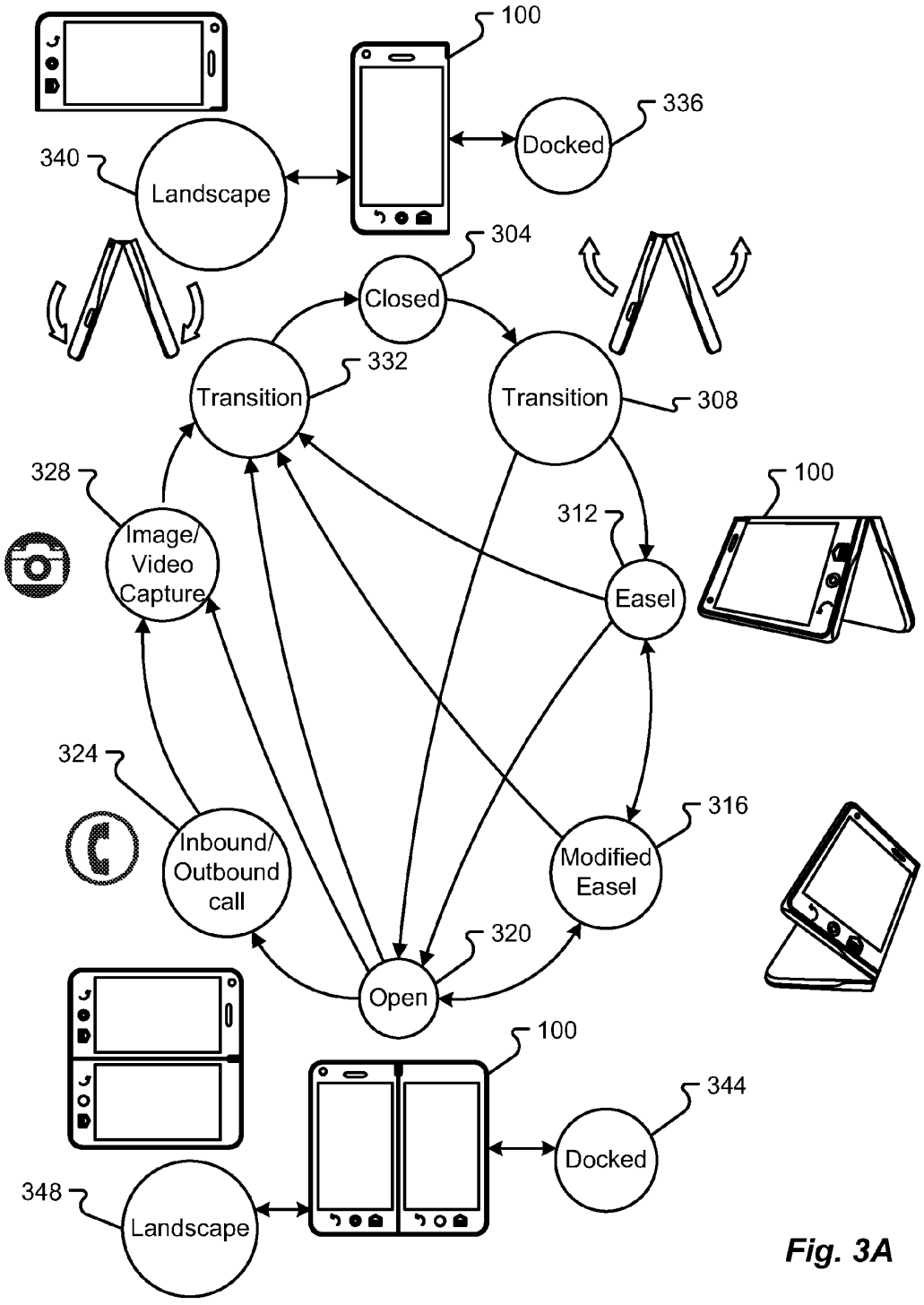
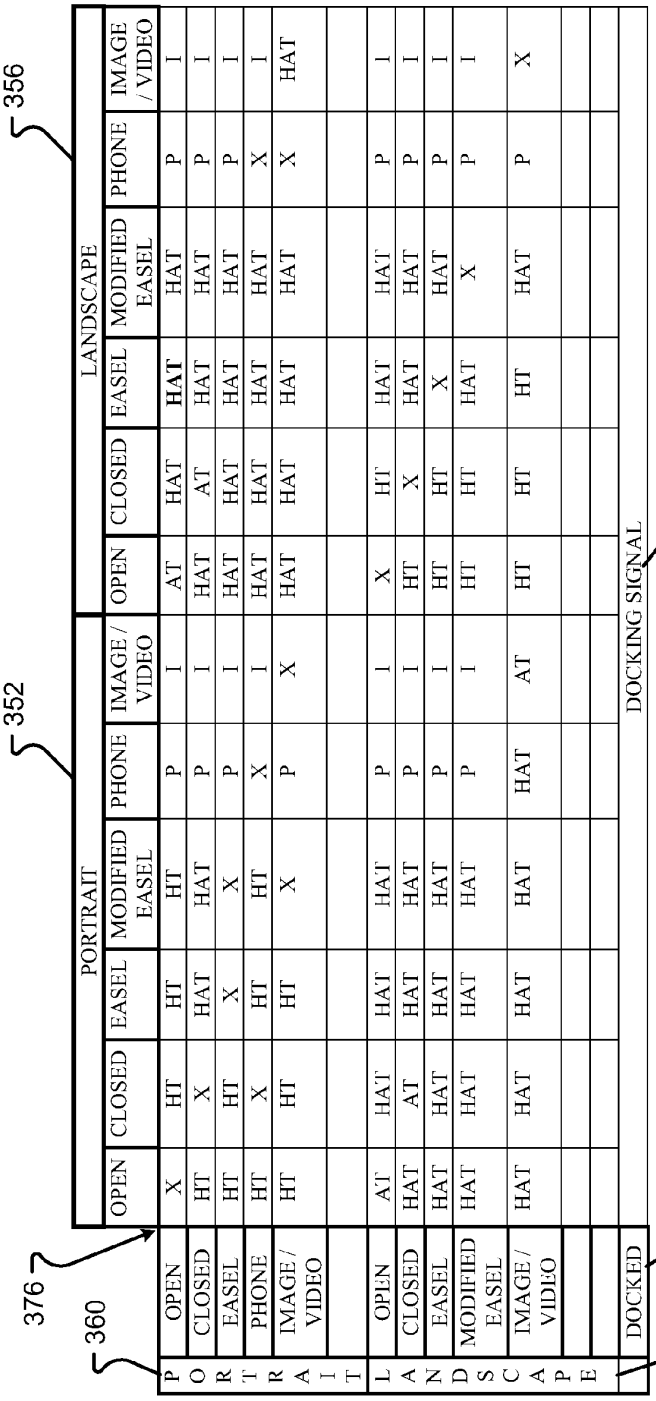

100
336
Docked
340
Landscape
304
Closed
332
Transition
Transition
308
328
Image/
Video
Capture
312
Easel
100
324
Inbound/
Outbound
call
316
Modified
Easel
320
Open
100
344
Docked
348
Landscape

Fig. 3A



Key:
H - Hall Effect Sensor(s)
a - accelerometer(s)
T- Timer
P – communications Trigger
I – Image / Video capture Request

FIG. 3B

Tap

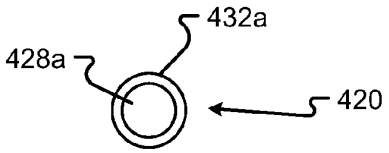


Fig. 4A

Long Press

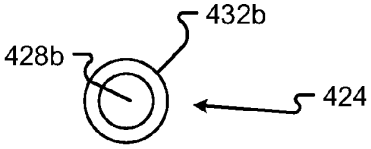


Fig. 4B

Drag

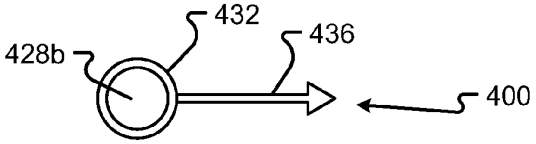


Fig. 4C

Flick

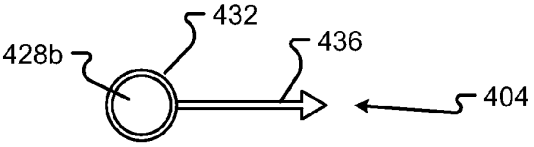


Fig. 4D

Pinch

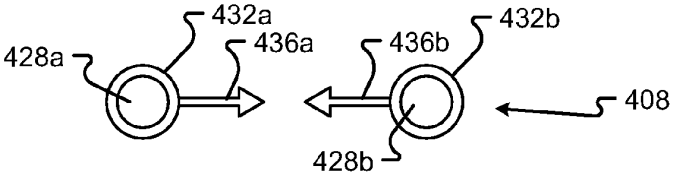


Fig. 4E

Spread

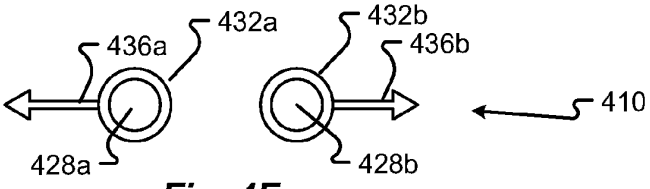


Fig. 4F

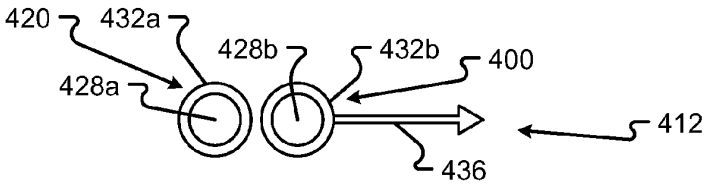

420
432a
428b
432b
400
428a
412
436

Fig. 4G

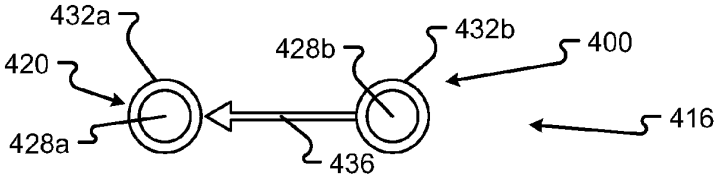

432a
420
428b
432b
400
428a
416
436

Fig. 4H

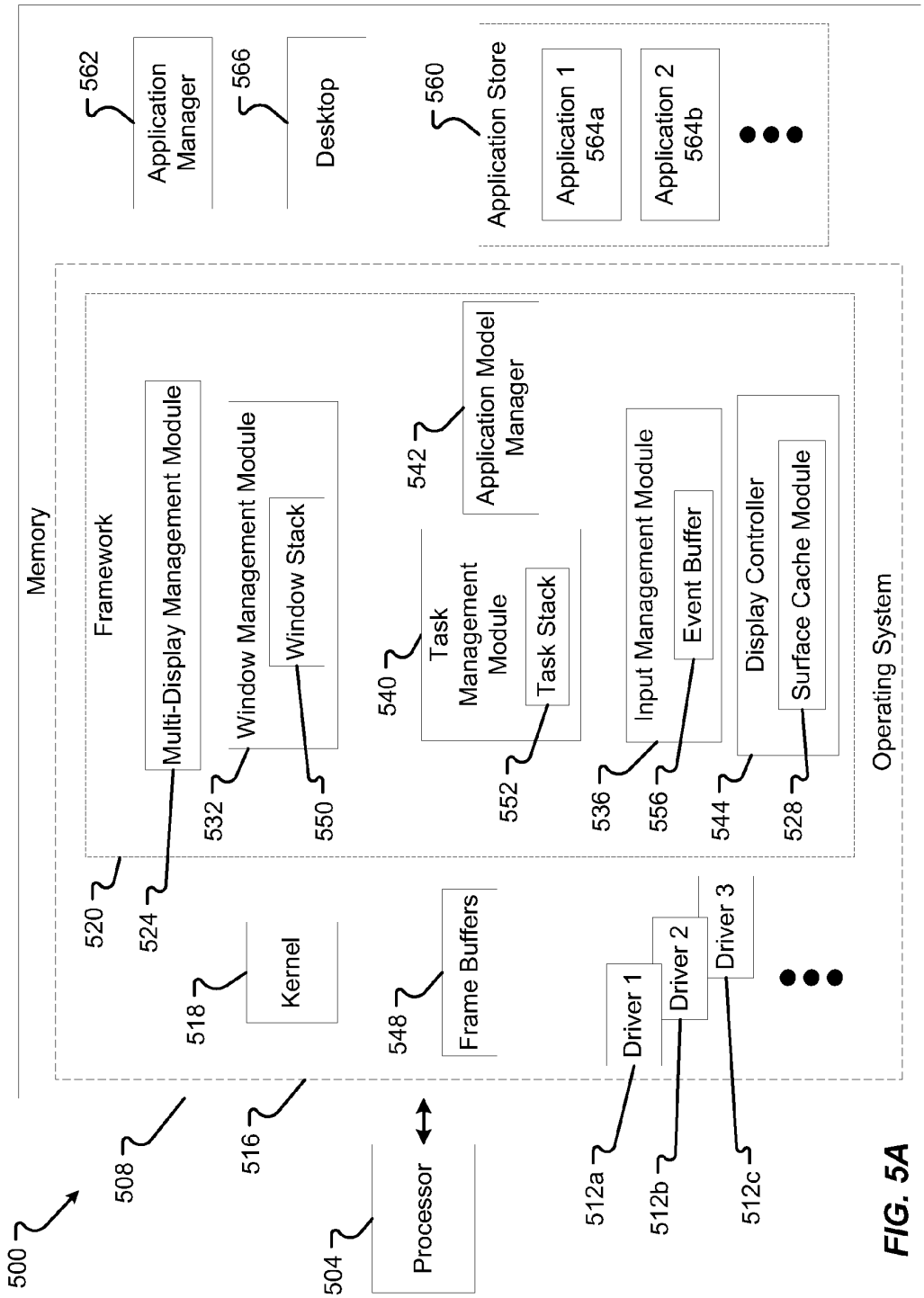

500
508
516
504
Processor
Memory
Framework
520
524
Multi-Display Management Module
518
Kernel
532
Window Management Module
550
Window Stack
548
Frame Buffers
540
Task Management Module
552
Task Stack
542
Application Model Manager
536
Input Management Module
556
Event Buffer
544
Display Controller
528
Surface Cache Module
512a
Driver 1
512b
Driver 2
512c
Driver 3
Operating System
562
Application Manager
566
Desktop
560
Application Store
Application 1 564a
Application 2 564b

FIG. 5A

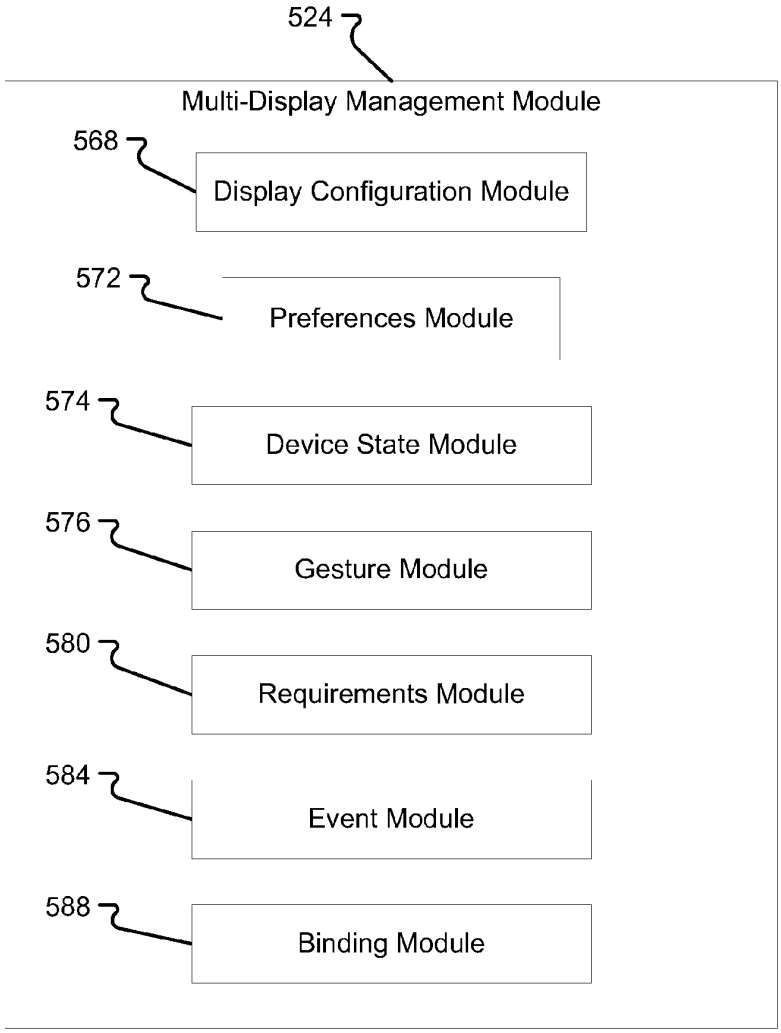

524
Multi-Display Management Module
568
Display Configuration Module
572
Preferences Module
574
Device State Module
576
Gesture Module
580
Requirements Module
584
Event Module
588
Binding Module

Fig. 5B

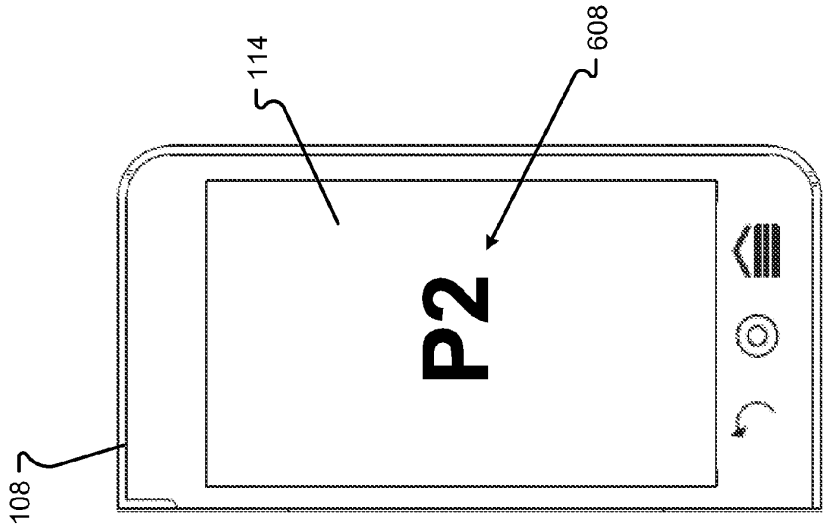


Fig. 6B

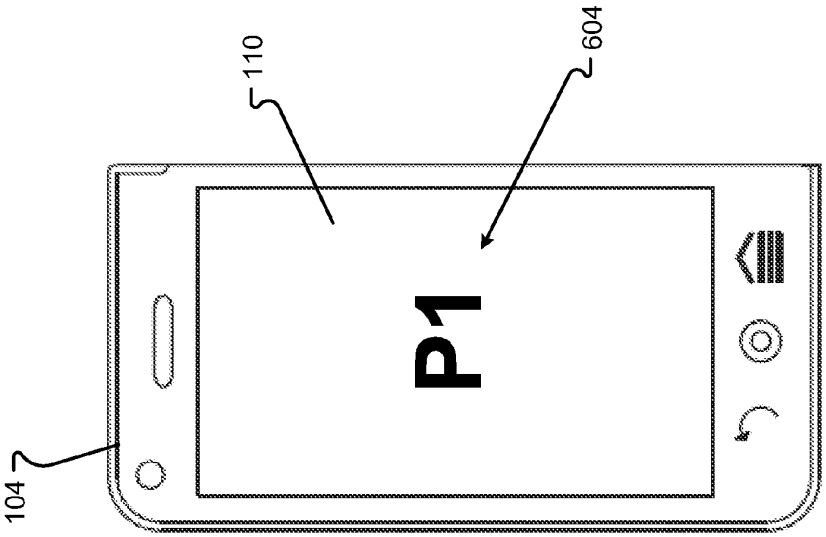


Fig. 6A

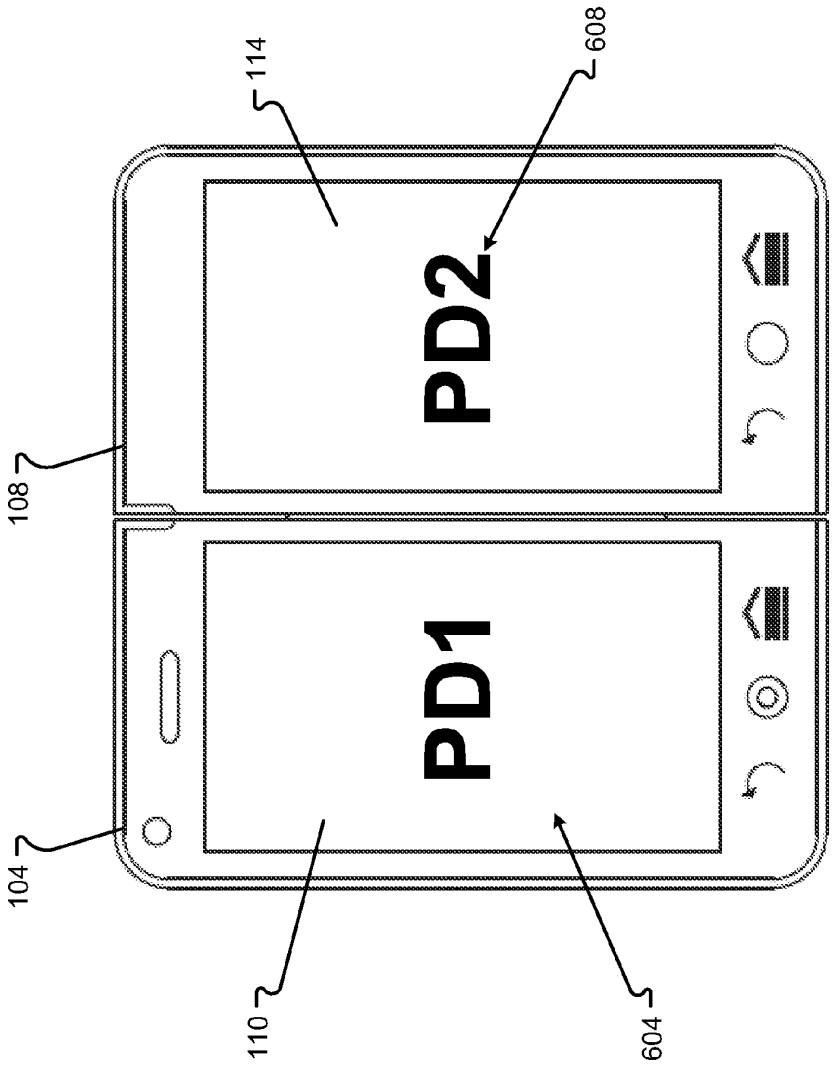


Fig. 6C

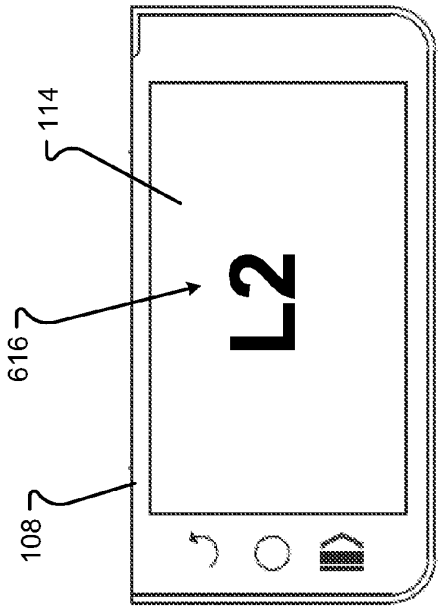


Fig. 6E

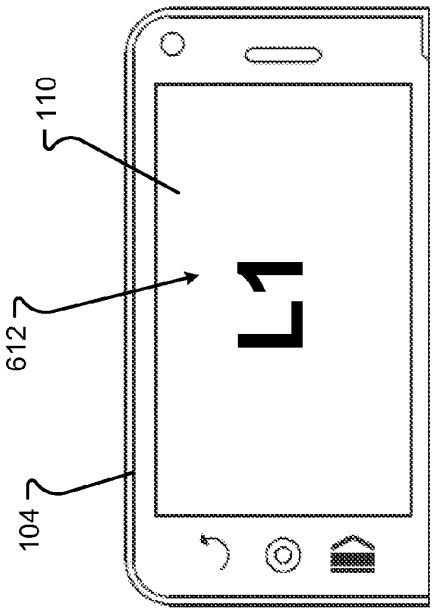


Fig. 6D

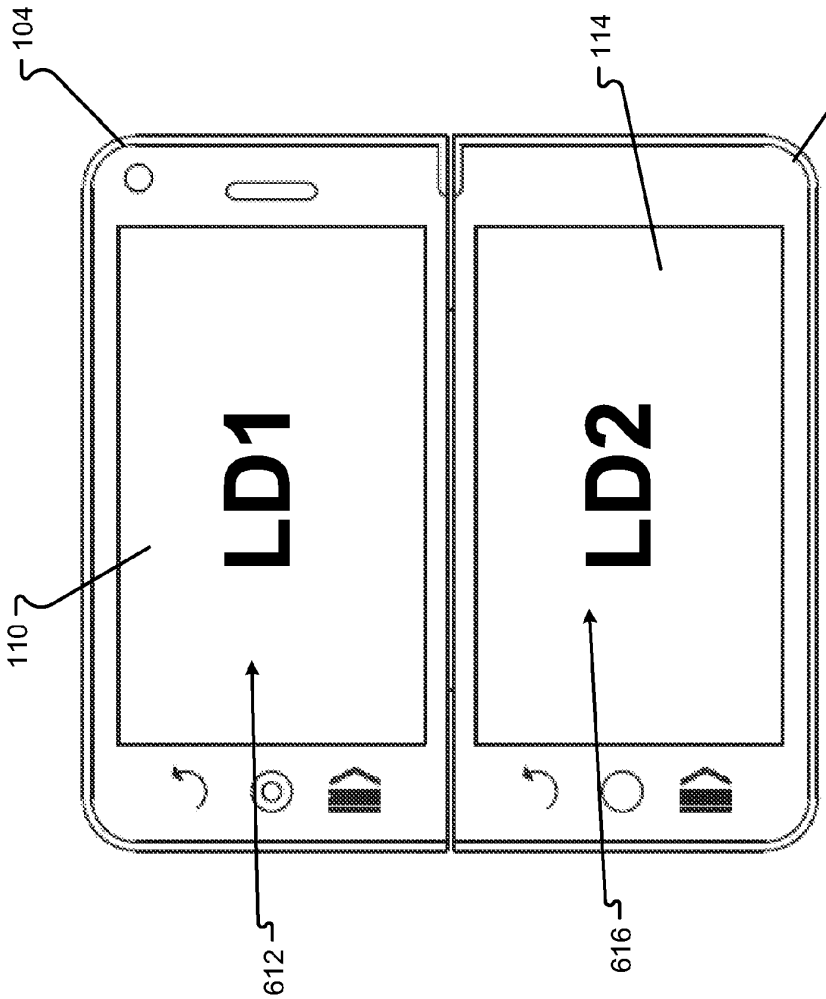


Fig. 6F

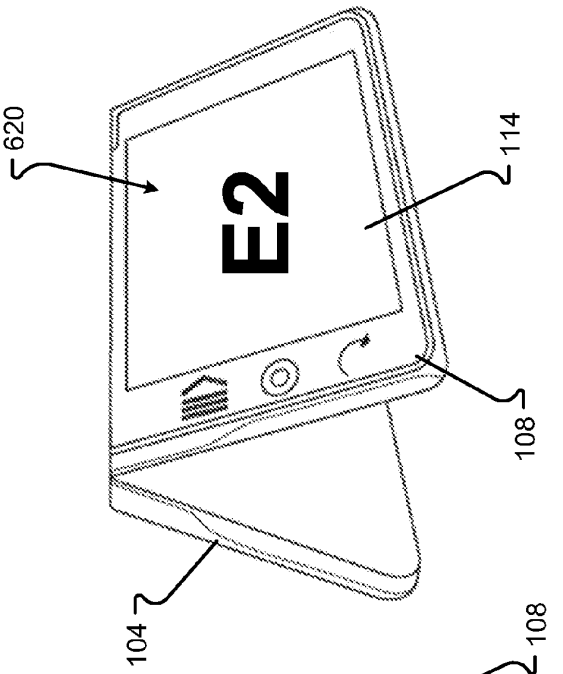


Fig. 6H

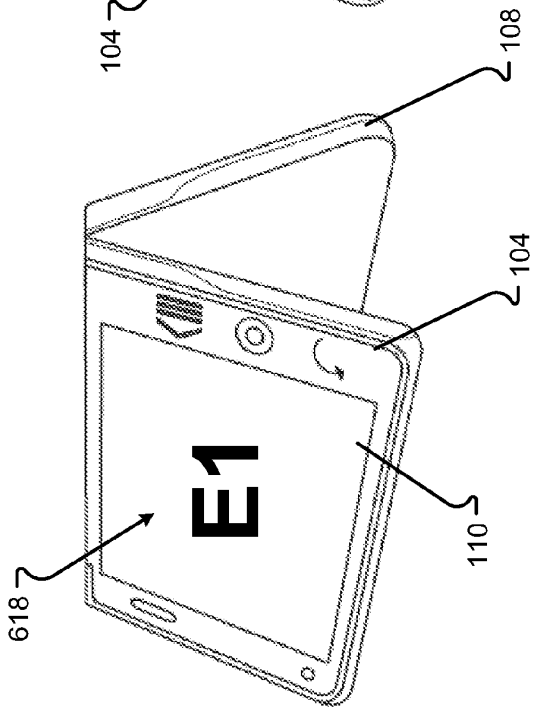


Fig. 6G

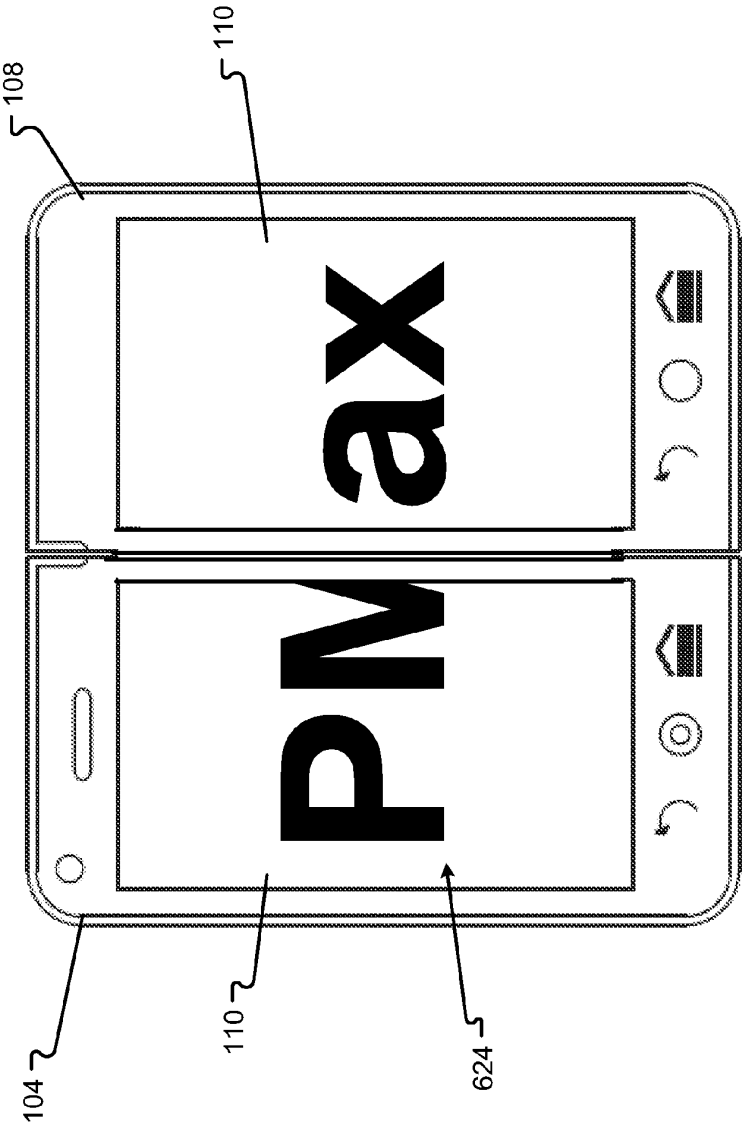


Fig. 6I

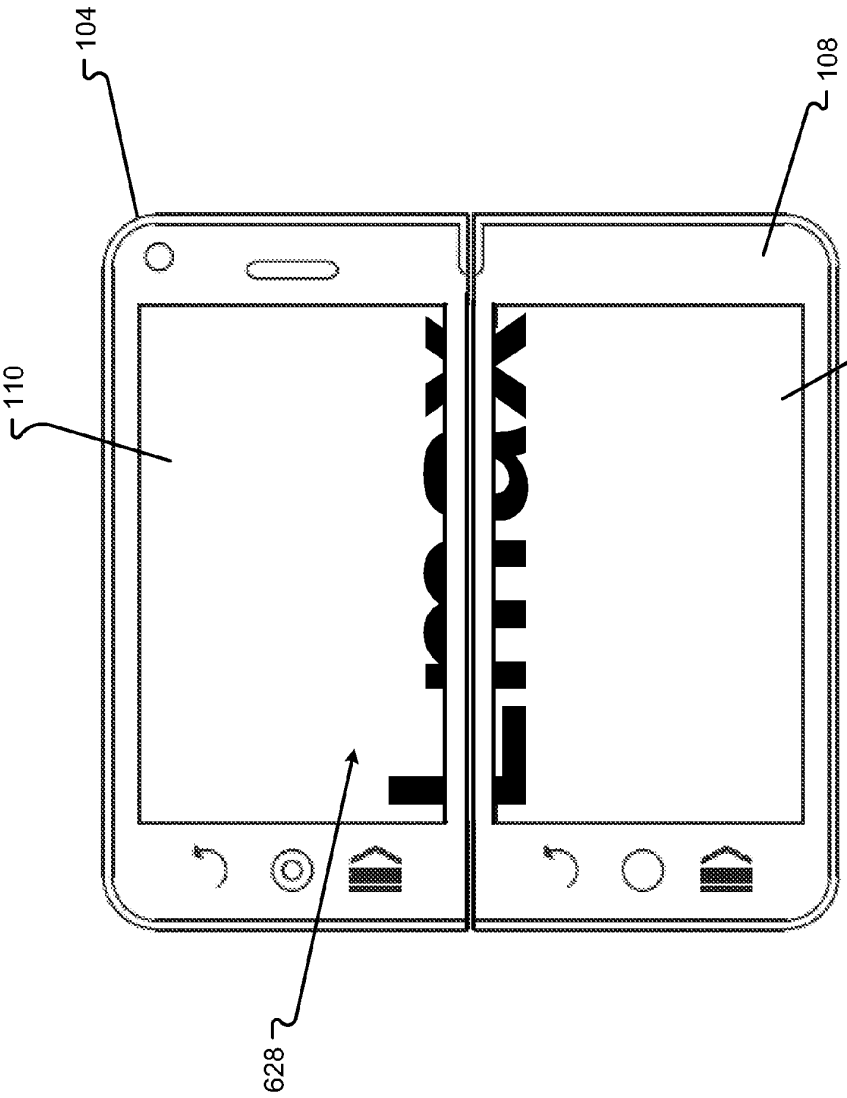


Fig. 6J

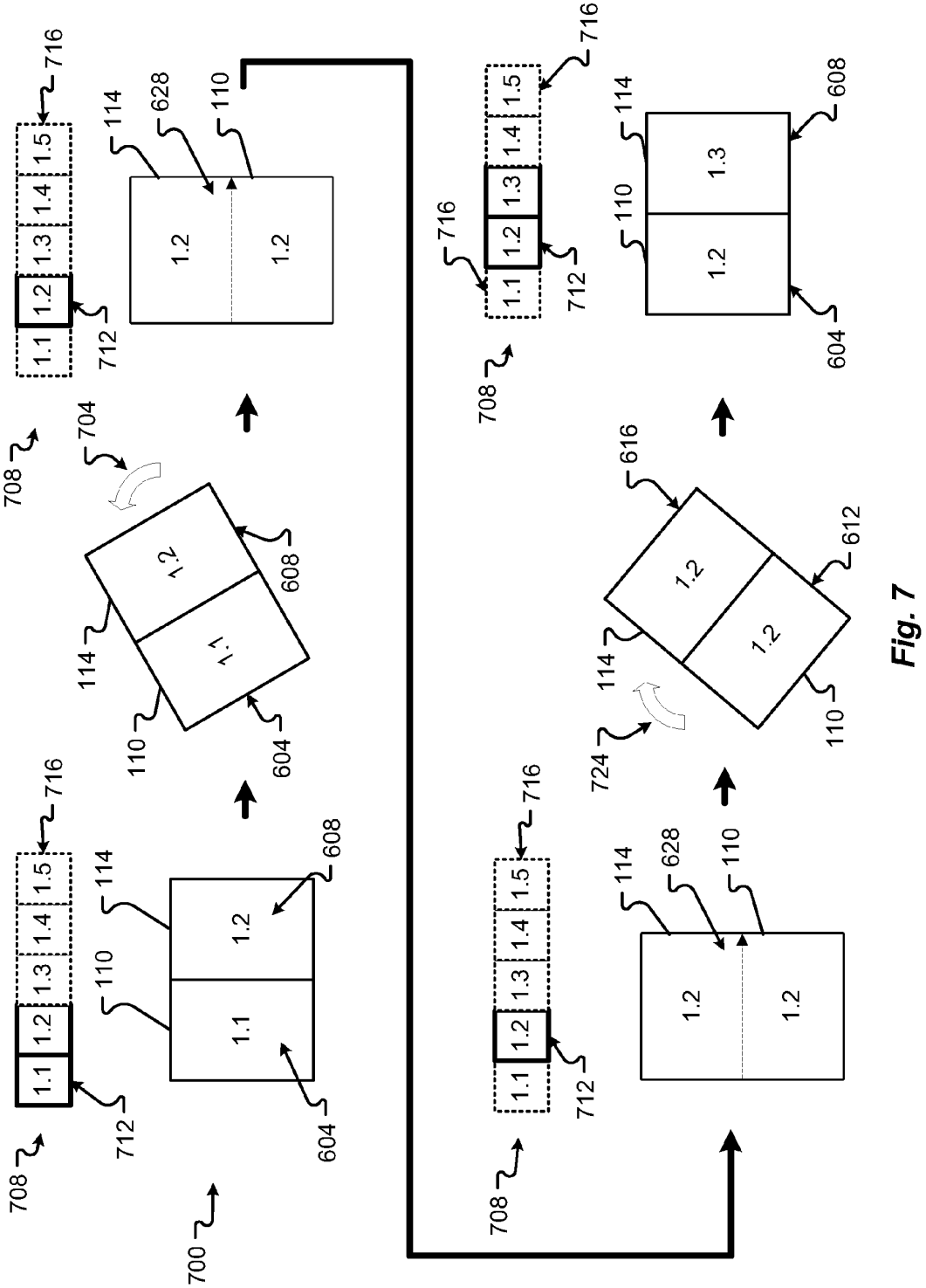


Fig. 7

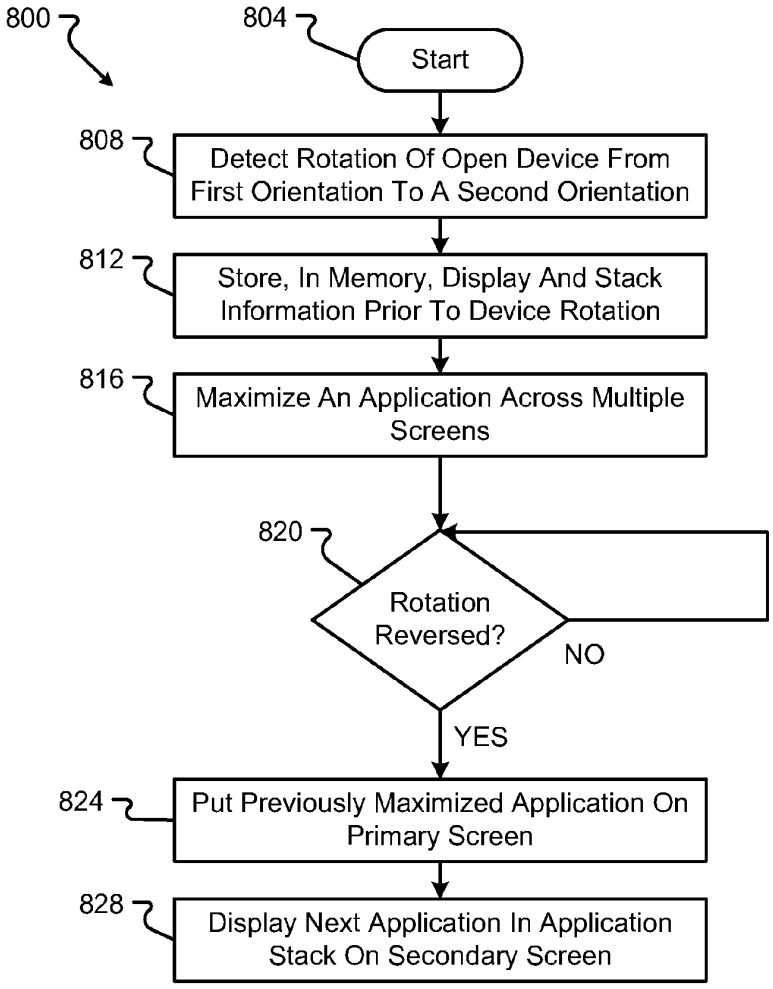

800
804
Start
808
Detect Rotation Of Open Device From First Orientation To A Second Orientation
812
Store, In Memory, Display And Stack Information Prior To Device Rotation
816
Maximize An Application Across Multiple Screens
820
Rotation Reversed?
NO
YES
824
Put Previously Maximized Application On Primary Screen
828
Display Next Application In Application Stack On Secondary Screen

Fig. 8

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 11/53902

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - G09G 5/00 (2012.01)
USPC - 345/1.3
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
USPC:345/1.3

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
USPC:345/1.1, 1.3, 156, 659; 715/765, 781, 792, 802 (keyword limited; terms below)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
Electronic Database Searched: PubWEST(PGPB, USPT, EPAB, JPAB), Google Scholar
Search Terms Used: two, second, multiple, many, plurality, dual, touchscreen, screen, display, multiscreen, multidisplay, orient, rotate, reorient, revolve, spin, turn, configuration, fold, output, show, project, expand, spread, data, movie, application, content, program

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2010/0007603 A1 (Kirkup) 14 January 2010 (14.01.2010), see entire document; especially para [0020]-[0022], [0044]-[0052], Fig. 3A, 6B, 7-8	1-6, 9-15, 17-20
X	US 2010/0085382 A1 (Lundqvist et al.) 08 April 2010 (08.04.2010), see entire document; especially para [0093]-[0095], [0145]-[0150], [0213], Fig. 1, 3-6, 21, 27-31	1, 7-8, 10, 16
A	US 2010/0245209 A1 (Miller et al.) 30 September 2010 (30.09.2010), see entire document	1-20

☐ Further documents are listed in the continuation of Box C. ☐

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
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"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
10 February 2012 (10.02.2012)	22 FEB 2012
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer: Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

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61/389,000	1 October 2010 (01.10.2010)	US
61/458,150	17 November 2010 (17.11.2010)	US
61/539,884	27 September 2011 (27.09.2011)	US
13/247,982	28 September 2011 (28.09.2011)	US

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(74) Agent: **DUPRAY, Dennis, J.**; Sheridan Ross P.C., 1560 Broadway, Suite 1200, Denver, CO 80202 (US).

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Published:

— *with international search report (Art. 21(3))*

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

(54) Title: APPLICATION DISPLAY TRANSITIONS BETWEEN SINGLE AND MULTIPLE DISPLAYS

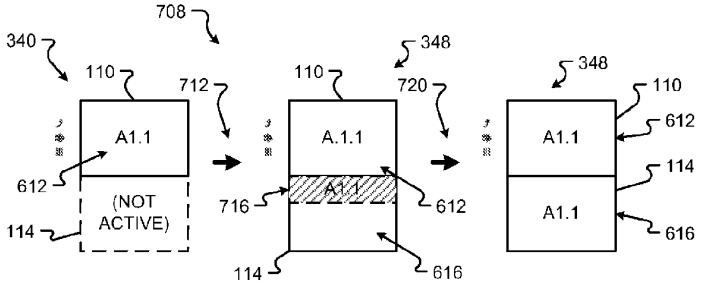


Fig. 7B

(57) Abstract: A multi-screen user device and methods for controlling data displayed are disclosed. The data displayed by the multiple screens of the device is dependent on the physical orientation of the device, whether the content for an application is displayed across a plurality of the multiple screens, and whether the data being displayed for the application originated from a single-screen application or a multi-screen application.

WO 2012/044801 A1

APPLICATION DISPLAY TRANSITIONS BETWEEN SINGLE AND MULTIPLE DISPLAYS

CROSS REFERENCE TO RELATED APPLICATION

[0001] The present application claims the benefits of and priority, under 35 U.S.C. § 119(e), to U.S. Provisional Application Serial Nos. 61/389,000, filed October 1, 2010, entitled "DUAL DISPLAY WINDOWING SYSTEM;" 61/389,117, filed October 1, 2010, entitled "MULTI-OPERATING SYSTEM PORTABLE DOCKETING DEVICE;" 61/389,087, filed October 1, 2010, entitled "TABLET COMPUTING USER INTERFACE;" 61/458,150, filed November 17, 2010, entitled "Dual Screen Email Client;" 61/539,884, filed September 27, 2011, entitled "MOBILE DEVICE." Each of the aforementioned documents is incorporated herein by this reference in their entirety for all that they teach and for all purposes.

BACKGROUND

[0002] A substantial number of handheld computing devices, such as cellular phones, tablets, and E-Readers, make use of a touch screen display not only to deliver display information to the user but also to receive inputs from user interface commands. While touch screen displays may increase the configurability of the handheld device and provide a wide variety of user interface options, this flexibility typically comes at a price. The dual use of the touch screen to provide content and receive user commands, while flexible for the user, may obfuscate the display and cause visual clutter, thereby leading to user frustration and loss of productivity.

[0003] The small form factor of handheld computing devices requires a careful balancing between the displayed graphics and the area provided for receiving inputs. On the one hand, the small display constrains the display space, which may increase the difficulty of interpreting actions or results. On the other, a virtual keypad or other user interface scheme is superimposed on or positioned adjacent to an executing application, requiring the application to be squeezed into an even smaller portion of the display.

[0004] This balancing act is particularly difficult for single display touch screen devices. Single display touch screen devices are crippled by their limited screen space. When users are entering information into the device, through the single display, the ability to interpret information in the display can be severely hampered, particularly when a complex interaction between display and interface is required.

SUMMARY

[0005] There is a need for a multi-display handheld computing device that provides for enhanced power and/or versatility compared to conventional single display handheld computing devices. In particular, the present disclosure is directed to a multi-screen user device and methods for controlling data displayed thereon. The data displayed by the multiple screens of the device is dependent on the physical orientation of the device, whether the content for an application is displayed across a plurality of the multiple screens, and whether the data being displayed for the application originated from a single-screen application or a multi-screen application. More particularly, an application displayed on only a single screen or display of the device may automatically be extended across two of the screens or displays of the device when, e.g., the two screens or displays are not folded together (i.e., unfolded from one another), and a physically higher of the screens supports such a multi-screen display of its content. Such an automatic extending across two screens or displays is referred to herein as "gravity drop". Additionally, an application, whose content is displayed across two screens concurrently, can automatically be displayed, under certain circumstances, on only one of the two screens. Such a reduction from two screens or displays to only a single such screen or display is referred to herein as "reverse gravity drop". These and other needs are addressed by the various aspects, embodiments, and/or configurations of the present disclosure. Also, while the disclosure is presented in terms of exemplary embodiments, it should be appreciated that individual aspects of the disclosure can be separately claimed.

[0006] In one embodiment, the present disclosure describes a method of controlling data displayed by a multi-screen device, comprising the steps (a) through (c) following:

(a) determining that the multi-screen device has moved from a first physical orientation to a different second physical orientation, wherein the first and second physical orientations differ by the first physical orientation being one of: folded or in a landscape orientation;

(b) determining whether a first screen and a second screen of the multi-screen device are each displaying content for a same application;

(c) changing a display of the application to conform to a predetermined display configuration of the of the application on at least one of the first and second screens, wherein the display configuration is dependent upon the second physical orientation and a result of the step of determining;

wherein the above step of changing includes a step of modifying a display of the application: (a) from being displayed on only the first screen to being displayed on both the first and second screens at a same time, or (b) from being displayed on both the first and second screens at a same time to being displayed on only the first screen.

[0007] In a related embodiment, the present disclosure describes the multi-display device as having the following elements (a) through (f):

(a) a first screen including a first display area;

(b) a second screen including a second display area;

(c) an attachment configured to foldably connect the first screen with the second screen;

(d) a first sensor configured to produce a first signal indicative of a position of the hinge;

(e) a second sensor configured to produce a second signal indicative of relative positions of the first screen to the second screen; and

(f) a computer-readable medium having instructions stored thereon that include:

(f-1) a first set of the instructions configured to determine that the multi-screen device has moved from a first physical orientation to a different second physical orientation, wherein the first and second physical orientations differ by the first physical orientation being one of: folded or in a landscape orientation;

(f-2) a second set of the instructions configured to determine, whether a first screen and a second screen of the multi-screen device are each displaying content for a same application; and

(f-3) a third set of the instructions configured to change a display of the application to conform to a predetermined display configuration of the of the application on at least one of the first and second screens, wherein the display configuration is dependent upon the second physical orientation and a result of the step of determining; and

wherein the third set of the instructions are configured to modify a display of the application: (a) from being displayed on only the first screen to being displayed on both the first and second screens at a same time, or (b) from being displayed on both the first and second screens at a same time to being displayed on only the first screen.

[0008]

[0009] The present disclosure can provide a number of advantages depending on the particular aspect, embodiment, and/or configuration. In particular, the gravity drop and reverse gravity drop operations available on the multi-display device provide an more intuitive and enhanced user experience for a user interacting with an embodiment of the multi-display device.

[0010] These and other advantages will be apparent from the disclosure.

[0011] The phrases "at least one", "one or more", and "and/or" are open-ended expressions that are both conjunctive and disjunctive in operation. For example, each of the expressions "at least one of A, B and C", "at least one of A, B, or C", "one or more of A, B, and C", "one or more of A, B, or C" and "A, B, and/or C" means A alone, B alone, C alone, A and B together, A and C together, B and C together, or A, B and C together.

[0012] The term "a" or "an" entity refers to one or more of that entity. As such, the terms "a" (or "an"), "one or more" and "at least one" can be used interchangeably herein. It is also to be noted that the terms "comprising", "including", and "having" can be used interchangeably.

[0013] The term "automatic" and variations thereof, as used herein, refers to any process or operation done without material human input when the process or operation is performed. However, a process or operation can be automatic, even though performance of the process or operation uses material or immaterial human input, if the input is received before performance of the process or operation. Human input is deemed to be material if such input influences how the process or operation will be performed. Human input that consents to the performance of the process or operation is not deemed to be "material".

[0014] The term "computer-readable medium" as used herein refers to any tangible storage and/or transmission medium that participate in providing instructions to a processor for execution. Such a medium may take many forms, including but not limited to, non-volatile media, volatile media, and transmission media. Non-volatile media includes, for example, NVRAM, or magnetic or optical disks. Volatile media includes dynamic memory, such as main memory. Common forms of computer-readable media include, for example, a floppy disk, a flexible disk, hard disk, magnetic tape, or any other magnetic medium, magneto-optical medium, a CD-ROM, any other optical medium, punch cards, paper tape, any other physical medium with patterns of holes, a RAM, a PROM, and EPROM, a FLASH-EPROM, a solid state medium like a memory card, any other memory chip or cartridge, a carrier wave as described hereinafter, or any other

medium from which a computer can read. A digital file attachment to e-mail or other self-contained information archive or set of archives is considered a distribution medium equivalent to a tangible storage medium. When the computer-readable media is configured as a database, it is to be understood that the database may be any type of database, such as relational, hierarchical, object-oriented, and/or the like. Accordingly, the disclosure is considered to include a tangible storage medium or distribution medium and prior art-recognized equivalents and successor media, in which the software implementations of the present disclosure are stored.

[0015] The term "application" as used herein refers to a software program and/or the display therefor on an electronic display screen, wherein the application is computer software designed to help the user to perform one or more predetermined tasks. Examples include enterprise software, accounting software, office suites, graphics software, and media players. An "application" has a user interface for receiving and presenting information from a user. An "application" as used herein typically refers to software (and/or its graphical presentation) wherein: (i) the application can be activated from a user input that explicitly identifies the application separately and independently from other applications; (ii) the application is interactive with the user for assisting the user in performing a task that the user is cognizant of and purposefully activates the application to perform the task, and (iii) the application is ***not*** viewed by the user as providing graphical interactions for graphically displaying other applications that are operable independently from the application for, e.g., one or more of being independently being installed, uninstalled, downloaded, displayed, not displayed, minimized or maximized, or of independently processing user input and displaying results therefrom.

[0016] The term "application window" refers to a potentially complex data structure(s) defining a graphical presentation of interrelated information that can be manipulated on a graphical display screen for moving, minimizing, and maximizing as a unit. Each application window has an "application" associated therewith that defines predetermined user input thereto to which the application window is responsive according to processing performed by the associated application. As referred to herein, an "application window" also refers its graphical presentation when the application window is displayed on an electronic display device such as a "touch screen" as one skilled in the art will appreciate.

[0017] The term "desktop" refers to a metaphor used to portray systems. A desktop is generally considered a "surface" that typically includes pictures, called icons, widgets, folders, etc. that can activate or show applications, windows, cabinets, files, folders,

documents, and other graphical items thereon. The icons are generally selectable to initiate a task through user interface interaction to allow a user to execute applications or conduct other operations. More precisely, as used herein a "desktop" refers to a potentially complex data structure for providing graphical interactions for graphically displaying with a display of the desktop a plurality of applications such that by user input to the desktop, the displays of the applications can be rearranged relative to the desktop display, added to the desktop display, deleted from the desktop display, and activated from the desktop display. Each desktop includes or has associated therewith data identifying it as a desktop and not an application and not an application window. Similarly, each application and application window includes or has associated therewith data identifying it has an application or application window and not a desktop.

[0018] The term "display" refers to a portion of a screen used to display the output of a computer to a user.

[0019] The term "displayed image" refers to an image produced on the display. A typical displayed image is a window or desktop. The displayed image may occupy all or a portion of the display.

[0020] The term "display orientation" refers to the way in which a rectangular display is oriented by a user for viewing. The two most common types of display orientation are portrait and landscape. In landscape mode, the display is oriented such that the width of the display is greater than the height of the display (such as a 4:3 ratio, which is 4 units wide and 3 units tall, or a 16:9 ratio, which is 16 units wide and 9 units tall). Stated differently, the longer dimension of the display is oriented substantially horizontal in landscape mode while the shorter dimension of the display is oriented substantially vertical. In the portrait mode, by contrast, the display is oriented such that the width of the display is less than the height of the display. Stated differently, the shorter dimension of the display is oriented substantially horizontal in the portrait mode while the longer dimension of the display is oriented substantially vertical. The multi-screen display can have one composite display that encompasses all the screens. The composite display can have different display characteristics based on the various orientations of the device.

[0021] The term "gesture" refers to a user action that expresses an intended idea, action, meaning, result, and/or outcome. The user action can include manipulating a device (e.g., opening or closing a device, changing a device orientation, moving a trackball or wheel, etc.), movement of a body part in relation to the device, movement of an implement or tool

in relation to the device, audio inputs, etc. A gesture may be made on a device (such as on the screen) or with the device to interact with the device.

[0022] The term "module" as used herein refers to any known or later developed hardware, software, firmware, artificial intelligence, fuzzy logic, or combination of hardware and software that is capable of performing the functionality associated with that element.

[0023] The term "gesture capture" refers to a sense or otherwise a detection of an instance and/or type of user gesture. The gesture capture can occur in one or more areas of the screen, A gesture region can be on the display, where it may be referred to as a touch sensitive display or off the display where it may be referred to as a gesture capture area.

[0024] A "multi-screen application" refers to an application that is capable of producing one or more windows that may simultaneously occupy multiple screens. A multi-screen application commonly can operate in single-screen mode in which one or more windows of the application are displayed only on one screen or in multi-screen mode in which one or more windows are displayed simultaneously on multiple screens.

[0025] A "single-screen application" refers to an application that is capable of producing one or more windows that may occupy only a single screen at a time.

[0026] The term "screen," "touch screen," or "touchscreen" refers to a physical structure that enables the user to interact with the computer by touching areas on the screen and provides information to a user through a display. The touch screen may sense user contact in a number of different ways, such as by a change in an electrical parameter (e.g., resistance or capacitance), acoustic wave variations, infrared radiation proximity detection, light variation detection, and the like. In a resistive touch screen, for example, normally separated conductive and resistive metallic layers in the screen pass an electrical current. When a user touches the screen, the two layers make contact in the contacted location, whereby a change in electrical field is noted and the coordinates of the contacted location calculated. In a capacitive touch screen, a capacitive layer stores electrical charge, which is discharged to the user upon contact with the touch screen, causing a decrease in the charge of the capacitive layer. The decrease is measured, and the contacted location coordinates determined. In a surface acoustic wave touch screen, an acoustic wave is transmitted through the screen, and the acoustic wave is disturbed by user contact. A receiving transducer detects the user contact instance and determines the contacted location coordinates.

[0027] The term "window" refers to a, typically rectangular, displayed image on at least part of a screen display that contains or provides content different from the rest of the screen. Such a window may obscure a desktop for the screen display.

[0028] The terms "determine", "calculate" and "compute," and variations thereof, as used herein, are used interchangeably and include any type of methodology, process, mathematical operation or technique.

[0029] It shall be understood that the term "means" as used herein shall be given its broadest possible interpretation in accordance with 35 U.S.C., Section 112, Paragraph 6. Accordingly, a claim incorporating the term "means" shall cover all structures, materials, or acts set forth herein, and all of the equivalents thereof. Further, the structures, materials or acts and the equivalents thereof shall include all those described in the summary of the invention, brief description of the drawings, detailed description, abstract, and claims themselves.

[0030] The preceding is a simplified summary of the disclosure to provide an understanding of some aspects of the disclosure. This summary is neither an extensive nor exhaustive overview of the disclosure and its various aspects, embodiments, and/or configurations. It is intended neither to identify key or critical elements of the disclosure nor to delineate the scope of the disclosure but to present selected concepts of the disclosure in a simplified form as an introduction to the more detailed description presented below. As will be appreciated, other aspects, embodiments, and/or configurations of the disclosure are possible utilizing, alone or in combination, one or more of the features set forth above or described in detail below.

BRIEF DESCRIPTION OF THE DRAWINGS

[0031] FIG. 1A includes a first view of an embodiment of a multi-screen user device 100;

[0032] FIG. 1B includes a second view of an embodiment of a multi-screen user device 100;

[0033] FIG. 1C includes a third view of an embodiment of a multi-screen user device 100;

[0034] FIG. 1D includes a fourth view of an embodiment of a multi-screen user device 100;

[0035] FIG. 1E includes a fifth view of an embodiment of a multi-screen user device 100;

[0036] FIG. 1F includes a sixth view of an embodiment of a multi-screen user device 100;

[0037] FIG. 1G includes a seventh view of an embodiment of a multi-screen user device 100;

[0038] FIG. 1H includes a eighth view of an embodiment of a multi-screen user device 100;

[0039] FIG. 1I includes a ninth view of an embodiment of a multi-screen user device 100;

[0040] FIG. 1J includes a tenth view of an embodiment of a multi-screen user device 100;

[0041] FIG. 2 is a block diagram of an embodiment of the hardware of the device 100;

[0042] FIG. 3A is a block diagram of an embodiment of the state model for the device 100 based on the device's orientation and/or configuration;

[0043] FIG. 3B is a table of an embodiment of the state model for the device 100 based on the device's orientation and/or configuration;

[0044] FIG. 4A is a first representation of an embodiment of user gesture received at a device 100;

[0045] FIG. 4B is a second representation of an embodiment of user gesture received at a device 100;

[0046] FIG. 4C is a third representation of an embodiment of user gesture received at a device 100;

[0047] FIG. 4D is a fourth representation of an embodiment of user gesture received at a device 100;

[0048] FIG. 4E is a fifth representation of an embodiment of user gesture received at a device 100;

[0049] FIG. 4F is a sixth representation of an embodiment of user gesture received at a device 100;

[0050] FIG. 4G is a seventh representation of an embodiment of user gesture received at a device 100;

[0051] FIG. 4H is a eighth representation of an embodiment of user gesture received at a device 100;

[0052] FIG. 5A is a block diagram of an embodiment of the software and/or firmware for a device 100;

[0053] FIG. 5B is a second block diagram of an embodiment of the software and/or firmware for a device 100;

[0054] FIG. 6A is a first representation of an embodiment of a device configuration generated in response to the device state for a device 100;

[0055] FIG. 6B is a second representation of an embodiment of a device configuration generated in response to the device state for a device 100;

[0056] FIG. 6C is a third representation of an embodiment of a device configuration generated in response to the device state for a device 100;

[0057] FIG. 6D is a fourth representation of an embodiment of a device configuration generated in response to the device state for a device 100;

[0058] FIG. 6E is a fifth representation of an embodiment of a device configuration generated in response to the device state for a device 100;

[0059] FIG. 6F is a sixth representation of an embodiment of a device configuration generated in response to the device state for a device 100;

[0060] FIG. 6G is a seventh representation of an embodiment of a device configuration generated in response to the device state for a device 100;

[0061] FIG. 6H is a eighth representation of an embodiment of a device configuration generated in response to the device state for a device 100;

[0062] FIG. 6I is a ninth representation of an embodiment of a device configuration generated in response to the device state for a device 100;

[0063] FIG. 6J is a tenth representation of an embodiment of a device configuration generated in response to the device state for a device 100;

[0064] Fig. 7A depicts a first sequence of gestures to invoke a first display action in accordance with embodiments of the present disclosure;

[0065] Fig. 7B depicts a second sequence of gestures to invoke a second display action in accordance with embodiments of the present disclosure;

[0066] Fig. 7C depicts a third sequence of gestures to invoke a third display action in accordance with embodiments of the present disclosure;

[0067] FIG. 8 is a flowchart of an embodiment of high level steps for performing gravity drop; and

[0068] FIG. 9 is a flow chart of an embodiment of high level steps for performing reverse gravity drop;

[0069] In the appended figures, similar components and/or features may have the same reference label. Further, various components of the same type may be distinguished by

following the reference label by a letter that distinguishes among the similar components. If only the first reference label is used in the specification, the description is applicable to any one of the similar components having the same first reference label irrespective of the second reference label.

DETAILED DESCRIPTION

[0070] Presented herein are embodiments of a device. The device can be a communications device, such as a cellular telephone, or other smart device. The device can include two screens that are oriented to provide several unique display configurations. Further, the device can receive user input in unique ways. The overall design and functionality of the device provides for an enhanced user experience making the device more useful and more efficient.

[0071] Mechanical Features:

[0072] Figs. 1A-1J illustrate a device 100 in accordance with embodiments of the present disclosure. As described in greater detail below, device 100 can be positioned in a number of different ways each of which provides different functionality to a user. The device 100 is a multi-screen device that includes a primary screen 104 and a secondary screen 108, both of which are touch sensitive. In embodiments, the entire front surface of screens 104 and 108 may be touch sensitive and capable of receiving input by a user touching the front surface of the screens 104 and 108. Primary screen 104 includes touch sensitive display 110, which, in addition to being touch sensitive, also displays information to a user. Secondary screen 108 includes touch sensitive display 114, which also displays information to a user. In other embodiments, screens 104 and 108 may include more than one display area.

[0073] Primary screen 104 also includes a configurable area 112 that has been configured for specific inputs when the user touches portions of the configurable area 112. Secondary screen 108 also includes a configurable area 116 that has been configured for specific inputs. Areas 112a and 116a have been configured to receive a "back" input indicating that a user would like to view information previously displayed. Areas 112b and 116b have been configured to receive a "menu" input indicating that the user would like to view options from a menu. Areas 112c and 116c have been configured to receive a "home" input indicating that the user would like to view information associated with a "home" view. In other embodiments, areas 112a-c and 116a-c may be configured, in addition to the configurations described above, for other types of specific inputs including controlling features of device 100, some non-limiting examples including adjusting overall

system power, adjusting the volume, adjusting the brightness, adjusting the vibration, selecting of displayed items (on either of screen 104 or 108), operating a camera, operating a microphone, and initiating/terminating of telephone calls. Also, in some embodiments, areas 112a-C and 116a-C may be configured for specific inputs depending upon the application running on device 100 and/or information displayed on touch sensitive displays 110 and/or 114.

[0074] In addition to touch sensing, primary screen 104 and secondary screen 108 may also include areas that receive input from a user without requiring the user to touch the display area of the screen. For example, primary screen 104 includes gesture capture area 120, and secondary screen 108 includes gesture capture area 124. These gesture capture areas are, e.g., capacitive touch sensitive areas which are able to receive user touch input to be used for recognizing gestures made by a user without the need for the user to actually touch the surface of the display area (i.e., display area 110 or 114). In comparison to touch sensitive displays 110 and 114, the gesture capture areas 120 and 124 are commonly not capable of rendering a displayed image, and in particular, cannot display a desktop or an application window.

[0075] The two screens 104 and 108 are connected together with a hinge 128, shown clearly in Fig. 1C (illustrating a back view of device 100). Hinge 128, in the embodiment shown in Figs. 1A-1J, is a center hinge that connects screens 104 and 108 so that when the hinge is closed, screens 104 and 108 are juxtaposed (i.e., side-by-side) as shown in Fig. 1B (illustrating a front view of device 100). Hinge 128 can be opened to position the two screens 104 and 108 in different relative positions to each other. As described in greater detail below, the device 100 may have different functionalities depending on the relative positions of screens 104 and 108.

[0076] Fig. 1D illustrates the right side of device 100. As shown in Fig. 1D, secondary screen 108 also includes a card slot 132 and a port 136 on its side. Card slot 132 in embodiments, accommodates different types of cards including a subscriber identity module (SIM). Port 136 in embodiments is an input/output port (I/O port) that allows device 100 to be connected to other peripheral devices, such as a display, keyboard, or printing device. As can be appreciated, these are merely some examples and in other embodiments device 100 may include other slots and ports such as slots and ports for accommodating additional memory devices and/or for connecting other peripheral devices. Also shown in Fig. 1D is an audio jack 140 that accommodates a tip, ring, sleeve (TRS) connector for example to allow a user to utilize headphones or a headset.

[0077] Device 100 also includes a number of buttons 158. For example, Fig. 1E illustrates the left side of device 100. As shown in Fig. 1E, the side of primary screen 104 includes three buttons 144, 148, and 152, which can be configured for specific inputs. For example, buttons 144, 148, and 152 may be configured to, in combination or alone, control a number of aspects of device 100. Some non-limiting examples include overall system power, volume, brightness, vibration, selection of displayed items (on either of screen 104 or 108), a camera, a microphone, and initiation/termination of telephone calls. In some embodiments, instead of separate buttons two buttons may be combined into a rocker button. This arrangement is useful in situations where the buttons are configured to control features such as volume or brightness. In addition to buttons 144, 148, and 152, device 100 also includes a button 156, shown in Fig. 1F, which illustrates the top of device 100. In one embodiment, button 156 is configured as an on/off button used to control overall system power to device 100. In other embodiments, button 156 is configured to, in addition to or in lieu of controlling system power, control other aspects of device 100. In some embodiments, one or more of the buttons 144, 148, 152, and 156 are capable of supporting different user commands. By way of example, a normal press has a duration commonly of less than about 1 second and resembles a quick tap. A medium press has a duration commonly of 1 second or more but less than about 12 seconds. A long press has a duration commonly of about 12 seconds or more. The function of the buttons is normally specific to the application that is currently in focus on the respective display 110 and 114. In a telephone application for instance and depending on the particular button, a normal, medium, or long press can mean end call, increase in call volume, decrease in call volume, and toggle microphone mute. In a camera or video application for instance and depending on the particular button, a normal, medium, or long press can mean increase zoom, decrease zoom, and take photograph or record video.

[0078] There are also a number of hardware components within device 100. As illustrated in Fig. 1C, device 100 includes a speaker 160 and a microphone 164. Device 100 also includes a camera 168 (Fig. 1B). Additionally, device 100 includes two position sensors 172A and 172B, which are used to determine the relative positions of screens 104 and 108. In one embodiment, position sensors 172A and 172B are Hall effect sensors. However, in other embodiments other sensors can be used in addition to or in lieu of the Hall effect sensors. An accelerometer 176 may also be included as part of device 100 to determine the orientation of the device 100 and/or the orientation of screens 104 and 108.

Additional internal hardware components that may be included in device 100 are described below with respect to Fig. 2.

[0079] The overall design of device 100 allows it to provide additional functionality not available in other communication devices. Some of the functionality is based on the various positions and orientations that device 100 can have. As shown in Figs. 1B-1G, device 100 can be operated in an "open" position where screens 104 and 108 are juxtaposed. This position allows a large display area for displaying information to a user. When position sensors 172A and 172B determine that device 100 is in the open position, they can generate a signal that can be used to trigger different events such as displaying information on both screens 104 and 108. Additional events may be triggered if accelerometer 176 determines that device 100 is in a portrait position (Fig. 1B) as opposed to a landscape position (not shown).

[0080] In addition to the open position, device 100 may also have a "closed" position illustrated in Fig. 1H. Again, position sensors 172A and 172B can generate a signal indicating that device 100 is in the "closed" position. This can trigger an event that results in a change of displayed information on screen 104 and/or 108. For example, device 100 may be programmed to stop displaying information on one of the screens, e.g., screen 108, since a user can only view one screen at a time when device 100 is in the "closed" position. In other embodiments, the signal generated by position sensors 172A and 172B, indicating that the device 100 is in the "closed" position, can trigger device 100 to answer an incoming telephone call. The "closed" position can also be a preferred position for utilizing the device 100 as a mobile phone.

[0081] Device 100 can also be used in an "easel" position which is illustrated in Fig. 1I. In the "easel" position, screens 104 and 108 are angled with respect to each other and facing outward with the edges of screens 104 and 108 substantially horizontal. In this position, device 100 can be configured to display information on both screens 104 and 108 to allow two users to simultaneously interact with device 100. When device 100 is in the "easel" position, sensors 172A and 172B generate a signal indicating that the screens 104 and 108 are positioned at an angle to each other, and the accelerometer 176 can generate a signal indicating that device 100 has been placed so that the edge of screens 104 and 108 are substantially horizontal. The signals can then be used in combination to generate events that trigger changes in the display of information on screens 104 and 108.

[0082] Fig. 1J illustrates device 100 in a "modified easel" position. In the "modified easel" position, one of screens 104 or 108 is used as a stand and is faced down on the

surface of an object such as a table. This position provides a convenient way for information to be displayed to a user in landscape orientation. Similar to the easel position, when device 100 is in the "modified easel" position, position sensors 172A and 172B generate a signal indicating that the screens 104 and 108 are positioned at an angle to each other. The accelerometer 176 would generate a signal indicating that device 100 has been positioned so that one of screens 104 and 108 is faced downwardly and is substantially horizontal. The signals can then be used to generate events that trigger changes in the display of information of screens 104 and 108. For example, information may not be displayed on the screen that is face down since a user cannot see the screen.

[0083] Transitional states are also possible. When the position sensors 172A and B and/or accelerometer indicate that the screens are being closed or folded (from open), a closing transitional state is recognized. Conversely when the position sensors 172A and B indicate that the screens are being opened or folded (from closed), an opening transitional state is recognized. The closing and opening transitional states are typically time-based, or have a maximum time duration from a sensed starting point. Normally, no user input is possible when one of the closing and opening states is in effect. In this manner, incidental user contact with a screen during the closing or opening function is not misinterpreted as user input. In embodiments, another transitional state is possible when the device 100 is closed. This additional transitional state allows the display to switch from one screen 104 to the second screen 108 when the device 100 is closed based on some user input, e.g., a double tap on the screen 110,114.

[0084] As can be appreciated, the description of device 100 is made for illustrative purposes only, and the embodiments are not limited to the specific mechanical features shown in Figs. 1A-1J and described above. In other embodiments, device 100 may include additional features, including one or more additional buttons, slots, display areas, hinges, and/or locking mechanisms. Additionally, in embodiments, the features described above may be located in different parts of device 100 and still provide similar functionality. Therefore, Figs. 1A-1J and the description provided above are nonlimiting.

[0085] Hardware Features:

[0086] Fig. 2 illustrates components of a device 100 in accordance with embodiments of the present disclosure. In general, the device 100 includes a primary screen 104 and a secondary screen 108. While the primary screen 104 and its components are normally enabled in both the opened and closed positions or states, the secondary screen 108 and its components are normally enabled in the opened state but disabled in the closed state.

However, even when in the closed state a user or application triggered interrupt (such as in response to a phone application or camera application operation) can flip the active screen, or disable the primary screen 104 and enable the secondary screen 108, by a suitable command. Each screen 104, 108 can be touch sensitive and can include different operative areas. For example, a first operative area, within each touch sensitive screen 104 and 108, may comprise a touch sensitive display 110, 114. In general, the touch sensitive display 110, 114 may comprise a full color, touch sensitive display. A second area within each touch sensitive screen 104 and 108 may comprise a gesture capture region 120, 124. The gesture capture region 120, 124 may comprise an area or region that is outside of the touch sensitive display 110, 114 area, and that is capable of receiving input, for example in the form of gestures provided by a user. However, the gesture capture region 120, 124 does not include pixels that can perform a display function or capability.

[0087] A third region of the touch sensitive screens 104 and 108 may comprise a configurable area 112, 116. The configurable area 112, 116 is capable of receiving input and has display or limited display capabilities. In embodiments, the configurable area 112, 116 may present different input options to the user. For example, the configurable area 112, 116 may display buttons or other relatable items. Moreover, the identity of displayed buttons, or whether any buttons are displayed at all within the configurable area 112, 116 of a touch sensitive screen 104 or 108, may be determined from the context in which the device 100 is used and/or operated. In an exemplary embodiment, the touch sensitive screens 104 and 108 comprise liquid crystal display devices extending across at least those regions of the touch sensitive screens 104 and 108 that are capable of providing visual output to a user, and a capacitive input matrix over those regions of the touch sensitive screens 104 and 108 that are capable of receiving input from the user.

[0088] One or more display controllers 216a, 216b may be provided for controlling the operation of the touch sensitive screens 104 and 108, including input (touch sensing) and output (display) functions. In the exemplary embodiment illustrated in Fig. 2, a separate touch screen controller 216a or 216b is provided for each touch screen 104 and 108. In accordance with alternate embodiments, a common or shared touch screen controller 216 may be used to control each of the included touch sensitive screens 104 and 108. In accordance with still other embodiments, the functions of a touch screen controller 216 may be incorporated into other components, such as a processor 204.

[0089] The processor 204 may comprise a general purpose programmable processor or controller for executing application programming or instructions. In accordance with at

least some embodiments, the processor 204 may include multiple processor cores, and/or implement multiple virtual processors. In accordance with still other embodiments, the processor 204 may include multiple physical processors. As a particular example, the processor 204 may comprise a specially configured application specific integrated circuit (ASIC) or other integrated circuit, a digital signal processor, a controller, a hardwired electronic or logic circuit, a programmable logic device or gate array, a special purpose computer, or the like. The processor 204 generally functions to run programming code or instructions implementing various functions of the device 100.

[0090] A communication device 100 may also include memory 208 for use in connection with the execution of application programming or instructions by the processor 204, and for the temporary or long term storage of program instructions and/or data. As examples, the memory 208 may comprise RAM, DRAM, SDRAM, or other solid state memory. Alternatively or in addition, data storage 212 may be provided. Like the memory 208, the data storage 212 may comprise a solid state memory device or devices. Alternatively or in addition, the data storage 212 may comprise a hard disk drive or other random access memory.

[0091] In support of communications functions or capabilities, the device 100 can include a cellular telephony module 228. As examples, the cellular telephony module 228 can comprise a GSM, CDMA, FDMA and/or analog cellular telephony transceiver capable of supporting voice, multimedia and/or data transfers over a cellular network. Alternatively or in addition, the device 100 can include an additional or other wireless communications module 232. As examples, the other wireless communications module 232 can comprise a Wi-Fi, BLUETOOTH TM, WiMax, infrared, or other wireless communications link. The cellular telephony module 228 and the other wireless communications module 232 can each be associated with a shared or a dedicated antenna 224.

[0092] A port interface 252 may be included. The port interface 252 may include proprietary or universal ports to support the interconnection of the device 100 to other devices or components, such as a dock, which may or may not include additional or different capabilities from those integral to the device 100. In addition to supporting an exchange of communication signals between the device 100 and another device or component, the docking port 136 and/or port interface 252 can support the supply of power to or from the device 100. The port interface 252 also comprises an intelligent

element that comprises a docking module for controlling communications or other interactions between the device 100 and a connected device or component.

[0093] An input/output module 248 and associated ports may be included to support communications over wired networks or links, for example with other communication devices, server devices, and/or peripheral devices. Examples of an input/output module 248 include an Ethernet port, a Universal Serial Bus (USB) port, Institute of Electrical and Electronics Engineers (IEEE) 1394, or other interface.

[0094] An audio input/output interface/device(s) 244 can be included to provide analog audio to an interconnected speaker or other device, and to receive analog audio input from a connected microphone or other device. As an example, the audio input/output interface/device(s)244 may comprise an associated amplifier and analog to digital converter. Alternatively or in addition, the device 100 can include an integrated audio input/output device 256 and/or an audio jack for interconnecting an external speaker or microphone. For example, an integrated speaker and an integrated microphone can be provided, to support near talk or speaker phone operations.

[0095] Hardware buttons 158 can be included for example for use in connection with certain control operations. Examples include a master power switch, volume control, etc., as described in conjunction with Figs. 1A through 1J. One or more image capture interfaces/devices 240, such as a camera, can be included for capturing still and/or video images. Alternatively or in addition, an image capture interface/device 240 can include a scanner or code reader. An image capture interface/device 240 can include or be associated with additional elements, such as a flash or other light source.

[0096] The device 100 can also include a global positioning system (GPS) receiver 236. In accordance with embodiments of the present invention, the GPS receiver 236 may further comprise a GPS module that is capable of providing absolute location information to other components of the device 100. An accelerometer(s) 176 may also be included. For example, in connection with the display of information to a user and/or other functions, a signal from the accelerometer 176 can be used to determine an orientation and/or format in which to display that information to the user.

[0097] Embodiments of the present invention can also include one or more position sensor(s) 172. The position sensor 172 can provide a signal indicating the position of the touch sensitive screens 104 and 108 relative to one another. This information can be provided as an input, for example to a user interface application, to determine an operating mode, characteristics of the touch sensitive displays 110, 114, and/or other device 100

operations. As examples, a screen position sensor 172 can comprise a series of Hall effect sensors, a multiple position switch, an optical switch, a Wheatstonebridge, a potentiometer, or other arrangement capable of providing a signal indicating of multiple relative positions the touch screens are in.

[0098] Communications between various components of the device 100 can be carried by one or more buses 222. In addition, power can be supplied to the components of the device 100 from a power source and/or power control module 260. The power control module 260 can, for example, include a battery, an AC to DC converter, power control logic, and/or ports for interconnecting the device 100 to an external source of power.

[0099] Device State:

[00100] Figs. 3A and 3B represent illustrative states of device 100. While a number of illustrative states are shown, and transitions from a first state to a second state, it is to be appreciated that the illustrative state diagram may not encompass all possible states and/or all possible transitions from a first state to a second state. As illustrated in Fig. 3, the various arrows between the states (illustrated by the state represented in the circle) represent a physical change that occurs to the device 100, that is detected by one or more of hardware and software, the detection triggering one or more of a hardware and/or software interrupt that is used to control and/or manage one or more functions of device 100.

[00101] As illustrated in Fig. 3A, there are twelve exemplary "physical" states: closed 304, transition 308 (or opening transitional state), easel 312, modified easel 316, open 320, inbound/outbound call or communication 324, image/video capture 328, transition 332 (or closing transitional state), landscape 340, docked 336, docked 344 and landscape 348. Next to each illustrative state is a representation of the physical state of the device 100 with the exception of states 324 and 328, where the state is generally symbolized by the international icon for a telephone and the icon for a camera, respectfully.

[00102] In state 304, the device is in a closed state with the device 100 generally oriented in the portrait direction with the primary screen 104 and the secondary screen 108 back-to-back in different planes (see Fig. 1H). From the closed state, the device 100 can enter, for example, docked state 336, where the device 100 is coupled with a docking station, docking cable, or in general docked or associated with one or more other devices or peripherals, or the landscape state 340, where the device 100 is generally oriented with the primary screen 104 facing the user, and the primary screen 104 and the secondary screen 108 being back-to-back.

[00103] In the closed state, the device can also move to a transitional state where the device remains closed but the display (of an application or desktop) is moved from one screen 104 to another screen 108 based on a user input, e.g., a double tap on the screen 110, 114. Still another embodiment includes a bilateral state. In the bilateral state, the device remains closed, but a single application displays at least one window on both the first display 110 and the second display 114. The windows shown on the first and second display 110, 114 may be the same or different based on the application and the state of that application. For example, while acquiring an image with a camera, the device may display the view finder on the first display 110 and displays a preview for the photo subjects (full screen and mirrored left-to-right) on the second display 114.

[00104] In state 308, a transition state from the closed state 304 to the semi-open state or easel state 312, the device 100 is shown opening with the primary screen 104 and the secondary screen 108 being rotated around a point of axis coincidence with the hinge. Upon entering the easel state 312, the primary screen 104 and the secondary screen 108 are separated from one another such that, for example, the device 100 can sit in an easel-like configuration on a surface.

[00105] In state 316, known as the modified easel position, the device 100 has the primary screen 104 and the secondary screen 108 in a similar relative relationship to one another as in the easel state 312, with the difference being one of the primary screen 104 or the secondary screen 108 are placed on a surface as shown.

[0100] State 320 is the open state where the primary screen 104 and the secondary screen 108 are generally on the same plane. From the open state, the device 100 can transition to the docked state 344 or the open landscape state 348. In the open state 320, the primary screen 104 and the secondary screen 108 are generally in the portrait-like orientation while in landscaped state 348 the primary screen 104 and the secondary screen 108 are generally in a landscape-like orientation.

[0101] State 324 is illustrative of a communication state, such as when an inbound or outbound call is being received or placed, respectively, by the device 100. While not illustrated for clarity, it should be appreciated the device 100 can transition to the inbound/outbound call state 324 from any state illustrated in Fig. 3. In a similar manner, the image/video capture state 328 can be entered into from any other state in Fig. 3, with the image/video capture state 328 allowing the device 100 to take one or more images via a camera and/or videos with a video capture device 240.

[0102] Transition state 322 illustratively shows primary screen 104 and the secondary screen 108 being closed upon one another for entry into, for example, the closed state 304.

[0103] Fig. 3B illustrates, with reference to the key, the inputs that are received to detect a transition from a first state to a second state. In Fig. 3B, various combinations of states are shown with in general, a portion of the columns being directed toward a portrait state 352, a landscape state 356, and a portion of the rows being directed to portrait state 360 and landscape state 364.

[0104] In Fig. 3B, the Key indicates that "H" represents an input from one or more Hall Effect sensors, "A" represents an input from one or more accelerometers, "T" represents an input from a timer, "P" represents a communications trigger input and "I" represents an image and/or video capture request input. Thus, in the center portion 376 of the chart, an input, or combination of inputs, are shown that represent how the device 100 detects a transition from a first physical state to a second physical state.

[0105] As discussed, in the center portion of the chart 376, the inputs that are received enable the detection of a transition from, for example, a portrait open state to a landscape easel state - shown in bold – "HAT." For this exemplary transition from the portrait open to the landscape easel state, a Hall Effect sensor ("H"), an accelerometer ("A") and a timer ("T") input may be needed. The timer input can be derived from, for example, a clock associated with the processor.

[0106] In addition to the portrait and landscape states, a docked state 368 is also shown that is triggered based on the receipt of a docking signal 372. As discussed above and in relation to Fig. 3, the docking signal can be triggered by the association of the device 100 with one or more other device 100s, accessories, peripherals, smart docks, or the like.

[0107] User Interaction:

[0108] Figs. 4A through 4H depict various graphical representations of gesture inputs that may be recognized by the screens 104, 108. The gestures may be performed not only by a user's body part, such as a digit, but also by other devices, such as a stylus, that may be sensed by the contact sensing portion(s) of a screen 104, 108. In general, gestures are interpreted differently, based on where the gestures are performed (either directly on the display 110, 114 or in the gesture capture region 120, 124). For example, in one embodiment, gestures in the display 110,114 may be directed to a desktop or application, and gestures in the gesture capture region 120, 124 may be interpreted as for the system.

[0109] With reference to Figs. 4A-4H, a first type of gesture, a touch gesture 420, is substantially stationary on the screen 104,108 for a selected length of time. A circle 428

represents a touch or other contact type received at particular location of a contact sensing portion of the screen. The circle 428 may include a border 432, the thickness of which indicates a length of time that the contact is held substantially stationary at the contact location. For instance, a tap 420 (or short press) has a thinner border 432a than the border 432b for a long press 424 (or for a normal press). The long press 424 may involve a contact that remains substantially stationary on the screen for longer time period than that of a tap 420. As will be appreciated, differently defined gestures may be registered depending upon the length of time that the touch remains stationary prior to contact cessation or movement on the screen.

[0110] With reference to Fig. 4C, a drag gesture 400 on the screen 104,108 is an initial contact (represented by circle 428) with contact movement 436 in a selected direction. The initial contact 428 may remain stationary on the screen 104,108 for a certain amount of time represented by the border 432. The drag gesture typically requires the user to contact an icon, window, or other displayed image at a first location followed by movement of the contact in a drag direction to a new second location desired for the selected displayed image. The contact movement need not be in a straight line but have any path of movement so long as the contact is substantially continuous from the first to the second locations.

[0111] With reference to Fig. 4D, a flick gesture 404 on the screen 104,108 is an initial contact (represented by circle 428) with truncated contact movement 436 (relative to a drag gesture) in a selected direction. In embodiments, a flick has a higher exit velocity for the last movement in the gesture compared to the drag gesture. The flick gesture can, for instance, be a finger snap following initial contact. Compared to a drag gesture, a flick gesture generally does not require continual contact with the screen 104,108 from the first location of a displayed image to a predetermined second location. The contacted displayed image is moved by the flick gesture in the direction of the flick gesture to the predetermined second location. Although both gestures commonly can move a displayed image from a first location to a second location, the temporal duration and distance of travel of the contact on the screen is generally less for a flick than for a drag gesture.

[0112] With reference to Fig. 4E, a pinch gesture 408 on the screen 104,108 is depicted. The pinch gesture 408 may be initiated by a first contact 428 to the screen 104,108 by, for example, a first digit and a second contact 428b to the screen 104,108 by, for example, a second digit. The first and second contacts 428a,b may be detected by a common contact sensing portion of a common screen 104,108, by different contact sensing portions of a

common screen 104 or108, or by different contact sensing portions of different screens. The first contact 428a is held for a first amount of time, as represented by the border 432a, and the second contact 428b is held for a second amount of time, as represented by the border 432b. The first and second amounts of time are generally substantially the same, and the first and second contacts 428 a, b generally occur substantially simultaneously. The first and second contacts 428 a, b generally also include corresponding first and second contact movements 436 a, b, respectively. The first and second contact movements 436 a, b are generally in opposing directions. Stated another way, the first contact movement 436a is towards the second contact 436b, and the second contact movement 436b is towards the first contact 436a. More simply stated, the pinch gesture 408 may be accomplished by a user's digits touching the screen 104,108 in a pinching motion.

[0113] With reference to Fig. 4F, a spread gesture 410 on the screen 104,108 is depicted. The spread gesture 410 may be initiated by a first contact 428a to the screen 104,108 by, for example, a first digit and a second contact 428b to the screen 104,108 by, for example, a second digit. The first and second contacts 428a,b may be detected by a common contact sensing portion of a common screen 104,108, by different contact sensing portions of a common screen 104,108, or by different contact sensing portions of different screens. The first contact 428a is held for a first amount of time, as represented by the border 432a, and the second contact 428b is held for a second amount of time, as represented by the border 432b. The first and second amounts of time are generally substantially the same, and the first and second contacts 428 a, b generally occur substantially simultaneously. The first and second contacts 428 a, b generally also include corresponding first and second contact movements 436a, b, respectively. The first and second contact movements 436 a, b are generally in a common direction. Stated another way, the first and second contact movements 436 a, b are away from the first and second contacts 428a, b. More simply stated, the spread gesture 410 may be accomplished by a user's digits touching the screen 104,108 in a spreading motion.

[0114] The above gestures may be combined in any manner, such as those shown by Figs. 4G and 4H, to produce a determined functional result. For example, in Fig. 4G a tap gesture 420 is combined with a drag or flick gesture 412 in a direction away from the tap gesture 420. In Fig. 4H, a tap gesture 420 is combined with a drag or flick gesture 412 in a direction towards the tap gesture 420.

[0115] The functional result of receiving a gesture can vary depending on a number of factors, including a state of the device 100, display 110, 114, or screen 104, 108, a context

associated with the gesture, or sensed location of the gesture. The state of the device commonly refers to one or more of a configuration of the device 100, a display orientation, and user and other inputs received by the device 100. Context commonly refers to one or more of the particular application(s) selected by the gesture and the portion(s) of the application currently executing, whether the application is a single- or multi-screen application, and whether the application is a multi-screen application displaying one or more windows in one or more screens or in one or more stacks. Sensed location of the gesture commonly refers to whether the sensed set(s) of gesture location coordinates are on a touch sensitive display 110, 114 or a gesture capture region 120, 124, whether the sensed set(s) of gesture location coordinates are associated with a common or different display or screen 104,108, and/or what portion of the gesture capture region contains the sensed set(s) of gesture location coordinates.

[0116] A tap, when received by an a touch sensitive display 110, 114, can be used, for instance, to select an icon to initiate or terminate execution of a corresponding application, to maximize or minimize a window, to reorder windows in a stack, and to provide user input such as by keyboard display or other displayed image. A drag, when received by a touch sensitive display 110, 114, can be used, for instance, to relocate an icon or window to a desired location within a display, to reorder a stack on a display, or to span both displays (such that the selected window occupies a portion of each display simultaneously). A flick, when received by a touch sensitive display 110, 114 or a gesture capture region 120, 124, can be used to relocate a window from a first display to a second display or to span both displays (such that the selected window occupies a portion of each display simultaneously). Unlike the drag gesture, however, the flick gesture is generally not used to move the displayed image to a specific user-selected location but to a default location that is not configurable by the user.

[0117] The spread gesture, when received by a touch sensitive display 110, 114 or a gesture capture region 120, 124, can be used to minimize or otherwise increase the displayed area or size of a window (typically when received entirely by a common display), to switch windows displayed at the top of the stack on each display to the top of the stack of the other display (typically when received by different displays or screens), or to display an application manager (a "pop-up window" that displays the windows in the stack). The pinch gesture, when received by a touch sensitive display 110, 114 or a gesture capture region 120, 124, can be used to maximize or otherwise decrease the displayed area or size of a window, to switch windows displayed at the top of the stack on

each display to the top of the stack of the other display (typically when received by different displays or screens), or to display an application manager (typically when received by an off-screen gesture capture region on the same or different screens).

[0118] The combined gestures of Fig. 4G, when received by a common display capture region in a common display or screen 104,108, can be used: (A) to hold constant a position or entry in a first window stack (a "window stack" being a first-in-last-accessible ordering or "stack" data structure of entries thereto, as one skilled in the art will understand, wherein each entry thereof provides data for displaying a corresponding application or desktop, and the ordering determines both the ordering of displaying the corresponding applications or desktops as well as their ordering for other operations such as deletion or insertion; further discussion of window stacks is provided hereinbelow; however, note that such a "window stack" may be only a logical arrangement of windows and/or desktops for one or both of the displays 110, 114) for the display 110 or 114 receiving the gesture, and (B) concurrently inserting into a second window stack, the window in the display that received the gesture. The combined gestures of Fig. 4H, when received by different display capture regions, in a common display or screen 104,108 (if such functionality is provided for a single display), or in different displays or screens, can be used to hold a first window stack location in a first window stack constant for a display receiving the tap part of the gesture while reordering a second window stack location in a second window stack to include a window in the display receiving the flick or drag gesture. Although specific gestures and gesture capture regions in the preceding examples have been associated with corresponding sets of functional results, it is to be appreciated that these associations can be redefined in any manner to produce differing associations between gestures and/or gesture capture regions and/or functional results.

[0119] Firmware and Software:

[0120] Referring to Fig. 5A,the memory 508 may store and the processor 504 may execute one or more software components. These components can include at least one operating system (OS) 516a and/or 516b, a framework 520, and/or one or more applications 564a and/or 564b from an application store 560. The processor 504 may receive inputs from drivers 512, previously described in conjunction with Fig. 2. The OS 516 can be any software, consisting of programs and data that manages computer hardware resources and provides common services for the execution of various applications 564. The OS 516 can be any operating system and, at least in some embodiments, dedicated to mobile devices, including, but not limited to, Linux,

ANDROID TM, iPhone OS (IOS TM), WINDOWS PHONE 7 TM, etc. The OS 516 is operable to provide functionality to the phone by executing one or more operations, as described herein.

[0121] The applications 564 can be any higher level software that executes particular functionality for the user. Applications 564 can include programs such as email clients, web browsers, texting applications, games, media players, office suites, etc. The applications 564 can be stored in an application store 560, which may represent any memory or data storage, and the management software associated therewith, for storing the applications 564. Once executed, the applications 564 may be run in a different area of memory 508.

[0122] The framework 520 may be any software or data that allows the multiple tasks running on the device to interact. In embodiments, at least portions of the framework 520 and the discrete components described hereinafter may be considered part of the OS 516 or an application 564. However, these portions will be described as part of the framework 520, but those components are not so limited. The framework 520 can include, but is not limited to, a Multi-Display Management (MDM) module 524, a Surface Cache module 528, a Window Management module 532, an Input Management module 536, a Task Management module 540, a Display Controller, one or more frame buffers 548, a task stack 552, one or more window stacks 550 (which is a logical arrangement of windows and/or desktops in a display area), and/or an event buffer 556.

[0123] The MDM module 524 includes one or more modules that are operable to manage the display of applications or other data on the screens of the device. An embodiment of the MDM module 524 is described in conjunction with Fig. 5B. In embodiments, the MDM module 524 receives inputs from the OS 516, the drivers 512 and the applications 564. The inputs assist the MDM module 524 in determining how to configure and allocate the displays according to the application's preferences and requirements, and the user's actions. Once a determination for display configurations is determined, the MDM module 524 can bind the applications 564 to a display configuration. The configuration may then be provided to one or more other components to generate the display.

[0124] The Surface Cache module 528 includes any memory or storage and the software associated therewith to store or cache one or more images from the display screens. Each display screen may have associated with the screen a series of active and non-active windows (or other display objects (such as a desktop display)). The active window (or

other display object) is currently being displayed. The non-active windows (or other display objects) were opened and/or at some time displayed but are now "behind" the active window (or other display object). To enhance the user experience, before being covered by another active window (or other display object), a "screen shot" of a last generated image of the window (or other display object) can be stored. The Surface Cache module 528 may be operable to store the last active image of a window (or other display object) not currently displayed. Thus, the Surface Cache module 528 stores the images of non-active windows (or other display objects) in a data store (not shown).

[0125] In embodiments, the Window Management module 532 is operable to manage the windows (or other display objects) that are active or not active on each of the screens. The Window Management module 532, based on information from the MDM module 524, the OS 516, or other components, determines when a window (or other display object) is active or not active. The Window Management module 532 may then put a non-visible window (or other display object) in a "not active state" and, in conjunction with the Task Management module 540 suspend the application's operation. Further, the Window Management module 532 may assign a screen identifier to the window (or other display object) or manage one or more other items of data associated with the window (or other display object). The Window Management module 532 may also provide the stored information to the application 564, the Task Management module 540, or other components interacting with or associated with the window (or other display object).

[0126] The Input Management module 536 is operable to manage events that occur with the device. An event is any input into the window environment, for example, a user interface interactions with a user. The Input Management module 536 receives the events and logically stores the events in an event buffer 556. Events can include such user interface interactions as a "down event," which occurs when a screen 104, 108 receives a touch signal from a user, a "move event," which occurs when the screen 104, 108 determines that a user's finger is moving across a screen(s), an "up event, which occurs when the screen 104, 108 determines that the user has stopped touching the screen 104, 108, etc. These events are received, stored, and forwarded to other modules by the Input Management module 536.

[0127] A task can be an application component that provides a screen with which a user can interact in order to do something, such as dial the phone, take a photo, send an email, or view a map. Each task may be given a window in which to draw a user interface. The window typically fills the display 110,114, but may be smaller than the display 110,114

and float on top of other windows. An application usually consists of multiple activities that are loosely bound to each other. Typically, one task in an application is specified as the "main" task, which is presented to the user when launching the application for the first time. Each task can then start another task to perform different actions.

[0128] The Task Management module 540 is operable to manage the operation of the one or more applications 564 that may be executed by the device. Thus, the Task Management module 540 can receive signals to execute an application stored in the application store 560. The Task Management module 540 may then instantiate one or more tasks or components of the application 564 to begin operation of the application 564. Further, the Task Management module 540 may suspend the application 564 based on user interface changes. Suspending the application 564 may maintain application data in memory but may limit or stop access to processor cycles for the application 564. Once the application becomes active again, the Task Management module 540 can again provide access to the processor.

[0129] The Display Controller 544 is operable to render and output the display(s) for the multi-screen device. In embodiments, the Display Controller 544 creates and/or manages one or more frame buffers 548. A frame buffer 548 can be a display output that drives a display from a portion of memory containing a complete frame of display data. In embodiments, the Display Controller 544 manages one or more frame buffers. One frame buffer may be a composite frame buffer that can represent the entire display space of both screens. This composite frame buffer can appear as a single frame to the OS 516. The Display Controller 544 can sub-divide this composite frame buffer as required for use by each of the displays 110, 114. Thus, by using the Display Controller 544, the device 100 can have multiple screen displays without changing the underlying software of the OS 516.

[0130] The Application Manager 562 can be a service that provides the presentation layer for the window environment. Thus, the Application Manager 562 provides the graphical model for rendering by the Window Management Module 556. Likewise, the Desktop 566 provides the presentation layer for the Application Store 560. Thus, the desktop provides a graphical model of a surface having selectable application icons for the Applications 564 in the Application Store 560 that can be provided to the Window Management Module 556 for rendering.

[0131] An embodiment of the MDM module 524 is shown in Fig. 5B. The MDM module 524 is operable to determine the state of the environment for the device, including,

but not limited to, the orientation of the device, what applications 564 are executing, how the applications 564 are to be displayed, what actions the user is conducting, the tasks being displayed, etc. To configure the display, the MDM module 524 interprets these environmental factors and determines a display configuration, as described in conjunction with Figs. 6A-6J. Then, the MDM module 524 can bind the applications 564 or other device components to the displays. The configuration may then be sent to the Display Controller 544 and/or the OS 516 to generate the display. The MDM module 524 can include one or more of, but is not limited to, a Display Configuration Module 568, a Preferences Module 572, a Device State Module 574, a Gesture Module 576, a Requirements Module 580, an Event Module 584, and/or a Binding Module 588.

[0132] The Display Configuration Module 568 determines the layout for the display. In embodiments, the Display Configuration Module 568 can determine the environmental factors. The environmental factors may be received from one or more other MDM module 524 modules or from other sources. The Display Configuration Module 568 can then determine from the list of factors the best configuration for the display. Some embodiments of the possible configurations and the factors associated therewith are described in conjunction with Figs. 6A-6F.

[0133] The Preferences Module 572 is operable to determine display preferences for an application 564 or other component. For example, an application can have a preference for Single or Dual displays. The Preferences Module 572 can determine or receive the application preferences and store the preferences. As the configuration of the device changes, the preferences may be reviewed to determine if a better display configuration can be achieved for the application 564.

[0134] The Device State Module 574 is operable to determine or receive the state of the device. The state of the device can be as described in conjunction with Figs. 3A and 3B. The state of the device can be used by the Display Configuration Module 568 to determine the configuration for the display. As such, the Device State Module 574 may receive inputs and interpret the state of the device. The state information is then provided to the Display Configuration Module 568.

[0135] The Gesture Module 576 is operable to determine if the user is conducting any actions on the user interface. Thus, the Gesture Module 576 can receive task information either from the task stack 552 or the Input Management module 536. Gestures may be as defined in accordance with Figs. 4A through 4H. For example, moving a window causes the display to render a series of display frames that illustrate the window moving. The

gesture associated with such user interface interaction can be received and interpreted by the Gesture Module 576. The information about the user gesture is then sent to the Task Management Module 540 to modify the display binding of the task.

[0136] The Requirements Module 580, similar to the Preferences Module 572, is operable to determine display requirements for an application 564 or other component. An application can have a set display requirement that must be observed. Some applications require a particular display orientation. For example, the application "Angry Birds" can only be displayed in landscape orientation. This type of display requirement can be determined or received, by the Requirements Module 580. As the orientation of the device changes, the Requirements Module 580 can reassert the display requirements for the application 564. The Display Configuration Module 568 can generate a display configuration that is in accordance with the application display requirements, as provided by the Requirements Module 580.

[0137] The Event Module 584, similar to the Gesture Module 576, is operable to determine one or more events occurring with an application or other component that can affect the user interface. Thus, the Gesture Module 576 can receive event information either from the event buffer 556 or the Task Management module 540. These events can change how the tasks are bound to the displays. For example, an email application receiving an email can cause the display to render the new message in a secondary screen. The events associated with such application execution can be received and interpreted by the Event Module 584. The information about the events then may be sent to the Display Configuration Module 568 to modify the configuration of the display.

[0138] The Binding Module 588 is operable to bind the applications 564 or the other components to the configuration determined by the Display Configuration Module 568. A binding associates, in memory, the display configuration for each application with the display and mode of the application. Thus, the Binding Module 588 can associate an application with a display configuration for the application (e.g. landscape, portrait, multi-screen, etc.). Then, the Binding Module 588 may assign a display identifier to the display. The display identifier associated the application with a particular screen of the device. This binding is then stored and provided to the Display Controller 544, the OS 516, or other components to properly render the display. The binding is dynamic and can change or be updated based on configuration changes associated with events, gestures, state changes, application preferences or requirements, etc.

[0139] User Interface Configurations:

[0140] With reference now to Figs. 6A-J, various types of output configurations made possible by the device 100 will be described hereinafter.

[0141] Figs. 6A and 6B depict two different output configurations of the device 100 being in a first state. Specifically, Fig. 6A depicts the device 100 being in a closed portrait state 304 where the data is displayed on the primary screen 104. In this example, the device 100 displays data via the touch sensitive display 110 in a first portrait configuration 604. As can be appreciated, the first portrait configuration 604 may only display a desktop or operating system home screen. Alternatively, one or more windows may be presented in a portrait orientation while the device 100 is displaying data in the first portrait configuration 604.

[0142] Fig. 6B depicts the device 100 still being in the closed portrait state 304, but instead data is displayed on the secondary screen 108. In this example, the device 100 displays data via the touch sensitive display 114 in a second portrait configuration 608.

[0143] It may be possible to display similar or different data in either the first or second portrait configuration 604, 608. It may also be possible to transition between the first portrait configuration 604 and second portrait configuration 608 by providing the device 100 with a user gesture (e.g., a double tap), a menu selection, or other means. Other suitable gestures may also be employed to transition between configurations. Furthermore, it may also be possible to transition the device 100 from the first or second portrait configuration 604, 608 to any other configuration described herein depending upon which state the device 100 is moved.

[0144] An alternative output configuration may be accommodated by the device 100 being in a second state. Specifically, Fig. 6C depicts a third portrait configuration where data is displayed simultaneously on both the primary screen 104 and the secondary screen 108. The third portrait configuration may be referred to as a Dual-Portrait (DP) output configuration. In the DP output configuration, the touch sensitive display 110 of the primary screen 104 depicts data in the first portrait configuration 604 while the touch sensitive display 114 of the secondary screen 108 depicts data in the second portrait configuration 608. The simultaneous presentation of the first portrait configuration 604 and the second portrait configuration 608 may occur when the device 100 is in an open portrait state 320. In this configuration, the device 100 may display one application window in one display 110 or 114, two application windows (one in each display 110 and 114), one application window and one desktop, or one desktop. Other configurations may be possible. It should be appreciated that it may also be possible to transition the device

100 from the simultaneous display of configurations 604, 608 to any other configuration described herein depending upon which state the device 100 is moved. Furthermore, while in this state, an application's display preference may place the device into bilateral mode, in which both displays are active to display different windows in the same application. For example, a Camera application may display a viewfinder and controls on one side, while the other side displays a mirrored preview that can be seen by the photo subjects. Games involving simultaneous play by two players may also take advantage of bilateral mode.

[0145] Figs. 6D and 6E depicts two further output configurations of the device 100 being in a third state. Specifically, Fig. 6D depicts the device 100 being in a closed landscape state 340 where the data is displayed on the primary screen 104. In this example, the device 100 displays data via the touch sensitive display 110 in a first landscape configuration 612. Much like the other configurations described herein, the first landscape configuration 612 may display a desktop, a home screen, one or more windows displaying application data, or the like.

[0146] Fig. 6E depicts the device 100 still being in the closed landscape state 340, but instead data is displayed on the secondary screen 108. In this example, the device 100 displays data via the touch sensitive display 114 in a second landscape configuration 616. It may be possible to display similar or different data in either the first or second portrait configuration 612, 616. It may also be possible to transition between the first landscape configuration 612 and second landscape configuration 616 by providing the device 100 with one or both of a twist and tap gesture or a flip and slide gesture. Other suitable gestures may also be employed to transition between configurations. Furthermore, it may also be possible to transition the device 100 from the first or second landscape configuration 612, 616 to any other configuration described herein depending upon which state the device 100 is moved.

[0147] Fig. 6F depicts a third landscape configuration where data is displayed simultaneously on both the primary screen 104 and the secondary screen 108. The third landscape configuration may be referred to as a Dual-Landscape (LD) output configuration. In the LD output configuration, the touch sensitive display 110 of the primary screen 104 depicts data in the first landscape configuration 612 while the touch sensitive display 114 of the secondary screen 108 depicts data in the second landscape configuration 616. The simultaneous presentation of the first landscape configuration 612 and the second landscape configuration 616 may occur when the device 100 is in an open

landscape state 340. It should be appreciated that it may also be possible to transition the device 100 from the simultaneous display of configurations 612, 616 to any other configuration described herein depending upon which state the device 100 is moved.

[0148] Figs. 6G and 6H depict two views of a device 100 being in yet another state. Specifically, the device 100 is depicted as being in an easel state 312. Fig. 6G shows that a first easel output configuration 618 may be displayed on the touch sensitive display 110. Fig. 6H shows that a second easel output configuration 620 may be displayed on the touch sensitive display 114. The device 100 may be configured to depict either the first easel output configuration 618 or the second easel output configuration 620 individually. Alternatively, both the easel output configurations 618, 620 may be presented simultaneously. In some embodiments, the easel output configurations 618, 620 may be similar or identical to the landscape output configurations 612, 616. The device 100 may also be configured to display one or both of the easel output configurations 618, 620 while in a modified easel state 316. It should be appreciated that simultaneous utilization of the easel output configurations 618, 620 may facilitate two-person games (e.g., Battleship®, chess, checkers, etc.), multi-user conferences where two or more users share the same device 100, and other applications. As can be appreciated, it may also be possible to transition the device 100 from the display of one or both configurations 618, 620 to any other configuration described herein depending upon which state the device 100 is moved.

[0149] Fig. 6I depicts yet another output configuration that may be accommodated while the device 100 is in an open portrait state 320. Specifically, the device 100 may be configured to present a single continuous image across both touch sensitive displays 110, 114 in a portrait configuration referred to herein as a Portrait-Max (PMax) configuration 624. In this configuration, data (e.g., a single image, application, window, icon, video, etc.) may be split and displayed partially on one of the touch sensitive displays while the other portion of the data is displayed on the other touch sensitive display. The Pmax configuration 624 may facilitate a larger display and/or better resolution for displaying a particular image on the device 100. Similar to other output configurations, it may be possible to transition the device 100 from the Pmax configuration 624 to any other output configuration described herein depending upon which state the device 100 is moved.

[0150] Fig. 6J depicts still another output configuration that may be accommodated while the device 100 is in an open landscape state 348. Specifically, the device 100 may be configured to present a single continuous image across both touch sensitive displays 110, 114 in a landscape configuration referred to herein as a Landscape-Max (LMax)

configuration 628. In this configuration, data (e.g., a single image, application, window, icon, video, etc.) may be split and displayed partially on one of the touch sensitive displays while the other portion of the data is displayed on the other touch sensitive display. The Lmax configuration 628 may facilitate a larger display and/or better resolution for displaying a particular image on the device 100. Similar to other output configurations, it may be possible to transition the device 100 from the Lmax configuration 628 to any other output configuration described herein depending upon which state the device 100 is moved.

[00106] Display Controls.

[00107] Figs. 7A-C depict three examples of gesture sequences that can cause the device 100 to alter the display of data thereon. Specifically, Fig. 7A depicts a first gesture sequence 700 which results in a first display action. Although the first display action is depicted as being performed on the touch sensitive displays 110, 114, it should be appreciated that the first display action can alternatively, or additionally, be performed on other parts of the primary screen 104 and/or secondary screen 108. The first gesture sequence 700 begins when the device 100 is in a closed landscape state 340. While in this state, the device 100 is displaying data in a first landscape configuration 612. The user of the device 100 then provides a first user input 704 (of the first gesture sequence 700) causing the device 100 to change from the closed landscape state 340 to an open landscape state 348. This first user input 704 may be detected by one or more of the hardware components of the device 100 as discussed herein.

[00108] In the example of Fig. 7A, the data displayed in the first landscape configuration 612 may be derived from a single-screen application, A1, which means that the application data currently being displayed on the touch sensitive display 110 is originating from the application A1 which is configured to only display data on a single screen 104 or 108. Accordingly, either before or after the MDM module 524 registers the first user input 704, the MDM module 524 determines whether the application A1 being displayed in the first landscape configuration 612 corresponds to a single-screen application. Assuming that the application A1 being displayed on the touch sensitive display 110 corresponds to a single-screen application, the MDM module 524 may be configured to select a second application or desktop D2, and cause data therefrom to be displayed in a second landscape configuration 616 of the touch sensitive display 114. Thus, in response to the first user input 704, the MDM module 524 instructs the window management module 532 to display

data for the second application or desktop (D2), different from the first application (A1) being displayed on the touch sensitive display 110, on the touch sensitive display 114.

[00109] In some embodiments, the second application or desktop (D2) is selected by the window management module 532 and may correspond to a next application or desktop behind the first application in the window stack 550. More specifically, as part of selecting the second application or desktop (D2), the MDM module 524 and/or window management module 532 may reference the window stack 550 that identifies active and non-active applications or desktops, as well as display priorities for such applications or desktops, and then select the second application or desktop (D2) as the next application or desktop in the window stack 550. If no application (as opposed to desktop) is "next" behind the first application (A1), then the window management module 532 may cause either a desktop or some other default display element to be displayed on the touch sensitive display 114 as D2.

[00110] Fig. 7B depicts a second gesture sequence 708, which results in a second display action. Similar to the first display action, the second display action can be performed on any visualization or output component of the device 100. The second gesture sequence 708 begins similarly to the first gesture sequence 700 with the device 100 being in a closed landscape state 340. The difference between the two sequences, however, is that the application (A1.1) being displayed on the touch sensitive display 110 is a multi-screen application. While the device 100 is in the closed landscape state 340, first data from the application A1.1 is displayed via the touch sensitive display 110. As indicated by the dotted lines under touch sensitive display 110 and labeling, the other touch sensitive display 114 is not actively displaying any data.

[00111] The second gesture sequence 708 continues when a first user input 712 causing the device 100 to change from the closed landscape state 340 to an open landscape state 348. This first user input 712 may be similar or identical to the first user input 704.

[00112] Still referring to Fig. 7B, before or after the MDM module 524 registers the first user input 712, the MDM module 524 determines that the application being displayed in the first landscape configuration 612 corresponds to a multi-screen application. Thus, in response to the first user input 712, the MDM module 524 instructs the window management module 532 to begin dropping display data from the first application A1.1 across the touch sensitive display 114 in a transition area 716. In some embodiments, the transition area 716 moves across the touch sensitive display 114 (e.g., in a downward motion that progressively fills more and more of the touch sensitive display 114 with data

from the first application A1.1). The motion of the transition area 716 may be configured to emulate a dropping of the first landscape configuration 612 across the touch sensitive display 114 under the force of gravity.

[00113] After the transition area 716 has completely moved across the touch sensitive display 114, the MDM module 524 may register a second event 720 that signifies completion of the gravity-based drop of the first application A1.1 from the touch sensitive display 110. At this point, data from the first application A1.1 may be displayed by both touch sensitive displays 110, 114 in any number of display configurations. In some embodiments, the application data from the first application A1.1 is automatically maximized. This may cause the first application A1.1 to either be simultaneously displayed on the touch sensitive screens 110, 114 in separate landscape configurations 612, 616 (e.g., an LD output configuration) or in the Lmax configuration 628. The application itself of the MDM module 524 may control the manner in which the first application A1.1 is displayed and whether the application data is displayed in an LD output configuration or an Lmax configuration 628.

[00114] In one embodiment, the type of data displayed from the first application A1.1 on the touch sensitive displays 110, 114 may vary depending upon the nature of the first application. As a non-limiting example, the type of user input available for interfacing with the first application A1.1 may change from a first type of user input (e.g., a writing-capture area, a half QWERTY keyboard) to a second type of user input (e.g., a full QWERTY keyboard or combination writing-capture area and half QWERTY keyboard) when the first application A1.1 is automatically maximized across the touch sensitive displays 110, 114 during the gravity drop. Likewise, the type of user output may vary from a first type of user output to a second type of user output when the first application A1.1 is automatically maximized across the touch sensitive displays 110, 114 during the gravity drop.

[00115] Fig. 7C depicts a third gesture sequence 724 for obtaining a resulting third display action, wherein the device 100 is in a "reverse landscape" state 340a where the configurable area 112 is on the opposite side (i.e., right side) of the device when the display 110 faces the user. Similar to the first and second display actions, the third display action can be performed on any visualization or output component of the device 100. The third gesture sequence 724 begins similarly to the other gesture sequences 700, 708 with the device 100 being in a closed landscape state; i.e., the reverse landscape state 340a. While the device 100 is in the closed reverse landscape state 340a, a first set of data from

the first application A1.1 is displayed via the touch sensitive display 110. As indicated by the dotted lines above the touch sensitive display 110 and labeling, the other touch sensitive display 114 is not actively displaying any data.

[00116] The third gesture sequence 724 has a first user input 728 causing the device 100 to change from the closed reverse landscape state 340a to an open reverse landscape state 348a. This first user input 728 may be similar or identical to the other user inputs 704, 712, except that the secondary screen 108 is opened above the primary screen 104. Also, after the first user input 728 is received, the data from the first application A1.1 is already being displayed on the bottom touch sensitive display 110 (e.g., the display 110 which is positioned below the other touch sensitive display 114). The relative positions of the displays 110, 114 (or more specifically the screens 104, 108) may be determined from data provided by the accelerometer 176 or some other appropriate hardware component of the device 100.

[00117] In some embodiments, when the touch sensitive display 114 is opened above the active touch sensitive display 110 as in Fig. 7C, the application (A1.1) in view on the touch sensitive display 110 maintains its original display configuration. Specifically, the first application A1.1 being displayed on the touch sensitive display 110 may continue to be displayed in a first landscape configuration 612 while data from a second application A2 may be displayed in a second landscape configuration 616 via the other touch sensitive display 114 since no gravity drops occurs to pull the display of the first application A1.1 onto screen 114 which is thereabove.

[00118] The display actions performed on the touch sensitive displays 110, 114 may be controlled by the collective actions of the MDM module 524 and window management module 532 based on one or more event interrupts received from various hardware devices. Such interrupts may be registered and interpreted by the task management module 540. In selecting the data that is to be displayed via the touch sensitive display 114, the MDM module 524 and/or window management module 532 may identify the next application in a display stack as discussed above. If no application is "next" behind the first application A1.1, then the MDM module 524 and/or window management module 532 may cause either the desktop (e.g., a display rendered for the OS) or some other default display element to be displayed on the touch sensitive display 114.

[00119] Although the three examples of display actions were given in instances where an application was initially displayed on touch sensitive display 110, it should be appreciated that if the touch sensitive display 114 is initially displaying application data then the

subsequent processing steps and display actions may be reversed. Specifically, if data from, e.g., the application (A1 or A1.1) is initially displayed via touch sensitive display 114 when device 100 is in a closed landscape state 340, then after the first user input 704, 712, 728 is received, the window management module 532 may manipulate the subsequent display of data on the touch sensitive display 110 depending upon the position of the touch sensitive display 110 relative to the touch sensitive display 114 and/or whether the application having data displayed is a single-screen application or a multi-screen application.

[00120] Referring now to Fig. 8, this figure presents a high level flowchart of the steps performed by the device 100 in determining whether a gravity drop is to be performed as described hereinabove. In particular, the steps of Fig. 8 are, in one embodiment, performed by the MDM module 524. Accordingly, in step 804, a determination is made as to whether the device 100 is oriented in (a) the open landscape state 348, or (b) the open reverse landscape state 348a, or (c) another orientation. If it is determined that the device 100 is oriented in neither the open landscape state 348 nor the open reverse landscape state 348a, then any further gravity drop processing is terminated (e.g., at least until the device 100 is reoriented, or another application is considered for gravity drop). Thus, the flowchart terminates at terminator 808 wherein the device 100 (more particularly, the MDM module 524) ceases the current gravity drop processing. If, however, it is determined in step 804 that the device 100 is in the open landscape state 348 or the open reverse landscape state 348a, then step 812 is performed, wherein further determinations are made to assure that the device 100 is properly configured for performing a gravity drop (e.g., from display 110 to display 114 as shown in Fig. 7B). In particular, step 812 determines whether the following additional three conditions are satisfied:

(a) In the current device orientation, is the display 110 or 114 that is physically uppermost (e.g., physically higher) displaying an application in a single screen mode (i.e., displaying on only one of the displays 110 or 114)?

(b) Can this application be displayed (i.e., does it support being displayed) on more than one display (e.g., both displays 110 and 114)?

(c) Has gravity drop for this application not been entirely disabled? Note that for certain applications, gravity drop should never occur. For example, in a camera or video application where the application is only operable for taking photos or videos when the device 100 is in a folded configuration, or, a game application where the game is played by two players, each

viewing only one of the displays 110 or 114, and wherein the device is in the orientation as shown in, e.g., Fig. 1I.

[00121] If one or more of the conditions (a) through (c) immediately above are not satisfied, then again any further gravity drop processing is terminated (at least until the device 100 is reoriented, or another application is considered for gravity drop). Thus, the flowchart terminates at terminator 808 wherein the device 100 (more particularly, the MDM module 524) ceases the current gravity drop processing.

[00122] However, if all of the conditions (a) through (c) immediately above are satisfied, then step 816 is performed where further conditions are evaluated for determining whether gravity drop should occur. More specifically, the present step determines whether the current settings for the application would prevent a gravity drop from occurring (e.g., since such a gravity drop would not make sense to the user, or would decrease a user's experience with the device 100). For example, if the user has input a request that another application, on the lowermost one of the displays 110 or 114, remain visible on this lowermost display, then the determination in step 816 would be positive. As a further example, if at least some applications may only have gravity drop performed thereon when the lowermost display is not actively outputting new information to the user such as if a user is watching a movie or video. Accordingly, if the determination in step is positive, then in step 820, one or more gravity drop parameters may be set to indicate that no gravity drop is to be performed on the application's display as currently configured. Alternatively, if the determination in step 816 is negative, then in step 824, gravity drop is performed on the application.

[00123] Note that machine instructions corresponding to the flowchart of Fig. 8 may be performed by the device 100 when: (a) the device enters one of the open landscape configurations 348 or 348a (e.g., by the user unfolding the device, and/or rotating the device into a landscape state), or (b) a user explicitly requests the device to perform a gravity drop on a displayed application.

[00124] For an application on which a gravity drop is performed, there are of course conditions when the application's display should preferably revert back to a single screen display. In particular, such a reversion may configure the application's display to be on the same one of the displays 110 or 114 from which gravity drop occurred. The activation of a procedure to perform such a reversion is referred to herein as "reverse gravity drop". A reverse gravity drop may be performed: (a) substantially automatically, e.g., when the MDM module 524 receives appropriate input for directing the reverse gravity drop to

occur, or (b) the user may explicitly request a reverse gravity drop on a displayed application upon which a gravity drop was performed.

[00125] In Fig. 9 a high level flowchart is shown providing the steps performed, e.g., by the MDM module 524 for performing a reverse gravity drop. In step 904, a determination is made as to whether the device 100 is being oriented from one of the landscape states 348 or 348a to the dual-portrait orientation. If the result of decision step 904 is negative, then any further current processing regarding performing a reverse gravity drop is terminated (e.g., at least until the device 100 is reoriented, or another application is considered for gravity drop). Thus, the flowchart terminates at terminator 908 wherein the device 100 (more particularly, the MDM module 524) ceases the current reverse gravity drop processing. If, however, there result of step 904 is positive, then step 912 is performed, wherein further determinations are made to assure that the device 100 is properly configured for performing a reverse gravity drop. In particular, step 912 determines whether: (a) the target application (for a reverse gravity drop) is indeed displayed on both displays 110 and 114, and (b) there is configuration data identifying that a reverse gravity drop is pending for being performed on the target application when specific conditions are satisfied. Note that such "reverse gravity drop pending" configuration data is created for a target application only whenever a gravity drop has previously performed on the target application, and deleted whenever a reverse gravity drop is performed on the target application. Thus, if there is "reverse gravity drop pending" configuration data for a target application, this is intended to mean that a previous gravity drop for the target application occurred, and the target application is currently displayed according to this gravity drop.

[00126] If the result to the decision step 912 is negative, then terminator 908 is encountered and processing for a reverse gravity drop ceases. However, if the result to the decision step 912 is positive, then an additional set of conditions is checked for determining if a reverse gravity drop can be performed on the display of the target application. In particular, in step 916, the following conditions (a) and (b) are evaluated by the MDM module 524:

(a) Is the device 100 being folded?

(b) Is the device 100 being docked or undocked?

That is, if the MDM module 524 receives input indicating that either of these conditions is satisfied, then in step 920, the reverse gravity pending configuration data for the target application is at least confirmed to be deleted (or at least rendered invalid). In particular,

if the device 100 is being folded, then in one embodiment, any reverse gravity drop pending configuration data is automatically deleted since for various applications, a folding of the device 100 is permissible (and desirable) when the application is displayed on both the displays 110 and 114 (e.g., certain game applications). Accordingly, whether a dual screen display of an application (e.g., due to a previous gravity drop operation) should revert back to being displayed on only one of the displays 110 or 114 may be dependent on the particular application requesting or not requesting a reverse gravity drop.

[00127] Alternatively, if it is determined in step 916 that device 100 is not being folded, and not being docked, and not being undocked, then the target application remains eligible for a reverse gravity drop to be performed thereon. Accordingly, regardless of the outcome of step 916, decision step 924 is performed to evaluate whether a reverse gravity drop is actually to be performed on the display of the target application. In particular, when step 924 determines that when one or more of the following conditions (a) through (c) are satisfied, a reverse gravity drop is to be performed in step 928: (a) data for a reverse gravity drop pending is still valid, or (b) the user provides an input to explicitly request the target application to be displayed on only a single one of the displays 110 or 114, or (c) the target application requests a reverse gravity drop. Accordingly, depending on the outcome from decision step 924, reverse gravity drop is performed (in step 928), or processing for such a reverse gravity drop terminates without a reverse gravity drop being performed.

[0151] The exemplary systems and methods of this disclosure have been described in relation to processing performed for the gravity drop and reverse gravity drop. However, to avoid unnecessarily obscuring the present disclosure, the preceding description omits a number of known structures and devices. This omission is not to be construed as a limitation of the scopes of the claims. Specific details are set forth to provide an understanding of the present disclosure. It should however be appreciated that the present disclosure may be practiced in a variety of ways beyond the specific detail set forth herein.

[0152] Furthermore, while the exemplary aspects, embodiments, and/or configurations illustrated herein show the various components of the system collocated, certain components of the system can be located remotely, at distant portions of a distributed network, such as a LAN and/or the Internet, or within a dedicated system. Thus, it should be appreciated, that the components of the system can be combined in to one or more devices, or collocated on a particular node of a distributed network, such as an analog and/or digital telecommunications network, a packet-switch network, or a circuit-switched network. It will be appreciated from the preceding description, and for reasons of

computational efficiency, that the components of the system can be arranged at any location within a distributed network of components without affecting the operation of the system. For example, the various components can be located in a switch such as a PBX and media server, gateway, in one or more communications devices, at one or more users' premises, or some combination thereof. Similarly, one or more functional portions of the system could be distributed between a telecommunications device(s) and an associated computing device.

[0153] Furthermore, it should be appreciated that the various links connecting the elements can be wired or wireless links, or any combination thereof, or any other known or later developed element(s) that is capable of supplying and/or communicating data to and from the connected elements. These wired or wireless links can also be secure links and may be capable of communicating encrypted information. Transmission media used as links, for example, can be any suitable carrier for electrical signals, including coaxial cables, copper wire and fiber optics, and may take the form of acoustic or light waves, such as those generated during radio-wave and infra-red data communications.

[0154] Also, while the flowcharts have been discussed and illustrated in relation to a particular sequence of events, it should be appreciated that changes, additions, and omissions to this sequence can occur without materially affecting the operation of the disclosed embodiments, configuration, and aspects.

[0155] A number of variations and modifications of the disclosure can be used. It would be possible to provide for some features of the disclosure without providing others.

[0156] In yet another embodiment, the systems and methods of this disclosure can be implemented in conjunction with a special purpose computer, a programmed microprocessor or microcontroller and peripheral integrated circuit element(s), an ASIC or other integrated circuit, a digital signal processor, a hard-wired electronic or logic circuit such as discrete element circuit, a programmable logic device or gate array such as PLD, PLA, FPGA, PAL, special purpose computer, any comparable means, or the like. In general, any device(s) or means capable of implementing the methodology illustrated herein can be used to implement the various aspects of this disclosure. Exemplary hardware that can be used for the disclosed embodiments, configurations and aspects includes computers, handheld devices, telephones (e.g., cellular, Internet enabled, digital, analog, hybrids, and others), and other hardware known in the art. Some of these devices include processors (e.g., a single or multiple microprocessors), memory, nonvolatile storage, input devices, and output devices. Furthermore, alternative software

implementations including, but not limited to, distributed processing or component/object distributed processing, parallel processing, or virtual machine processing can also be constructed to implement the methods described herein.

[0157] In yet another embodiment, the disclosed methods may be readily implemented in conjunction with software using object or object-oriented software development environments that provide portable source code that can be used on a variety of computer or workstation platforms. Alternatively, the disclosed system may be implemented partially or fully in hardware using standard logic circuits or VLSI design. Whether software or hardware is used to implement the systems in accordance with this disclosure is dependent on the speed and/or efficiency requirements of the system, the particular function, and the particular software or hardware systems or microprocessor or microcomputer systems being utilized.

[0158] In yet another embodiment, the disclosed methods may be partially implemented in software that can be stored on a storage medium, executed on programmed general-purpose computer with the cooperation of a controller and memory, a special purpose computer, a microprocessor, or the like. In these instances, the systems and methods of this disclosure can be implemented as program embedded on personal computer such as an applet, JAVA® or CGI script, as a resource residing on a server or computer workstation, as a routine embedded in a dedicated measurement system, system component, or the like. The system can also be implemented by physically incorporating the system and/or method into a software and/or hardware system.

[0159] Although the present disclosure describes components and functions implemented in the aspects, embodiments, and/or configurations with reference to particular standards and protocols, the aspects, embodiments, and/or configurations are not limited to such standards and protocols. Other similar standards and protocols not mentioned herein are in existence and are considered to be included in the present disclosure. Moreover, the standards and protocols mentioned herein and other similar standards and protocols not mentioned herein are periodically superseded by faster or more effective equivalents having essentially the same functions. Such replacement standards and protocols having the same functions are considered equivalents included in the present disclosure.

[0160] The present disclosure, in various aspects, embodiments, and/or configurations, includes components, methods, processes, systems and/or apparatus substantially as depicted and described herein, including various aspects, embodiments, configurations

embodiments, subcombinations, and/or subsets thereof. Those of skill in the art will understand how to make and use the disclosed aspects, embodiments, and/or configurations after understanding the present disclosure. The present disclosure, in various aspects, embodiments, and/or configurations, includes providing devices and processes in the absence of items not depicted and/or described herein or in various aspects, embodiments, and/or configurations hereof, including in the absence of such items as may have been used in previous devices or processes, e.g., for improving performance, achieving ease and\or reducing cost of implementation.

[0161] The foregoing discussion has been presented for purposes of illustration and description. The foregoing is not intended to limit the disclosure to the form or forms disclosed herein. In the foregoing Detailed Description for example, various features of the disclosure are grouped together in one or more aspects, embodiments, and/or configurations for the purpose of streamlining the disclosure. The features of the aspects, embodiments, and/or configurations of the disclosure may be combined in alternate aspects, embodiments, and/or configurations other than those discussed above. This method of disclosure is not to be interpreted as reflecting an intention that the claims require more features than are expressly recited in each claim. Rather, as the following claims reflect, inventive aspects lie in less than all features of a single foregoing disclosed aspect, embodiment, and/or configuration. Thus, the following claims are hereby incorporated into this Detailed Description, with each claim standing on its own as a separate preferred embodiment of the disclosure.

[0162] Moreover, though the description has included description of one or more aspects, embodiments, and/or configurations and certain variations and modifications, other variations, combinations, and modifications are within the scope of the disclosure, e.g., as may be within the skill and knowledge of those in the art, after understanding the present disclosure. It is intended to obtain rights which include alternative aspects, embodiments, and/or configurations to the extent permitted, including alternate, interchangeable and/or equivalent structures, functions, ranges or steps to those claimed, whether or not such alternate, interchangeable and/or equivalent structures, functions, ranges or steps are disclosed herein, and without intending to publicly dedicate any patentable subject matter.

What is claimed is:

1. A method of controlling data displayed by a multi-screen device, comprising:

determining that the multi-screen device has moved from a first physical orientation to a different second physical orientation, wherein the first and second physical orientations differ by the first physical orientation being one of: folded or in a landscape orientation;

determining whether a first screen and a second screen of the multi-screen device are each displaying content for a same application;

changing a display of the application to conform to a predetermined display configuration of the of the application on at least one of the first and second screens, wherein the display configuration is dependent upon the second physical orientation and a result of the step of determining;

wherein the step of changing includes a step of modifying a display of the application: (a) from being displayed on only the first screen to being displayed on both the first and second screens at a same time, or (b) from being displayed on both the first and second screens at a same time to being displayed on only the first screen.

2. The method of claim 1, wherein the first screen is determined to be above the second screen.

3. The method of claim 2, wherein a relative position of the first to the second screen is determined, at least in part, based on data received from an accelerometer.

4. The method of claim 2, further comprising:

determining whether the application is a single-screen application or a multi-screen application; and

wherein controlling data displayed on the second screen in an open landscape state is also based on whether the application is a single-screen application or a multi-screen application.

5. The method of claim 4, wherein the application is a multi-screen application, the method further comprising:

automatically causing data from the application to be displayed on the second screen in a landscape state such that the device is not in a folded closed configuration.

6. The method of claim 4, wherein the application is a single-screen application and wherein data from a different second application is concurrently displayed on the second screen.

7. The method of claim 1, wherein: (a) the second physical orientation is a portrait orientation, (b) the first physical orientation is a landscape orientation, (c) prior to the step of changing, the first and second screens each display content for the application, and the step of modifying includes displaying the application on only the first screen.

8. The method of claim 7, wherein data from a second application is displayed on the second screen simultaneous with data from the application being displayed on the first screen.

9. The method of claim 1, wherein: (a) the second physical orientation is an unfolded orientation of the device, (b) the first physical orientation is a folded orientation, (c) prior to the step of changing, the only first screen displays the content of the application, and the step of modifying includes displaying concurrently at least a portion of the content on each the first and second screens.

10. A non-transitory computer-readable medium having machine instructions stored thereon, the instructions comprising:

a first set of the instructions configured to determine that a multi-screen device has moved from a first physical orientation to a different second physical orientation, wherein the first and second physical orientations differ by the first physical orientation being one of: folded or in a landscape orientation;

a second set of the instructions configured to determine whether a first screen and a second screen of the multi-screen device are each displaying content for a same application; and

a third set of the instructions configured to change a display of the application to conform to a predetermined display configuration of the of the application on at least one of the first and second screens, wherein the display configuration is dependent upon the second physical orientation and a result of the step of determining;

wherein the third set of the instructions are configured to modify a display of the application: (a) from being displayed on only the first screen to being displayed on both the first and second screens at a same time, or (b) from being displayed on both the first and second screens at a same time to being displayed on only the first screen.

11. The computer-readable medium of claim 10, wherein the first screen corresponds to a primary screen and wherein the second screen corresponds to a secondary screen.

12. The method of claim 10, wherein the first screen is determined to be above the second screen, and wherein data displayed on the second display in an open landscape

state is also based on whether the application is a single-screen application or a multi-screen application.

13. The computer-readable medium of claim 12, wherein the application is a multi-screen application and wherein the instructions configured to control data displayed on the first and second displays also generates a transition area on the second display that moves across and progressively fills the second display with data from the first application.

14. The computer-readable medium of claim 13, wherein the data from the application is automatically displayed on both the first and second displays when: (a) the second physical orientation is an unfolded orientation of the device, (b) the first physical orientation is a folded orientation, (c) prior to a corresponding execution of the instructions for modifying the display of the application, the only first screen displays the content of the application, and after the execution of the instruction for modifying, concurrently displaying at least a portion of the content on each the first and second screens. .

15. The computer-readable medium of claim 12, wherein the application is a single-screen application and wherein data from a second application is automatically displayed on the second screen immediately after the device transitions to the open landscape state.

16. A multi-screen user device, comprising:

a first screen including a first display area;

a second screen including a second display area;

an attachment configured to foldably connect the first screen with the second screen;

a first sensor configured to produce a first signal indicative of a position of the hinge;

a second sensor configured to produce a second signal indicative of relative positions of the first screen to the second screen; and

a computer-readable medium having instructions stored thereon that include:

a first set of the instructions configured to determine that the multi-screen device has moved from a first physical orientation to a different second physical orientation, wherein the first and second physical orientations differ by the first physical orientation being one of: folded or in a landscape orientation;

a second set of the instructions configured to determine, whether a first screen and a second screen of the multi-screen device are each displaying content for a same application; and

a third set of the instructions configured to change a display of the application to conform to a predetermined display configuration of the of the application on at least one of the first and second screens, wherein the display configuration is dependent upon the second physical orientation and a result of the step of determining; and

wherein the third set of the instructions are configured to modify a display of the application: (a) from being displayed on only the first screen to being displayed on both the first and second screens at a same time, or (b) from being displayed on both the first and second screens at a same time to being displayed on only the first screen.

17. The device of claim 16, wherein the application is a multi-screen application and wherein the third set of instructions is further configured to generate a transition area on the second display that moves across and progressively fills the second display with data from the application.

18. The device of claim 17, wherein the data from the application is automatically displayed on both the first and second displays when: (a) the second physical orientation is an unfolded orientation of the device, (b) the first physical orientation is a folded orientation, (c) prior to a corresponding execution of the instructions for modifying the display of the application, the only first screen displays the content of the application, and after the execution of the instruction for modifying, concurrently displaying at least a portion of the content on each the first and second screens..

19. The device of claim 17, wherein the data from the application is automatically displayed on only the first screen when (a) the second physical orientation is a portrait orientation, (b) the first physical orientation is a landscape orientation, (c) prior to a corresponding execution of the third set of instructions, the first and second screens each display content for the application, and after corresponding execution of the third set of instructions, displaying the application on only the first screen.

20. The device of claim 17, wherein the first screen is determined to be above the second screen, based at least partially on the second signal.

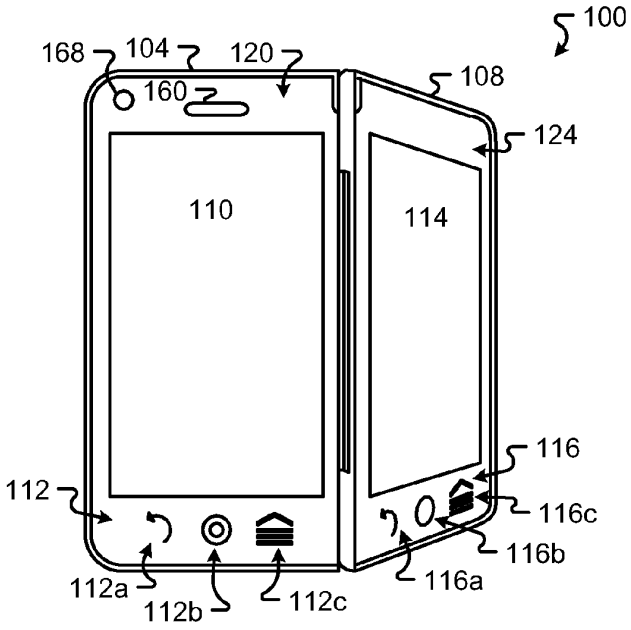

100
168
104
120
160
108
124
110
114
116
112
116c
116b
112a
112b
112c
116a

FIG. 1A

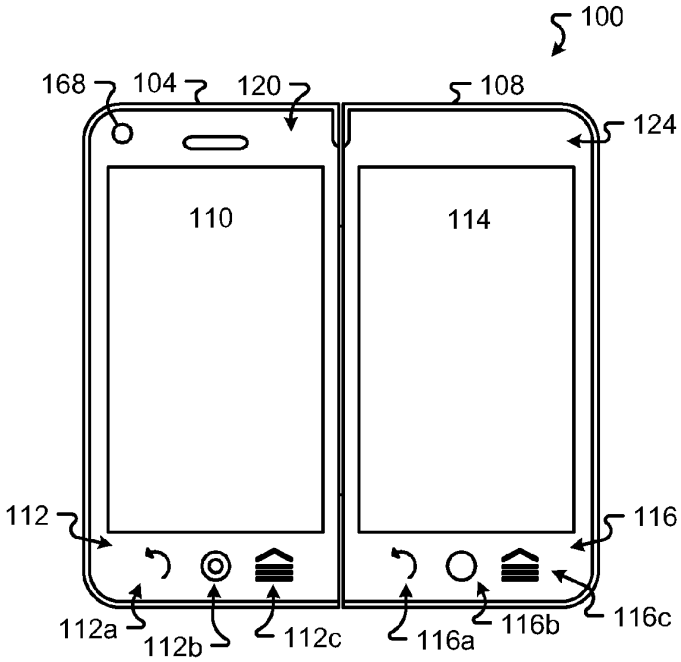

100
168
104
120
108
124
110
114
112
116
112a
112b
112c
116a
116b
116c

FIG. 1B

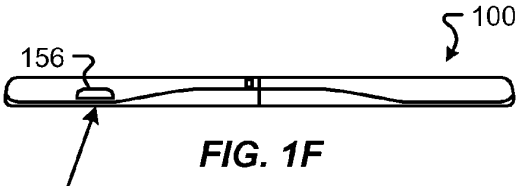


FIG. 1F

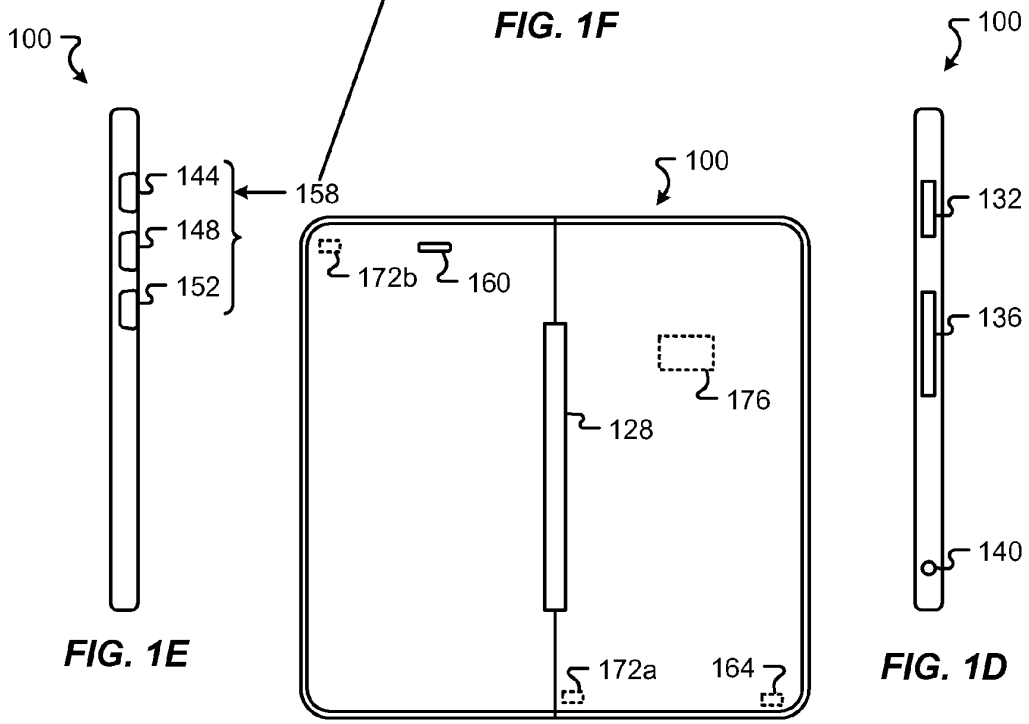


FIG. 1E

FIG. 1C

FIG. 1D



FIG. 1G

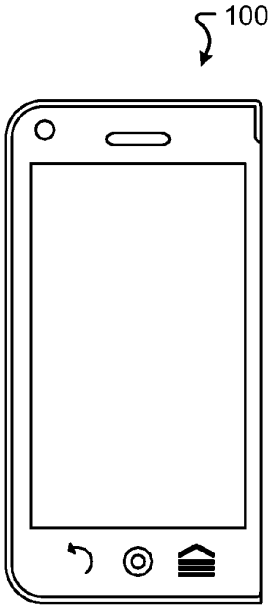


FIG. 1H

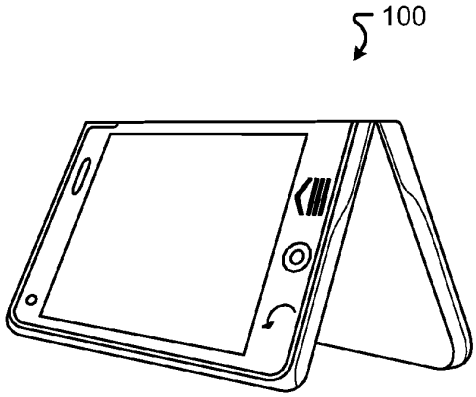


FIG. 1I

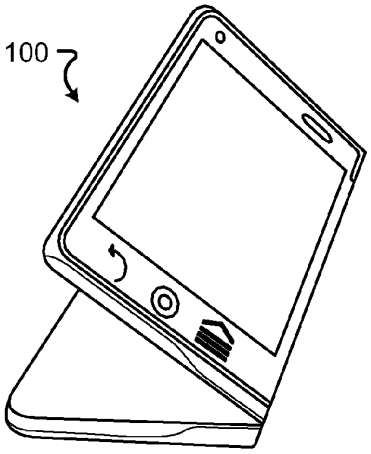


FIG. 1J

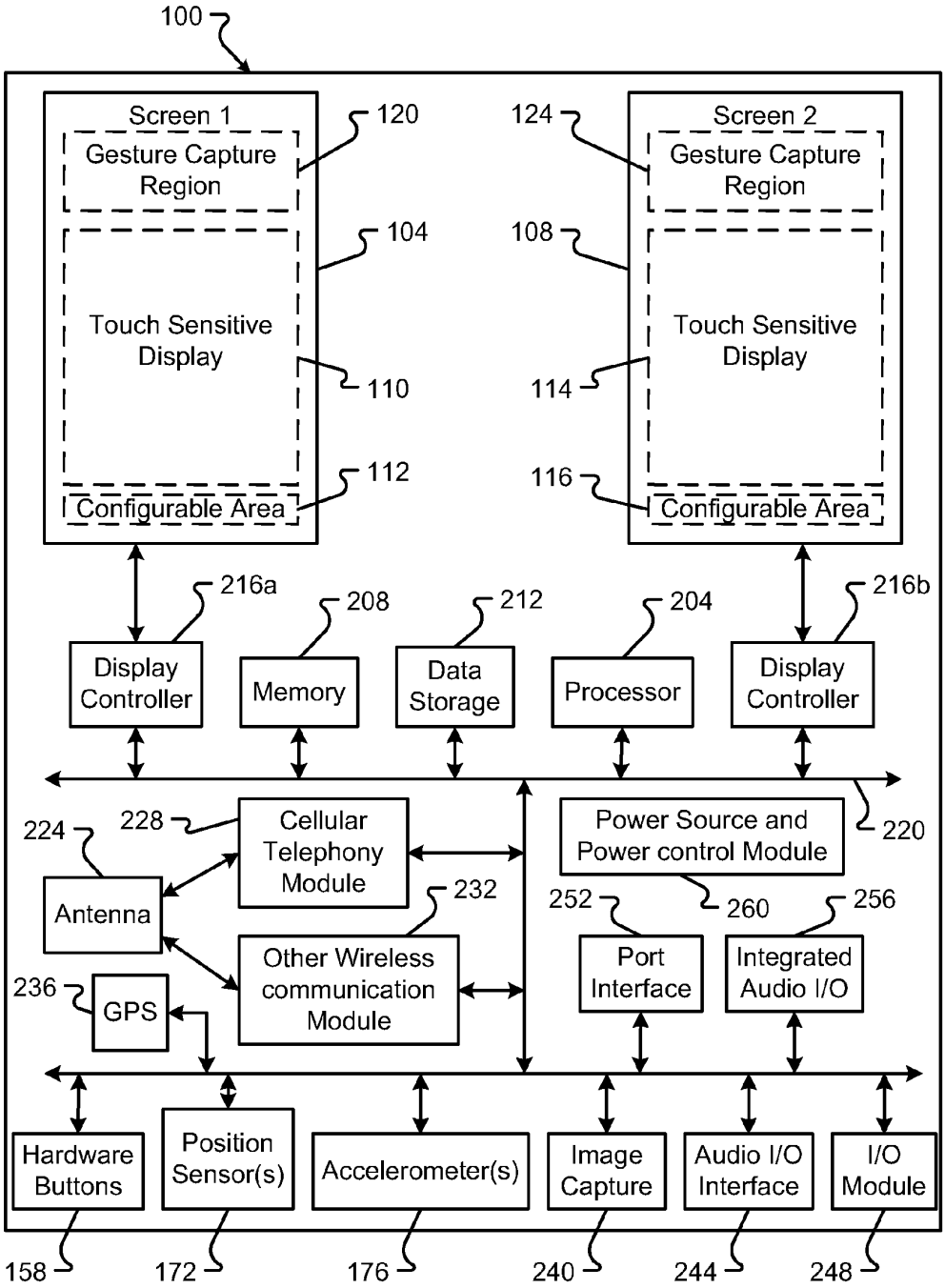

100
Screen 1
Gesture Capture Region
120
104
Touch Sensitive Display
110
112
Configurable Area
124
Screen 2
Gesture Capture Region
108
Touch Sensitive Display
114
116
Configurable Area
216a
208
212
204
216b
Display Controller
Memory
Data Storage
Processor
Display Controller
220
224
228
Cellular Telephony Module
Power Source and Power control Module
Antenna
232
252
260
256
Other Wireless communication Module
Port Interface
Integrated Audio I/O
236
GPS
Hardware Buttons
Position Sensor(s)
Accelerometer(s)
Image Capture
Audio I/O Interface
I/O Module
158
172
176
240
244
248

FIG. 2

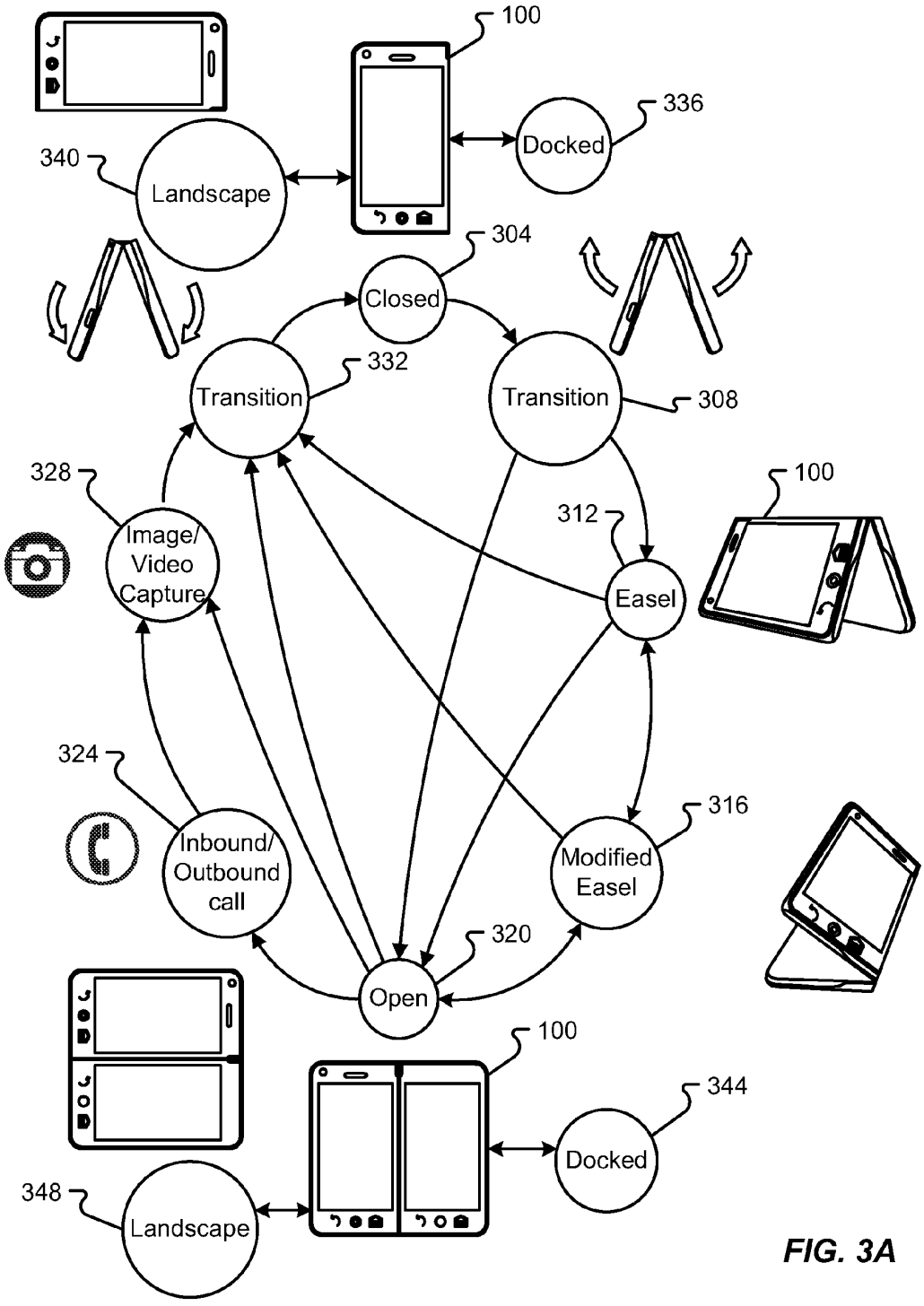
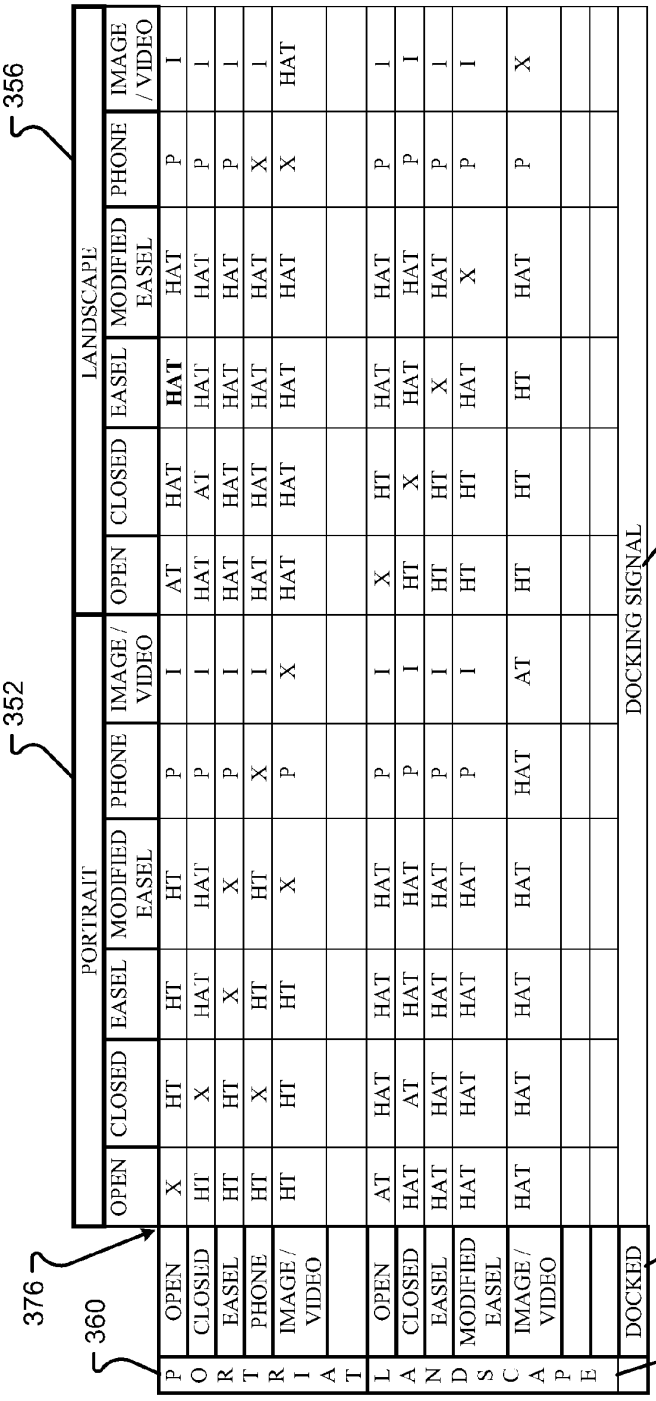

100
336
Docked
340
Landscape
304
Closed
332
Transition
Transition
308
328
Image/
Video
Capture
312
100
Easel
324
Inbound/
Outbound
call
316
Modified
Easel
320
Open
100
344
Docked
348
Landscape

FIG. 3A



Key:
H - Hall Effect Sensor(s)
a - accelerometer(s)
T- Timer
P – communications Trigger
I – Image / Video capture Request

FIG. 3B

Tap

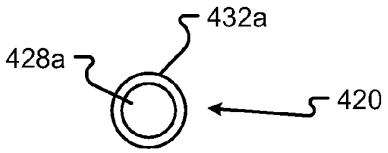


FIG. 4A

Long Press

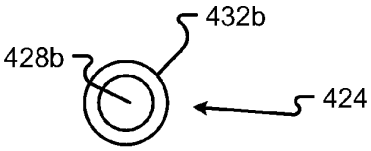


FIG. 4B

Drag

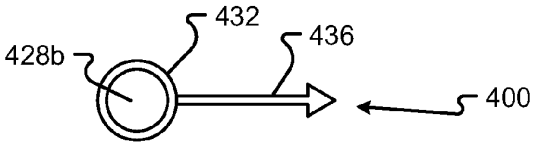


FIG. 4C

Flick

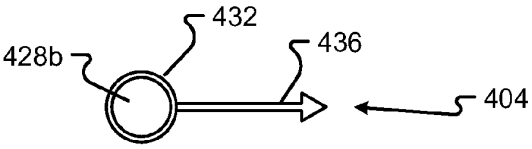


FIG. 4D

Pinch

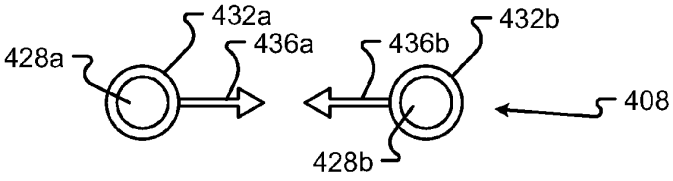


FIG. 4E

Spread

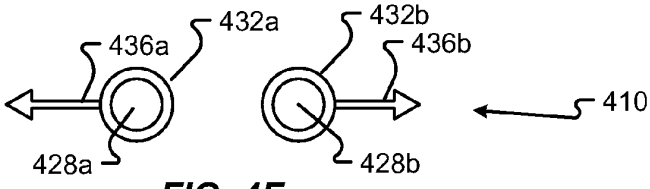


FIG. 4F

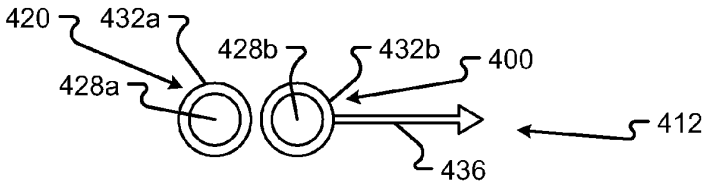

420
432a
428b
432b
400
428a
412
436

FIG. 4G

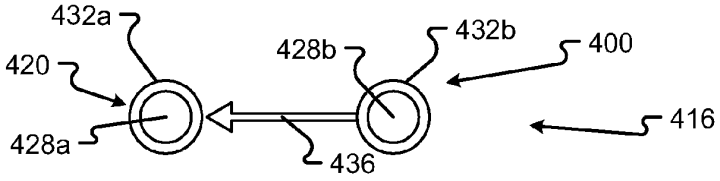

432a
420
428b
432b
400
428a
416
436

FIG. 4H

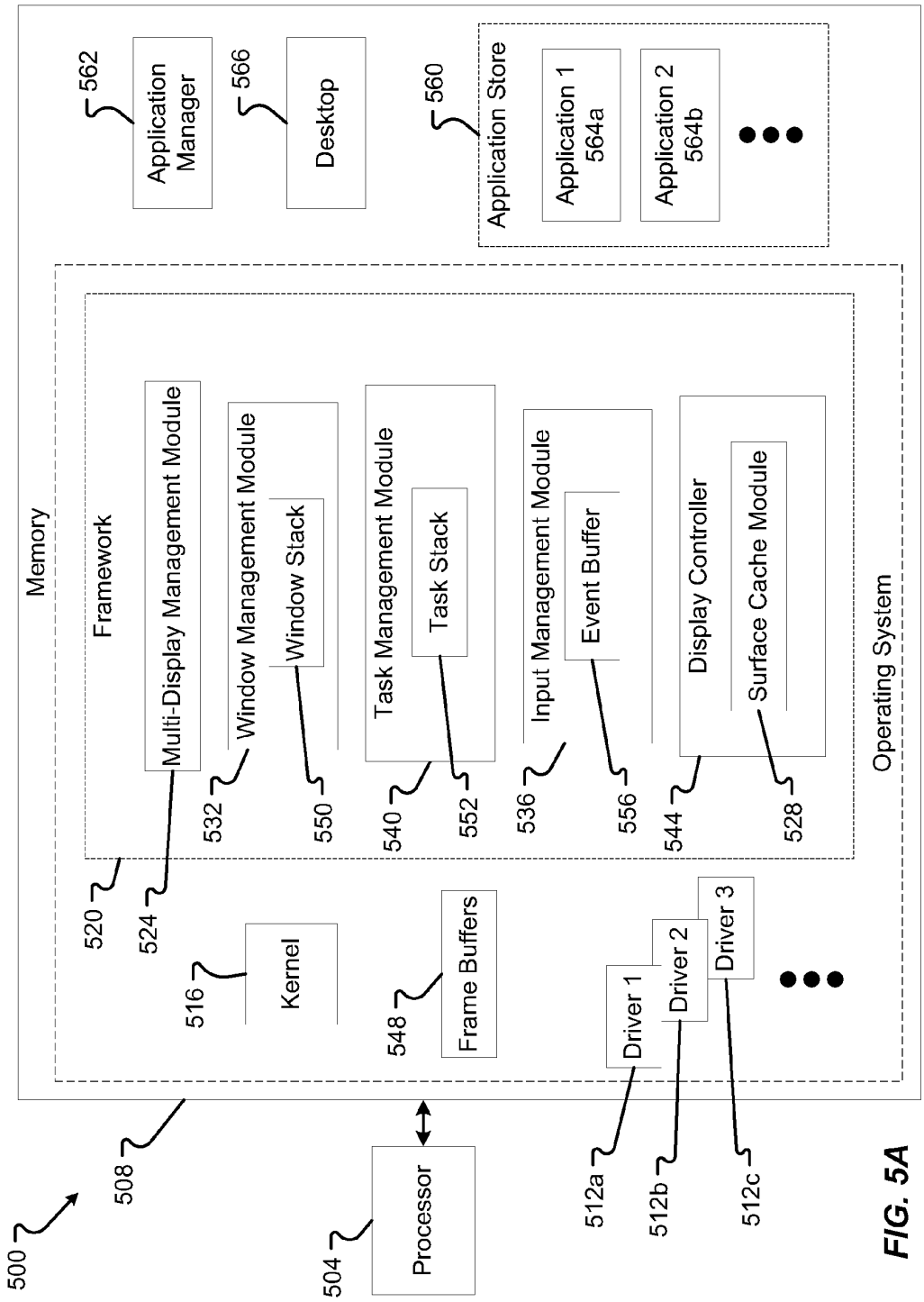

500
508
Memory
Framework
520
Multi-Display Management Module
524
Kernel
516
Window Management Module
532
Window Stack
550
Frame Buffers
548
Task Management Module
540
Task Stack
552
Input Management Module
536
Event Buffer
556
Display Controller
544
Surface Cache Module
528
Operating System
Driver 1
Driver 2
Driver 3
512a
512b
512c
Processor
504
562
Application Manager
566
Desktop
560
Application Store
Application 1
564a
Application 2
564b

FIG. 5A

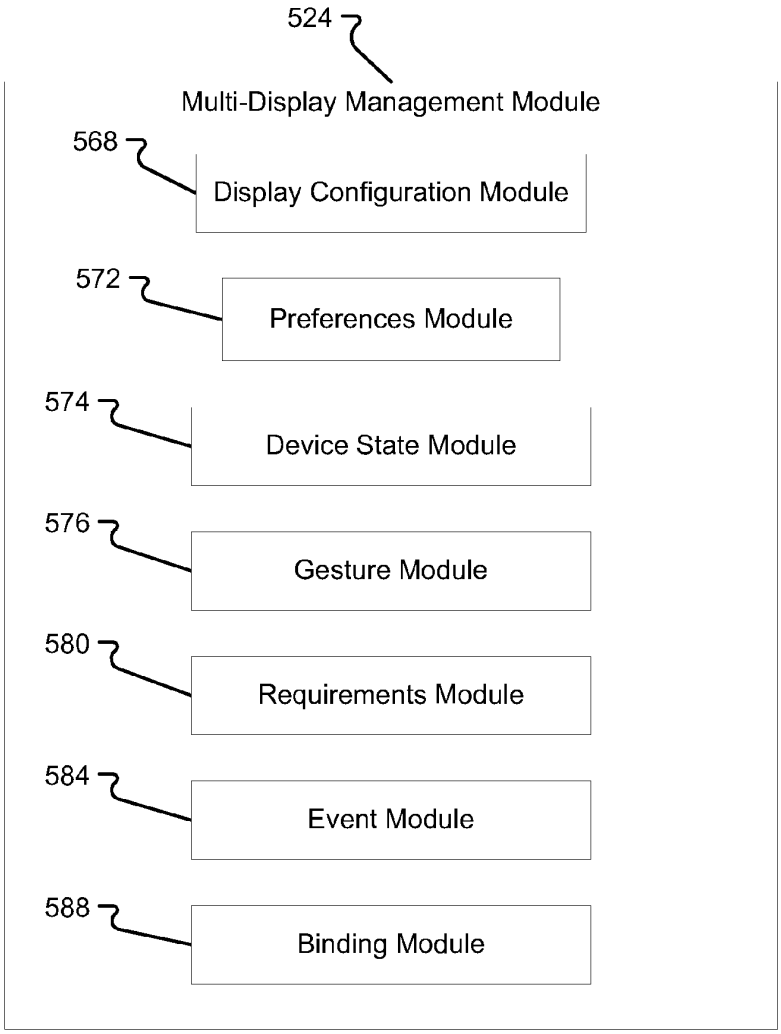

524
Multi-Display Management Module
568
Display Configuration Module
572
Preferences Module
574
Device State Module
576
Gesture Module
580
Requirements Module
584
Event Module
588
Binding Module

FIG. 5B

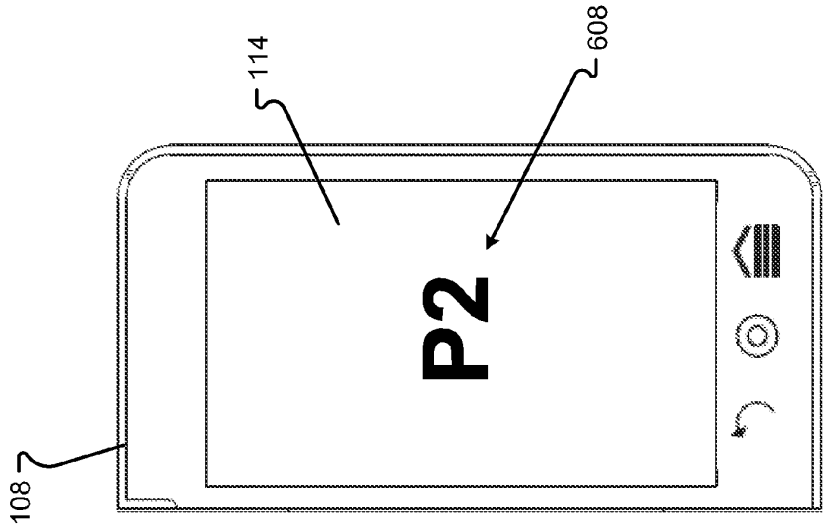


FIG. 6B

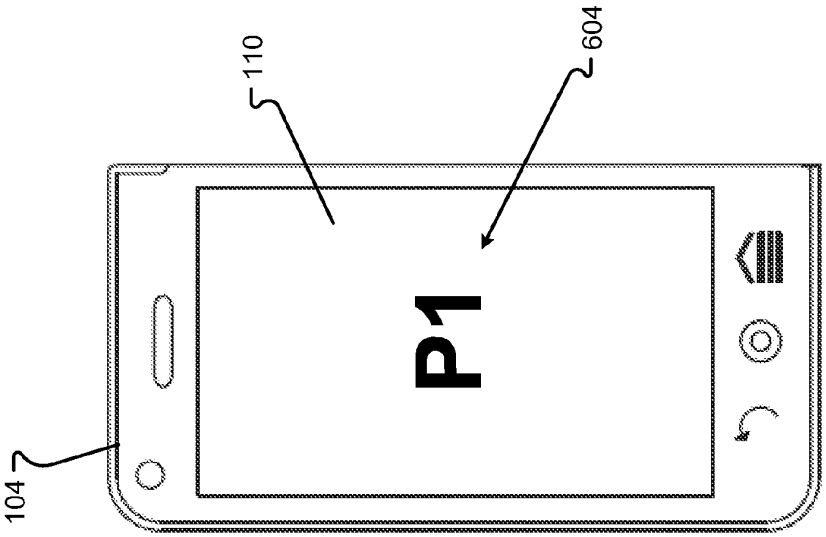


FIG. 6A

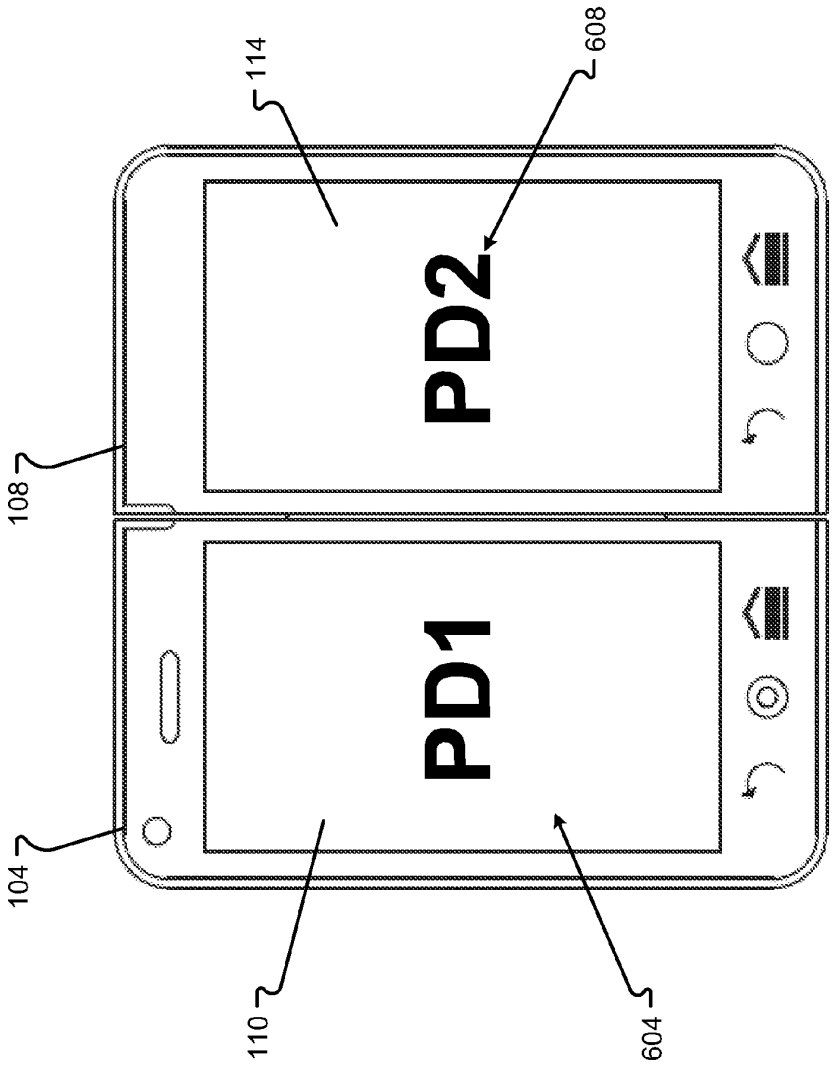


FIG. 6C

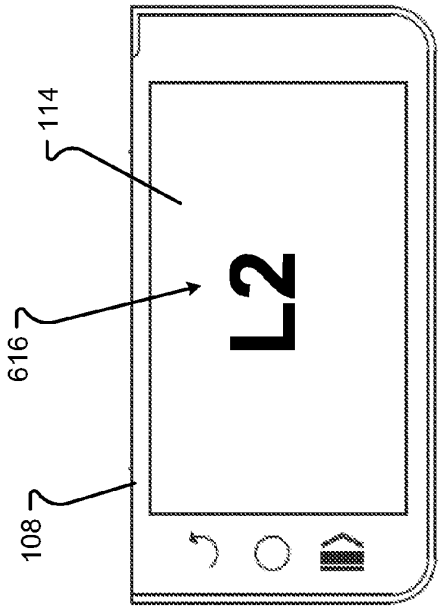


FIG. 6E

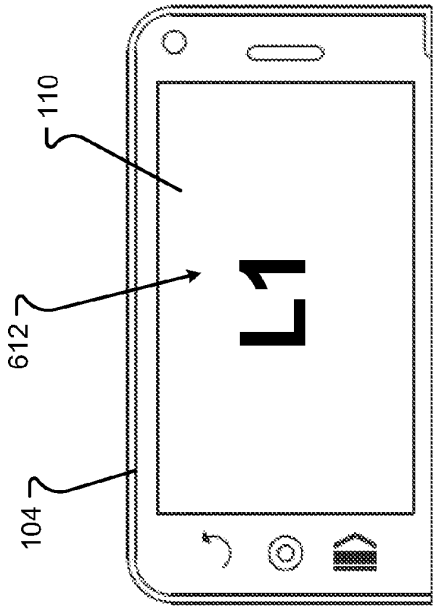


FIG. 6D

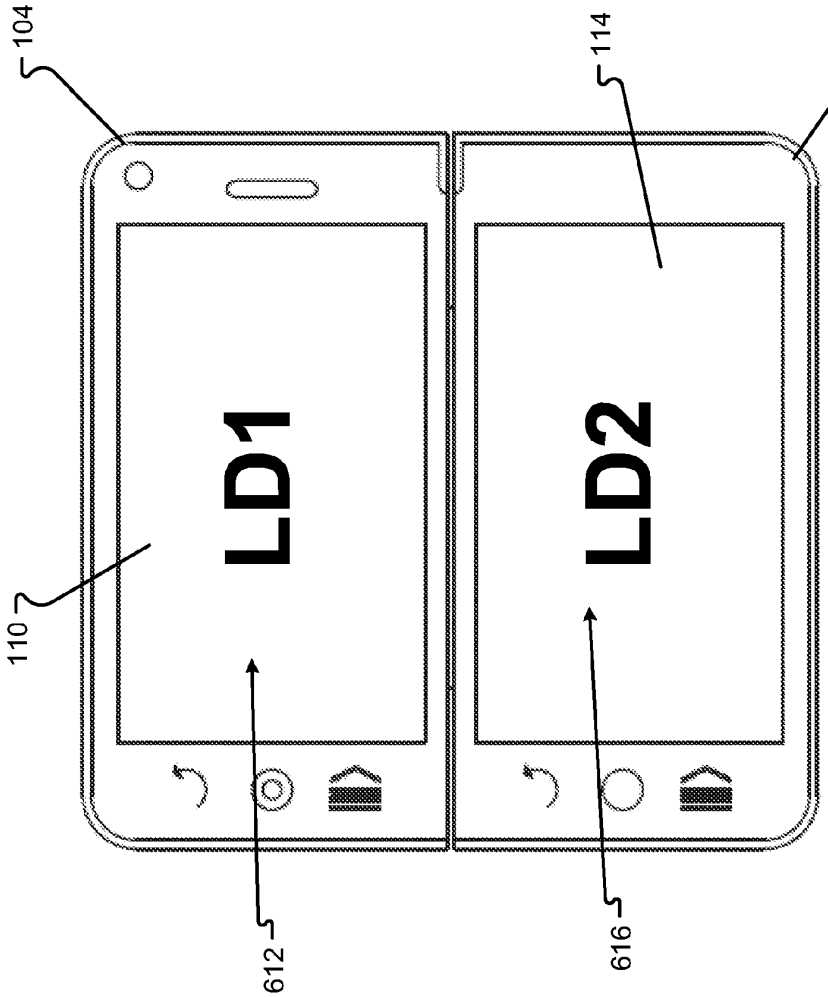


FIG. 6F

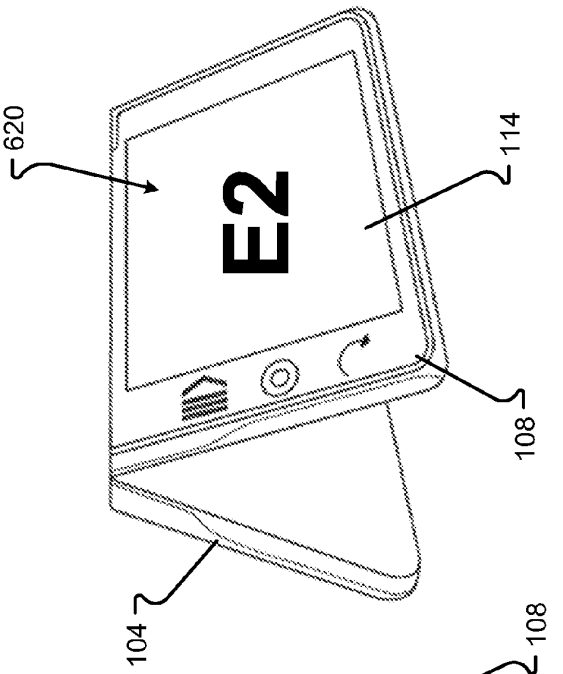


FIG. 6H

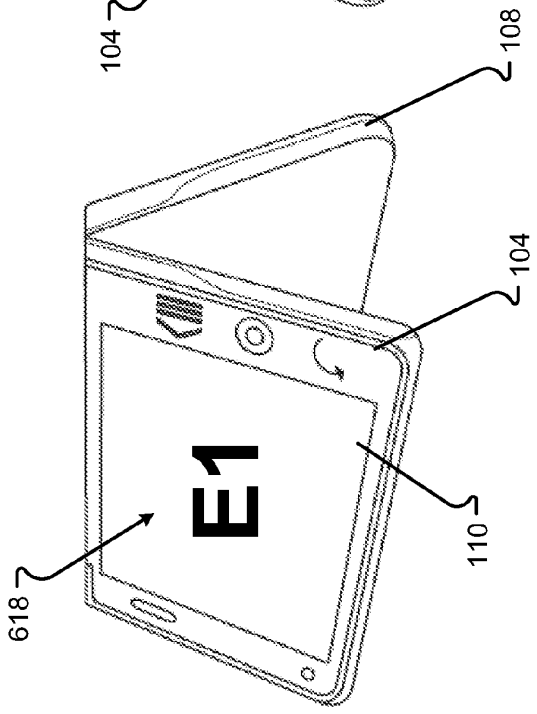


FIG. 6G

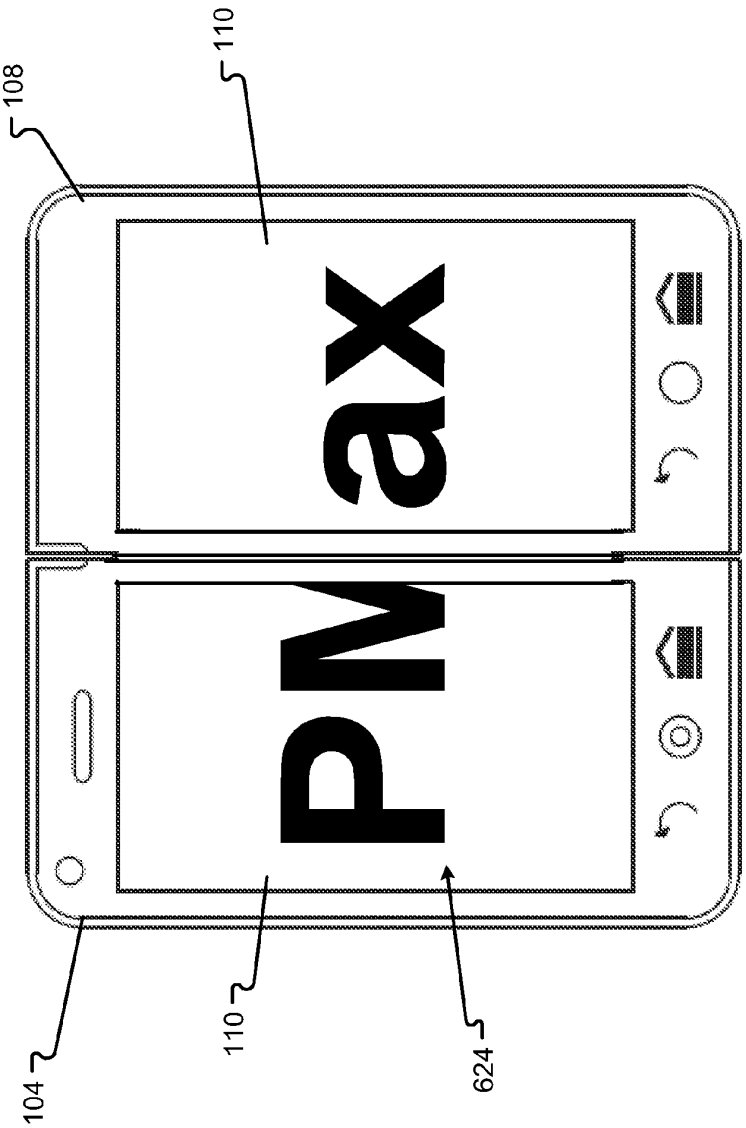


FIG. 6I

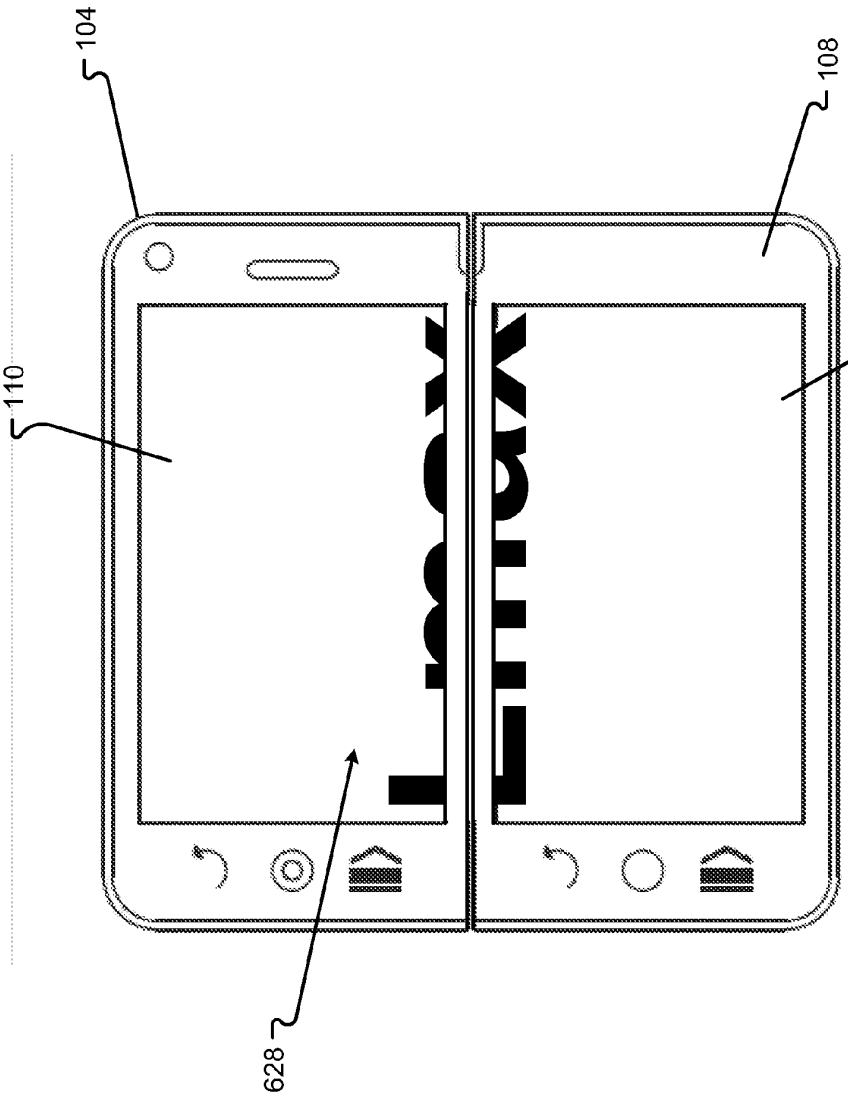


FIG. 6J

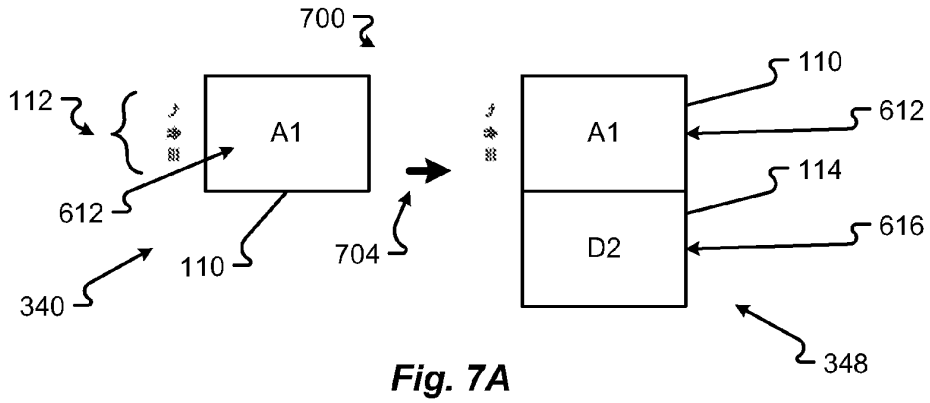


Fig. 7A

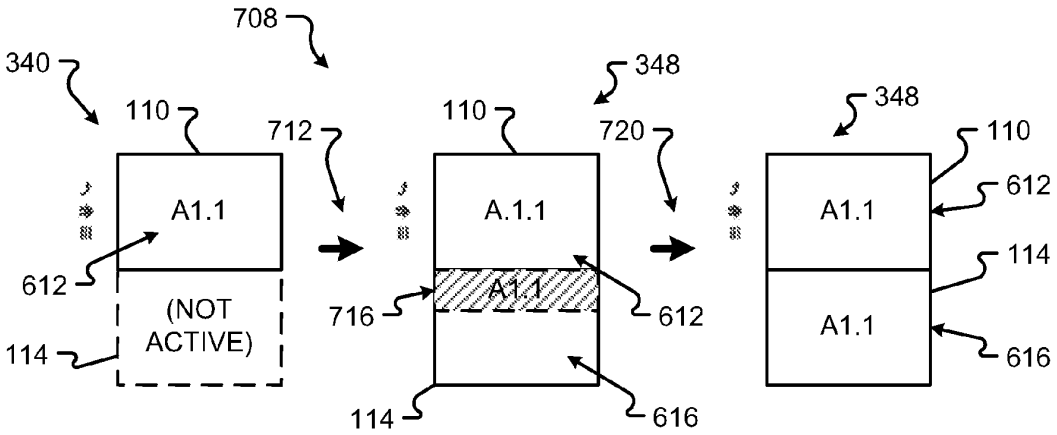


Fig. 7B

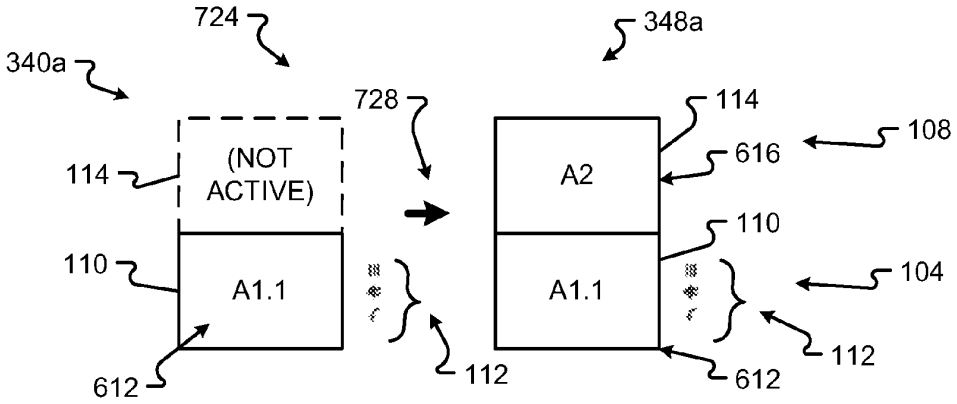


Fig. 7C

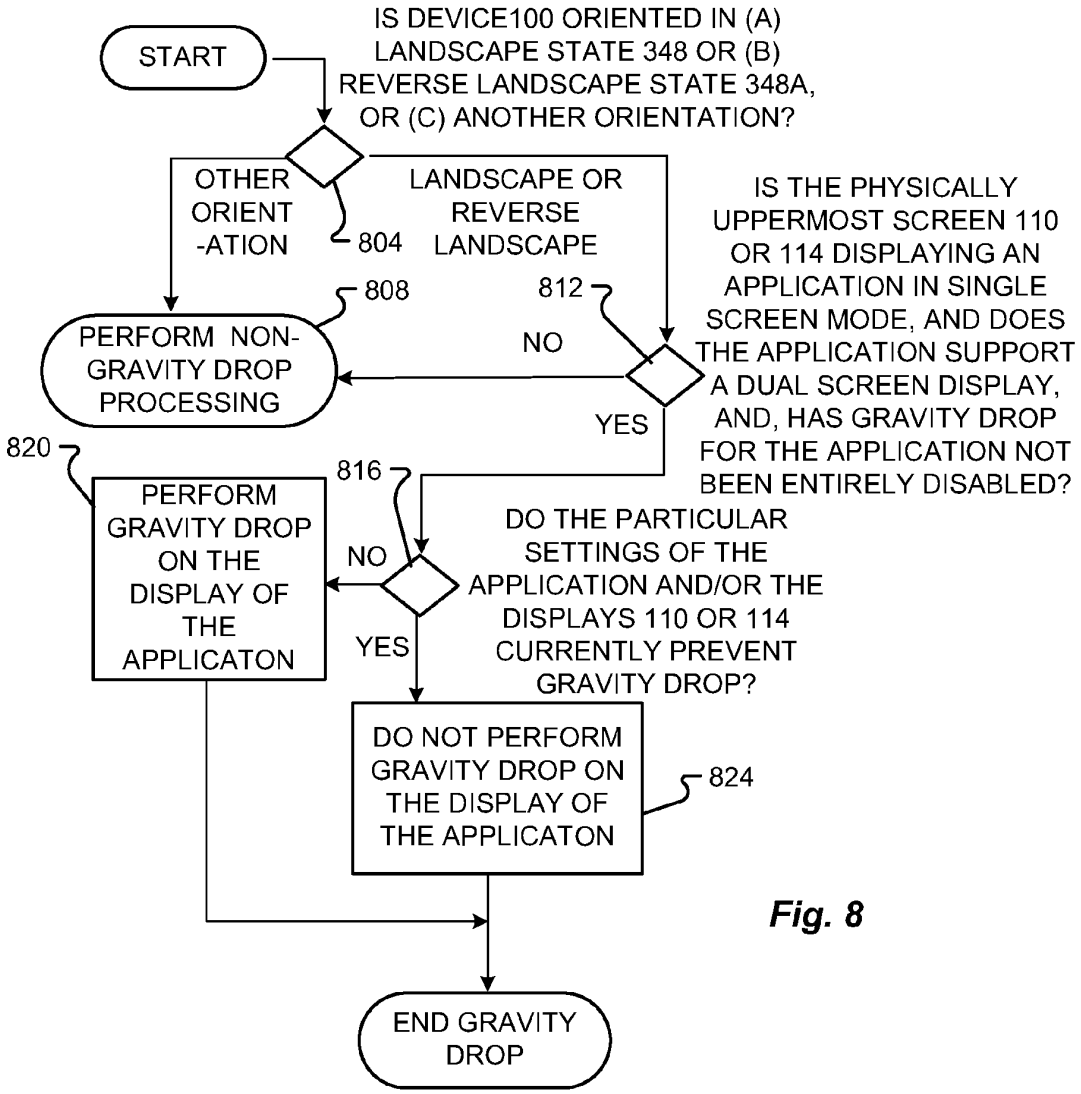

START
IS DEVICE100 ORIENTED IN (A) LANDSCAPE STATE 348 OR (B) REVERSE LANDSCAPE STATE 348A, OR (C) ANOTHER ORIENTATION?
OTHER ORIENT -ATION
804
LANDSCAPE OR REVERSE LANDSCAPE
808
812
IS THE PHYSICALLY UPPERMOST SCREEN 110 OR 114 DISPLAYING AN APPLICATION IN SINGLE SCREEN MODE, AND DOES THE APPLICATION SUPPORT A DUAL SCREEN DISPLAY, AND, HAS GRAVITY DROP FOR THE APPLICATION NOT BEEN ENTIRELY DISABLED?
NO
PERFORM NON-GRAVITY DROP PROCESSING
YES
820
816
PERFORM GRAVITY DROP ON THE DISPLAY OF THE APPLICATON
NO
DO THE PARTICULAR SETTINGS OF THE APPLICATION AND/OR THE DISPLAYS 110 OR 114 CURRENTLY PREVENT GRAVITY DROP?
YES
DO NOT PERFORM GRAVITY DROP ON THE DISPLAY OF THE APPLICATON
824
END GRAVITY DROP

Fig. 8

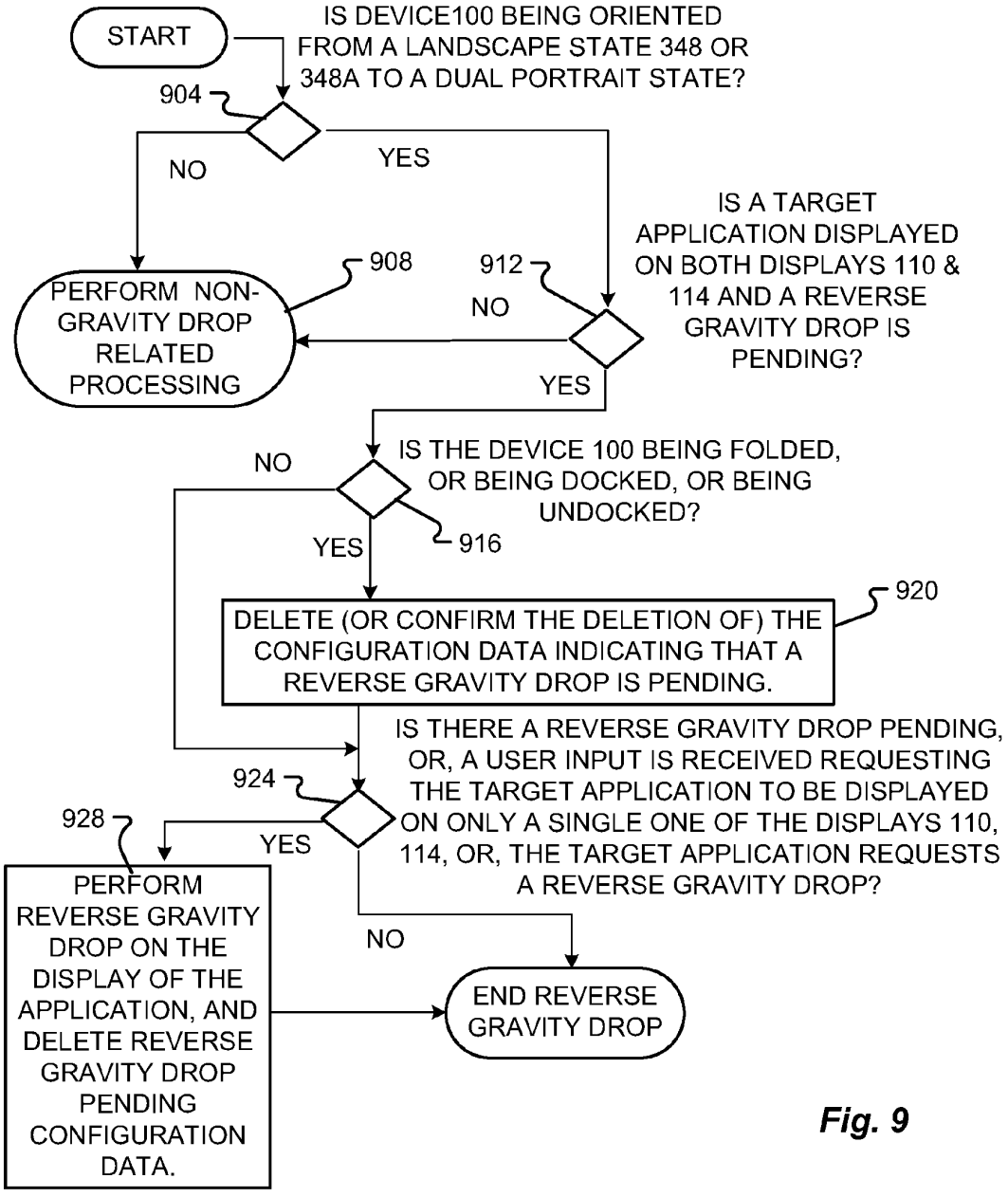

START
IS DEVICE100 BEING ORIENTED FROM A LANDSCAPE STATE 348 OR 348A TO A DUAL PORTRAIT STATE?
904
NO
YES
IS A TARGET APPLICATION DISPLAYED ON BOTH DISPLAYS 110 & 114 AND A REVERSE GRAVITY DROP IS PENDING?
912
908
PERFORM NON-GRAVITY DROP RELATED PROCESSING
NO
YES
IS THE DEVICE 100 BEING FOLDED, OR BEING DOCKED, OR BEING UNDOCKED?
NO
YES
916
920
DELETE (OR CONFIRM THE DELETION OF) THE CONFIGURATION DATA INDICATING THAT A REVERSE GRAVITY DROP IS PENDING.
IS THERE A REVERSE GRAVITY DROP PENDING, OR, A USER INPUT IS RECEIVED REQUESTING THE TARGET APPLICATION TO BE DISPLAYED ON ONLY A SINGLE ONE OF THE DISPLAYS 110, 114, OR, THE TARGET APPLICATION REQUESTS A REVERSE GRAVITY DROP?
924
928
YES
NO
PERFORM REVERSE GRAVITY DROP ON THE DISPLAY OF THE APPLICATION, AND DELETE REVERSE GRAVITY DROP PENDING CONFIGURATION DATA.
END REVERSE GRAVITY DROP

Fig. 9

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 11/53942

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - G06F 3/048 (2012.01)
USPC - 715/778
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
USPC: 715/778

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
USPC: 715/206, 804, 863; 361/600; 345/1.1, 1.3, 158, 173; 348/42, 51, 54, 207.1, E5.024, E13.015, E13.025, E13.029, E13.031, E13.043, E13.058 (text search)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
PubWest (PGPB, USPT, EPAB, JPAB), Google,
Search terms used: transitioning, between, single, dual, displays, transitions, orientation, phone, hand, held, portable, device, tablet, display, turn, rotat, orient, portrait, landscape, vertical, horizontal, dual, multiple, plurality, window, screen, multidisplay, multi, fold

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X -- Y	US 2010/0081475 A1 (CHIANG et al.) 01 April 2010 (01.04.2010) entire document, especially Abstract; Figs. 2B, 2C; para [0019], [0028], [0030]-[0039], [0041]-[0048]	1, 2, 4-20 ---------- 3
Y	US 2010/0085382 A1 (LUNDQVIST et al.) 08 April 2010 (08.04.2010) entire document, especially Abstract; para [0107]	3
A	US 2010/0064536 A1 (CASKEY et al.) 18 March 2010 (18.03.2010) entire document	1-20
A	US 2010/0085274 A1 (KILPATRICK II et al.) 08 April 2010 (08.04.2010) entire document	1-20
A	US 2008/0165152 A1 (FORSTALL et al.) 10 July 2008 (10.07.2008) entire document	1-20
A	US 2002/0021278 A1 (HINCKLEY et al.) 21 February 2002 (21.02.2002) entire document	1-20

☐ Further documents are listed in the continuation of Box C. ☐

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

Date of the actual completion of the international search	Date of mailing of the international search report
07 February 2012 (07.02.2012)	21 FEB 2012
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer: Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

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29 September 2011 (29.09.2011)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

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61/389,000	1 October 2010 (01.10.2010)	US
61/389,117	1 October 2010 (01.10.2010)	US
61/458,150	17 November 2010 (17.11.2010)	US
61/539,884	27 September 2011 (27.09.2011)	US
13/247,369	28 September 2011 (28.09.2011)	US

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(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **SIRPAL, Sanjiv** [CA/CA]; 3264 Stocksbridge Avenue, Oakville, ON L6M 0E3 (CA). **GIMPL, Martin** [FI/FI]; Jussaarenkuja 5 C 32, FI-00840 Helsinki (FI). **MILANO, Eduardo Diego Torres** [AR/CA]; 629 Marley Road, Burlington, ON L7T 3R8 (CA).

(74) Agent: **JOHNSON, Brent, P.**; Sheridan Ross P.C., 1560 Broadway, Suite 1200, Denver, CO 80202 (US).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ,

[Continued on next page]

(54) Title: REPOSITIONING WINDOWS IN THE POP-UP WINDOW

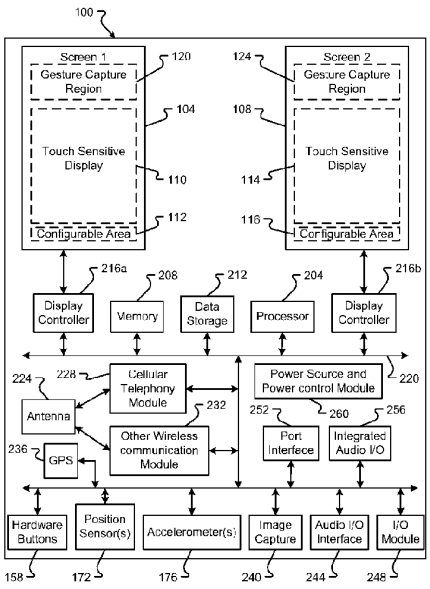


FIG. 2

(57) Abstract: A dual-screen user device and methods for revealing a combination of desktops on single and multiple screens are disclosed. Selected desktops and/or running applications are displayed on dual screen displays. Desktops and applications can be shifted between screens by user gestures, and/or moved off of the screens and therefore hidden. Hidden desktops and screens can be re-displayed by yet other gestures. The desktops and applications are arranged in a window stack that represents a logical order of the desktops and applications providing a user with an intuitive ability to manage multiple applications/desktops running simultaneously. One user gesture launches an applications management window that provides visual indications of all of the applications and desktops running at the time, applications/desktops displayed on the screens. Other gestures can rearrange the order of all of the applications and desktops in the window stack.

WO 2012/044809 A1

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

Published:

— *with international search report (Art. 21(3))*

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

REPOSITIONING WINDOWS IN THE POP-UP WINDOW

CROSS REFERENCE TO RELATED APPLICATION

[0001] The present application claims the benefits of and priority, under 35 U.S.C. § 119(e), to U.S. Provisional Application Serial Nos. 61/389,000, filed October 1, 2010, entitled "DUAL DISPLAY WINDOWING SYSTEM;" 61/389,117, filed October 1, 2010, entitled "MULTI-OPERATING SYSTEM PORTABLE DOCKETING DEVICE;" 61/389,087, filed October 1,2010, entitled "TABLET COMPUTING USER INTERFACE;"61/458,150, filed November 17, 2010, entitled "Dual Screen Email Client;" 61/539,884, filed September 27, 2011, entitled "MOBILE DEVICE." Each of the aforementioned documents is incorporated herein by this reference in their entirety for all that they teach and for all purposes.

BACKGROUND

[0002] A substantial number of handheld computing devices, such as cellular phones, tablets, and E-Readers, make use of a touch screen display not only to deliver display information to the user but also to receive inputs from user interface commands. While touch screen displays may increase the configurability of the handheld device and provide a wide variety of user interface options, this flexibility typically comes at a price. The dual use of the touch screen to provide content and receive user commands, while flexible for the user, may obfuscate the display and cause visual clutter, thereby leading to user frustration and loss of productivity.

[0003] The small form factor of handheld computing devices requires a careful balancing between the displayed graphics and the area provided for receiving inputs. On the one hand, the small display constrains the display space, which may increase the difficulty of interpreting actions or results. On the other, a virtual keypad or other user interface scheme is superimposed on or positioned adjacent to an executing application, requiring the application to be squeezed into an even smaller portion of the display.

[0004] This balancing act is particularly difficult for single display touch screen devices. Single display touch screen devices are crippled by their limited screen space. When users are entering information into the device, through the single display, the ability to interpret information in the display can be severely hampered, particularly when a complex interaction between display and interface is required.

SUMMARY

[0005] There is a need for a dual multi-display handheld computing device that provides for enhanced power and/or versatility compared to conventional single display handheld computing devices. These and other needs are addressed by the various aspects, embodiments, and/or configurations of the present disclosure. Also, while the disclosure is presented in terms of exemplary embodiments, it should be appreciated that individual aspects of the disclosure can be separately claimed.

[0006] In one aspect of the invention according to one or more embodiments, it can be described as a method of displaying a plurality of desktops and/or applications, each having at least one window, on a multi-screen device, comprising: (i) receiving a first input that represents an instruction to reveal one of a desktop or application on a first screen of the multi-screen device; (ii) selecting a first desktop or application to display on the first screen; (iii) receiving a second input that represents an instruction to reveal one of a desktop or application on a second screen of the multi-screen device; (iv) selecting a second desktop or application to display on the second screen; (v) displaying the selected first and second desktops or applications on the first and second screens; (vi) receiving a third input that represents an instruction to launch an application manager feature ; (vii) displaying the applications or desktops on the first and second screens, and displaying a management window showing all other applications or desktops currently running; (viii) determining a desired order for a window stack comprising the first and second applications or desktops, and said other applications or desktops; (ix) receiving a fourth input that represents an instruction to selectively move one of said first and second applications or desktops, or said other applications or desktops, within the window stack to a different position; and (x) displaying the window stack in a new order in response to said fourth input.

[0007] In another aspect of the invention according to one or more embodiments, it can be described as a non-transitory computer-readable medium having stored thereon instructions that cause a computing system to execute a method, the instructions comprising: (i) instructions configured to receive a first predetermined input that represents an instruction to determine and reveal a first desktop or application on a first screen of the multi-screen device; (ii) instructions configured to receive a second predetermined input that represents an instruction to determine and reveal a second

desktop or application on a second screen of the multi-screen device; (iii) instructions configured to respond to the first and second predetermined inputs with outputs that cause the first desktop or application to be displayed on the first screen and cause the second desktop or application to be displayed on the second screen; (iv) instructions configured to receive a third predetermined input that represents an instruction to launch an application manager feature; (v) instructions configured to respond to the third predetermined input that causes a display of a management window showing all other applications or desktops currently running; (vi) instructions configured to receive a fourth predetermined input that represents an instruction to selectively move one of said first and second applications or desktops, or said other applications or desktops, within the window stack to a different position; and (vii) instructions configured to respond to the fourth predetermined input that causes displaying of the window stack in a new order.

[0008] In yet another aspect of the invention according to one or more embodiments, it can be described as a multi-screen user device, comprising: (i) a first screen including a first display area;(ii) a second screen including a second display area; (iii) a first user input gesture area of the first screen; (iv) a second user input gesture area of the second screen, wherein the first and second user input gesture areas are configured to accept input from a user; (v) a computer-readable medium having instructions stored thereon that include: (1) a first set of instructions configured to determine a number and identity of desktops or applications selected to be run by a user; (2) a second set of instructions configured to determine, based on the number and identity of the desktops or applications running, a window stack comprising a logical representation of the desktops and applications within an ordered group whereby a user can selectively move a selected desktop or application to either a visible position on another screen or a non-visible position; (3) a third set of instructions responsive to a gesture made by the user that represents an instruction to launch an application manager feature, wherein the applications or desktops are displayed on the first and second screens, and a management window is displayed showing all other applications or desktops currently running; (4) a fourth set of instructions responsive to one or more gestures made by the user that represent an instruction to selectively move one of said first and second applications or desktops, or said other applications or desktops, within the window stack to a different position, and wherein the window stack is displayed in a new order in response to said fourth set of instructions.

[0009] The present disclosure can provide a number of advantages depending on the particular aspect, embodiment, and/or configuration. Currently, the consumer electronics industry is dominated by single-screen devices. Unfortunately, these devices are limited in the manner in which they can efficiently display information and receive user input. Specifically, multiple applications and desktops cannot be adequately shown on a single screen and require the user to constantly switch between displayed pages to access content from more than one application. Additionally, user input devices such as keyboards, touch-sensitive or capacitive displays, and hardware interface buttons are usually reduced in size to fit onto a single-screen device. Manipulating this type of device, and being forced to switch between multiple applications that only use one screen results in user fatigue, frustration, and in some cases repetitive motion injuries.

[0010] Recently, dual-screen devices have been made available to consumers of electronic devices. However, the currently available dual-screen devices have failed to adequately address the needs of the consumer. Although the devices include two screens in their design, they tend to incorporate the negative limitations of their single-screen counterparts. In particular, the typical dual-screen device limits the user interface to a particular screen, in some cases only providing a keyboard, or touch-sensitive/capacitive display, on one of the screens. Moreover, the management of the device's applications and desktops is limited to the traditional concepts of single-screen content switching. The present disclosure addresses the limitations of the traditional single/dual-screen devices and provides advantages in display, input, and content management.

[0011] At least one embodiment of the present disclosure describes a multi-screen device and methods for managing the display of content that allows the user a greater degree of creative latitude when operating the device. In particular, when a device is running an application or group of applications, the device is capable of detecting a user gesture input that can reveal a desktop on multiple screens of the device. This desktop can show a representation of different applications that the user can select. From this desktop, a user is able to launch applications or navigate between multiple desktop pages, including those that are displayed and those that are not. A user, or the device itself, may choose how and when to initiate the reveal desktop expansion, which may be determined by, but not limited to, a specific input detected, an output from another process, program or

hardware logic, software control, or combination thereof. The management of the displayed desktops may be directed by the device or the user. These and other advantages will be apparent from the disclosure. One particular feature of managing the display includes an application manager feature that may be launched by a user input gesture. As described more fully below, a user may manipulate the order of running desktops and applications so that the user can more easily display desired applications and desktops on the screens, and hiding others from view with the ability to easily re-display selected hidden applications and desktops that are still running.

[0012] The present disclosure can provide a number of advantages depending on the particular aspect, embodiment, and/or configuration. These and other advantages will be apparent from the disclosure.

[0013] The phrases "at least one", "one or more", and "and/or" are open-ended expressions that are both conjunctive and disjunctive in operation. For example, each of the expressions "at least one of A, B and C", "at least one of A, B, or C", "one or more of A, B, and C", "one or more of A, B, or C" and "A, B, and/or C" means A alone, B alone, C alone, A and B together, A and C together, B and C together, or A, B and C together.

[0014] The term "a" or "an" entity refers to one or more of that entity. As such, the terms "a" (or "an"), "one or more" and "at least one" can be used interchangeably herein. It is also to be noted that the terms "comprising", "including", and "having" can be used interchangeably.

[0015] The term "automatic" and variations thereof, as used herein, refers to any process or operation done without material human input when the process or operation is performed. However, a process or operation can be automatic, even though performance of the process or operation uses material or immaterial human input, if the input is received before performance of the process or operation. Human input is deemed to be material if such input influences how the process or operation will be performed. Human input that consents to the performance of the process or operation is not deemed to be "material".

[0016] The term "computer-readable medium" as used herein refers to any tangible storage and/or transmission medium that participate in providing instructions to a processor for execution. Such a medium may take many forms, including but not limited to, non-volatile media, volatile media, and transmission media. Non-volatile media

includes, for example, NVRAM, or magnetic or optical disks. Volatile media includes dynamic memory, such as main memory. Common forms of computer-readable media include, for example, a floppy disk, a flexible disk, hard disk, magnetic tape, or any other magnetic medium, magneto-optical medium, a CD-ROM, any other optical medium, punch cards, paper tape, any other physical medium with patterns of holes, a RAM, a PROM, and EPROM, a FLASH-EPROM, a solid state medium like a memory card, any other memory chip or cartridge, a carrier wave as described hereinafter, or any other medium from which a computer can read. A digital file attachment to e-mail or other self-contained information archive or set of archives is considered a distribution medium equivalent to a tangible storage medium. When the computer-readable media is configured as a database, it is to be understood that the database may be any type of database, such as relational, hierarchical, object-oriented, and/or the like. Accordingly, the disclosure is considered to include a tangible storage medium or distribution medium and prior art-recognized equivalents and successor media, in which the software implementations of the present disclosure are stored.

[0017] The term "desktop" refers to a metaphor used to portray systems. A desktop is generally considered a "surface" that typically includes pictures, called icons, widgets, folders, etc. that can activate show applications, windows, cabinets, files, folders, documents, and other graphical items. The icons are generally selectable to initiate a task through user interface interaction to allow a user to execute applications or conduct other operations.

[0018] The term "screen," "touch screen," or "touchscreen" refers to a physical structure that includes one or more hardware components that provide the device with the ability to render a user interface and/or receive user input. A screen can encompass any combination of gesture capture region, a touch sensitive display, and/or a configurable area. The device can have one or more physical screens embedded in the hardware. However a screen may also include an external peripheral device that may be attached and detached from the device. In embodiments, multiple external devices may be attached to the device. Thus, in embodiments, the screen can enable the user to interact with the device by touching areas on the screen and provides information to a user through a display. The touch screen may sense user contact in a number of different ways, such as by a change in an electrical parameter (e.g., resistance or capacitance), acoustic wave variations, infrared radiation

proximity detection, light variation detection, and the like. In a resistive touch screen, for example, normally separated conductive and resistive metallic layers in the screen pass an electrical current. When a user touches the screen, the two layers make contact in the contacted location, whereby a change in electrical field is noted and the coordinates of the contacted location calculated. In a capacitive touch screen, a capacitive layer stores electrical charge, which is discharged to the user upon contact with the touch screen, causing a decrease in the charge of the capacitive layer. The decrease is measured, and the contacted location coordinates determined. In a surface acoustic wave touch screen, an acoustic wave is transmitted through the screen, and the acoustic wave is disturbed by user contact. A receiving transducer detects the user contact instance and determines the contacted location coordinates.

[0019] The term "display" refers to a portion of one or more screens used to display the output of a computer to a user. A display may be a single-screen display or a multi-screen display, referred to as a composite display. A composite display can encompass the touch sensitive display of one or more screens. A single physical screen can include multiple displays that are managed as separate logical displays. Thus, different content can be displayed on the separate displays although part of the same physical screen.

[0020] The term "displayed image" refers to an image produced on the display. A typical displayed image is a window or desktop. The displayed image may occupy all or a portion of the display.

[0021] The term "display orientation" refers to the way in which a rectangular display is oriented by a user for viewing. The two most common types of display orientation are portrait and landscape. In landscape mode, the display is oriented such that the width of the display is greater than the height of the display (such as a 4:3 ratio, which is 4 units wide and 3 units tall, or a 16:9 ratio, which is 16 units wide and 9 units tall). Stated differently, the longer dimension of the display is oriented substantially horizontal in landscape mode while the shorter dimension of the display is oriented substantially vertical. In the portrait mode, by contrast, the display is oriented such that the width of the display is less than the height of the display. Stated differently, the shorter dimension of the display is oriented substantially horizontal in the portrait mode while the longer dimension of the display is oriented substantially vertical.

[0022] The term "composited display" refers to a logical structure that defines a display that can encompass one or more screens. A multi-screen display can be associated with a composite display that encompasses all the screens. The composite display can have different display characteristics based on the various orientations of the device.

[0023] The term "gesture" refers to a user action that expresses an intended idea, action, meaning, result, and/or outcome. The user action can include manipulating a device (e.g., opening or closing a device, changing a device orientation, moving a trackball or wheel, etc.), movement of a body part in relation to the device, movement of an implement or tool in relation to the device, audio inputs, etc. A gesture may be made on a device (such as on the screen) or with the device to interact with the device.

[0024] The term "module" as used herein refers to any known or later developed hardware, software, firmware, artificial intelligence, fuzzy logic, or combination of hardware and software that is capable of performing the functionality associated with that element.

[0025] The term "gesture capture" refers to a sense or otherwise a detection of an instance and/or type of user gesture. The gesture capture can occur in one or more areas of the screen, A gesture region can be on the display, where it may be referred to as a touch sensitive display or off the display where it may be referred to as a gesture capture area.

[0026] A "multi-screen application" refers to an application that is capable of multiple modes. The multi-screen application mode can include, but is not limited to, a single screen mode (where the application is displayed on a single screen) or a composite display mode (where the application is displayed on two or more screens). A multi-screen application can have different layouts optimized for the mode. Thus, the multi-screen application can have different layouts for a single screen or for a composite display that can encompass two or more screens. The different layouts may have different screen/display dimensions and/or configurations on which the user interfaces of the multi-screen applications can be rendered. The different layouts allow the application to optimize the application's user interface for the type of display, *e.g.,* single screen or multiple screens. In single screen mode, the multi-screen application may present one window pane of information. In a composite display mode, the multi-screen application may present multiple window panes of information or may provide a larger and a richer

presentation because there is more space for the display contents. The multi-screen applications may be designed to adapt dynamically to changes in the device and the mode depending on which display (single or composite) the system assigns to the multi-screen application. In alternative embodiments, the user can use a gesture to request the application transition to a different mode, and, if a display is available for the requested mode, the device can allow the application to move to that display and transition modes.

[0027] A "single-screen application" refers to an application that is capable of single screen mode. Thus, the single-screen application can produce only one window and may not be capable of different modes or different display dimensions. A single-screen application is incapable of the several modes discussed with the multi-screen application.

[0028] The term "window" refers to a, typically rectangular, displayed image on at least part of a display that contains or provides content different from the rest of the screen. The window may obscure the desktop.

[0029] The terms "determine", "calculate" and "compute," and variations thereof, as used herein, are used interchangeably and include any type of methodology, process, mathematical operation or technique.

[0030] It shall be understood that the term "means" as used herein shall be given its broadest possible interpretation in accordance with 35 U.S.C., Section 112, Paragraph 6. Accordingly, a claim incorporating the term "means" shall cover all structures, materials, or acts set forth herein, and all of the equivalents thereof. Further, the structures, materials or acts and the equivalents thereof shall include all those described in the summary of the invention, brief description of the drawings, detailed description, abstract, and claims themselves.

[0031] The preceding is a simplified summary of the disclosure to provide an understanding of some aspects of the disclosure. This summary is neither an extensive nor exhaustive overview of the disclosure and its various aspects, embodiments, and/or configurations. It is intended neither to identify key or critical elements of the disclosure nor to delineate the scope of the disclosure but to present selected concepts of the disclosure in a simplified form as an introduction to the more detailed description presented below. As will be appreciated, other aspects, embodiments, and/or configurations of the disclosure are possible utilizing, alone or in combination, one or more of the features set forth above or described in detail below.

BRIEF DESCRIPTION OF THE DRAWINGS

[0032] FIG. 1A includes a first view of an embodiment of a multi-screen user device;

[0033] FIG. 1B includes a second view of an embodiment of a multi-screen user device;

[0034] FIG. 1C includes a third view of an embodiment of a multi-screen user device;

[0035] FIG. 1D includes a fourth view of an embodiment of a multi-screen user device;

[0036] FIG. 1E includes a fifth view of an embodiment of a multi-screen user device;

[0037] FIG. 1F includes a sixth view of an embodiment of a multi-screen user device;

[0038] FIG. 1G includes a seventh view of an embodiment of a multi-screen user device;

[0039] FIG. 1H includes a eighth view of an embodiment of a multi-screen user device;

[0040] FIG. 1I includes a ninth view of an embodiment of a multi-screen user device;

[0041] FIG. 1J includes a tenth view of an embodiment of a multi-screen user device;

[0042] FIG. 2 is a block diagram of an embodiment of the hardware of the device;

[0043] FIG. 3A is a block diagram of an embodiment of the state model for the device based on the device's orientation and/or configuration;

[0044] FIG. 3B is a table of an embodiment of the state model for the device based on the device's orientation and/or configuration;

[0045] FIG. 4A is a first representation of an embodiment of user gesture received at a device;

[0046] FIG. 4B is a second representation of an embodiment of user gesture received at a device;

[0047] FIG. 4C is a third representation of an embodiment of user gesture received at a device;

[0048] FIG. 4D is a fourth representation of an embodiment of user gesture received at a device;

[0049] FIG. 4E is a fifth representation of an embodiment of user gesture received at a device;

[0050] FIG. 4F is a sixth representation of an embodiment of user gesture received at a device;

[0051] FIG. 4G is a seventh representation of an embodiment of user gesture received at a device;

[0052] FIG. 4H is a eighth representation of an embodiment of user gesture received at a device;

[0053] FIG. 5A is a block diagram of an embodiment of the device software and/or firmware;

[0054] FIG. 5B is a second block diagram of an embodiment of the device software and/or firmware;

[0055] FIG. 6A is a first representation of an embodiment of a device configuration generated in response to the device state;

[0056] FIG. 6B is a second representation of an embodiment of a device configuration generated in response to the device state;

[0057] FIG. 6C is a third representation of an embodiment of a device configuration generated in response to the device state;

[0058] FIG. 6D is a fourth representation of an embodiment of a device configuration generated in response to the device state;

[0059] FIG. 6E is a fifth representation of an embodiment of a device configuration generated in response to the device state;

[0060] FIG. 6F is a sixth representation of an embodiment of a device configuration generated in response to the device state;

[0061] FIG. 6G is a seventh representation of an embodiment of a device configuration generated in response to the device state;

[0062] FIG. 6H is a eighth representation of an embodiment of a device configuration generated in response to the device state;

[0063] FIG. 6I is a ninth representation of an embodiment of a device configuration generated in response to the device state;

[0064] FIG. 6J is a tenth representation of an embodiment of a device configuration generated in response to the device state;

[0065] FIG. 7A is representation of a logical window stack;

[0066] FIG. 7B is another representation of an embodiment of a logical window stack;

[0067] FIG. 7C is another representation of an embodiment of a logical window stack;

[0068] FIG. 7D is another representation of an embodiment of a logical window stack;

[0069] FIG. 7E is another representation of an embodiment of a logical window stack;

[0070] FIG. 8 is block diagram of an embodiment of a logical data structure for a window stack;

[0071] FIG. 9 is a flow chart of an embodiment of a method for creating a window stack;

[0072] FIG. 10A depicts a first display state of an open device with a depiction of executing a spread gesture to launch an application manager;

[0073] FIG. 10B depicts a second display state of an open device with the application manager launched in the form of a separate window or tray that depicts the non-displayed applications and/or desktops running on the device, and also depicting the stack arrangement of the non-displayed applications and/or desktops; this Figure 10B also displays execution of a user gesture to rearrange the order of the window stack by a gesture executed on the primary screen;

[0074] FIG. 10C depicts a third display state of an open device after execution of the gesture in FIG. 10B , and also another spread gesture to re-launch the application manager;

[0075] FIG. 10D shows a fourth display state of the open device in which the application manager is launched and the non-displayed applications and/or desktops running on the device are shown in the manager window or tray in a new order based on the user gesture executed in FIG. 10B;

[0076] FIG. 10E depicts a first display state of an open device in another embodiment with a depiction of executing a spread gesture to launch an application manager;

[0077] FIG. 10F depicts a second display state of the open device of FIG. 10E with the application manager launched showing the manager window or tray that depicts the non-displayed applications and/or desktops running on the device, and also showing the stack arrangement of the non-displayed applications and/or desktops; this Figure 10F also displays execution of a user gesture to rearrange the order of the window stack by a gesture executed within the application manager to move a non-displayed application or desktop onto the primary screen;

[0078] FIG. 10G depicts a third display state of the open device of FIG. 10E after execution of the gesture in FIG 10F , and also another spread gesture to re-launch the application manager;

[0079] FIG. 10H shows a fourth display state of the open device of FIG 10E in which the application manager is launched and the non-displayed applications and/or desktops running on the device are shown in a new order based on the user gesture executed in FIG. 10F;

[0080] Figure 10I displays a first display state of an open device in yet another embodiment with the application manager launched showing the manager window or tray with multiple applications/desktops, and showing execution of a user gesture in the form of a drag gesture to rearrange the order of the window stack

[0081] FIG 10J displays a second display state of the open device of Figure 10I with the application manager launched showing the manager window or tray with the multiple applications/desktops, and showing execution of another user gesture in the form of a drag gesture to further rearrange the order of the window stack;

[0082] FIG 10K displays a third display state of the open device of Figure 10I with the application manager launched showing the manager window or tray with the multiple applications/desktops, and showing execution of yet another user gesture in the form of a tap gesture to further rearrange the order of the window stack in which the gesture opens the corresponding application/desktop in a predetermined screen;

[0083] FIG 10L displays a fourth display state of the open device of Figure 10I showing the new application displayed in the primary screen and the application manager closed; this Figure further depicts execution of another spread gesture to re-launch the application manager;

[0084] FIG. 10M displays a fifth display state of the open device of Figure 10I in which the manager window or tray shows the new window stack order responsive to the previous user gestures that rearranged the window stack; and

[0085] FIG. 11 shows a flow diagram depicting logic for executing rearrangement of a selected window stack.

[0086] In the appended figures, similar components and/or features may have the same reference label. Further, various components of the same type may be distinguished by following the reference label by a letter that distinguishes among the similar components. If only the first reference label is used in the specification, the description is applicable to any one of the similar components having the same first reference label irrespective of the second reference label.

DETAILED DESCRIPTION

[0087] Presented herein are embodiments of a device. The device can be a communications device, such as a cellular telephone, or other smart device. The device can include two screens that are oriented to provide several unique display configurations. Further, the device can receive user input in unique ways. The overall design and functionality of the device provides for an enhanced user experience making the device more useful and more efficient.

[0088] Mechanical Features:

[0089] Figs. 1A-1J illustrate a device 100 in accordance with embodiments of the present disclosure. As described in greater detail below, device 100 can be positioned in a number of different ways each of which provides different functionality to a user. The device 100 is a multi-screen device that includes a primary screen 104 and a secondary screen 108, both of which are touch sensitive. In embodiments, the entire front surface of screens 104 and 108 may be touch sensitive and capable of receiving input by a user touching the front surface of the screens 104 and 108. Primary screen 104 includes touch sensitive display 110, which, in addition to being touch sensitive, also displays information to a user. Secondary screen 108 includes touch sensitive display 114, which also displays information to a user. In other embodiments, screens 104 and 108 may include more than one display area.

[0090] Primary screen 104 also includes a configurable area 112 that has been configured for specific inputs when the user touches portions of the configurable area 112. Secondary screen 108 also includes a configurable area 116 that has been configured for specific inputs. Areas 112a and 116a have been configured to receive a "back" input indicating that a user would like to view information previously displayed. Areas 112b and 116b have been configured to receive a "menu" input indicating that the user would like to view options from a menu. Areas 112c and 116c have been configured to receive a "home" input indicating that the user would like to view information associated with a "home" view. In other embodiments, areas 112a-c and 116a-c may be configured, in addition to the configurations described above, for other types of specific inputs including controlling features of device 100, some non-limiting examples including adjusting overall system power, adjusting the volume, adjusting the brightness, adjusting the vibration, selecting of displayed items (on either of screen 104 or 108), operating a camera,

operating a microphone, and initiating/terminating of telephone calls. Also, in some embodiments, areas 112a-C and 116a-C may be configured for specific inputs depending upon the application running on device 100 and/or information displayed on touch sensitive displays 110 and/or 114.

[0091] In addition to touch sensing, primary screen 104 and secondary screen 108 may also include areas that receive input from a user without requiring the user to touch the display area of the screen. For example, primary screen 104 includes gesture capture area 120, and secondary screen 108 includes gesture capture area 124. These areas are able to receive input by recognizing gestures made by a user without the need for the user to actually touch the surface of the display area. In comparison to touch sensitive displays 110 and 114, the gesture capture areas 120 and 124 are commonly not capable of rendering a displayed image.

[0092] The two screens 104 and 108 are connected together with a hinge 128, shown clearly in Fig. 1C (illustrating a back view of device 100). Hinge 128, in the embodiment shown in Figs. 1A-1J, is a center hinge that connects screens 104 and 108 so that when the hinge is closed, screens 104 and 108 are juxtaposed (i.e., side-by-side) as shown in Fig. 1B (illustrating a front view of device 100). Hinge 128 can be opened to position the two screens 104 and 108 in different relative positions to each other. As described in greater detail below, the device 100 may have different functionalities depending on the relative positions of screens 104 and 108.

[0093] Fig. 1D illustrates the right side of device 100. As shown in Fig. 1D, secondary screen 108 also includes a card slot 132 and a port 136 on its side. Card slot 132 in embodiments, accommodates different types of cards including a subscriber identity module (SIM). Port 136 in embodiments is an input/output port (I/O port) that allows device 100 to be connected to other peripheral devices, such as a display, keyboard, or printing device. As can be appreciated, these are merely some examples and in other embodiments device 100 may include other slots and ports such as slots and ports for accommodating additional memory devices and/or for connecting other peripheral devices. Also shown in Fig. 1D is an audio jack 140 that accommodates a tip, ring, sleeve (TRS) connector for example to allow a user to utilize headphones or a headset.

[0094] Device 100 also includes a number of buttons 158. For example, Fig. 1E illustrates the left side of device 100. As shown in Fig. 1E, the side of primary screen 104

includes three buttons 144, 148, and 152, which can be configured for specific inputs. For example, buttons 144, 148, and 152 may be configured to, in combination or alone, control a number of aspects of device 100. Some non-limiting examples include overall system power, volume, brightness, vibration, selection of displayed items (on either of screen 104 or 108), a camera, a microphone, and initiation/termination of telephone calls. In some embodiments, instead of separate buttons two buttons may be combined into a rocker button. This arrangement is useful in situations where the buttons are configured to control features such as volume or brightness. In addition to buttons 144, 148, and 152, device 100 also includes a button 156, shown in Fig. 1F, which illustrates the top of device 100. In one embodiment, button 156 is configured as an on/off button used to control overall system power to device 100. In other embodiments, button 156 is configured to, in addition to or in lieu of controlling system power, control other aspects of device 100. In some embodiments, one or more of the buttons 144, 148, 152, and 156 are capable of supporting different user commands. By way of example, a normal press has a duration commonly of less than about 1 second and resembles a quick tap. A medium press has a duration commonly of 1 second or more but less than about 12 seconds. A long press has a duration commonly of about 12 seconds or more. The function of the buttons is normally specific to the application that is currently in focus on the respective display 110 and 114. In a telephone application for instance and depending on the particular button, a normal, medium, or long press can mean end call, increase in call volume, decrease in call volume, and toggle microphone mute. In a camera or video application for instance and depending on the particular button, a normal, medium, or long press can mean increase zoom, decrease zoom, and take photograph or record video.

[0095] There are also a number of hardware components within device 100. As illustrated in Fig. 1C, device 100 includes a speaker 160 and a microphone 164. Device 100 also includes a camera 168 (Fig. 1B). Additionally, device 100 includes two position sensors 172A and 172B, which are used to determine the relative positions of screens 104 and 108. In one embodiment, position sensors 172A and 172B are Hall effect sensors. However, in other embodiments other sensors can be used in addition to or in lieu of the Hall effect sensors. An accelerometer 176 may also be included as part of device 100 to determine the orientation of the device 100 and/or the orientation of screens 104 and 108.

Additional internal hardware components that may be included in device 100 are described below with respect to Fig. 2.

[0096] The overall design of device 100 allows it to provide additional functionality not available in other communication devices. Some of the functionality is based on the various positions and orientations that device 100 can have. As shown in Figs. 1B-1G, device 100 can be operated in an "open" position where screens 104 and 108 are juxtaposed. This position allows a large display area for displaying information to a user. When position sensors 172A and 172B determine that device 100 is in the open position, they can generate a signal that can be used to trigger different events such as displaying information on both screens 104 and 108. Additional events may be triggered if accelerometer 176 determines that device 100 is in a portrait position (Fig. 1B) as opposed to a landscape position (not shown).

[0097] In addition to the open position, device 100 may also have a "closed" position illustrated in Fig. 1H. Again, position sensors 172A and 172B can generate a signal indicating that device 100 is in the "closed" position. This can trigger an event that results in a change of displayed information on screen 104 and/or 108. For example, device 100 may be programmed to stop displaying information on one of the screens, e.g., screen 108, since a user can only view one screen at a time when device 100 is in the "closed" position. In other embodiments, the signal generated by position sensors 172A and 172B, indicating that the device 100 is in the "closed" position, can trigger device 100 to answer an incoming telephone call. The "closed" position can also be a preferred position for utilizing the device 100 as a mobile phone.

[0098] Device 100 can also be used in an "easel" position which is illustrated in Fig. 1I. In the "easel" position, screens 104 and 108 are angled with respect to each other and facing outward with the edges of screens 104 and 108 substantially horizontal. In this position, device 100 can be configured to display information on both screens 104 and 108 to allow two users to simultaneously interact with device 100. When device 100 is in the "easel" position, sensors 172A and 172B generate a signal indicating that the screens 104 and 108 are positioned at an angle to each other, and the accelerometer 176 can generate a signal indicating that device 100 has been placed so that the edge of screens 104 and 108 are substantially horizontal. The signals can then be used in combination to generate events that trigger changes in the display of information on screens 104 and 108.

[0099] Fig. 1J illustrates device 100 in a "modified easel" position. In the "modified easel" position, one of screens 104 or 108 is used as a stand and is faced down on the surface of an object such as a table. This position provides a convenient way for information to be displayed to a user in landscape orientation. Similar to the easel position, when device 100 is in the "modified easel" position, position sensors 172A and 172B generate a signal indicating that the screens 104 and 108 are positioned at an angle to each other. The accelerometer 176 would generate a signal indicating that device 100 has been positioned so that one of screens 104 and 108 is faced downwardly and is substantially horizontal. The signals can then be used to generate events that trigger changes in the display of information of screens 104 and 108. For example, information may not be displayed on the screen that is face down since a user cannot see the screen.

[00100] Transitional states are also possible. When the position sensors 172A and B and/or accelerometer indicate that the screens are being closed or folded (from open), a closing transitional state is recognized. Conversely when the position sensors 172A and B indicate that the screens are being opened or folded (from closed), an opening transitional state is recognized. The closing and opening transitional states are typically time-based, or have a maximum time duration from a sensed starting point. Normally, no user input is possible when one of the closing and opening states is in effect. In this manner, incidental user contact with a screen during the closing or opening function is not misinterpreted as user input. In embodiments, another transitional state is possible when the device 100 is closed. This additional transitional state allows the display to switch from one screen 104 to the second screen 108 when the device 100 is closed based on some user input, e.g., a double tap on the screen 110,114.

[00101] As can be appreciated, the description of device 100 is made for illustrative purposes only, and the embodiments are not limited to the specific mechanical features shown in Figs. 1A-1J and described above. In other embodiments, device 100 may include additional features, including one or more additional buttons, slots, display areas, hinges, and/or locking mechanisms. Additionally, in embodiments, the features described above may be located in different parts of device 100 and still provide similar functionality. Therefore, Figs. 1A-1J and the description provided above are nonlimiting.

[00102] Hardware Features:

[00103] Fig. 2 illustrates components of a device 100 in accordance with embodiments of the present disclosure. In general, the device 100 includes a primary screen 104 and a secondary screen 108. While the primary screen 104 and its components are normally enabled in both the opened and closed positions or states, the secondary screen 108 and its components are normally enabled in the opened state but disabled in the closed state. However, even when in the closed state a user or application triggered interrupt (such as in response to a phone application or camera application operation) can flip the active screen, or disable the primary screen 104 and enable the secondary screen 108, by a suitable command. Each screen 104, 108 can be touch sensitive and can include different operative areas. For example, a first operative area, within each touch sensitive screen 104 and 108, may comprise a touch sensitive display 110, 114. In general, the touch sensitive display 110, 114 may comprise a full color, touch sensitive display. A second area within each touch sensitive screen 104 and 108 may comprise a gesture capture region 120, 124. The gesture capture region 120, 124 may comprise an area or region that is outside of the touch sensitive display 110, 114 area, and that is capable of receiving input, for example in the form of gestures provided by a user. However, the gesture capture region 120, 124 does not include pixels that can perform a display function or capability.

[00104] A third region of the touch sensitive screens 104 and 108 may comprise a configurable area 112, 116. The configurable area 112, 116 is capable of receiving input and has display or limited display capabilities. In embodiments, the configurable area 112, 116 may present different input options to the user. For example, the configurable area 112, 116 may display buttons or other relatable items. Moreover, the identity of displayed buttons, or whether any buttons are displayed at all within the configurable area 112, 116 of a touch sensitive screen 104 or 108, may be determined from the context in which the device 100 is used and/or operated. In an exemplary embodiment, the touch sensitive screens 104 and 108 comprise liquid crystal display devices extending across at least those regions of the touch sensitive screens 104 and 108 that are capable of providing visual output to a user, and a capacitive input matrix over those regions of the touch sensitive screens 104 and 108 that are capable of receiving input from the user.

[00105] One or more display controllers 216a, 216b may be provided for controlling the operation of the touch sensitive screens 104 and 108, including input (touch sensing) and output (display) functions. In the exemplary embodiment illustrated in Fig. 2, a separate

touch screen controller 216a or 216b is provided for each touch screen 104 and 108. In accordance with alternate embodiments, a common or shared touch screen controller 216 may be used to control each of the included touch sensitive screens 104 and 108. In accordance with still other embodiments, the functions of a touch screen controller 216 may be incorporated into other components, such as a processor 204.

[00106] The processor 204 may comprise a general purpose programmable processor or controller for executing application programming or instructions. In accordance with at least some embodiments, the processor 204 may include multiple processor cores, and/or implement multiple virtual processors. In accordance with still other embodiments, the processor 204 may include multiple physical processors. As a particular example, the processor 204 may comprise a specially configured application specific integrated circuit (ASIC) or other integrated circuit, a digital signal processor, a controller, a hardwired electronic or logic circuit, a programmable logic device or gate array, a special purpose computer, or the like. The processor 204 generally functions to run programming code or instructions implementing various functions of the device 100.

[00107] A communication device 100 may also include memory 208 for use in connection with the execution of application programming or instructions by the processor 204, and for the temporary or long term storage of program instructions and/or data. As examples, the memory 208 may comprise RAM, DRAM, SDRAM, or other solid state memory. Alternatively or in addition, data storage 212 may be provided. Like the memory 208, the data storage 212 may comprise a solid state memory device or devices. Alternatively or in addition, the data storage 212 may comprise a hard disk drive or other random access memory.

[00108] In support of communications functions or capabilities, the device 100 can include a cellular telephony module 228. As examples, the cellular telephony module 228 can comprise a GSM, CDMA, FDMA and/or analog cellular telephony transceiver capable of supporting voice, multimedia and/or data transfers over a cellular network. Alternatively or in addition, the device 100 can include an additional or other wireless communications module 232. As examples, the other wireless communications module 232 can comprise a Wi-Fi, BLUETOOTH TM, WiMax, infrared, or other wireless communications link. The cellular telephony module 228 and the other wireless

communications module 232 can each be associated with a shared or a dedicated antenna 224.

[00109] A port interface 252 may be included. The port interface 252 may include proprietary or universal ports to support the interconnection of the device 100 to other devices or components, such as a dock, which may or may not include additional or different capabilities from those integral to the device 100. In addition to supporting an exchange of communication signals between the device 100 and another device or component, the docking port 136 and/or port interface 252 can support the supply of power to or from the device 100. The port interface 252 also comprises an intelligent element that comprises a docking module for controlling communications or other interactions between the device 100 and a connected device or component.

[00110] An input/output module 248 and associated ports may be included to support communications over wired networks or links, for example with other communication devices, server devices, and/or peripheral devices. Examples of an input/output module 248 include an Ethernet port, a Universal Serial Bus (USB) port, Institute of Electrical and Electronics Engineers (IEEE) 1394, or other interface.

[00111] An audio input/output interface/device(s) 244 can be included to provide analog audio to an interconnected speaker or other device, and to receive analog audio input from a connected microphone or other device. As an example, the audio input/output interface/device(s) 244 may comprise an associated amplifier and analog to digital converter. Alternatively or in addition, the device 100 can include an integrated audio input/output device 256 and/or an audio jack for interconnecting an external speaker or microphone. For example, an integrated speaker and an integrated microphone can be provided, to support near talk or speaker phone operations.

[00112] Hardware buttons 158 can be included for example for use in connection with certain control operations. Examples include a master power switch, volume control, etc., as described in conjunction with Figs. 1A through 1J. One or more image capture interfaces/devices 240, such as a camera, can be included for capturing still and/or video images. Alternatively or in addition, an image capture interface/device 240 can include a scanner or code reader. An image capture interface/device 240 can include or be associated with additional elements, such as a flash or other light source.

[00113] The device 100 can also include a global positioning system (GPS) receiver 236. In accordance with embodiments of the present invention, the GPS receiver 236 may further comprise a GPS module that is capable of providing absolute location information to other components of the device 100. An accelerometer(s) 176 may also be included. For example, in connection with the display of information to a user and/or other functions, a signal from the accelerometer 176 can be used to determine an orientation and/or format in which to display that information to the user.

[00114] Embodiments of the present invention can also include one or more position sensor(s) 172. The position sensor 172 can provide a signal indicating the position of the touch sensitive screens 104 and 108 relative to one another. This information can be provided as an input, for example to a user interface application, to determine an operating mode, characteristics of the touch sensitive displays 110, 114, and/or other device 100 operations. As examples, a screen position sensor 172 can comprise a series of Hall effect sensors, a multiple position switch, an optical switch, a Wheatstone bridge, a potentiometer, or other arrangement capable of providing a signal indicating of multiple relative positions the touch screens are in.

[00115] Communications between various components of the device 100 can be carried by one or more buses 222. In addition, power can be supplied to the components of the device 100 from a power source and/or power control module 260. The power control module 260 can, for example, include a battery, an AC to DC converter, power control logic, and/or ports for interconnecting the device 100 to an external source of power.

[00116] Device State:

[00117] Figs. 3A and 3B represent illustrative states of device 100. While a number of illustrative states are shown, and transitions from a first state to a second state, it is to be appreciated that the illustrative state diagram may not encompass all possible states and/or all possible transitions from a first state to a second state. As illustrated in Fig. 3, the various arrows between the states (illustrated by the state represented in the circle) represent a physical change that occurs to the device 100, that is detected by one or more of hardware and software, the detection triggering one or more of a hardware and/or software interrupt that is used to control and/or manage one or more functions of device 100.

[00118] As illustrated in Fig. 3A, there are twelve exemplary "physical" states: closed 304, transition 308 (or opening transitional state), easel 312, modified easel 316, open 320, inbound/outbound call or communication 324, image/video capture 328, transition 332 (or closing transitional state), landscape 340, docked 336, docked 344 and landscape 348. Next to each illustrative state is a representation of the physical state of the device 100 with the exception of states 324 and 328, where the state is generally symbolized by the international icon for a telephone and the icon for a camera, respectfully.

[00119] In state 304, the device is in a closed state with the device 100 generally oriented in the portrait direction with the primary screen 104 and the secondary screen 108 back-to-back in different planes (see Fig. 1H). From the closed state, the device 100 can enter, for example, docked state 336, where the device 100 is coupled with a docking station, docking cable, or in general docked or associated with one or more other devices or peripherals, or the landscape state 340, where the device 100 is generally oriented with the primary screen 104 facing the user, and the primary screen 104 and the secondary screen 108 being back-to-back.

[00120] In the closed state, the device can also move to a transitional state where the device remains closed but the display is moved from one screen 104 to another screen 108 based on a user input, e.g., a double tap on the screen 110, 114. Still another embodiment includes a bilateral state. In the bilateral state, the device remains closed, but a single application displays at least one window on both the first display 110 and the second display 114. The windows shown on the first and second display 110, 114 may be the same or different based on the application and the state of that application. For example, while acquiring an image with a camera, the device may display the view finder on the first display 110 and displays a preview for the photo subjects (full screen and mirrored left-to-right) on the second display 114.

[00121] In state 308, a transition state from the closed state 304 to the semi-open state or easel state 312, the device 100 is shown opening with the primary screen 104 and the secondary screen 108 being rotated around a point of axis coincidence with the hinge. Upon entering the easel state 312, the primary screen 104 and the secondary screen 108 are separated from one another such that, for example, the device 100 can sit in an easel-like configuration on a surface.

[0100] In state 316, known as the modified easel position, the device 100 has the primary screen 104 and the secondary screen 108 in a similar relative relationship to one another as in the easel state 312, with the difference being one of the primary screen 104 or the secondary screen 108 are placed on a surface as shown.

[0101] State 320 is the open state where the primary screen 104 and the secondary screen 108 are generally on the same plane. From the open state, the device 100 can transition to the docked state 344 or the open landscape state 348. In the open state 320, the primary screen 104 and the secondary screen 108 are generally in the portrait-like orientation while in landscaped state 348 the primary screen 104 and the secondary screen 108 are generally in a landscape-like orientation.

[0102] State 324 is illustrative of a communication state, such as when an inbound or outbound call is being received or placed, respectively, by the device 100. While not illustrated for clarity, it should be appreciated the device 100 can transition to the inbound/outbound call state 324 from any state illustrated in Fig. 3. In a similar manner, the image/video capture state 328 can be entered into from any other state in Fig. 3, with the image/video capture state 328 allowing the device 100 to take one or more images via a camera and/or videos with a video capture device 240.

[0103] Transition state 322 illustratively shows primary screen 104 and the secondary screen 108 being closed upon one another for entry into, for example, the closed state 304.

[0104] Fig. 3B illustrates, with reference to the key, the inputs that are received to detect a transition from a first state to a second state. In Fig. 3B, various combinations of states are shown with in general, a portion of the columns being directed toward a portrait state 352, a landscape state 356, and a portion of the rows being directed to portrait state 360 and landscape state 364.

[0105] In Fig. 3B, the Key indicates that "H" represents an input from one or more Hall Effect sensors, "A" represents an input from one or more accelerometers, "T" represents an input from a timer, "P" represents a communications trigger input and "I" represents an image and/or video capture request input. Thus, in the center portion 376 of the chart, an input, or combination of inputs, are shown that represent how the device 100 detects a transition from a first physical state to a second physical state.

[0106] As discussed, in the center portion of the chart 376, the inputs that are received enable the detection of a transition from, for example, a portrait open state to a landscape

easel state - shown in bold – "HAT." For this exemplary transition from the portrait open to the landscape easel state, a Hall Effect sensor ("H"), an accelerometer ("A") and a timer ("T") input may be needed. The timer input can be derived from, for example, a clock associated with the processor.

[0107] In addition to the portrait and landscape states, a docked state 368 is also shown that is triggered based on the receipt of a docking signal 372. As discussed above and in relation to Fig. 3, the docking signal can be triggered by the association of the device 100 with one or more other device 100s, accessories, peripherals, smart docks, or the like.

[0108] User Interaction:

[0109] Figs. 4A through 4H depict various graphical representations of gesture inputs that may be recognized by the screens 104, 108. The gestures may be performed not only by a user's body part, such as a digit, but also by other devices, such as a stylus, that may be sensed by the contact sensing portion(s) of a screen 104, 108. In general, gestures are interpreted differently, based on where the gestures are performed (either directly on the display 110, 114 or in the gesture capture region 120, 124). For example, gestures in the display 110,114 may be directed to a desktop or application, and gestures in the gesture capture region 120, 124 may be interpreted as for the system.

[0110] With reference to Figs. 4A-4H, a first type of gesture, a touch gesture 420, is substantially stationary on the screen 104,108 for a selected length of time. A circle 428 represents a touch or other contact type received at particular location of a contact sensing portion of the screen. The circle 428 may include a border 432, the thickness of which indicates a length of time that the contact is held substantially stationary at the contact location. For instance, a tap 420 (or short press) has a thinner border 432a than the border 432b for a long press 424 (or for a normal press). The long press 424 may involve a contact that remains substantially stationary on the screen for longer time period than that of a tap 420. As will be appreciated, differently defined gestures may be registered depending upon the length of time that the touch remains stationary prior to contact cessation or movement on the screen.

[0111] With reference to Fig. 4C, a drag gesture 400 on the screen 104,108 is an initial contact (represented by circle 428) with contact movement 436 in a selected direction. The initial contact 428 may remain stationary on the screen 104,108 for a certain amount of time represented by the border 432. The drag gesture typically requires the user to contact

an icon, window, or other displayed image at a first location followed by movement of the contact in a drag direction to a new second location desired for the selected displayed image. The contact movement need not be in a straight line but have any path of movement so long as the contact is substantially continuous from the first to the second locations.

[0112] With reference to Fig. 4D, a flick gesture 404 on the screen 104,108 is an initial contact (represented by circle 428) with truncated contact movement 436 (relative to a drag gesture) in a selected direction. In embodiments, a flick has a higher exit velocity for the last movement in the gesture compared to the drag gesture. The flick gesture can, for instance, be a finger snap following initial contact. Compared to a drag gesture, a flick gesture generally does not require continual contact with the screen 104,108 from the first location of a displayed image to a predetermined second location. The contacted displayed image is moved by the flick gesture in the direction of the flick gesture to the predetermined second location. Although both gestures commonly can move a displayed image from a first location to a second location, the temporal duration and distance of travel of the contact on the screen is generally less for a flick than for a drag gesture.

[0113] With reference to Fig. 4E, a pinch gesture 408 on the screen 104,108 is depicted. The pinch gesture 408 may be initiated by a first contact 428 to the screen 104,108 by, for example, a first digit and a second contact 428b to the screen 104,108 by, for example, a second digit. The first and second contacts 428a,b may be detected by a common contact sensing portion of a common screen 104,108, by different contact sensing portions of a common screen 104 or108, or by different contact sensing portions of different screens. The first contact 428a is held for a first amount of time, as represented by the border 432a, and the second contact 428b is held for a second amount of time, as represented by the border 432b. The first and second amounts of time are generally substantially the same, and the first and second contacts 428 a, b generally occur substantially simultaneously. The first and second contacts 428 a, b generally also include corresponding first and second contact movements 436 a, b, respectively. The first and second contact movements 436 a, b are generally in opposing directions. Stated another way, the first contact movement 436a is towards the second contact 436b, and the second contact movement 436b is towards the first contact 436a. More simply stated, the pinch gesture 408 may be accomplished by a user's digits touching the screen 104,108 in a pinching motion.

[0114] With reference to Fig. 4F, a spread gesture 410 on the screen 104,108 is depicted. The spread gesture 410 may be initiated by a first contact 428a to the screen 104,108 by, for example, a first digit and a second contact 428b to the screen 104,108 by, for example, a second digit. The first and second contacts 428a,b may be detected by a common contact sensing portion of a common screen 104,108, by different contact sensing portions of a common screen 104,108, or by different contact sensing portions of different screens. The first contact 428a is held for a first amount of time, as represented by the border 432a, and the second contact 428b is held for a second amount of time, as represented by the border 432b. The first and second amounts of time are generally substantially the same, and the first and second contacts 428 a, b generally occur substantially simultaneously. The first and second contacts 428 a, b generally also include corresponding first and second contact movements 436a, b, respectively. The first and second contact movements 436 a, b are generally in a common direction. Stated another way, the first and second contact movements 436 a, b are away from the first and second contacts 428a, b. More simply stated, the spread gesture 410 may be accomplished by a user's digits touching the screen 104,108 in a spreading motion.

[0115] The above gestures may be combined in any manner, such as those shown by Figs. 4G and 4H, to produce a determined functional result. For example, in Fig. 4G a tap gesture 420 is combined with a drag or flick gesture 412 in a direction away from the tap gesture 420. In Fig. 4H, a tap gesture 420 is combined with a drag or flick gesture 412 in a direction towards the tap gesture 420.

[0116] The functional result of receiving a gesture can vary depending on a number of factors, including a state of the device 100, display 110, 114, or screen 104, 108, a context associated with the gesture, or sensed location of the gesture. The state of the device commonly refers to one or more of a configuration of the device 100, a display orientation, and user and other inputs received by the device 100. Context commonly refers to one or more of the particular application(s) selected by the gesture and the portion(s) of the application currently executing, whether the application is a single- or multi-screen application, and whether the application is a multi-screen application displaying one or more windows in one or more screens or in one or more stacks. Sensed location of the gesture commonly refers to whether the sensed set(s) of gesture location coordinates are on a touch sensitive display 110, 114 or a gesture capture region 120, 124, whether the

sensed set(s) of gesture location coordinates are associated with a common or different display or screen 104,108, and/or what portion of the gesture capture region contains the sensed set(s) of gesture location coordinates.

[0117] A tap, when received by an a touch sensitive display 110, 114, can be used, for instance, to select an icon to initiate or terminate execution of a corresponding application, to maximize or minimize a window, to reorder windows in a stack, and to provide user input such as by keyboard display or other displayed image. A drag, when received by a touch sensitive display 110, 114, can be used, for instance, to relocate an icon or window to a desired location within a display, to reorder a stack on a display, or to span both displays (such that the selected window occupies a portion of each display simultaneously). A flick, when received by a touch sensitive display 110, 114 or a gesture capture region 120, 124, can be used to relocate a window from a first display to a second display or to span both displays (such that the selected window occupies a portion of each display simultaneously). Unlike the drag gesture, however, the flick gesture is generally not used to move the displayed image to a specific user-selected location but to a default location that is not configurable by the user.

[0118] The pinch gesture, when received by a touch sensitive display 110, 114 or a gesture capture region 120, 124, can be used to minimize or otherwise increase the displayed area or size of a window (typically when received entirely by a common display), to switch windows displayed at the top of the stack on each display to the top of the stack of the other display (typically when received by different displays or screens), or to display an application manager (a "pop-up window" that displays the windows in the stack). The spread gesture, when received by a touch sensitive display 110, 114 or a gesture capture region 120, 124, can be used to maximize or otherwise decrease the displayed area or size of a window, to switch windows displayed at the top of the stack on each display to the top of the stack of the other display (typically when received by different displays or screens), or to display an application manager (typically when received by an off-screen gesture capture region on the same or different screens).

[0119] The combined gestures of Fig. 4G, when received by a common display capture region in a common display or screen 104,108, can be used to hold a first window stack location in a first stack constant for a display receiving the gesture while reordering a second window stack location in a second window stack to include a window in the

display receiving the gesture. The combined gestures of Fig. 4H, when received by different display capture regions in a common display or screen 104,108 or in different displays or screens, can be used to hold a first window stack location in a first window stack constant for a display receiving the tap part of the gesture while reordering a second window stack location in a second window stack to include a window in the display receiving the flick or drag gesture. Although specific gestures and gesture capture regions in the preceding examples have been associated with corresponding sets of functional results, it is to be appreciated that these associations can be redefined in any manner to produce differing associations between gestures and/or gesture capture regions and/or functional results.

[0120] Firmware and Software:

[0121] The memory 508 may store and the processor 504 may execute one or more software components. These components can include at least one operating system (OS) 516, an application manager 562, a desktop 566, and/or one or more applications 564a and/or 564b from an application store 560. The OS 516 can include a framework 520, one or more frame buffers 548, one or more drivers 512, previously described in conjunction with Fig. 2, and/or a kernel 518. The OS 516 can be any software, consisting of programs and data, which manages computer hardware resources and provides common services for the execution of various applications 564. The OS 516 can be any operating system and, at least in some embodiments, dedicated to mobile devices, including, but not limited to, Linux, ANDROID TM, iPhone OS (IOS TM), WINDOWS PHONE 7 TM, etc. The OS 516 is operable to provide functionality to the phone by executing one or more operations, as described herein.

[0122] The applications 564 can be any higher level software that executes particular functionality for the user. Applications 564 can include programs such as email clients, web browsers, texting applications, games, media players, office suites, etc. The applications 564 can be stored in an application store 560, which may represent any memory or data storage, and the management software associated therewith, for storing the applications 564. Once executed, the applications 564 may be run in a different area of memory 508.

[0123] The framework 520 may be any software or data that allows the multiple tasks running on the device to interact. In embodiments, at least portions of the framework 520

and the discrete components described hereinafter may be considered part of the OS 516 or an application 564. However, these portions will be described as part of the framework 520, but those components are not so limited. The framework 520 can include, but is not limited to, a Multi-Display Management (MDM) module 524, a Surface Cache module 528, a Window Management module 532, an Input Management module 536, a Task Management module 540, an Application Model Manager 542, a Display Controller, one or more frame buffers 548, a task stack 552, one or more window stacks 550 (which is a logical arrangement of windows and/or desktops in a display area), and/or an event buffer 556.

[0124] The MDM module 524 includes one or more modules that are operable to manage the display of applications or other data on the screens of the device. An embodiment of the MDM module 524 is described in conjunction with Fig. 5B. In embodiments, the MDM module 524 receives inputs from the other OS 516 components, such as, the drivers 512, and from the applications 564 to determine continually the state of the device 100. The inputs assist the MDM module 524 in determining how to configure and allocate the displays according to the application's preferences and requirements, and the user's actions. Once a determination for display configurations is made, the MDM module 524 can bind the applications 564 to a display. The configuration may then be provided to one or more other components to generate a window with a display.

[0125] The Surface Cache module 528 includes any memory or storage and the software associated therewith to store or cache one or more images of windows. A series of active and/or non-active windows (or other display objects, such as, a desktop display) can be associated with each display. An active window (or other display object) is currently displayed. A non-active windows (or other display objects) were opened and, at some time, displayed but are now not displayed. To enhance the user experience, before a window transitions from an active state to an inactive state, a "screen shot" of a last generated image of the window (or other display object) can be stored. The Surface Cache module 528 may be operable to store a bitmap of the last active image of a window (or other display object) not currently displayed. Thus, the Surface Cache module 528 stores the images of non-active windows (or other display objects) in a data store.

[0126] In embodiments, the Window Management module 532 is operable to manage the windows (or other display objects) that are active or not active on each of the displays. The Window Management module 532, based on information from the MDM module 524, the OS 516, or other components, determines when a window (or other display object) is visible or not active. The Window Management module 532 may then put a non-visible window (or other display object) in a "not active state" and, in conjunction with the Task Management module Task Management 540 suspends the application's operation. Further, the Window Management module 532 may assign, through collaborative interaction with the MDM module 524, a display identifier to the window (or other display object) or manage one or more other items of data associated with the window (or other display object). The Window Management module 532 may also provide the stored information to the application 564, the Task Management module 540, or other components interacting with or associated with the window (or other display object). The Window Management module 532 can also associate an input task with a window based on window focus and display coordinates within the motion space.

[0127] The Input Management module 536 is operable to manage events that occur with the device. An event is any input into the window environment, for example, a user interface interactions with a user. The Input Management module 536 receives the events and logically stores the events in an event buffer 556. Events can include such user interface interactions as a "down event," which occurs when a screen 104, 108 receives a touch signal from a user, a "move event," which occurs when the screen 104, 108 determines that a user's finger is moving across a screen(s), an "up event, which occurs when the screen 104, 108 determines that the user has stopped touching the screen 104, 108, etc. These events are received, stored, and forwarded to other modules by the Input Management module 536. The Input Management module 536 may also map screen inputs to a motion space which is the culmination of all physical and virtual display available on the device.

[0128] The motion space is a virtualized space that includes all touch sensitive displays 110,114 "tiled" together to mimic the physical dimensions of the device 100. For example, when the device 100 is unfolded, the motion space size may be 960x800, which may be the number of pixels in the combined display area for both touch sensitive displays 110, 114. If a user touches on a first touch sensitive display 110 on location (40, 40), a full

screen window can receive touch event with location (40, 40). If a user touches on a second touch sensitive display 114, with location (40, 40), the full screen window can receive touch event with location (520, 40), because the second touch sensitive display 114 is on the right side of the first touch sensitive display 110, so the device 100 can offset the touch by the first touch sensitive display's 110 width, which is 480 pixels. When a hardware event occurs with location info from a driver 512, the framework 520 can up-scale the physical location to the motion space because the location of the event may be different based on the device orientation and state. The motion space may be as described in U.S. Patent Application No. 13/187,026, filed July 20, 2011, entitled "Systems and Methods for Receiving Gesture Inputs Spanning Multiple Input Devices," which is hereby incorporated by reference in its entirety for all that it teaches and for all purposes.

[0129] A task can be an application and a sub-task can be an application component that provides a window with which users can interact to do something, such as dial the phone, take a photo, send an email, or view a map. Each task may be given a window in which to draw a user interface. The window typically fills a display (for example, touch sensitive display 110,114), but may be smaller than the display 110,114 and float on top of other windows. An application usually consists of multiple sub-tasks that are loosely bound to each other. Typically, one task in an application is specified as the "main" task, which is presented to the user when launching the application for the first time. Each task can then start another task or sub-task to perform different actions.

[0130] The Task Management module 540 is operable to manage the operation of one or more applications 564 that may be executed by the device. Thus, the Task Management module 540 can receive signals to launch, suspend, terminate, etc. an application or application sub-tasks stored in the application store 560. The Task Management module 540 may then instantiate one or more tasks or sub-tasks of the application 564 to begin operation of the application 564. Further, the Task Management Module 540 may launch, suspend, or terminate a task or sub-task as a result of user input or as a result of a signal from a collaborating framework 520 component. The Task Management Module 540 is responsible for managing the lifecycle of applications (tasks and sub-task) from when the application is launched to when the application is terminated.

[0131] The processing of the Task Management Module 540 is facilitated by a task stack 552, which is a logical structure associated with the Task Management Module 540.

The task stack 552 maintains the state of all tasks and sub-tasks on the device 100. When some component of the operating system 516 requires a task or sub-task to transition in its lifecycle, the OS 516 component can notify the Task Management Module 540. The Task Management Module 540 may then locate the task or sub-task, using identification information, in the task stack 552, and send a signal to the task or sub-task indicating what kind of lifecycle transition the task needs to execute. Informing the task or sub-task of the transition allows the task or sub-task to prepare for the lifecycle state transition. The Task Management Module 540 can then execute the state transition for the task or sub-task. In embodiments, the state transition may entail triggering the OS kernel 518 to terminate the task when termination is required.

[0132] Further, the Task Management module 540 may suspend the application 564 based on information from the Window Management Module 532. Suspending the application 564 may maintain application data in memory but may limit or stop the application 564 from rendering a window or user interface. Once the application becomes active again, the Task Management module 540 can again trigger the application to render its user interface. In embodiments, if a task is suspended, the task may save the task's state in case the task is terminated. In the suspended state, the application task may not receive input because the application window is not visible to the user.

[0133] The frame buffer 548 is a logical structure(s) used to render the user interface. The frame buffer 548 can be created and destroyed by the OS kernel 518. However, the Display Controller 544 can write the image data, for the visible windows, into the frame buffer 548. A frame buffer 548 can be associated with one screen or multiple screens. The association of a frame buffer 548 with a screen can be controlled dynamically by interaction with the OS kernel 518. A composite display may be created by associating multiple screens with a single frame buffer 548. Graphical data used to render an application's window user interface may then be written to the single frame buffer 548, for the composite display, which is output to the multiple screens 104,108. The Display Controller 544 can direct an application's user interface to a portion of the frame buffer 548 that is mapped to a particular display 110,114, thus, displaying the user interface on only one screen 104 or 108. The Display Controller 544 can extend the control over user interfaces to multiple applications, controlling the user interfaces for as many displays as are associated with a frame buffer 548 or a portion thereof. This approach compensates

for the multiple physical screens 104,108 that are in use by the software component above the Display Controller 544.

[0134] The Application Manager 562 is an application that provides a presentation layer for the window environment. Thus, the Application Manager 562 provides the graphical model for rendering by the Task Management Module 540. Likewise, the Desktop 566 provides the presentation layer for the Application Store 560. Thus, the desktop provides a graphical model of a surface having selectable application icons for the Applications 564 in the Application Store 560 that can be provided to the Window Management Module 556 for rendering.

[0135] Further, the framework can include an Application Model Manager (AMM) 542. The Application Manager 562 may interface with the AMM 542. In embodiments, the AMM 542 receives state change information from the device 100 regarding the state of applications (which are running or suspended). The AMM 542 can associate bit map images from the Surface Cache Module 528 to the tasks that are alive (running or suspended). Further, the AMM 542 can convert the logical window stack maintained in the Task Manager Module 540 to a linear ("film strip" or "deck of cards") organization that the user perceives when the using the off gesture capture area 120 to sort through the windows. Further, the AMM 542 may provide a list of executing applications to the Application Manager 562.

[0136] An embodiment of the MDM module 524 is shown in Fig. 5B. The MDM module 524 is operable to determine the state of the environment for the device, including, but not limited to, the orientation of the device, whether the device 100 is opened or closed, what applications 564 are executing, how the applications 564 are to be displayed, what actions the user is conducting, the tasks being displayed, etc. To configure the display, the MDM module 524 interprets these environmental factors and determines a display configuration, as described in conjunction with Figs. 6A-6J. Then, the MDM module 524 can bind the applications 564 or other device components to the displays. The configuration may then be sent to the Display Controller 544 and/or the other components within the OS 516 to generate the display. The MDM module 524 can include one or more of, but is not limited to, a Display Configuration Module 568, a Preferences Module 572, a Device State Module 574, a Gesture Module 576, a Requirements Module 580, an Event Module 584, and/or a Binding Module 588.

[0137] The Display Configuration Module 568 determines the layout for the display. In embodiments, the Display Configuration Module 568 can determine the environmental factors. The environmental factors may be received from one or more other MDM modules 524 or from other sources. The Display Configuration Module 568 can then determine from the list of factors the best configuration for the display. Some embodiments of the possible configurations and the factors associated therewith are described in conjunction with Figs. 6A-6F.

[0138] The Preferences Module 572 is operable to determine display preferences for an application 564 or other component. For example, an application can have a preference for Single or Dual displays. The Preferences Module 572 can determine an application's display preference (e.g., by inspecting the application's preference settings) and may allow the application 564 to change to a mode (e.g., single screen, dual screen, max, etc.) if the device 100 is in a state that can accommodate the preferred mode. However, some user interface policies may disallow a mode even if the mode is available. As the configuration of the device changes, the preferences may be reviewed to determine if a better display configuration can be achieved for an application 564.

[0139] The Device State Module 574 is operable to determine or receive the state of the device. The state of the device can be as described in conjunction with Figs. 3A and 3B. The state of the device can be used by the Display Configuration Module 568 to determine the configuration for the display. As such, the Device State Module 574 may receive inputs and interpret the state of the device. The state information is then provided to the Display Configuration Module 568.

[0140] The Gesture Module 576 is shown as part of the MDM module 524, but, in embodiments, the Gesture module 576 may be a separate Framework 520 component that is separate from the MDM module 524. In embodiments, the Gesture Module 576 is operable to determine if the user is conducting any actions on any part of the user interface. In alternative embodiments, the Gesture Module 576 receives user interface actions from the configurable area 112,116 only. The Gesture Module 576 can receive touch events that occur on the configurable area 112,116 (or possibly other user interface areas) by way of the Input Management Module 536 and may interpret the touch events (using direction, speed, distance, duration, and various other parameters) to determine what kind of gesture the user is performing. When a gesture is interpreted, the Gesture

Module 576 can initiate the processing of the gesture and, by collaborating with other Framework 520 components, can manage the required window animation. The Gesture Module 576 collaborates with the Application Model Manager 542 to collect state information with respect to which applications are running (active or paused) and the order in which applications must appear when a user gesture is performed. The Gesture Module 576 may also receive references to bitmaps (from the Surface Cache Module 528) and live windows so that when a gesture occurs it can instruct the Display Controller 544 how to move the window(s) across the display 110,114. Thus, suspended applications may appear to be running when those windows are moved across the display 110,114.

[0141] Further, the Gesture Module 576 can receive task information either from the Task Manage Module 540 or the Input Management module 536. The gestures may be as defined in conjunction with Figs. 4A through 4H. For example, moving a window causes the display to render a series of display frames that illustrate the window moving. The gesture associated with such user interface interaction can be received and interpreted by the Gesture Module 576. The information about the user gesture is then sent to the Task Management Module 540 to modify the display binding of the task.

[0142] The Requirements Module 580, similar to the Preferences Module 572, is operable to determine display requirements for an application 564 or other component. An application can have a set display requirement that must be observed. Some applications require a particular display orientation. For example, the application "Angry Birds" can only be displayed in landscape orientation. This type of display requirement can be determined or received, by the Requirements Module 580. As the orientation of the device changes, the Requirements Module 580 can reassert the display requirements for the application 564. The Display Configuration Module 568 can generate a display configuration that is in accordance with the application display requirements, as provided by the Requirements Module 580.

[0143] The Event Module 584, similar to the Gesture Module 576, is operable to determine one or more events occurring with an application or other component that can affect the user interface. Thus, the Event Module 584 can receive event information either from the event buffer 556 or the Task Management module 540. These events can change how the tasks are bound to the displays. The Event Module 584 can collect state change information from other Framework 520 components and act upon that state change

information. In an example, when the phone is opened or closed or when an orientation change has occurred, a new message may be rendered in a secondary screen. The state change based on the event can be received and interpreted by the Event Module 584. The information about the events then may be sent to the Display Configuration Module 568 to modify the configuration of the display.

[0144] The Binding Module 588 is operable to bind the applications 564 or the other components to the configuration determined by the Display Configuration Module 568. A binding associates, in memory, the display configuration for each application with the display and mode of the application. Thus, the Binding Module 588 can associate an application with a display configuration for the application (e.g. landscape, portrait, multi-screen, etc.). Then, the Binding Module 588 may assign a display identifier to the display. The display identifier associated the application with a particular display of the device 100. This binding is then stored and provided to the Display Controller 544, the other components of the OS 516, or other components to properly render the display. The binding is dynamic and can change or be updated based on configuration changes associated with events, gestures, state changes, application preferences or requirements, etc.

[0145] User Interface Configurations:

[0146] With reference now to Figs. 6A-J, various types of output configurations made possible by the device 100 will be described hereinafter.

[0147] Figs. 6A and 6B depict two different output configurations of the device 100 being in a first state. Specifically, Fig. 6A depicts the device 100 being in a closed portrait state 304 where the data is displayed on the primary screen 104. In this example, the device 100 displays data via the touch sensitive display 110 in a first portrait configuration 604. As can be appreciated, the first portrait configuration 604 may only display a desktop or operating system home screen. Alternatively, one or more windows may be presented in a portrait orientation while the device 100 is displaying data in the first portrait configuration 604.

[0148] Fig. 6B depicts the device 100 still being in the closed portrait state 304, but instead data is displayed on the secondary screen 108. In this example, the device 100 displays data via the touch sensitive display 114 in a second portrait configuration 608.

[0149] It may be possible to display similar or different data in either the first or second portrait configuration 604, 608. It may also be possible to transition between the first portrait configuration 604 and second portrait configuration 608 by providing the device 100 a user gesture (e.g., a double tap gesture), a menu selection, or other means. Other suitable gestures may also be employed to transition between configurations. Furthermore, it may also be possible to transition the device 100 from the first or second portrait configuration 604, 608 to any other configuration described herein depending upon which state the device 100 is moved.

[0150] An alternative output configuration may be accommodated by the device 100 being in a second state. Specifically, Fig. 6C depicts a third portrait configuration where data is displayed simultaneously on both the primary screen 104 and the secondary screen 108. The third portrait configuration may be referred to as a Dual-Portrait (PD) output configuration. In the PD output configuration, the touch sensitive display 110 of the primary screen 104 depicts data in the first portrait configuration 604 while the touch sensitive display 114 of the secondary screen 108 depicts data in the second portrait configuration 608. The simultaneous presentation of the first portrait configuration 604 and the second portrait configuration 608 may occur when the device 100 is in an open portrait state 320. In this configuration, the device 100 may display one application window in one display 110 or 114, two application windows (one in each display 110 and 114), one application window and one desktop, or one desktop. Other configurations may be possible. It should be appreciated that it may also be possible to transition the device 100 from the simultaneous display of configurations 604, 608 to any other configuration described herein depending upon which state the device 100 is moved. Furthermore, while in this state, an application's display preference may place the device into bilateral mode, in which both displays are active to display different windows in the same application. For example, a Camera application may display a viewfinder and controls on one side, while the other side displays a mirrored preview that can be seen by the photo subjects. Games involving simultaneous play by two players may also take advantage of bilateral mode.

[0151] Figs. 6D and 6E depicts two further output configurations of the device 100 being in a third state. Specifically, Fig. 6D depicts the device 100 being in a closed landscape state 340 where the data is displayed on the primary screen 104. In this

example, the device 100 displays data via the touch sensitive display 110 in a first landscape configuration 612. Much like the other configurations described herein, the first landscape configuration 612 may display a desktop, a home screen, one or more windows displaying application data, or the like.

[0152] Fig. 6E depicts the device 100 still being in the closed landscape state 340, but instead data is displayed on the secondary screen 108. In this example, the device 100 displays data via the touch sensitive display 114 in a second landscape configuration 616. It may be possible to display similar or different data in either the first or second portrait configuration 612, 616. It may also be possible to transition between the first landscape configuration 612 and second landscape configuration 616 by providing the device 100 with one or both of a twist and tap gesture or a flip and slide gesture. Other suitable gestures may also be employed to transition between configurations. Furthermore, it may also be possible to transition the device 100 from the first or second landscape configuration 612, 616 to any other configuration described herein depending upon which state the device 100 is moved.

[0153] Fig. 6F depicts a third landscape configuration where data is displayed simultaneously on both the primary screen 104 and the secondary screen 108. The third landscape configuration may be referred to as a Dual-Landscape (LD) output configuration. In the LD output configuration, the touch sensitive display 110 of the primary screen 104 depicts data in the first landscape configuration 612 while the touch sensitive display 114 of the secondary screen 108 depicts data in the second landscape configuration 616. The simultaneous presentation of the first landscape configuration 612 and the second landscape configuration 616 may occur when the device 100 is in an open landscape state 340. It should be appreciated that it may also be possible to transition the device 100 from the simultaneous display of configurations 612, 616 to any other configuration described herein depending upon which state the device 100 is moved.

[0154] Figs. 6G and 6H depict two views of a device 100 being in yet another state. Specifically, the device 100 is depicted as being in an easel state 312. Fig. 6G shows that a first easel output configuration 618 may be displayed on the touch sensitive display 110. Fig. 6H shows that a second easel output configuration 620 may be displayed on the touch sensitive display 114. The device 100 may be configured to depict either the first easel output configuration 618 or the second easel output configuration 620 individually.

Alternatively, both the easel output configurations 618, 620 may be presented simultaneously. In some embodiments, the easel output configurations 618, 620 may be similar or identical to the landscape output configurations 612, 616. The device 100 may also be configured to display one or both of the easel output configurations 618, 620 while in a modified easel state 316. It should be appreciated that simultaneous utilization of the easel output configurations 618, 620 may facilitate two-person games (e.g., Battleship®, chess, checkers, etc.), multi-user conferences where two or more users share the same device 100, and other applications. As can be appreciated, it may also be possible to transition the device 100 from the display of one or both configurations 618, 620 to any other configuration described herein depending upon which state the device 100 is moved.

[0155] Fig. 6I depicts yet another output configuration that may be accommodated while the device 100 is in an open portrait state 320. Specifically, the device 100 may be configured to present a single continuous image across both touch sensitive displays 110, 114 in a portrait configuration referred to herein as a Portrait-Max (PMax) configuration 624. In this configuration, data (e.g., a single image, application, window, icon, video, etc.) may be split and displayed partially on one of the touch sensitive displays while the other portion of the data is displayed on the other touch sensitive display. The Pmax configuration 624 may facilitate a larger display and/or better resolution for displaying a particular image on the device 100. Similar to other output configurations, it may be possible to transition the device 100 from the Pmax configuration 624 to any other output configuration described herein depending upon which state the device 100 is moved.

[0156] Fig. 6J depicts still another output configuration that may be accommodated while the device 100 is in an open landscape state 348. Specifically, the device 100 may be configured to present a single continuous image across both touch sensitive displays 110, 114 in a landscape configuration referred to herein as a Landscape-Max (LMax) configuration 628. In this configuration, data (e.g., a single image, application, window, icon, video, etc.) may be split and displayed partially on one of the touch sensitive displays while the other portion of the data is displayed on the other touch sensitive display. The Lmax configuration 628 may facilitate a larger display and/or better resolution for displaying a particular image on the device 100. Similar to other output configurations, it may be possible to transition the device 100 from the Lmax

configuration 628 to any other output configuration described herein depending upon which state the device 100 is moved.

[0157] The device 100 manages desktops and/or windows with at least one window stack 700, 728, as shown in Figs. 7A and 7B. A window stack 700, 728 is a logical arrangement of active and/or inactive windows for a multi-screen device. For example, the window stack 700, 728 may be logically similar to a deck of cards, where one or more windows or desktops are arranged in order, as shown in Figs. 7A and 7B. An active window is a window that is currently being displayed on at least one of the touch sensitive displays 110, 114. For example, windows 104 and 108 are active windows and are displayed on touch sensitive displays 110 and 114. An inactive window is a window that was opened and displayed but is now "behind" an active window and not being displayed. In embodiments, an inactive window may be for an application that is suspended, and thus, the window is not displaying active content. For example, windows 712, 716, 720, and 724 are inactive windows.

[0158] A window stack 700, 728 may have various arrangements or organizational structures. In the embodiment shown in Fig. 7A, the device 100 includes a first stack 760 associated with a first touch sensitive display 110 and a second stack associated with a second touch sensitive display 114. Thus, each touch sensitive display 110, 114 can have an associated window stack 760, 764. These two window stacks 760, 764 may have different numbers of windows arranged in the respective stacks 760, 764. Further, the two window stacks 760, 764 can also be identified differently and managed separately. Thus, the first window stack 760 can be arranged in order from a first window 704 to a next window 720 to a last window 724 and finally to a desktop 722, which, in embodiments, is at the "bottom" of the window stack 760. In embodiments, the desktop 722 is not always at the "bottom" as application windows can be arranged in the window stack below the desktop 722, and the desktop 722 can be brought to the "top" of a stack over other windows during a desktop reveal. Likewise, the second stack 764 can be arranged from a first window 708 to a next window 712 to a last window 716, and finally to a desktop 718, which, in embodiments, is a single desktop area, with desktop 722, under all the windows in both window stack 760 and window stack 764. A logical data structure for managing the two window stacks 760, 764 may be as described in conjunction with Fig. 8.

[0159] Another arrangement for a window stack 728 is shown in Fig. 7B. In this embodiment, there is a single window stack 728 for both touch sensitive displays 110, 114. Thus, the window stack 728 is arranged from a desktop 758 to a first window 744 to a last window 756. A window can be arranged in a position among all windows without an association to a specific touch sensitive display 110, 114. In this embodiment, a window is in the order of windows. Further, at least one window is identified as being active. For example, a single window may be rendered in two portions 732 and 736 that are displayed on the first touch sensitive screen 110 and the second touch sensitive screen 114. The single window may only occupy a single position in the window stack 728 although it is displayed on both displays 110, 114.

[0160] Yet another arrangement of a window stack 760 is shown in Figs. 7C through 7E. The window stack 760 is shown in three "elevation" views. In Fig. 7C, the top of the window stack 760 is shown. Two sides of the window stack 760 are shown in Figs. 7D and 7E. In this embodiment, the window stack 760 resembles a stack of bricks. The windows are stacked on each other. Looking from the top of the window stack 760 in Fig, 7C, only the top most windows in the window stack 760 are seen in different portions of the composite display 764. The composite display 764 represents a logical model for the entire display area of the device 100, which can include touch sensitive display 110 and touch sensitive display 114. A desktop 786 or a window can occupy part or all of the composite display 764.

[0161] In the embodiment shown, the desktop 786 is the lowest display or "brick" in the window stack 760. Thereupon, window 1 782, window 2 782, window 3 768, and window 4 770 are layered. Window 1 782, window 3 768, window 2 782, and window 4 770 only occupy a portion of the composite display 764. Thus, another part of the stack 760 includes window 8 774 and windows 5 through 7 shown in section 790. Only the top window in any portion of the composite display 764 is actually rendered and displayed. Thus, as shown in the top view in Fig. 7C, window 4 770, window 8 774, and window 3 768 are displayed as being at the top of the display in different portions of the window stack 760. A window can be dimensioned to occupy only a portion of the composite display 760 to "reveal" windows lower in the window stack 760. For example, window 3 768 is lower in the stack than both window 4 770 and window 8 774 but is still displayed.

A logical data structure to manage the window stack can be as described in conjunction with Fig. 8.

[0162] When a new window is opened, the newly activated window is generally positioned at the top of the stack. However, where and how the window is positioned within the stack can be a function of the orientation of the device 100, the context of what programs, functions, software, etc. are being executed on the device 100, how the stack is positioned when the new window is opened, etc. To insert the window in the stack, the position in the stack for the window is determined and the touch sensitive display 110, 114 to which the window is associated may also be determined. With this information, a logical data structure for the window can be created and stored. When user interface or other events or tasks change the arrangement of windows, the window stack(s) can be changed to reflect the change in arrangement. It should be noted that these same concepts described above can be used to manage the one or more desktops for the device 100.

[0163] A logical data structure 800 for managing the arrangement of windows or desktops in a window stack is shown in Fig. 8. The logical data structure 800 can be any data structure used to store data whether an object, record, file, etc. The logical data structure 800 can be stored in any type of database or data storage system, regardless of protocol or standard. In embodiments, the logical data structure 800 includes one or more portions, fields, attributes, etc. that store data in a logical arrangement that allows for easy storage and retrieval of the information. Hereinafter, these one or more portions, fields, attributes, etc. shall be described simply as fields. The fields can store data for a window identifier 804, dimensions 808, a stack position identifier 812, a display identifier 816, and/or an active indicator 820. Each window in a window stack can have an associated logical data structure 800. While only a single logical data structure 800 is shown in Fig. 8, there may be more or fewer logical data structures 800 used with a window stack (based on the number of windows or desktops in the stack), as represented by ellipses 824. Further, there may be more or fewer fields than those shown in Fig. 8, as represented by ellipses 828.

[0164] A window identifier 804 can include any identifier (ID) that uniquely identifies the associated window in relation to other windows in the window stack. The window identifier 804 can be a globally unique identifier (GUID), a numeric ID, an alphanumeric ID, or other type of identifier. In embodiments, the window identifier 804 can be one,

two, or any number of digits based on the number of windows that can be opened. In alternative embodiments, the size of the window identifier 804 may change based on the number of windows opened. While the window is open, the window identifier 804 may be static and remain unchanged.

[0165] Dimensions 808 can include dimensions for a window in the composite display 760. For example, the dimensions 808 can include coordinates for two or more corners of the window or may include one coordinate and dimensions for the width and height of the window. These dimensions 808 can delineate what portion of the composite display 760 the window may occupy, which may the entire composite display 760 or only part of composite display 760. For example, window 4 770 may have dimensions 880 that indicate that the window 770 will occupy only part of the display area for composite display 760, as shown in Figs. 7c through 7E. As windows are moved or inserted in the window stack, the dimensions 808 may change.

[0166] A stack position identifier 812 can be any identifier that can identify the position in the stack for the window or may be inferred from the window's control record within a data structure, such as a list or a stack. The stack position identifier 812 can be a GUID, a numeric ID, an alphanumeric ID, or other type of identifier. Each window or desktop can include a stack position identifier 812. For example, as shown in Fig. 7A, window 1 704 in stack 1 760 can have a stack position identifier 812 of 1 identifying that window 704 is the first window in the stack 760 and the active window. Similarly, window 6 724 can have a stack position identifier 812 of 3 representing that window 724 is the third window in the stack 760. Window 2 708 can also have a stack position identifier 812 of 1 representing that window 708 is the first window in the second stack 764. As shown in Fig. 7B, window 1 744 can have a stack position identifier 812 of 1, window 3, rendered in portions 732 and 736, can have a stack position identifier 812 of 3, and window 6 756 can have a stack position identifier 812 of 6. Thus, depending on the type of stack, the stack position identifier 812 can represent a window's location in the stack.

[0167] A display identifier 816 can identify that the window or desktop is associated with a particular display, such as the first display 110 or the second display 114, or the composite display 760 composed of both displays. While this display identifier 816 may not be needed for a multi-stack system, as shown in Fig. 7A, the display identifier 816 can indicate whether a window in the serial stack of Fig. 7B is displayed on a particular

display. Thus, window 3 may have two portions 732 and 736 in Fig. 7B. The first portion 732 may have a display identifier 816 for the first display while the second portion 736 may have a display identifier 816 for the second display 114. However, in alternative embodiments, the window may have two display identifier 816 that represent that the window is displayed on both of the displays 110, 114, or a display identifier 816 identifying the composite display. In another alternate embodiment, the window may have a single display identifier 816 to represent that the window is displayed on both of the displays 110, 114.

[0168] Similar to the display identifier 816, an active indicator 820 may not be needed with the dual stack system of Fig. 7A, as the window in stack position 1 is active and displayed. In the system of Fig. 7B, the active indicator 820 can indicate which window(s) in the stack is being displayed. Thus, window 3 may have two portions 732 and 736 in Fig. 7. The first portion 732 may have an active indicator 820 while the second portion 736 may also have an active indicator 820. However, in alternative embodiments, window 3 may have a single active indicator 820. The active indicator 820 can be a simple flag or bit that represents that the window is active or displayed.

[0169] An embodiment of a method 900 for creating a window stack is shown in Fig. 9. While a general order for the steps of the method 900 is shown in Fig. 9. Generally, the method 900 starts with a start operation 904 and ends with an end operation 928. The method 900 can include more or fewer steps or can arrange the order of the steps differently than those shown in Fig. 9. The method 900 can be executed as a set of computer-executable instructions executed by a computer system and encoded or stored on a computer readable medium. Hereinafter, the method 900 shall be explained with reference to the systems, components, modules, software, data structures, user interfaces, etc. described in conjunction with Figs. 1-8.

[0170] A multi-screen device 100 can receive activation of a window, in step 908. In embodiments, the multi-screen device 100 can receive activation of a window by receiving an input from the touch sensitive display 110 or 114, the configurable area 112 or 116, a gesture capture region 120 or 124, or some other hardware sensor operable to receive user interface inputs. The processor may execute the Task Management Module 540 may receive the input. The Task Management Module 540 can interpret the input as requesting an application task to be executed that will open a window in the window stack.

[0171] In embodiments, the Task Management Module 540 places the user interface interaction in the task stack 552 to be acted upon by the Display Configuration Module 568 of the Multi-Display Management Module 524. Further, the Task Management Module 540 waits for information from the Multi-Display Management Module 524 to send instructions to the Window Management Module 532 to create the window in the window stack.

[0172] The Multi-Display Management Module 524, upon receiving instruction from the Task Management Module 540, determines to which touch portion of the composite display 760, the newly activated window should be associated, in step 912. For example, window 4 770 is associated with the a portion of the composite display 764 In embodiments, the device state module 574 of the Multi-Display Management Module 524 may determine how the device is oriented or in what state the device is in, e.g., open, closed, portrait, etc. Further, the preferences module 572 and/or requirements module 580 may determine how the window is to be displayed. The gesture module 576 may determine the user's intentions about how the window is to be opened based on the type of gesture and the location of where the gesture is made.

[0173] The Display Configuration Module 568 may use the input from these modules and evaluate the current window stack 760 to determine the best place and the best dimensions, based on a visibility algorithm, to open the window. Thus, the Display Configuration Module 568 determines the best place to put the window at the top of the window stack 760, in step 916. The visibility algorithm, in embodiments, determines for all portions of the composite display, which windows are at the top of the stack. For example, the visibility algorithm determines that window 3 768, window 4 770, and window 8 774 are at the top of the stack 760 as viewed in Figs. 7C through 7E. Upon determining where to open the window, the Display Configuration Module 568 can assign a display identifier 816 and possibly dimensions 808 to the window. The display identifier 816 and dimensions 808 can then be sent back to the Task Management Module 540. The Task Management Module 540 may then assign the window a stack position identifier 812 indicating the windows position at the top of the window stack.

[0174] In embodiments, the Task Management Module 540 sends the window stack information and instructions to render the window to the Window Management Module 532. The Window Management Module 532 and the Task Management Module 540 can

create the logical data structure 800, in step 924. Both the Task Management Module 540 and the Window Management Module 532 may create and manage copies of the window stack. These copies of the window stack can be synchronized or kept similar through communications between the Window Management Module 532 and the Task Management Module 540. Thus, the Window Management Module 532 and the Task Management Module 540, based on the information determined by the Multi-Display Management Module 524, can assign dimensions 808, a stack position identifier 812 (e.g., window 1 782, window 4 770, etc.), a display identifier 816 (e.g., touch sensitive display 1 110, touch sensitive display 2 114, composite display identifier, etc,), and an active indicator 820, which is generally always set when the window is at the "top" of the stack. The logical data structure 800 may then be stored by both the Window Management Module 532 and the Task Management Module 540. Further, the Window Management Module 532 and the Task Management Module 540may thereinafter manage the window stack and the logical data structure(s) 800.

[0175] As noted above, the graphical representations of the desktops and running applications in the pages can conceptually be thought of as one or more combinations of virtual "stacks" comprising separate viewable windows that run respective desktops or applications. These stacks of pages can be created, deleted, shuffled, and/or moved by a user or by an output from the MDM class 524, similar to a user manipulating the virtual playing cards of a deck stack.

[0176] The concept of stacks disclosed herein may also be applied to desktops available on the device 100. In other words, a desktop virtual stack may be used for the desktops which can be displayed by the device 100 and an application virtual stack may be used for the applications which can be displayed by the device 100. Specifically, when a desktop is revealed it may be divided into multiple pages for display on multiple screens of the device 100. These pages may be manipulated in their own desktop virtual stack, or stacks, separate from the application virtual stacks and/or other virtual stacks. This separation of stacks allows for greater user flexibility in navigating through different applications or desktops by creating an intuitive interface dependent on the data displayed to the screens 104, 108. However, it is also anticipated that these stacks could be combined to form a single virtual stack. Further, pages in each stack may move together as if the pages in a

stack are virtually connected. Therefore, a single position move of a page in one stack correspondingly moves all of the pages in that stack by one position.

[0177] Figure 10A depicts graphical representations of embodiments of a device 100 in an open portrait state where the primary screen is also visible as indicated by a solid line. The primary screen 104 shows a first page 1004 running a single page application (A5), and the secondary display 108 shows a first page 1006 running another single page application (A6). Fig. 10A also shows a user input gesture 1002, namely, a spread gesture which is executed in order to launch the application manager window. Referring to Figure 10B, the device 100 is shown after the spread gesture 1002 is executed from Figure 10A thereby revealing the application manager "pop up" window or tray 1008. Within this window 1008, depictions are shown for all of the other applications and desktops that are running at the time, but are not displayed on the primary or secondary screens. These depictions of each of the applications/desktops are shown by the icons 1010, each icon representing a separate application or desktop. The application manager window or tray 1008 also illustrates each of the other running applications/desktops in their respective order within the window stacks.

[0178] One convention that is contemplated in the preferred embodiment of the present invention for displaying an order of a window stack when the window 1008 is activated is to depict each of the other applications/desktops with their respective icons 1010 placed next to one another in a linear format from left to right, and in which the right-most icon 1010 represents an application/desktop which is the top or lead application/desktop within the management window 1008, and the left-most icon 1010 represents an application/desktop which is the lowest or bottom application/desktop in the window stack. The icons representing the application/windows between the left and right-most icons are depicted in their respective orders as compared to the top and bottom application/desktops. Therefore, in the example of Fig. 10B, application A1 is the bottom application, A2 is the next to the bottom application, application A3 is the next application in the stack above application A2, and application A4 represents the top or lead application in the group of applications illustrated in the window 1008. Fig. 10B also illustrates the manager window 1008 as being separated by line 1014. This line represents a division of the manager window 1008 and accordingly that both the primary and secondary screens have their own separate window stack. The application/desktops

displayed on the primary and secondary screens are above or on top of the right-most applications/desktops displayed in the manager's window 1008. Therefore, applications A5 and A6 are the top applications in their respective window stacks. It is also contemplated that the manager window 1008 could represent a single stack common to both the primary and secondary screens. Thus, applications A5 andA6 would still be considered as applications residing above all of the others, but that one of the applications A5 or A6 would be the leading or very top application, and the other being the next application in the stack. Either application could be designated the leading or very top application in the single window stack according to the present invention. To designate a manager window with just one window stack for both screens, the line 1014 could be removed in accordance with yet another embodiment of the invention.

[0179] The shapes, sizes, and arrangements of the icons 1010 can be modified in order to provide the most convenient user interface enabling the user to view all of the running applications and desktops. In the example of Fig. 10B, the particular arrangement and size of the icons 1010 only allow three to be shown per screen. However, it is contemplated that the icons shown in Fig. 10B could be smaller or of different shapes enabling additional icons to be displayed if other applications were running. In the event there are more than three additional applications/desktops running on any of the screens, the bottommost non-displayed application/desktop would appear in the manager window if a user rearranged the window stack, and another application/desktop would become non-displayed.

[0180] Fig. 10B also illustrates another user gesture 1012, in the form of a drag gesture that allows the user to move the position of the selected application to the screen where the drag gesture is directed. Therefore referring to Fig. 10C, the state of the device 100 is shown after execution of the drag gesture 1012, and the application A5 is moved from the primary screen 104 to the secondary screen 108. Additionally, since the application A3 was the right-most application in the group of non-displayed applications/ desktops within the manager window 1008, this results in display of the application A3 on the primary screen 104. Accordingly the drag gesture, executed in Fig. 10B results in the display of the application A3 and movement of the application A5 from the primary screen to the secondary screen. The execution of the gesture 1012 causes the manager window 1008 to close.

[0181] Fig. 10C also illustrates another spread gesture 1002 that is executed to re-launch the application manager 1008. Accordingly, Fig. 10D illustrates the revised order for the application/desktops within the application manager 1008. More specifically, Fig. 10D shows application A3 on page 1016, application A5 is shown on page 1004, application A1 is shown on the window stack for the primary screen 104 as well as application A2, and applications A6 and A4 are shown on the window stack for the secondary screen 108. It is further noted with respect to Fig. 10D that the previously displayed application A6, after being "moved off" the secondary screen 108 by the movement of the application A5, now becomes the bottommost application in the window stack for the secondary screen 108.

[0182] While specific conventions are shown with respect to how the applications/desktops are arranged in an order within a particular window stack, it shall be understood that other conventions could be applied to include other methods of illustrating the particular order of each of the applications/desktops within a window stacks. For example, instead of the right to left order within the window 1008 depicting a top to bottom arrangement of the applications or desktops, a left to right convention could be used indicating a top to bottom arrangement of the window/application. Further for example, the icons 1010 could appear in a manager window or tray that was oriented vertically on one of the screens, and the icons 1010 could appear in a column arrangement with the top or uppermost applications/desktop indicating the top applications/desktop in the stack.

[0183] Figures 10E-10H illustrate yet another embodiment of the present invention showing other ways in which a window stack may be manipulated by use of the application manager module/tool. Referring first to Fig. 10E, the device 100 in a first state shows page 1016 with application A3 and page 1006 with application A6. A spread gesture 1002 is executed. Now referring to Fig. 10F, the application manager window or tray 1008 is displayed and the user has executed yet another user gesture, such as a tap gesture 1020on a selected application/desktop. Tapping of one of the icons 1010 in this manner results in that particular application/desktop appearing on the screen from which the gesture was executed. Fig. 10F also illustrates the application A3 in the manager window1008 in dotted lines to indicate that that application will be moved from the primary screen 104 to a non-displayed application within the manager window 1008.

Referring now to Fig. 10G, the tap gesture 1020 causes the manager window 1008 to close and the application A1 to appear on the primary screen 104 within another window 1022. Fig. 10G also illustrates the user executing another spread gesture 1002 in order to re-launch the application manager window. Therefore, referring to Fig. 10H a new order is illustrated for the window stack in which application A3 has been returned to the bottom of the window stack of the primary screen, and applications A4 and A5 still remain within the window stack of the secondary screen in the same order.

[0184] Fig. 10I -10M illustrate yet another preferred embodiment of the present invention. Referring first to Fig. 10I, the device 100 is shown after the user has launched the application manager, thereby displaying the window 1008 and the respective icons 1010. In the example of Fig. 10I, the user executes a drag gesture within the window 1008 in order to move the position of the selected application A5. More specifically, the user in Fig. 10I wishes to move the application A5 as the last application in the window stack for the secondary screen to the window stack for the primary screen 104.

[0185] Referring to Fig. 10J, it illustrates the application A5 as being moved to the stack within the primary screen and Fig. 10J also illustrates yet another drag gesture 1020 in which the user moves the application A4 into the window stack for the primary screen 104.

[0186] Now referring to Fig. 10K, this Figure illustrates no applications/desktops in the manager window for the secondary screen. For the primary screen, the applications A2, A5 and A6 are shown in the manager window 1008, but not the application A1. The application A1 is not illustrated because the particular size of the icons only allows a total of three applications/desktops to be displayed in the manager window per screen. Therefore, the application A1 is still running, but is simply not displayed in the manager window 1008. As mentioned above, if it were desired to also illustrate the application A1, the size, shape, or arrangement of the icons 1010 could be adjusted in order that all running applications/desktops could be illustrated within the application manager window 1008. Finally, Fig. 10K also illustrates the user executing a tap gesture 1020, which is the command to move the application A5 in a displayed position on the primary screen 104.

[0187] Now referring to Fig. 10L, the tap gesture 1020 closes the application manager window 1008, the application A5 is displayed on page 1004 on the primary screen 104, and application A6 in window 1006 remains displayed on the secondary screen 1008.

[0188] Fig. 10L also illustrates yet another spread gesture 1002, and in response as shown in Fig. 10M, the application manager window 1008 is again displayed, along with each of the icons 1010 illustrating the updated order of the window stack. Accordingly, applications A5 and A6 are displayed on the primary and secondary screens, respectively, no applications appear in the window stack for the secondary screen, and applications A1, A3, and A4 are illustrated in the manager window 1008 of the primary screen.

[0189] Now referring to Fig. 11, a simplified flow chart 1050 is provided to explain a basic sequence of events when a user launches the application manager in order to change the window stack(s) order. At the start 1052, the user determines the desired application/desktops to run, and then launches the applications, shown at block 1054. The user then must determine whether the apps are in the desired stack order, shown at block 1056. If the user believes the applications are in the desired stack order, the analysis is complete, shown at end block 1070. If the applications are not in the desired order, the user then executes a gesture to initiate the app manager, shown at block 1058. The user then views the applications as they are represented by the icons 1010 within the manager window 1008, and the user also determines a desired order, shown at block 1060. The user then executes the appropriate gesture to move a first selected application to a new position, shown at block 1062. In response to the executed gesture, the stack order changes, shown at block 1064. As discussed above with reference to Figs. 10A-10M, a user can execute a number of different gestures to move the applications into the desired order, such as a drag gesture on the screens 104 and 108, or tap or drag gestures within the application manager window 1008. At block 1068, The user then re-evaluates the applications in the stack and determines whether they are in the desired stack order after execution of the first move gesture, shown at block 1068. If the applications are now in the desired stack order, then the analysis is complete. If the applications are not yet in the desired stack order, the user then executes a second gesture to move another application to another location within the stack. The gestures are repeated until the user is satisfied with the desired window stack(s) order(s).

[0190] Based on the description of Figs. 10A-10M, it is evident that the display of windows in a window stack can be selectively changed by simple gesture interactions, thereby making desktops and multiple applications available to the user with minimum effort. Each screen has a logical representation of the windows that have been opened and

displayed on the screen. The logical representation is the stack that is made up of one or more windows that is arranged in an order that can be selected and changed by the user. By opening of the window manager tool, the windows can be indexed or shifted to place the window stack in a desired order as well as to move windows between separate window stacks, such as separate window stacks that may be present on both the primary and secondary screens. The ordered arrangement of the stack maintains the logical construction of the stack intact when the user navigates the window stack(s). The user can open the manager window 1008 repeatedly in order to continue to change the order of the window stack(s), and each subsequent gesture executed is based on the present order of the window stack(s) prior to executing the subsequent gesture(s). Therefore, a logical order is maintained for each window stack at all times. The use of the icons 1010 within the window manager provides a very convenient visual representation of the running applications/desktops. Therefore the device operates in a very intuitive way for the user to easily manage multiple desktops and applications within a dual screen environment.

[0191] The exemplary systems and methods of this disclosure have been described in relation to various preferred embodiments. However, to avoid unnecessarily obscuring the present disclosure, the preceding description omits a number of known structures and devices. This omission is not to be construed as a limitation of the scopes of the claims. Specific details are set forth to provide an understanding of the present disclosure. It should however be appreciated that the present disclosure may be practiced in a variety of ways beyond the specific detail set forth herein.

[0192] Furthermore, while the exemplary aspects, embodiments, and/or configurations illustrated herein show the various components of the system collocated, certain components of the system can be located remotely, at distant portions of a distributed network, such as a LAN and/or the Internet, or within a dedicated system. Thus, it should be appreciated, that the components of the system can be combined in to one or more devices, or collocated on a particular node of a distributed network, such as an analog and/or digital telecommunications network, a packet-switch network, or a circuit-switched network. It will be appreciated from the preceding description, and for reasons of computational efficiency, that the components of the system can be arranged at any location within a distributed network of components without affecting the operation of the system. For example, the various components can be located in a switch such as a PBX

and media server, gateway, in one or more communications devices, at one or more users' premises, or some combination thereof. Similarly, one or more functional portions of the system could be distributed between a telecommunications device(s) and an associated computing device.

[0193] Furthermore, it should be appreciated that the various links connecting the elements can be wired or wireless links, or any combination thereof, or any other known or later developed element(s) that is capable of supplying and/or communicating data to and from the connected elements. These wired or wireless links can also be secure links and may be capable of communicating encrypted information. Transmission media used as links, for example, can be any suitable carrier for electrical signals, including coaxial cables, copper wire and fiber optics, and may take the form of acoustic or light waves, such as those generated during radio-wave and infra-red data communications.

[0194] Also, while the flowcharts have been discussed and illustrated in relation to a particular sequence of events, it should be appreciated that changes, additions, and omissions to this sequence can occur without materially affecting the operation of the disclosed embodiments, configuration, and aspects.

[0195] A number of variations and modifications of the disclosure can be used. It would be possible to provide for some features of the disclosure without providing others.

[0196] In yet another embodiment, the systems and methods of this disclosure can be implemented in conjunction with a special purpose computer, a programmed microprocessor or microcontroller and peripheral integrated circuit element(s), an ASIC or other integrated circuit, a digital signal processor, a hard-wired electronic or logic circuit such as discrete element circuit, a programmable logic device or gate array such as PLD, PLA, FPGA, PAL, special purpose computer, any comparable means, or the like. In general, any device(s) or means capable of implementing the methodology illustrated herein can be used to implement the various aspects of this disclosure. Exemplary hardware that can be used for the disclosed embodiments, configurations and aspects includes computers, handheld devices, telephones (e.g., cellular, Internet enabled, digital, analog, hybrids, and others), and other hardware known in the art. Some of these devices include processors (e.g., a single or multiple microprocessors), memory, nonvolatile storage, input devices, and output devices. Furthermore, alternative software implementations including, but not limited to, distributed processing or component/object

distributed processing, parallel processing, or virtual machine processing can also be constructed to implement the methods described herein.

[0197] In yet another embodiment, the disclosed methods may be readily implemented in conjunction with software using object or object-oriented software development environments that provide portable source code that can be used on a variety of computer or workstation platforms. Alternatively, the disclosed system may be implemented partially or fully in hardware using standard logic circuits or VLSI design. Whether software or hardware is used to implement the systems in accordance with this disclosure is dependent on the speed and/or efficiency requirements of the system, the particular function, and the particular software or hardware systems or microprocessor or microcomputer systems being utilized.

[0198] In yet another embodiment, the disclosed methods may be partially implemented in software that can be stored on a storage medium, executed on programmed general-purpose computer with the cooperation of a controller and memory, a special purpose computer, a microprocessor, or the like. In these instances, the systems and methods of this disclosure can be implemented as program embedded on personal computer such as an applet, JAVA® or CGI script, as a resource residing on a server or computer workstation, as a routine embedded in a dedicated measurement system, system component, or the like. The system can also be implemented by physically incorporating the system and/or method into a software and/or hardware system.

[0199] Although the present disclosure describes components and functions implemented in the aspects, embodiments, and/or configurations with reference to particular standards and protocols, the aspects, embodiments, and/or configurations are not limited to such standards and protocols. Other similar standards and protocols not mentioned herein are in existence and are considered to be included in the present disclosure. Moreover, the standards and protocols mentioned herein and other similar standards and protocols not mentioned herein are periodically superseded by faster or more effective equivalents having essentially the same functions. Such replacement standards and protocols having the same functions are considered equivalents included in the present disclosure.

[0200] The present disclosure, in various aspects, embodiments, and/or configurations, includes components, methods, processes, systems and/or apparatus substantially as

depicted and described herein, including various aspects, embodiments, configurations embodiments, subcombinations, and/or subsets thereof. Those of skill in the art will understand how to make and use the disclosed aspects, embodiments, and/or configurations after understanding the present disclosure. The present disclosure, in various aspects, embodiments, and/or configurations, includes providing devices and processes in the absence of items not depicted and/or described herein or in various aspects, embodiments, and/or configurations hereof, including in the absence of such items as may have been used in previous devices or processes, e.g., for improving performance, achieving ease and\or reducing cost of implementation.

[0201] The foregoing discussion has been presented for purposes of illustration and description. The foregoing is not intended to limit the disclosure to the form or forms disclosed herein. In the foregoing Detailed Description for example, various features of the disclosure are grouped together in one or more aspects, embodiments, and/or configurations for the purpose of streamlining the disclosure. The features of the aspects, embodiments, and/or configurations of the disclosure may be combined in alternate aspects, embodiments, and/or configurations other than those discussed above. This method of disclosure is not to be interpreted as reflecting an intention that the claims require more features than are expressly recited in each claim. Rather, as the following claims reflect, inventive aspects lie in less than all features of a single foregoing disclosed aspect, embodiment, and/or configuration. Thus, the following claims are hereby incorporated into this Detailed Description, with each claim standing on its own as a separate preferred embodiment of the disclosure.

[0202] Moreover, though the description has included description of one or more aspects, embodiments, and/or configurations and certain variations and modifications, other variations, combinations, and modifications are within the scope of the disclosure, e.g., as may be within the skill and knowledge of those in the art, after understanding the present disclosure. It is intended to obtain rights which include alternative aspects, embodiments, and/or configurations to the extent permitted, including alternate, interchangeable and/or equivalent structures, functions, ranges or steps to those claimed, whether or not such alternate, interchangeable and/or equivalent structures, functions, ranges or steps are disclosed herein, and without intending to publicly dedicate any patentable subject matter.

What is claimed is:

1. A method of displaying a plurality of desktops and/or applications, each having at least one window, on a multi-screen device, comprising:

receiving, by a processor, a first input that represents an instruction to reveal one of a desktop or application on a first display of the multi-screen device;

selecting, by a processor, a first desktop or application to display on the first display;

receiving, by a processor , a second input that represents an instruction to reveal one of a desktop or application on a second display of the multi-screen device;

selecting, by a processor, a second desktop or application to display on the second display;

displaying, by a processor, the selected first and second desktops or applications on the first and second displays;

receiving, by a processor, a third input that represents an instruction to launch an application manager feature;

displaying, by a processor, the applications or desktops on the first and second displays, and displaying a management window showing all other applications or desktops currently running on the device;

determining, by a processor, a desired order for a window stack comprising the first and second applications or desktops, and said other applications or desktops;

receiving, by a processor, a fourth input that represents an instruction to selectively move one of said first and second applications or desktops, or said other applications or desktops, within the window stack to a different position; and

displaying, by a processor, the window stack in a new order in response to said fourth input.

2. The method of claim 1, wherein the fourth input is a user gesture comprising at least one of a flick, tap, long hold, or drag gesture.

3. The method of claim 1, wherein the third input is a user gesture comprising a spread gesture, and wherein the spread gesture is executed on off-screen areas of said first and seconds displays with one finger of a user placed on one screen, and another finger of the user placed on the other screen.

4. The method of claim 1, wherein said receiving a fourth input step is executed a number of times until the window stack is displayed in the desired order.

5. The method of claim 1, wherein at least one management window appears on said first and second displays, and the other applications or desktops are arranged linearly within the management window from left to right, and the left to right order of the other applications or desktops corresponds to an order of the other applications or desktops within the window stack.

6. The method of claim 5, wherein the rightmost appearing one of the other applications or desktops is the top application or desktop in the group of the other applications or desktops, and the leftmost appearing one of the other applications or desktops is the bottom application or desktop in the group of the other applications or desktops.

7. The method of claim 1, wherein the first or second applications or desktops are the first two applications or desktops within the window stack.

8. The method of claim 1, wherein an order of the first or second applications or desktops within the window stack can be changed by executing a user input gesture, comprising at least one of a flick or drag gesture, on the first and second displays.

9. The method of claim 5, wherein an order of the other applications or desktops within the window stack can be changed by executing a user input gesture, comprising at least one of a flick or drag gesture executed on a selected one of the other applications or desktops within the management window to thereby move the selected one to another position within the window stack.

10. The method of claim 9, wherein a flick or drag gesture executed in a left direction causes the selected one to move down in the stack a predetermined number of positions, and a flick or drag gesture executed in a right direction causes the selected one to move up in the stack a predetermined number of positions.

11. The method of claim 5, wherein separate management windows appear on said first and second displays denoting a first window stack for the first display and a second window stack for the second display, and wherein the other applications or

desktops are arranged linearly within each management window from left to right, and the left to right order of the other applications or desktops correspond to an order of the other applications or desktops within the window stack for each corresponding display.

12. The method of claim 5, wherein a selected one of the other applications or desktops is moved to a new position displayed on the first or second displays by executing another user input gesture on the selected one, the another user input gesture comprising at least one of a tap or long hold gesture.

13. A non-transitory computer-readable medium having stored thereon instructions that cause a computing system to execute a method, the instructions comprising:

instructions configured to receive a first predetermined input that represents an instruction to determine and reveal a first desktop or application on a first display of the multi-screen device;

instructions configured to receive a second predetermined input that represents an instruction to determine and reveal a second desktop or application on a second display of the multi-screen device;

instructions configured to respond to the first and second predetermined inputs with outputs that cause the first desktop or application to be displayed on the first display and cause the second desktop or application to be displayed on the second display

instructions configured to receive a third predetermined input that represents an instruction to launch an application manager feature;

instructions configured to respond to the third predetermined input that causes a display of a management window showing all other applications or desktops currently running;

instructions configured to receive a fourth predetermined input that represents an instruction to selectively move one of said first and second applications or desktops, or said other applications or desktops, within the window stack to a different position;

instructions configured to respond to the fourth predetermined input that causes displaying of the window stack in a new order.

14. The computer-readable medium of claim 13, wherein said fourth predetermined input step is executed a number of times by a user until the window stack is displayed in the desired order.

15. The computer-readable medium of claim 13 wherein said management window appears on said first and second displays, and the other applications or desktops are arranged linearly within the management window from left to right, and the left to right order of the other applications or desktops corresponds to an order of the other applications or desktops within the window stack.

16. The computer-readable medium of claim 13, wherein the first or second applications or desktops are the first two applications or desktops within the window stack, and an order of the first or second applications or desktops within the window stack can be changed by executing a user input gesture, comprising at least one of a flick or drag gesture, on the first and second displays.

17. A multi-screen user device, comprising:

a first display including a first display area;

a second display including a second display area;

a first user input gesture area of the first display;

a second user input gesture area of the second display, wherein the first and second user input gesture areas are configured to accept input from a user.

a computer-readable medium having instructions stored thereon that include:

a first set of instructions configured to determine a number and identity of desktops or applications selected to be run by a user;

a second set of instructions configured to determine, based on the number and identity of the desktops or applications running, a window stack comprising a logical representation of the desktops and applications within an ordered group whereby a user can selectively move a selected desktop or application to either a visible position on another display or a non-visible position; and

a third set of instructions responsive to a gesture made by the user that represents an instruction to launch an application manager feature, wherein the applications or desktops are displayed on the first and second displays, and a management window is displayed showing all other applications or desktops currently running;

a fourth set of instructions responsive to one or more gestures made by the user that represent an instruction to selectively move one of said first and second applications or desktops, or said other applications or desktops, within the window stack to a different position, and

wherein the window stack is displayed in a new order in response to said fourth set of instructions.

18. The device of claim 17, wherein said fourth set of instructions are executed a number of times until the window stack is displayed in the desired order.

19. The device of claim 17, wherein at least one management window appears on said first and second displays, and the other applications or desktops are arranged linearly within the management window from left to right, and the left to right order of the other applications or desktops corresponds to an order of the other applications or desktops within the window stack

20. The device of claim 19, wherein separate management windows appear on said first and second displays denoting a first window stack for the first display and a second window stack for the second display, and wherein the other applications or desktops are arranged linearly within each management window from left to right, and the left to right order of the other applications or desktops correspond to an order of the other applications or desktops within the window stack for each corresponding display.

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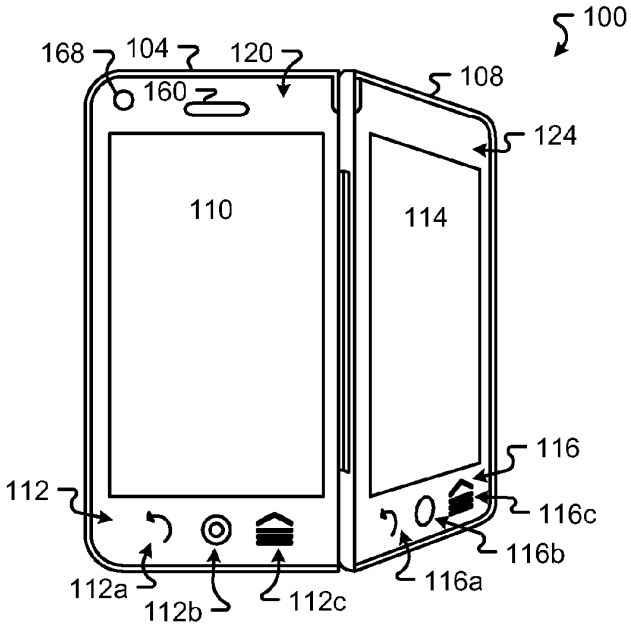


FIG. 1A

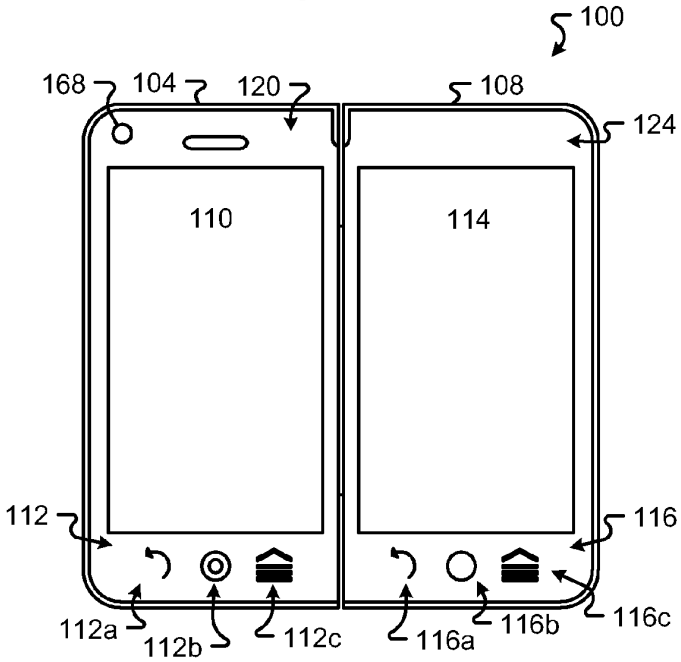


FIG. 1B

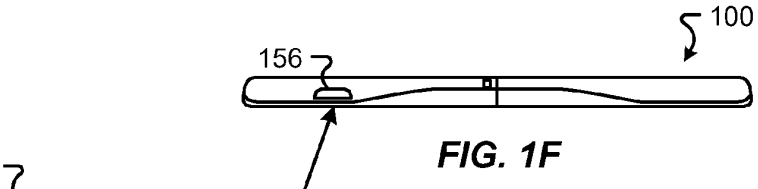


FIG. 1F

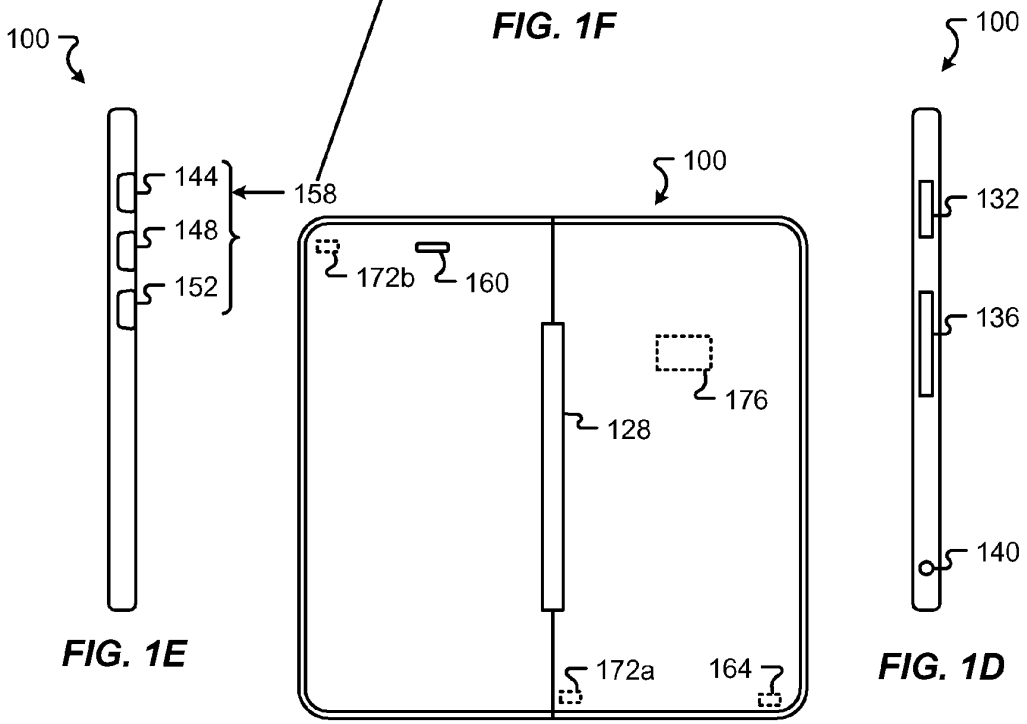


FIG. 1E

FIG. 1C

FIG. 1D

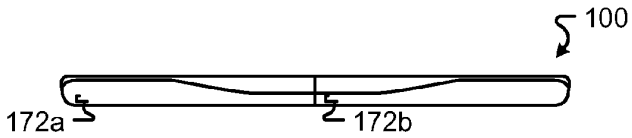


FIG. 1G

SHEET 3/27

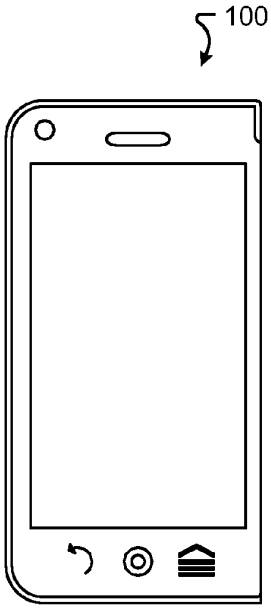


FIG. 1H

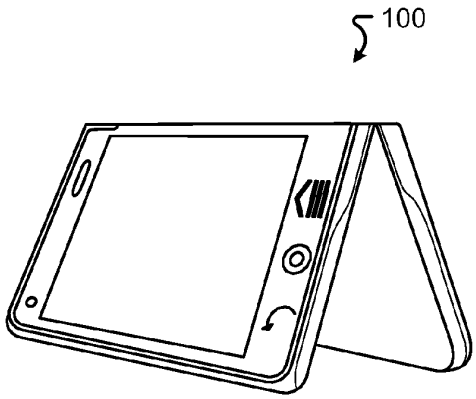


FIG. 1I

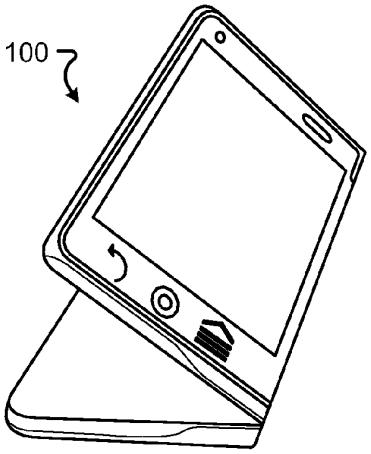


FIG. 1J

SHEET 4/27

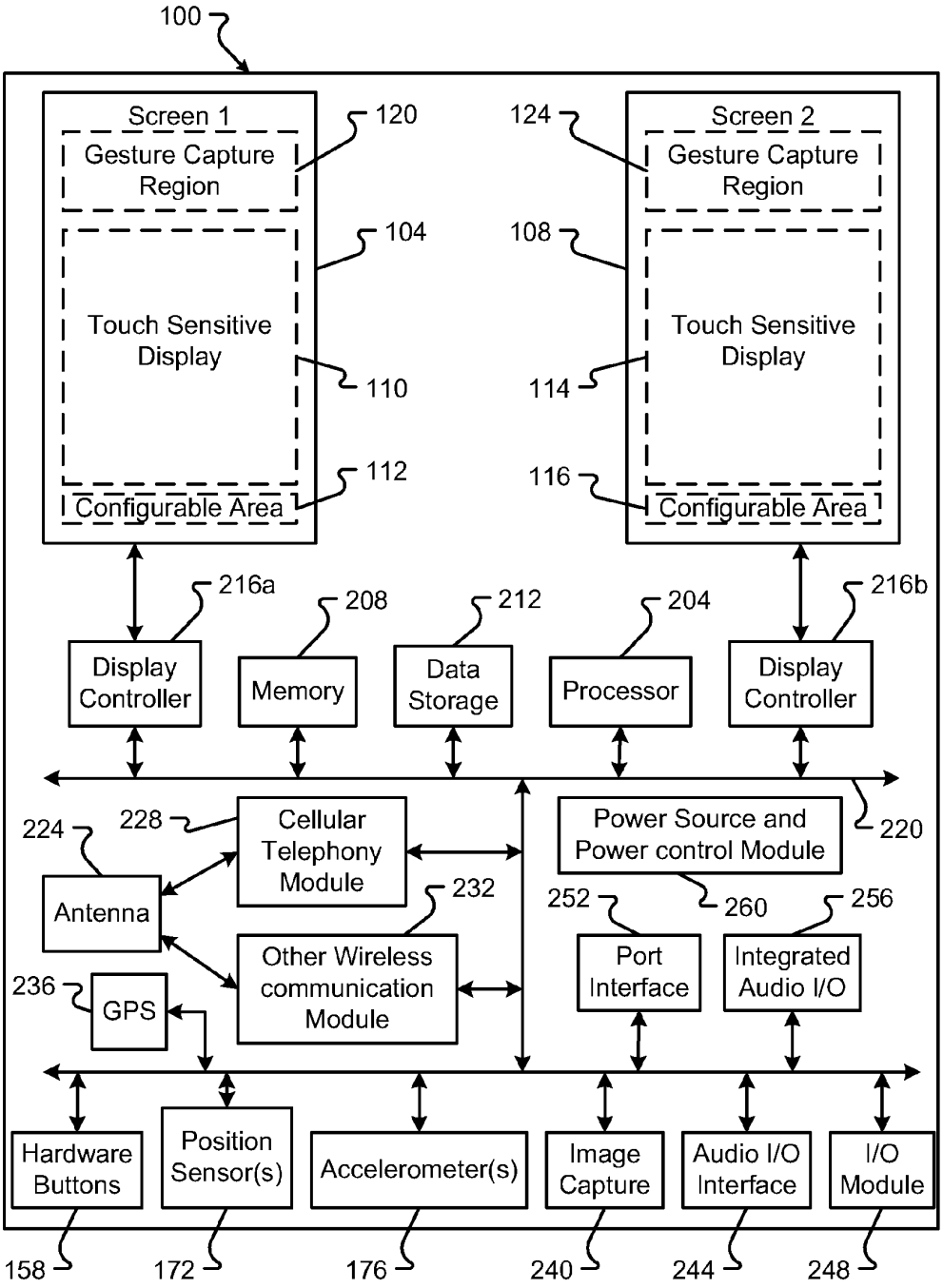


FIG. 2

SHEET 5/27

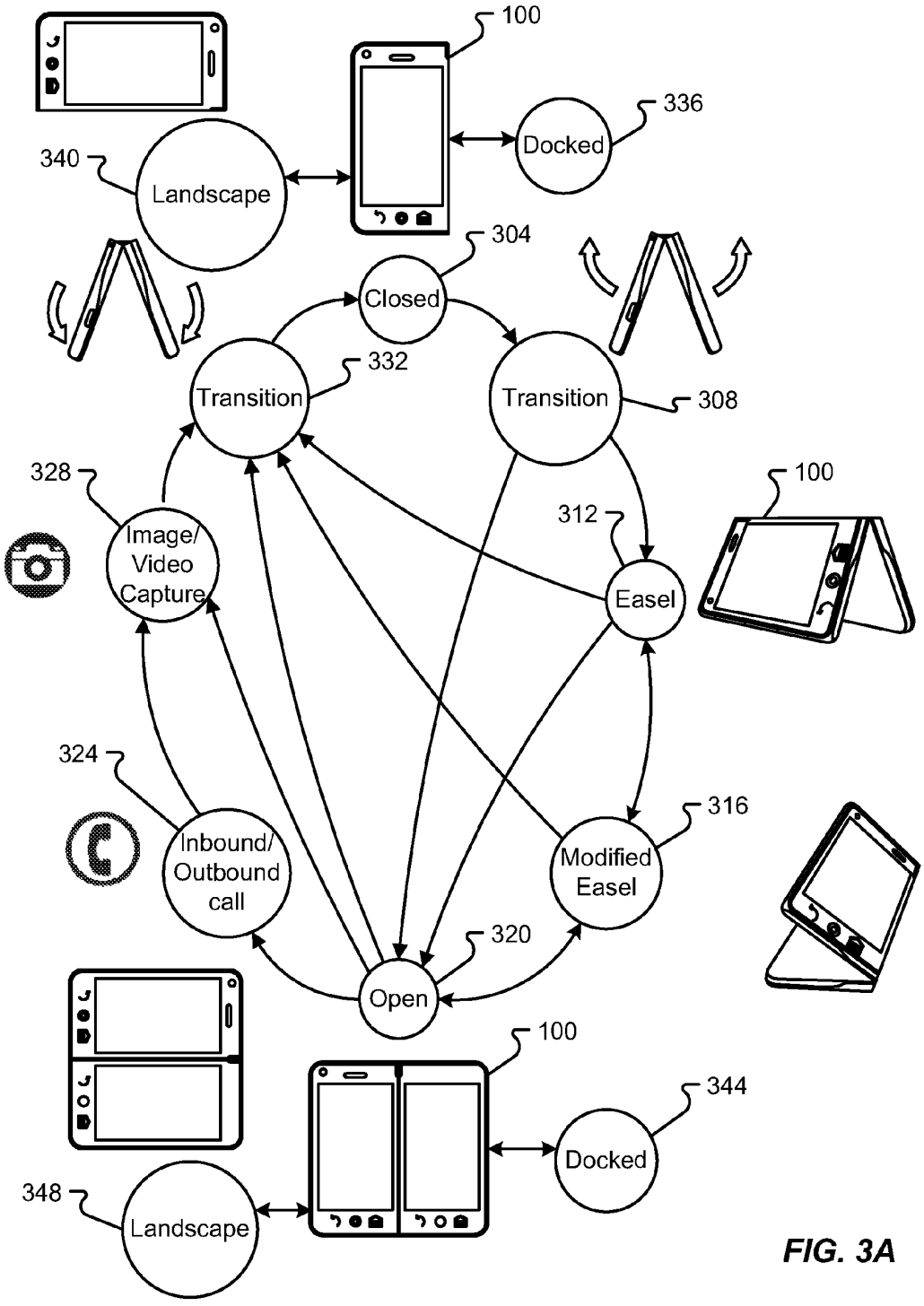
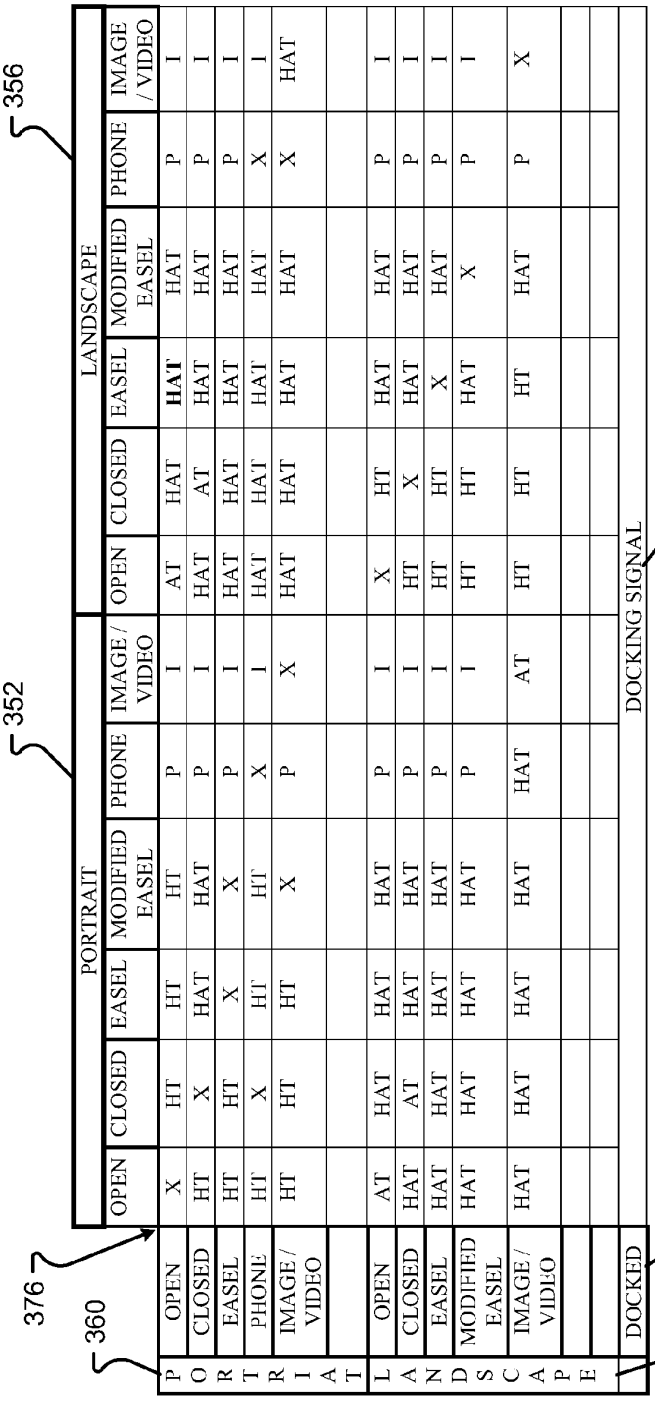


FIG. 3A



PORTRAIT							LANDSCAPE					
	OPEN	CLOSED	EASEL	MODIFIED EASEL	PHONE	IMAGE / VIDEO	OPEN	CLOSED	EASEL	MODIFIED EASEL	PHONE	IMAGE / VIDEO
OPEN	X	HT	HT	HT	P	I	AT	HAT	**HAT**	HAT	P	I
CLOSED	HT	X	HAT	HAT	P	I	HAT	AT	HAT	HAT	P	I
EASEL	HT	HT	X	X	P	I	HAT	HAT	HAT	HAT	P	I
PHONE	HT	X	HT	HT	X	I	HAT	HAT	HAT	HAT	X	I
IMAGE / VIDEO	HT	HT	HT	X	P	X	HAT	HAT	HAT	HAT	X	HAT
OPEN	AT	HAT	HAT	HAT	P	I	X	HT	HAT	HAT	P	I
CLOSED	HAT	AT	HAT	HAT	P	I	HT	X	HAT	HAT	P	I
EASEL	HAT	HAT	HAT	HAT	P	I	HT	HT	X	HAT	P	I
MODIFIED EASEL	HAT	HAT	HAT	HAT	P	I	HT	HT	HAT	X	P	I
IMAGE / VIDEO	HAT	HAT	HAT	HAT	HAT	AT	HT	HT	HT	HAT	P	X
DOCKED	DOCKING SIGNAL											

Key:
H - Hall Effect Sensor(s)
a - accelerometer(s)
T- Timer
P – communications Trigger
I – Image / Video capture Request

FIG. 3B

SHEET 7/27

Tap

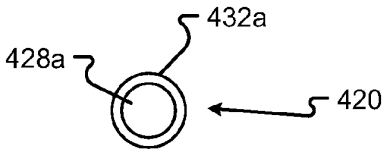


FIG. 4A

Long Press

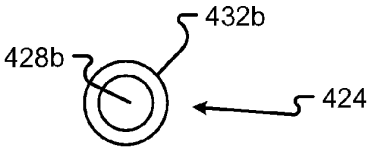


FIG. 4B

Drag

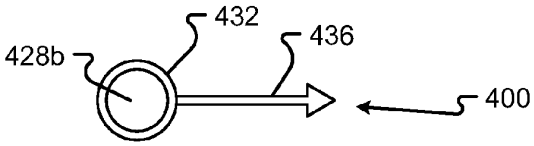


FIG. 4C

Flick

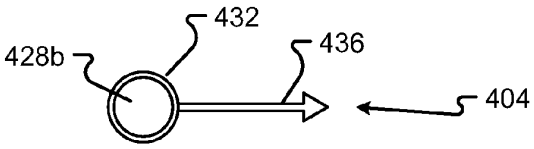


FIG. 4D

Pinch

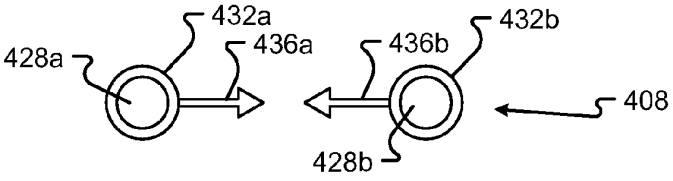


FIG. 4E

Spread

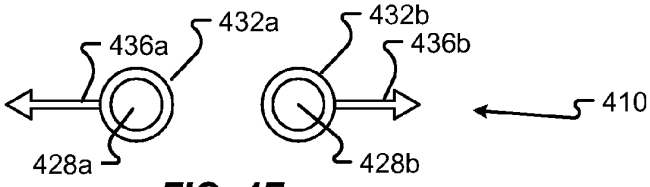


FIG. 4F

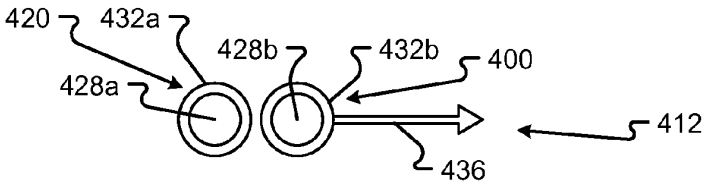

420
432a
428b
432b
400
428a
412
436

FIG. 4G

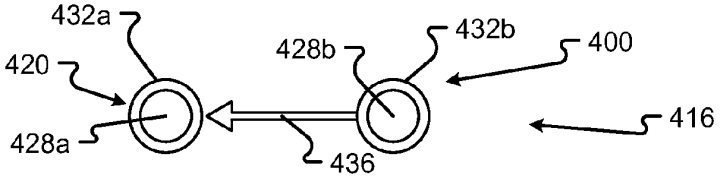

432a
420
428b
432b
400
428a
416
436

FIG. 4H

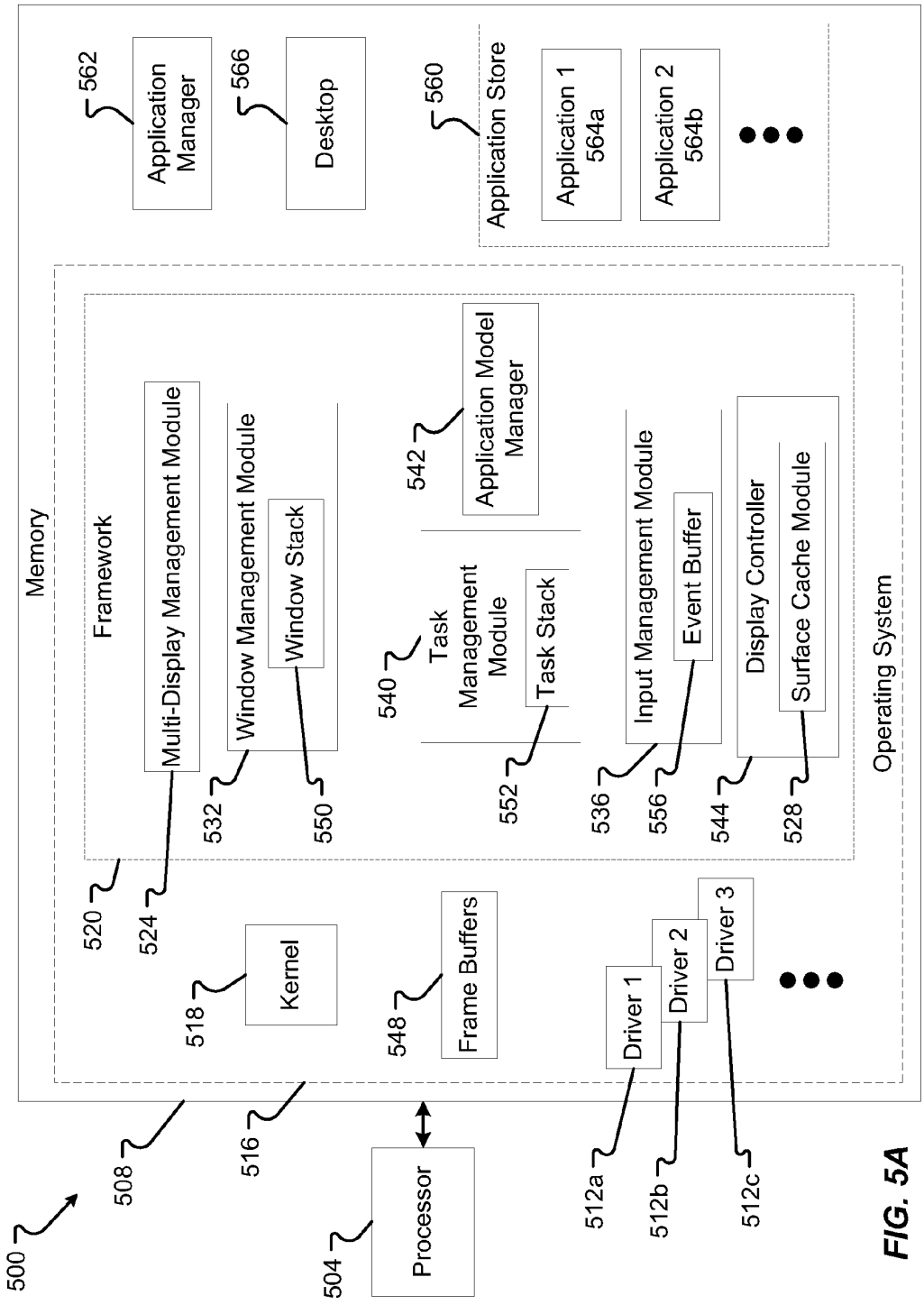

500
508
516
504
Processor
512a
512b
512c
Driver 1
Driver 2
Driver 3
548
Frame Buffers
518
Kernel
520
524
Framework
Multi-Display Management Module
532
Window Management Module
550
Window Stack
540
Task Management Module
552
Task Stack
542
Application Model Manager
536
Input Management Module
556
Event Buffer
544
Display Controller
528
Surface Cache Module
Operating System
Memory
562
Application Manager
566
Desktop
560
Application Store
Application 1 564a
Application 2 564b

FIG. 5A

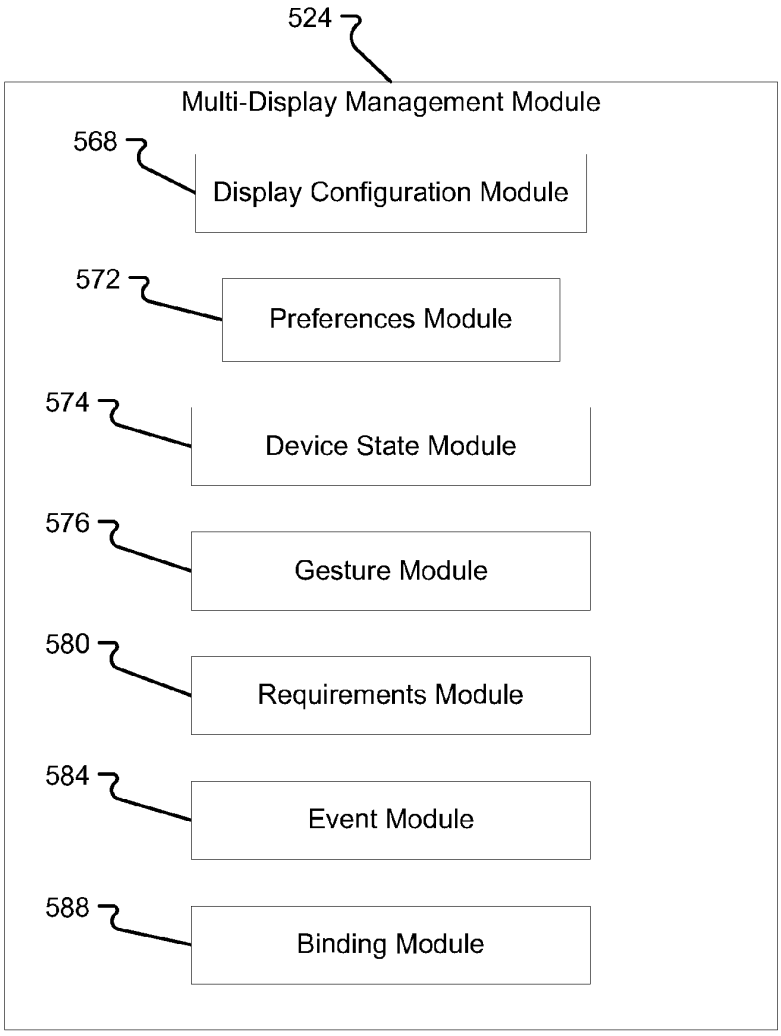

524
Multi-Display Management Module
568
Display Configuration Module
572
Preferences Module
574
Device State Module
576
Gesture Module
580
Requirements Module
584
Event Module
588
Binding Module

FIG. 5B

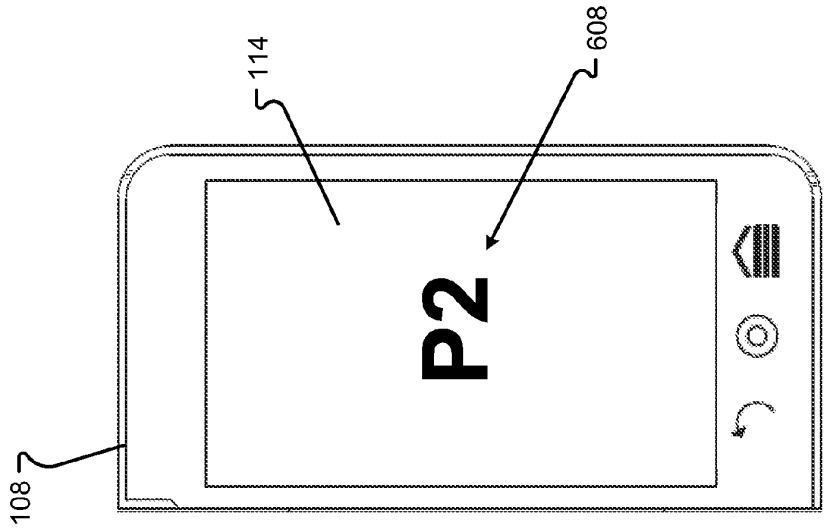


FIG. 6B

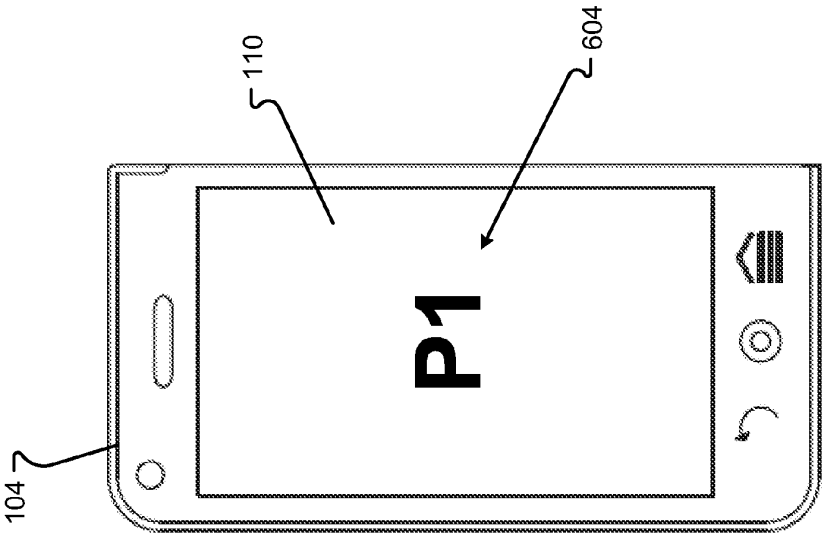


FIG. 6A

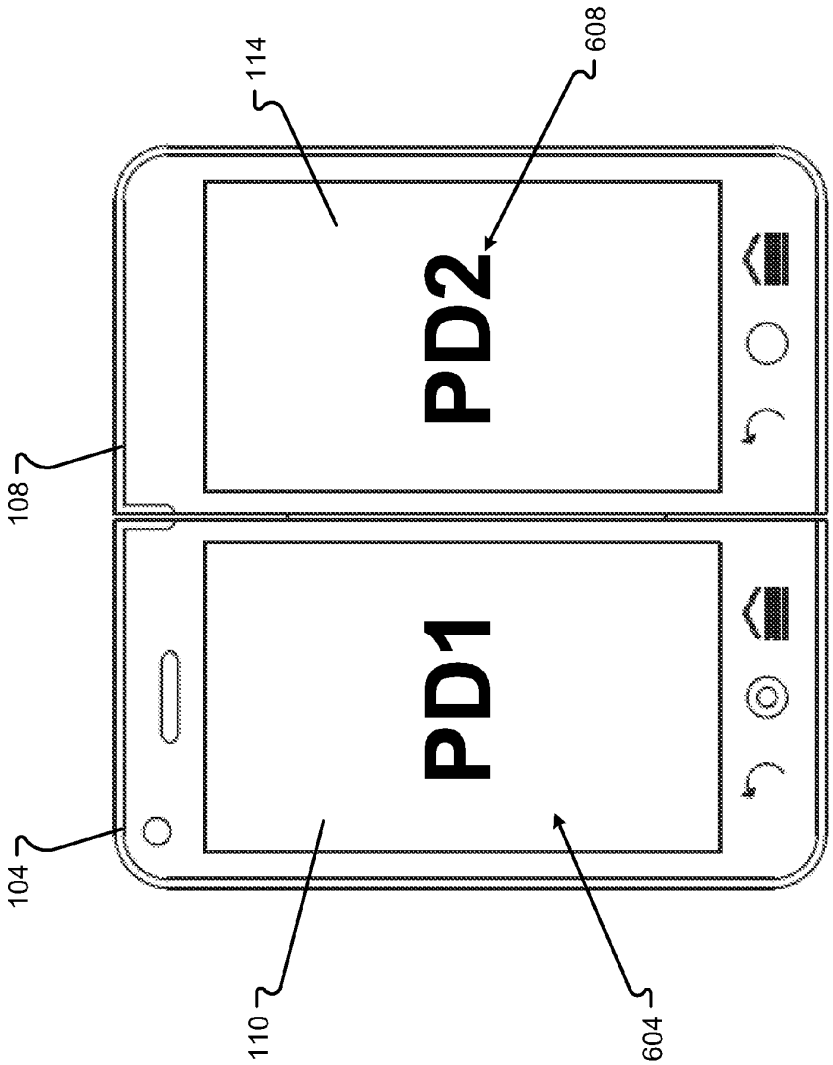


FIG. 6C

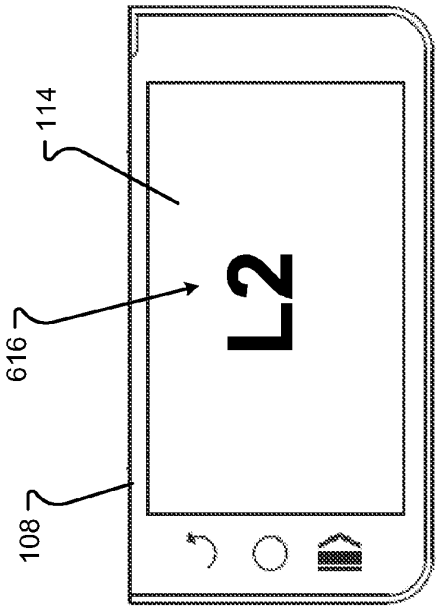


FIG. 6E

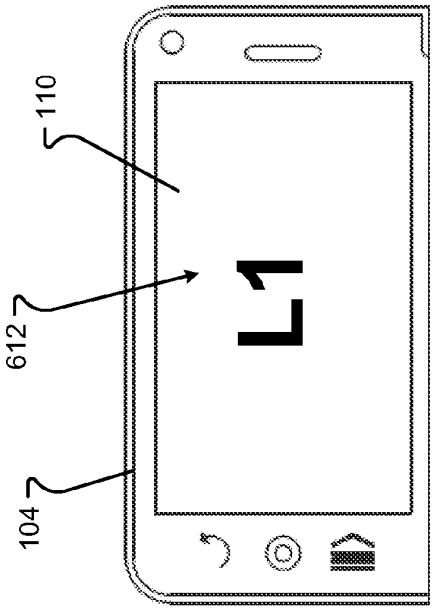


FIG. 6D

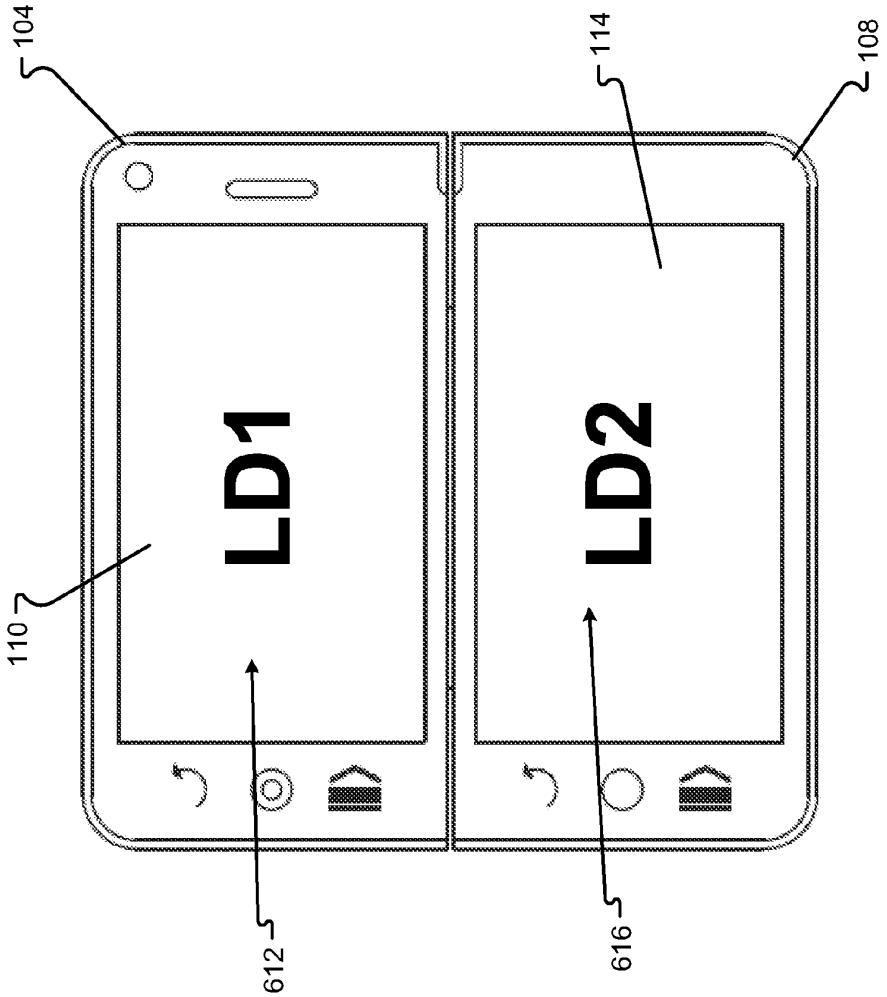


FIG. 6F

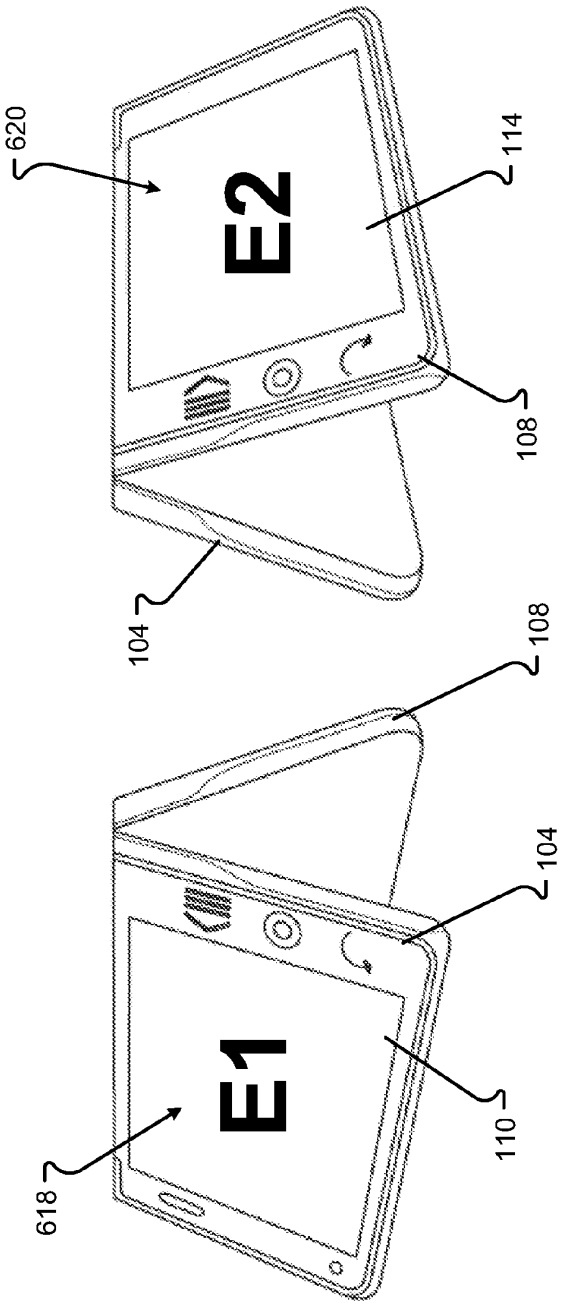


FIG. 6H

FIG. 6G

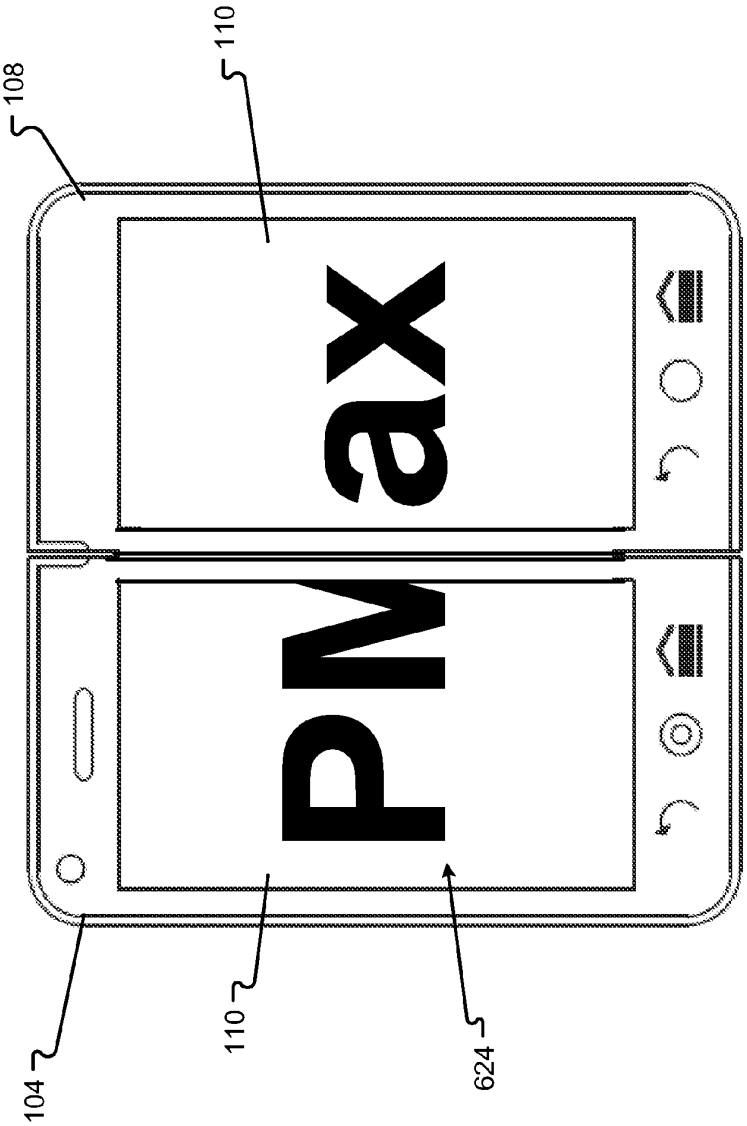


FIG. 6I

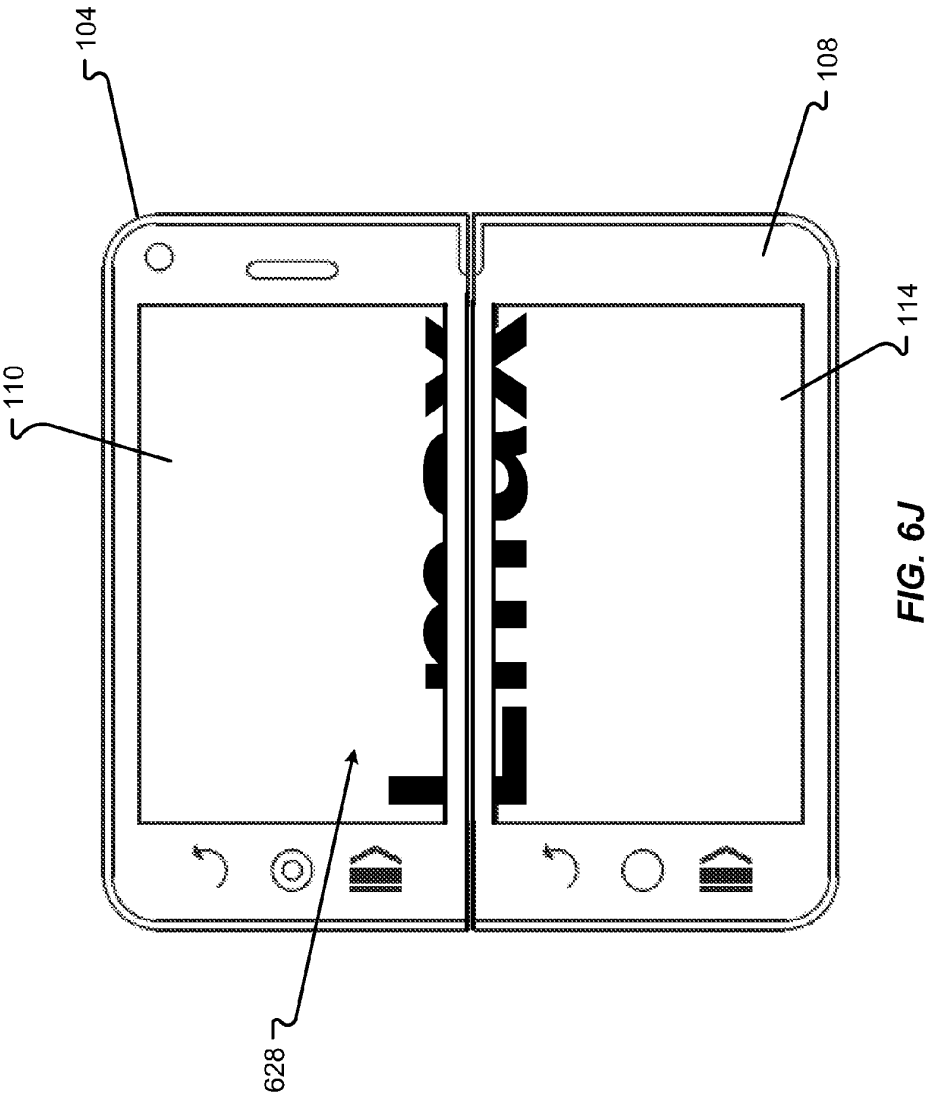


FIG. 6J

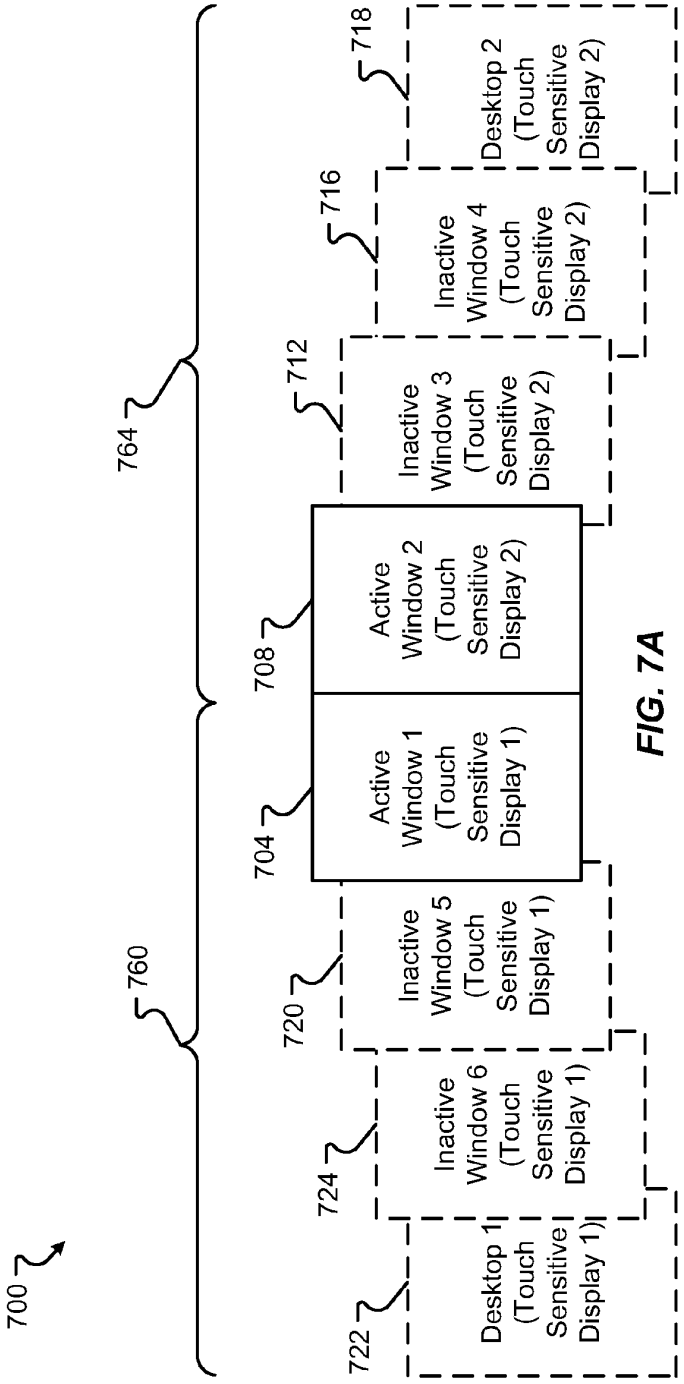

700
760
764
722
Desktop 1 (Touch Sensitive Display 1)
724
Inactive Window 6 (Touch Sensitive Display 1)
720
Inactive Window 5 (Touch Sensitive Display 1)
704
Active Window 1 (Touch Sensitive Display 1)
708
Active Window 2 (Touch Sensitive Display 2)
712
Inactive Window 3 (Touch Sensitive Display 2)
716
Inactive Window 4 (Touch Sensitive Display 2)
718
Desktop 2 (Touch Sensitive Display 2)

FIG. 7A

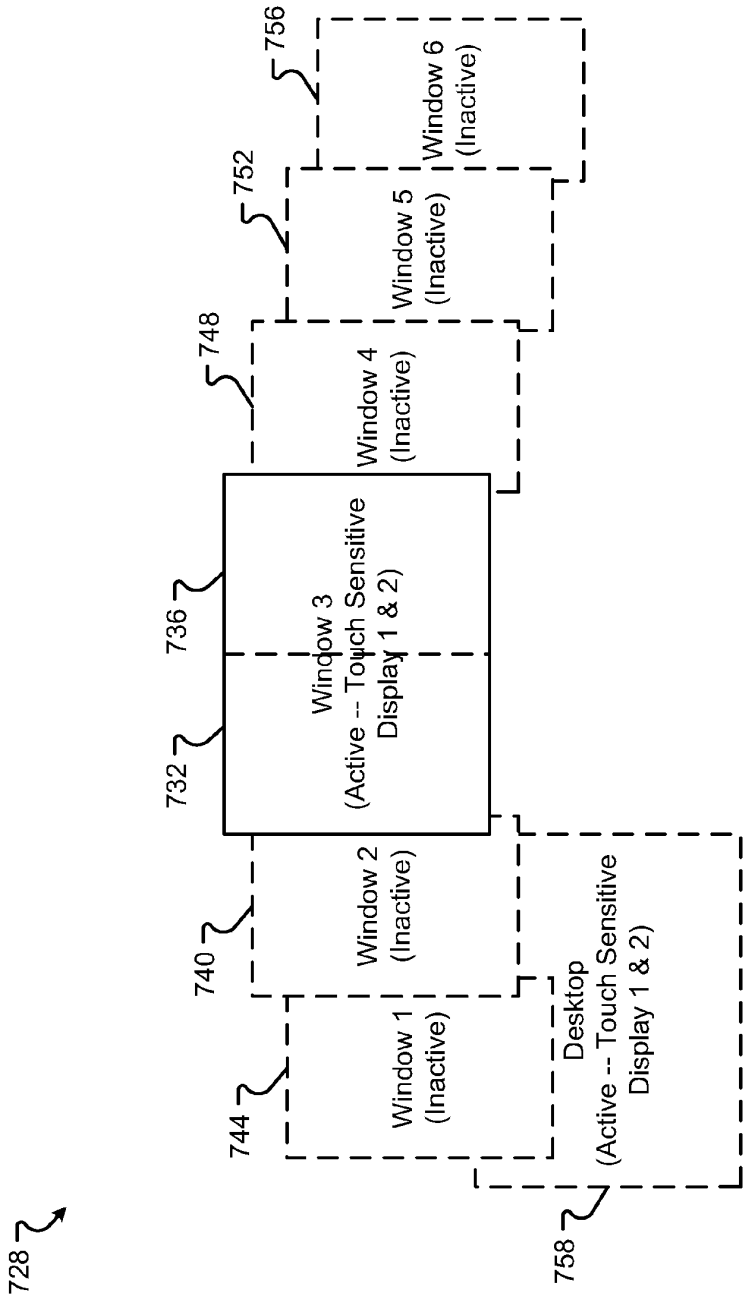

728
732
736
740
744
748
752
756
758
Window 3 (Active -- Touch Sensitive Display 1 & 2)
Window 2 (Inactive)
Window 1 (Inactive)
Desktop (Active -- Touch Sensitive Display 1 & 2)
Window 4 (Inactive)
Window 5 (Inactive)
Window 6 (Inactive)

FIG. 7B

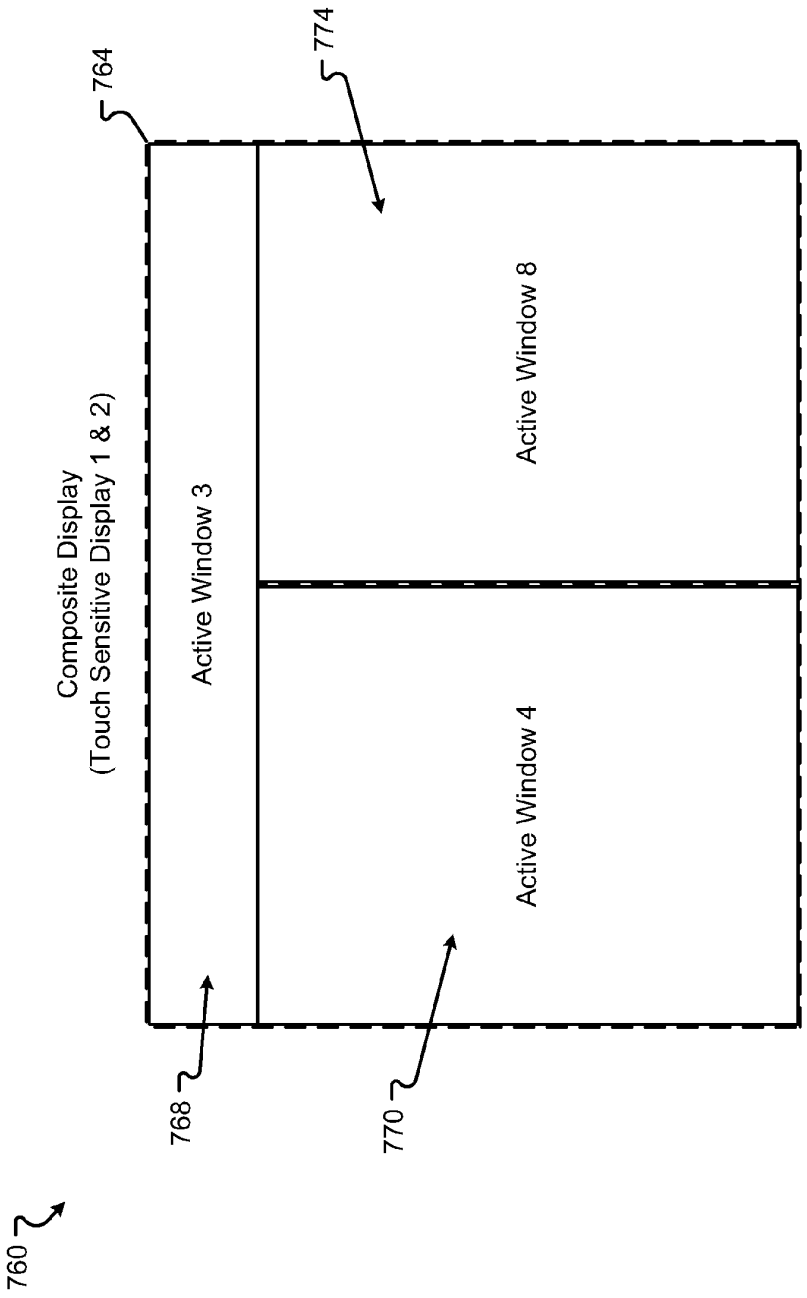

760
764
774
Composite Display
(Touch Sensitive Display 1 & 2)
Active Window 3
Active Window 8
Active Window 4
768
770

FIG. 7C

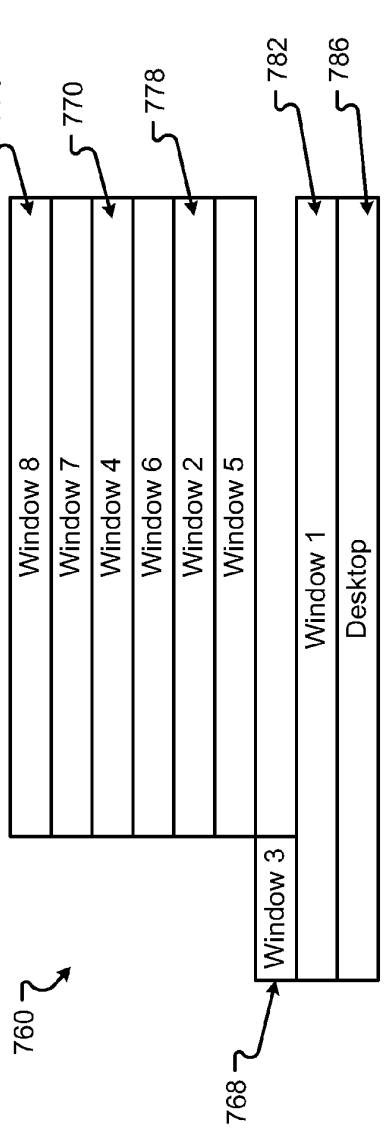

774
770
778
782
786
Window 8
Window 7
Window 4
Window 6
Window 2
Window 5
Window 1
Desktop
Window 3
760
768

FIG. 7D

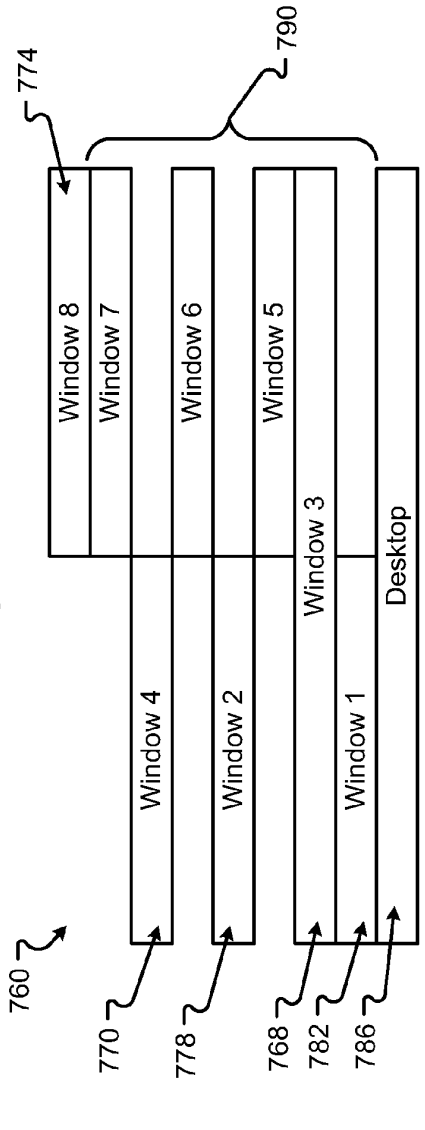

790
774
Window 8
Window 7
Window 6
Window 5
Window 4
Window 2
Window 3
Window 1
Desktop
760
770
778
768
782
786

FIG. 7E

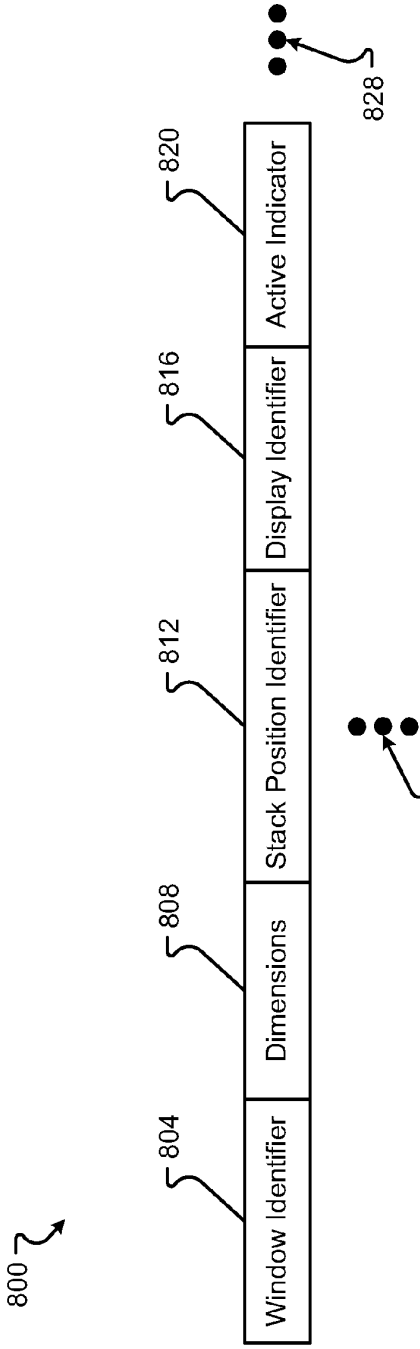

800
804
Window Identifier
808
Dimensions
812
Stack Position Identifier
816
Display Identifier
820
Active Indicator
824
828

FIG. 8

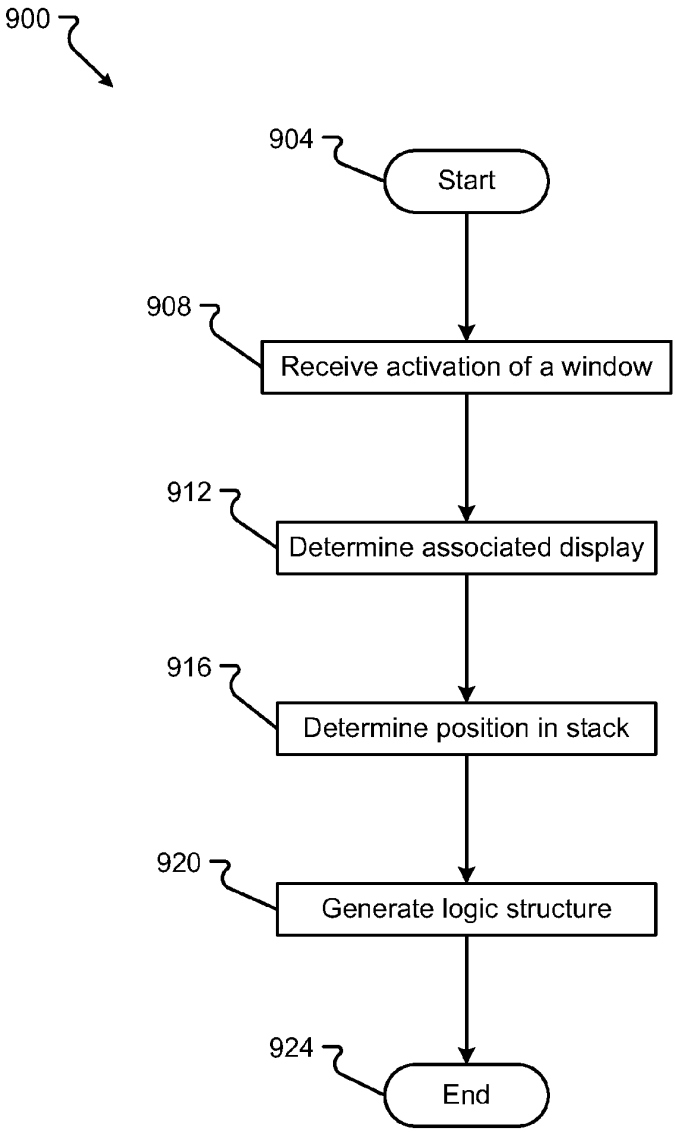

900
904
Start
908
Receive activation of a window
912
Determine associated display
916
Determine position in stack
920
Generate logic structure
924
End

FIG. 9

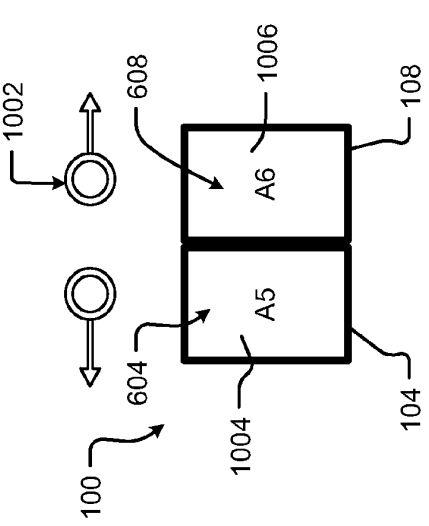


FIG. 10A

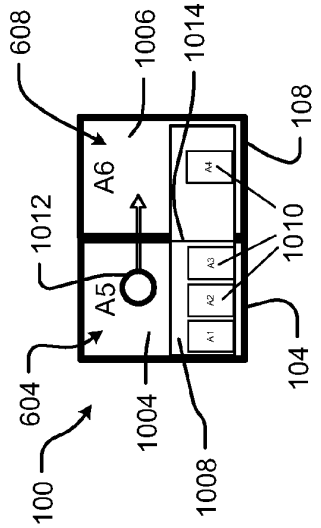


FIG. 10B

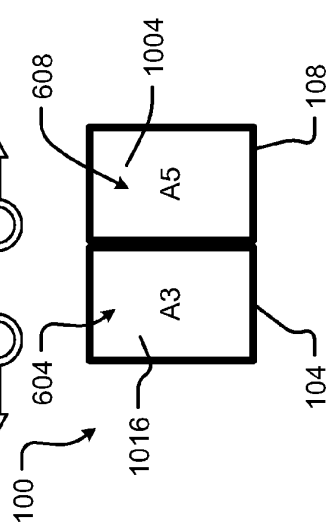


FIG. 10C

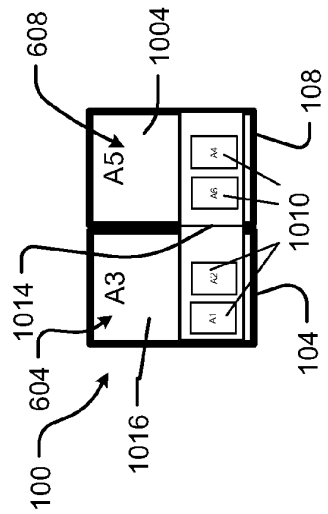


FIG. 10D

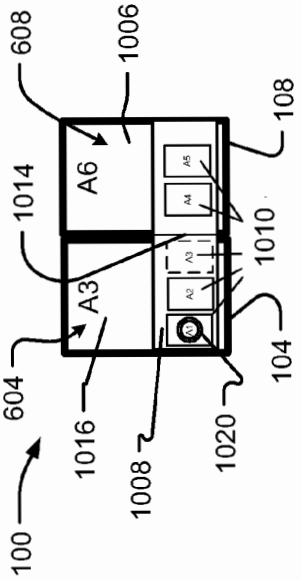


FIG. 10F

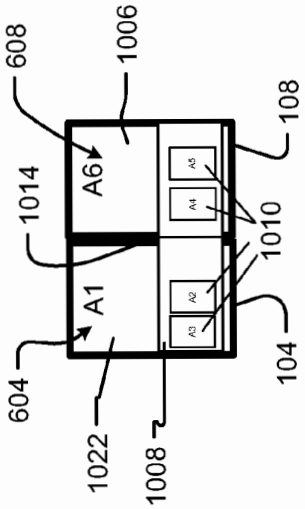


FIG. 10H

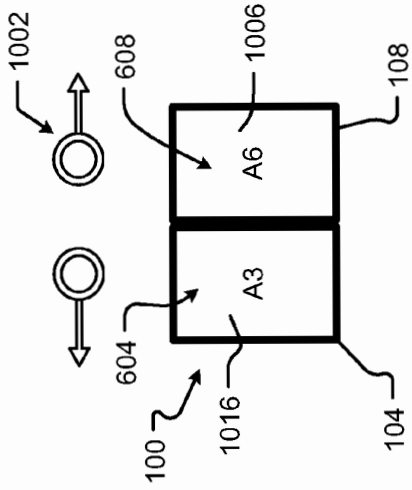


FIG. 10E

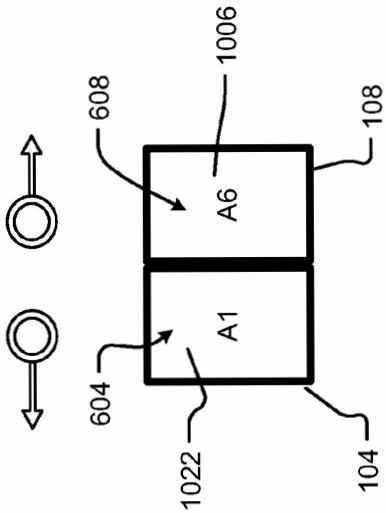


FIG. 10G

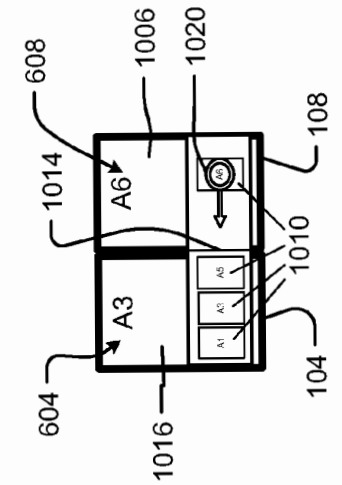


FIG. 10J

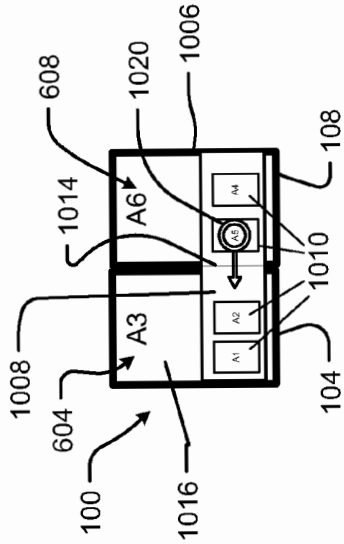


FIG. 10I

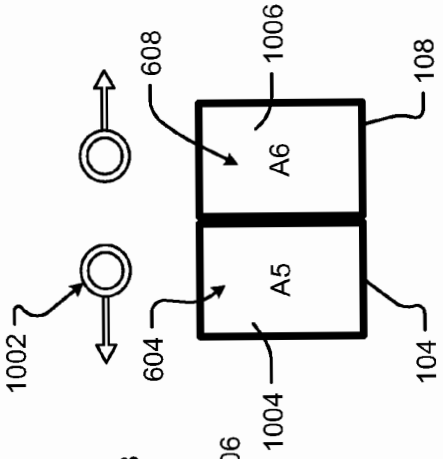


FIG. 10L

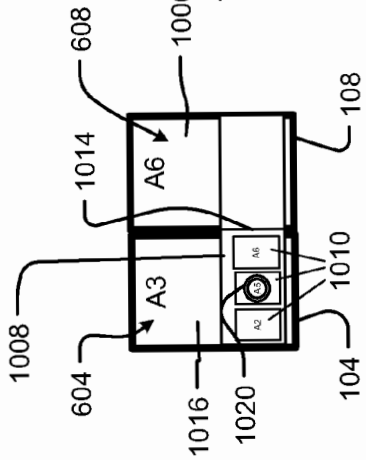


FIG. 10K

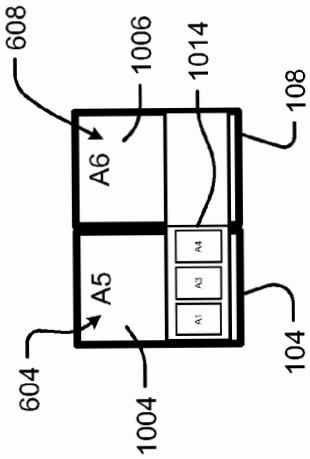


FIG. 10M

SHEET 27/27

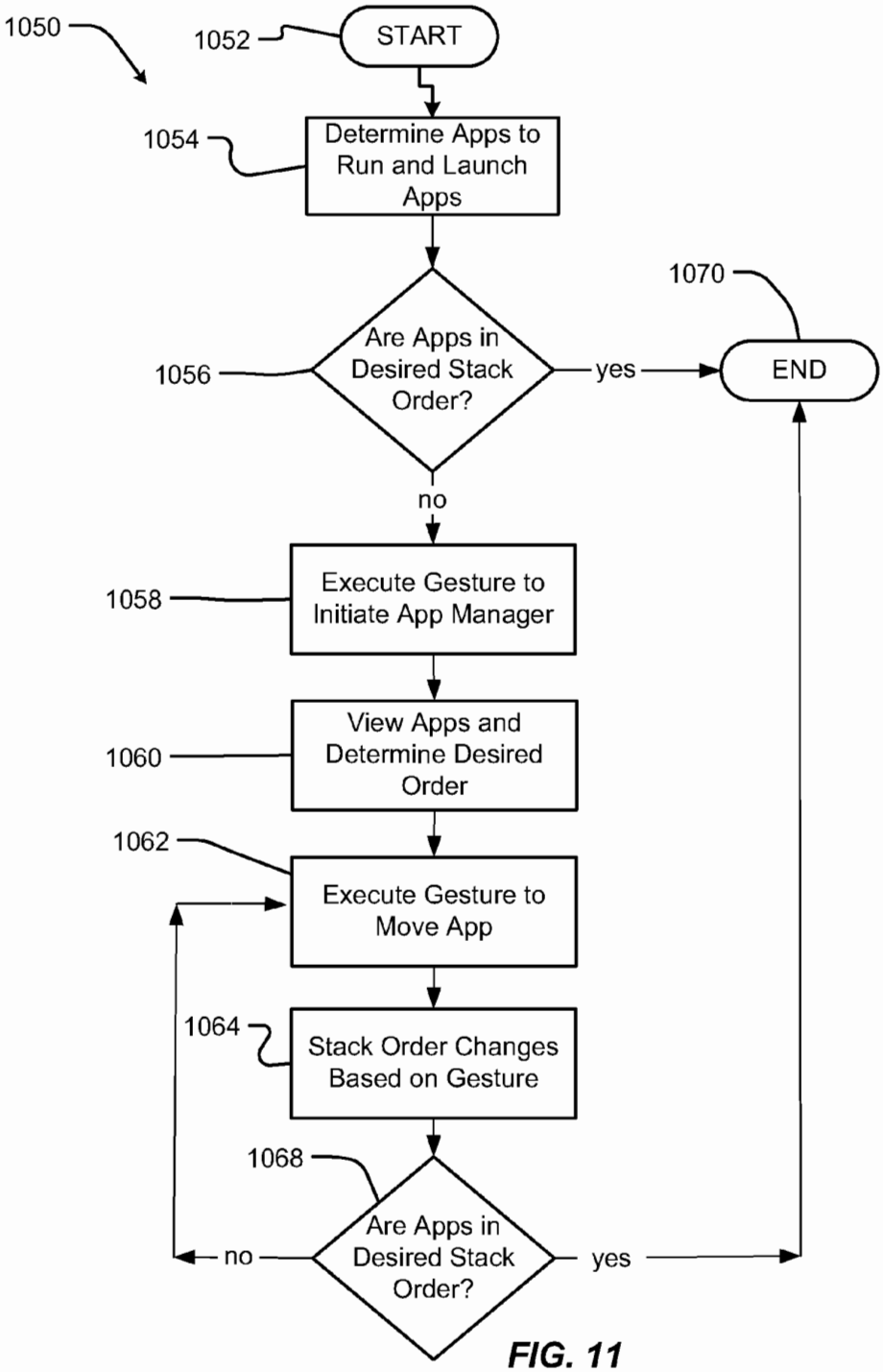


FIG. 11

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 11/53963

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - G06F 3/048 (2012.01)
USPC - 715/799
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC(8): G06F 3/048 (2012.01)
USPC: 715/799

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
USPC: 715/863,764-769,792-794 (keyword limited; terms below)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
PubWest; Google Scholar; Google Patents; FreePatentsOnline. Search terms used: device apparatus personal-electronic electronic-device electronic-apparatus, portable handheld PDA smartphone cell-phone mobile-phone memory processor microprocessor graphics-processor image-processor ASIC DSP code software instruction, dual-screen...

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2009/0319672 A1 (REISMAN) 24 December 2009 (24.12.2009) entire document, especially Abstract; para [0042], [0106], [0120], [0482]	1 - 20
Y	US 2010/0064536 A1 (CASKEY et al.) 18 March 2010 (18.03.2010) entire document, especially Abstract; para [0005], [0076], [0077], [0089], [0126], [0131], [0132], [0133], [0135], [0140], [0142], [0150]	1 - 20
Y	US 2010/0211872 A1 (ROLSTON et al.) 19 August 2010 (19.08.2010) entire document, especially Abstract; para [0007], [0101]	1 - 20
Y	US 2009/0143141 A1 (WELLS et al.) 04 June 2009 (04.06.2009) entire document, especially Abstract; para [0016], [0716], [0831], [0866], [0965]	3, 12
A	US 2010/0064244 A1 (KILPATRICK II, et al.) 11 March 2010 (11.03.2010) entire document	1 - 20

☐ Further documents are listed in the continuation of Box C. ☐

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

Date of the actual completion of the international search	Date of mailing of the international search report
13 February 2012 (13.02.2012)	22 FEB 2012
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer: Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/210 (second sheet) (July 2009)

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Application Number	13/247,708
				Filing Date	September 28, 2011
(Use as many sheets as necessary)				First Named Inventor	Sanjiv Sirpal
				Art Unit	2172
				Examiner Name	Steven Paul Sax
Sheet	1	of	3	Attorney Docket Number	6583-67

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No.[1]	Document Number Number-kind Code[2] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1	2002/0021278	02/21/2002	Hinckley et al.	
	2	2008/0165152	07/10/2008	Forstall et al.	
	3	2009/0143141	06/04/2009	Wells et al.	
	4	2009/0319672	12/24/2009	Reisman	
	5	2010/0007603	01/14/2010	Kirkup	
	6	2010/0064244	03/11/2010	Kilpatrick, II et al.	
	7	2010/0064536	03/18/2010	Caskey et al.	
	8	2010/0081475	04/01/2010	Chiang et al.	
	9	2010/0085274	04/08/2010	Kilpatrick, II et al.	
	10	2010/0085382	04/08/2010	Lundqvist et al.	
	11	2010/0211872	08/19/2010	Rolston et al.	
	12	2010/0245209	09/30/2010	Miller et al.	
	13	2012/0081271	04/05/2012	Gimpl et al.	
	14	2012/0081280	04/05/2012	Schrock et al.	
	15	2012/0081309	04/05/2012	Sirpal et al.	
	16	2012/0081311	04/05/2012	Sirpal et al.	
	17	2012/0084710	04/05/2012	Sirpal et al.	

UNPUBLISHED U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No.[1]	Document Number Number-kind Code[2] (if known)	Application Date MM-DD-YYYY	Name of First Named Inventor or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	18	13/187026	07/20/2011	Chen	
	19	13/366483	02/06/2012	Sirpal et al.	
	20	13/624591	09/21/2012	Sirpal et al.	
	21	13/627577	09/26/2012	Sirpal et al.	
	22	13/629211	09/27/2012	Reeves et al.	

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1] Applicant's unique citation designation number (optional). [2] See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6] Applicant is to place a check mark here if English language Translation is attached.

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Application Number	13/247,708
				Filing Date	September 28, 2011
(Use as many sheets as necessary)				First Named Inventor	Sanjiv Sirpal
				Art Unit	2172
				Examiner Name	Steven Paul Sax
Sheet	2	of	3	Attorney Docket Number	6583-67

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]; Number[4]; Kind Code[5] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]
	23	WO 2012/044780	04/05/2012	IMERJ LLC		
	24	WO 2012/044801	04/05/2012	IMERJ LLC		
	25	WO 2012/044809	04/05/2012	IMERJ LLC		

NON-PATENT LITERATURE DOCUMENTS		
Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
	26	BURNS, "Motorola ATRIX 4G Laptop Dock Review," at www.androidcommunity.com/motorola-atrix-4g-laptop-dock-review-20110220/, Feb. 20, 2011, 5 pages
	27	CATACCHIO, "This smartphone has two huge screens...that rotate," The Next Web at www.thenextweb.com/asia/2010/10/07/this-smartphone-has-two-huge-screens-that-rotate/, Jul. 21, 2011, 2 pages
	28	Google images, accessed Apr. 18, 2011, 6 pages
	29	Harman03, "Kyocera Echo Dual-screen Android Phone," posted 4 weeks from Apr. 18, 2011, 3 pages
	30	"Lapdock™ for MOTOROLA ATRIX," at www.motorola.com/Consumers/US-EN/Consumer-Product-and-Services/Mobile..., accessed Apr. 18, 2011, 1 page
	31	"Motorola ATRIX 4G Laptop Dock Review," at www.phonearena.com/reviews/Motorola-ATRIX-4G-Laptop-Dock-Review_id2667, Mar. 2, 2011, 6 pages
	32	STEIN, S., "How does the Motorola Atrix 4G Lapdock compare with a laptop?" Crave - CNET, at www.news.cnet.com/8301-17938_105-20031251-1.html, Feb. 9, 2011, 7 pages
	33	Website entitled, "Kyocera Echo," at www.echobykyocera.com/, 2011, 6 pages
	34	Website entitled, "Sony Tablet," at www.store.sony.com/webapp/wcs/stores/servlet/CategoryDisplay?catalogId=10551&storeId=10151&langId=-1&categoryId=8198552921644795521, 2011, 3 pages
	35	International Search Report and Written Opinion for International Patent Application No. PCT/US11/53942, mailed Feb. 21, 2012 (Attorney Ref. No. 6583-28-PCT), 8 pages

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1] Applicant's unique citation designation number (optional). [2] See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6] Applicant is to place a check mark here if English language Translation is attached.

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Application Number	13/247,708
				Filing Date	September 28, 2011
(Use as many sheets as necessary)				First Named Inventor	Sanjiv Sirpal
				Art Unit	2172
				Examiner Name	Steven Paul Sax
Sheet	3	of	3	Attorney Docket Number	6583-67

	36	International Search Report and Written Opinion for International Patent Application No. PCT/US11/53902, mailed Feb. 22, 2012 (Attorney Ref. No. 6583-47-PCT), 9 pages
	37	International Search Report and Written Opinion for International Patent Application No. PCT/US11/53963, mailed Feb. 22, 2012 (Attorney Ref. No. 6583-66-PCT), 7 pages

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1] Applicant's unique citation designation number (optional). [2] See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6] Applicant is to place a check mark here if English language Translation is attached.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re the Application of:	)	Group Art Unit: 2172
Sanjiv Sirpal	)	Confirmation No.: 8636
Serial No.: 13/247,708	)	Examiner: Steven Paul Sax
Filed: September 28, 2011	)	
Atty. File No.: 6583-67	)	INFORMATION DISCLOSURE STATEMENT
Entitled: "Full-Screen Annunciator"	)	*Electronically Submitted*

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

The references cited on attached Form PTO/SB08 are being called to the attention of the Examiner.

☒ Copies of the cited non-patent and/or foreign references are enclosed herewith.

☐ Copies of the cited U.S. patents and/or patent applications are enclosed herewith.

☒ Copies of the cited U.S. patents/patent application publications/unpublished patent applications are not enclosed in accordance with 37 C.F.R. § 1.98(a).

☐ Copies of the cited references are not enclosed, in accordance with 37 C.F.R. § 1.98(d), because the references were cited by or submitted to the U.S. Patent and Trademark Office in prior application Serial No. _____ filed _____, which is relied upon for an earlier filing date under 35 U.S.C. § 120.

☐ To the best of applicants' belief, the pertinence of the foreign-language references is believed to be summarized in the attached English abstracts and/or in the figures, although applicants do not necessarily vouch for the accuracy of the translation.

☒ Examiner's attention is drawn to the following related applications:

- Serial No. 13/247982 filed 09/28/2011 (Attorney Ref. No. 6583-28)
- Serial No. 13/247797 filed 09/28/2011 (Attorney Ref. No. 6583-47)
- Serial No. 13/247369 filed 09/28/2011 (Attorney Ref. No. 6583-66)
- Serial No. 13/223778 filed 09/01/2011 (Attorney Ref. No. 6583-110)
- Serial No. 13/366483 filed 02/06/2012 (Attorney Ref. No. 6583-120)
- Serial No. 13/624591 filed 09/21/2012 (Attorney Ref. No. 6583-122)
- Serial No. 13/627577 filed 09/26/2012 (Attorney Ref. No. 6583-253)

- Serial No. 13/629211 filed 09/27/2012 (Attorney Ref. No. 6583-312)

☐ Other:_____

Submission of the above information is not intended as an admission that any item is citable under the statutes or rules to support a rejection, that any item disclosed represents analogous art, or that those skilled in the art would refer to or recognize the pertinence of any reference without the benefit of hindsight, nor should an inference be drawn as to the pertinence of the references based on the order in which they are presented. Submission of this statement should not be taken as an indication that a search has been conducted, or that no better art exists.

It is respectfully requested that the cited information be expressly considered during the prosecution of this application and the references made of record therein.

FEES

☒	**37 CFR 1.97(b)**: No fee is believed due in connection with this submission, because the information disclosure statement submitted herewith is satisfied by one of the following conditions ("X" indicates satisfaction): ☐ Within three months of the filing date of a national application other than a continued prosecution application under 37 CFR 1.53(d), or ☐ Within three months of the date of entry of the national stage as set forth in § 1.491 in an international application, or ☒ Before the mailing date of a first Office Action on the merits, or ☐ Before the mailing of a first Office action after the filing of a request for continued examination under 37 CFR 1.114. Although no fee is believed due, if any fee is deemed due in connection with this submission, please charge such fee to Deposit Account 19-1970.
☐	**37 CFR 1.97(c)**: The information disclosure statement transmitted herewith is being filed after all the above conditions (37 CFR 1.97(b)), but before the mailing date of any one of the following conditions: (1) a final action under 37 C.F.R. 1.113, or (2) a notice of allowance under 37 C.F.R. 1.311, or (3) an action that otherwise closes prosecution in the application. This Information Disclosure Statement is accompanied by: ☐ A Certification (below) as specified by 37 C.F.R. 1.97(e). Although no fee is believed due, if any fee is deemed due in connection with this submission, please charge such fee to Deposit Account 19-1970. OR ☐ Please charge Deposit Account 19-1970 in the amount of $180.00 for the fee set forth in 37 C.F.R. 1.17(p) for submission of an information disclosure statement. Please credit any overpayment or charge any underpayment to Deposit Account 19-1970.
☐	**37 CFR 1.97(d)**: This Information Disclosure Statement is being submitted after the period specified in 37 CFR 1.97(c). ☐ This information Disclosure Statement includes a Certification (below) as specified by 37 C.F.R. 1.97(e) AND ☐ Applicants hereby requests consideration of the reference(s) disclosed herein. Please charge Deposit Account 19-1970 in the amount of $180.00 under 37 C.F.R. 1.17(p). Please credit any overpayment or charge any underpayment to Deposit Account 19-1970. Election to pay the fee should not be taken as an indication that applicant(s) cannot execute a certification.

Certification (37 C.F.R. 1.97(e))
(Applicable only if checked)

☐ The undersigned certifies that:

☐ Each item of information contained in this information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this statement. 37 C.F.R. 1.97(e)(1).

☐ A copy of the communication from the foreign patent office is enclosed.

OR

☐ No item of information contained in this information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the undersigned after making reasonable inquiry, no item of information contained in this Information Disclosure Statement was known to any individual designated in 37 C.F.R. 1.56(c) more than three months prior to the filing of this statement. 37 C.F.R. 1.97(e)(2).

Respectfully submitted,

SHERIDAN ROSS P.C.

By: _____

Brent P. Johnson
Registration No. 38031
1560 Broadway, Suite 1200
Denver, Colorado 80202-5141
(303) 863-9700

Date: 1/22/13

Electronic Acknowledgement Receipt	
EFS ID:	14774706
Application Number:	13247708
International Application Number:	
Confirmation Number:	8636
Title of Invention:	FULL-SCREEN ANNUNCIATOR
First Named Inventor/Applicant Name:	Sanjiv Sirpal
Customer Number:	22442
Filer:	Brent Philip Johnson/Theresa Brown
Filer Authorized By:	Brent Philip Johnson
Attorney Docket Number:	6583-67
Receipt Date:	23-JAN-2013
Filing Date:	28-SEP-2011
Time Stamp:	18:04:10
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		IDS_01.pdf	634141 396d89f180c8503aa9d8582c626f4ccfe21c65ae	yes	6

	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Transmittal Letter		1	3	
	Information Disclosure Statement (IDS) Form (SB08)		4	6	
Warnings:					
Information:					
2	Foreign Reference	WO2012044780.pdf	3113743 cac2a76eb2274a6d8cfa873ea15abeb1e6e184b5	no	70
Warnings:					
Information:					
3	Foreign Reference	WO2012044801.pdf	3176666 1160d60e62fb2d1facfbd126af50cff9da6b8b8d	no	70
Warnings:					
Information:					
4	Foreign Reference	WO2012044809.pdf	3811814 8a2c8b8a93cf7d943211b57067c4f54d3183c35b	no	91
Warnings:					
Information:					
5	Non Patent Literature	BURNS_Motorola_ATRIX_4G_Laptop_Dock_Review-AndroidCommunity.pdf	738297 27631c5ca3dd0bad6684a45c86b1b12a9d31f9ca	no	5
Warnings:					
Information:					
6	Non Patent Literature	CATACCHIO_This-smartphone-has-two-huge-screens-that-rotate.pdf	460845 0b6a081598ab0a4bdb4d2b5716f70db6261fe447	no	2
Warnings:					
Information:					
7	Non Patent Literature	GoogleImages_6pages.pdf	1211655 e82d6bdcb51046e9a191bb08e83031fe6ea680dd	no	6
Warnings:					
Information:					
8	Non Patent Literature	HARMAN03_Kyocera_Echo_Dual-screen_Android_Phone.pdf	398409 ae67d9a7d4486f55a1c3bdeff709b4efc8a1724e	no	3
Warnings:					
Information:					

9	Non Patent Literature	Lapdock_for_Motorola_ATRIX.pdf	219001 71f7dea7bf0b24744dff3152b8d71da1e2e8b6db	no	1
Warnings:					
Information:					
10	Non Patent Literature	Motorola_ATRIX_4G_Laptop_Dock_Review_PhoneArena.pdf	1148773 48529a6454baec0e433a2fed64335744b9bc3d1e	no	6
Warnings:					
Information:					
11	Non Patent Literature	STEIN_How_does_the_Motorola_Atrix_4g_Lapdock_compare.pdf	1202946 5c6825da3fbe0ad5955337628b965f36a5894da6	no	7
Warnings:					
Information:					
12	Non Patent Literature	Kyocera_Echo_website_.pdf	1071725 1177c1053765213f247363ee9b510fddcaf202e2	no	6
Warnings:					
Information:					
13	Non Patent Literature	Sony_Tablet_.pdf	616030 23bbd69392b75900dbef8d12d193952fdfa4574a	no	3
Warnings:					
Information:					
14	Non Patent Literature	6583-28-PCT_ISR_WO_2-21-2012.pdf	862417 8c1d82f84655caa1ce0e26839dfdcf87a02ca73e	no	8
Warnings:					
Information:					
15	Non Patent Literature	6583-47-PCT_ISR_WO_2-22-2012.pdf	1120027 00c1339e38a2ecf7d56007741d45ccf70d8245a7	no	9
Warnings:					
Information:					
16	Non Patent Literature	6583-66-PCT_ISR_WO_2-22-2012.pdf	890801 58d88d843c4cadbe4e89d1c05bdf99f7b4f2467b	no	7
Warnings:					
Information:					
		Total Files Size (in bytes):	20677290		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To:
DENNIS J. DUPRAY
SHERIDAN ROSS P.C.
1560 BROADWAY, SUITE 1200
DENVER, CO 80202

FEB 27 2012

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT AND THE WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

Date of mailing *(day/month/year)*	21 FEB 2012
Applicant's or agent's file reference 6583-28-PCT	**FOR FURTHER ACTION** See paragraphs 1 and 4 below
International application No. PCT/US 11/53942	International filing date *(day/month/year)* 29 September 2011 (29.09.2011)
Applicant IMERJ LLC	

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

   Filing of amendments and statement under Article 19:
   The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

   When? The time limit for filing such amendments is normally two months from the date of transmittal of the international search report.

   Where? Directly to the International Bureau of WIPO, 34 chemin des Colombettes 1211 Geneva 20, Switzerland, Facsimile No.: +41 22 338 82 70

   For more detailed instructions, see *PCT Applicant's Guide*, International Phase, paragraphs 9.004 – 9.011.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. ☐ **With regard to any protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

   ☐ the protest together with the decision thereon has been transmitted to the International Bureau together with any request to forward the texts of both the protest and the decision thereon to the designated Offices.

   ☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Reminders**

   The applicant may submit comments on an informal basis on the written opinion of the International Searching Authority to the International Bureau. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established. Following the expiration of 30 months from the priority date, these comments will also be made available to the public.

   Shortly after the expiration of **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau before the completion of the technical preparations for international publication (Rules 90*bis*.1 and 90*bis*.3).

   Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices.

   In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months.

   For details about the applicable time limits, Office by Office, see www.wipo.int/pct/en/texts/time_limits.html and the *PCT Applicant's Guide*, National Chapters.

Name and mailing address of the ISA/ Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450	Authorized officer Lee W. Young
Facsimile No. 571-273-3201	Telephone No. PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/220 (July 2010)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 6583-28-PCT	**FOR FURTHER ACTION**	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/US 11/53942	International filing date *(day/month/year)* 29 September 2011 (29.09.2011)	(Earliest) Priority Date *(day/month/year)* 01 October 2010 (01.10.2010)
Applicant IMERJ LLC		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 2 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

a. With regard to the **language**, the international search was carried out on the basis of:

☒ the international application in the language in which it was filed.

☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

b. ☐ This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6*bis*(a)).

c. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (see Box No. II).

3. ☐ **Unity of invention is lacking** (see Box No. III).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,

a. the figure of the **drawings** to be published with the abstract is Figure No. 7B

☒ as suggested by the applicant.

☐ as selected by this Authority, because the applicant failed to suggest a figure.

☐ as selected by this Authority, because this figure better characterizes the invention.

b. ☐ none of the figures is to be published with the abstract.

Form PCT/ISA/210 (first sheet) (July 2009)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 11/53942

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - G06F 3/048 (2012.01)
USPC - 715/778
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
USPC: 715/778

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
USPC: 715/206, 804, 863; 361/600; 345/1.1, 1.3, 158, 173; 348/42, 51, 54, 207.1, E5.024, E13.015, E13.025, E13.029, E13.031, E13.043, E13.058 (text search)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
PubWest (PGPB, USPT, EPAB, JPAB), Google,
Search terms used: transitioning, between, single, dual, displays, transitions, orientation, phone, hand, held, portable, device, tablet, display, turn, rotat, orient, portrait, landscape, vertical, horizontal, dual, multiple, plurality, window, screen, multidisplay, multi, fold

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X -- Y	US 2010/0081475 A1 (CHIANG et al.) 01 April 2010 (01.04.2010) entire document, especially Abstract; Figs. 2B, 2C; para [0019], [0028], [0030]-[0039], [0041]-[0048]	1, 2, 4-20 ---------- 3
Y	US 2010/0085382 A1 (LUNDQVIST et al.) 08 April 2010 (08.04.2010) entire document, especially Abstract; para [0107]	3
A	US 2010/0064536 A1 (CASKEY et al.) 18 March 2010 (18.03.2010) entire document	1-20
A	US 2010/0085274 A1 (KILPATRICK II et al.) 08 April 2010 (08.04.2010) entire document	1-20
A	US 2008/0165152 A1 (FORSTALL et al.) 10 July 2008 (10.07.2008) entire document	1-20
A	US 2002/0021278 A1 (HINCKLEY et al.) 21 February 2002 (21.02.2002) entire document	1-20

☐ Further documents are listed in the continuation of Box C. ☐

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

Date of the actual completion of the international search	Date of mailing of the international search report
07 February 2012 (07.02.2012)	21 FEB 2012
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer: Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/210 (second sheet) (July 2009)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To: DENNIS J. DUPRAY
SHERIDAN ROSS P.C.
1560 BROADWAY, SUITE 1200
DENVER, CO 80202

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)*	21 FEB 2012

Applicant's or agent's file reference	FOR FURTHER ACTION
6583-28-PCT	See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US 11/53942	29 September 2011 (29.09.2011)	01 October 2010 (01.10.2010)

International Patent Classification (IPC) or both national classification and IPC
IPC(8) - G06F 3/048 (2012.01)
USPC - 715/778

Applicant IMERJ LLC

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1 *bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Fom PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA/US	Date of completion of this opinion	Authorized officer:
Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	07 February 2012 (07.02.2012)	Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/237 (cover sheet) (July 2011)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 11/53942

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:

   ☒ the international application in the language in which it was filed.

   ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a))

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing filed or furnished:

   a. (means)

      ☐ on paper

      ☐ in electronic form

   b. (time)

      ☐ in the international application as filed

      ☐ together with the international application in electronic form

      ☐ subsequently to this Authority for the purposes of search

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 11/53942

Box No. V **Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	3	YES
	Claims	1, 2, 4-20	NO
Inventive step (IS)	Claims	None	YES
	Claims	1-20	NO
Industrial applicability (IA)	Claims	1-20	YES
	Claims	None	NO

2. Citations and explanations:

Claims 1, 2 and 4-20 lack novelty under PCT Article 33(2) as being anticipated by US 2010/0081475 A1 to Chiang et al. (hereinafter 'Chiang').

Regarding claims 1, 10, and 16, Chiang teaches a method, and corresponding non-transitory computer-readable medium and multi-screen user device, of controlling data displayed by a multi-screen device, comprising: determining that the multi-screen device has moved from a first physical orientation to a different second physical orientation, wherein the first and second physical orientations differ by the first physical orientation being one of: folded or in a landscape orientation (a mobile device having a user interface supporting multiple windows is provided, where the device may be re-oriented so that the device switches between single window or dual window modes automatically in response to a change in the device's physical orientation, Fig. 2B, para [0019], [0028], [0030]); determining whether a first screen and a second screen of the multi-screen device are each displaying content for a same application (an application may run concurrently on both windows in a single window mode so as to have the appearance of full screen, para [0035]-[0036]); changing a display of the application to conform to a predetermined display configuration of the of the application on at least one of the first and second screens, wherein the display configuration is dependent upon the second physical orientation and a result of the step of determining (the mobile device automatically switches between modes when the motion sensor detects a change in orientation of the device, para [0030], [0037]); wherein the step of changing includes a step of modifying a display of the application: from being displayed on only the first screen to being displayed on both the first and second screens at a same time, or from being displayed on both the first and second screens at a same time to being displayed on only the first screen (a coordinator module activates or deactivates the window control modules to switch the mobile device between single window mode and dual window mode, where the dual window mode allows two different applications to be displayed on the different screens, para [0037]).

Regarding claims 2 and 20, Chiang teaches wherein the first screen is determined to be above the second screen (a first window may be above the second window, Fig. 2C, para [0030]).

Regarding claim 4, Chiang teaches determining whether the application is a single-screen application or a multi-screen application, and wherein controlling data displayed on the second screen in an open landscape state is also based on whether the application is a single-screen application or a multi-screen application (various applications are provided, some configured to be launched in dual window mode when the device is positioned in a landscape orientation, para [0030], [0039], [0042], [0046]-[0048]).

Regarding claim 5, Chiang teaches wherein the application is a multi-screen application, the method further comprising: automatically causing data from the application to be displayed on the second screen in a landscape state such that the device is not in a folded closed configuration (an application may be operated in a single window mode where the application is displayed in both windows, para [0041]-[0043], [0046]-[0048]).

Regarding claims 6 and 15, Chiang teaches wherein the application is a single-screen application and wherein data from a different second application is concurrently displayed on the second screen (an application may be operated in a dual window mode where a first application is displayed in the first window and a second application is displayed in the second window, para [0041]-[0043], [0046]-[0048]).

Regarding claims 7 and 19, Chiang teaches wherein: the second physical orientation is a portrait orientation, the first physical orientation is a landscape orientation, prior to the step of changing, the first and second screens each display content for the application, and the step of modifying includes displaying the application on only the first screen (the different orientations include portrait and landscape orientations, where prior to being rotated in a landscape orientation the application is displayed in both windows, and after being rotated in the landscape orientation the application is displayed in one window and another application is displayed in the second window, para [0041]-[0043], [0046]-[0048]).

Regarding claim 8, Chiang teaches wherein data from a second application is displayed on the second screen simultaneous with data from the application being displayed on the first screen (the two applications are displayed concurrently in the two adjacent windows, Fig. 2B, para [0046]-[0048]).

--CONTINUED IN SUPPLEMENTAL BOX--

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 11/53942

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
Claim 12 should become a "non-transitory computer-readable medium" claim rather than a "method" claim (as written, claim 12 lacks adequate antecedent basis in 10). Therefore, as submitted, claim 12 reads as follows:

12. The method of claim 10, wherein the first screen is determined to be above the second screen, and wherein data displayed on the second display in an open landscape state is also based on whether the application is a single-screen application or a multiscreen application.

For purposes of this international search, claim 12 will be interpreted as follows:

12. The non-transitory computer-readable medium of claim 10, wherein the first screen is determined to be above the second screen, and wherein data displayed on the second display in an open landscape state is also based on whether the application is a single-screen application or a multiscreen application.

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 11/53942

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:
Box No. V. 2. Citations and Explanations:

Regarding claims 9, 14, and 18, Chiang teaches wherein: the second physical orientation is an unfolded orientation of the device, the first physical orientation is a folded orientation (the device may also have a folding form factor, where the screen is located on the inside of the device and is exposed when the user folds the device open, para [0028]), prior to the step of changing, the only first screen displays the content of the application, and the step of modifying includes displaying concurrently at least a portion of the content on each the first and second screens (an application may be operated in a single window mode where the application is displayed in both windows, para [0035]-[0037], [0041]-[0043]).

Regarding claim 11, Chiang teaches wherein the first screen corresponds to a primary screen and wherein the second screen corresponds to a secondary screen (the first window is primary in the sense that it opens an application when the application is launched in a single window configuration, where the second window is secondary, para [0043]).

Regarding claim 12, Chiang teaches wherein the first screen is determined to be above the second screen, and wherein data displayed on the second display in an open landscape state is also based on whether the application is a single-screen application or a multi-screen application (a first window may be above the second window, where various applications are provided, some configured to be launched in dual window mode when the device is positioned in a landscape orientation, Fig. 2C, para [0030], [0039], [0042]).

Regarding claims 13 and 17, Chiang teaches wherein the application is a multi-screen application and wherein the instructions configured to control data displayed on the first and second displays also generates a transition area on the second display that moves across and progressively fills the second display with data from the first application (a transition between modes might be automatically initiated by the application, where the application is configured to split windows when the device transitions from portrait mode to landscape mode, para [0046]-[0048]).

Claim 3 lacks an inventive step under PCT Article 33(3) as being obvious over Chiang in view of US 2010/0085382 A1 to Lundqvist et al. (hereinafter 'Lundqvist').

Regarding claim 3, Chiang fails to teach wherein a relative position of the first to the second screen is determined, at least in part, based on data received from an accelerometer. Lundqvist teaches wherein a relative position of the first to the second screen is determined, at least in part, based on data received from an accelerometer (a group of sensors, including one or more accelerometers, are used to provided information to a processor indicating a folding configuration, a relative or absolute alignment, and/or an inclination of a device, para [0107]). It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the method of Chiang to include wherein a relative position of the first to the second screen is determined, at least in part, based on data received from an accelerometer, as taught by Lundqvist, for the advantage of accurately determining when the device is rotated from a portrait to a landscape orientation.

Claims 1-20 have industrial applicability as defined by PCT Article 33(4), because the subject matter can be made or used in industry.

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To:
MATTHEW R. ELLSWORTH
SHERIDAN ROSS P.C.
1560 BROADWAY, SUITE 1200
DENVER, CO 80202

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT AND THE WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

	Date of mailing *(day/month/year)* 22 FEB 2012
Applicant's or agent's file reference 6583-47-PCT	**FOR FURTHER ACTION** See paragraphs 1 and 4 below
International application No. PCT/US 11/53902	International filing date *(day/month/year)* 29 September 2011 (29.09.2011)
Applicant MATTHEW R. ELLSWORTHSHERIDAN ROSS P.C.1560 BROADWAY, SUITE 1200DENVER, CO 80202	

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

   Filing of amendments and statement under Article 19:
   The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

   When? The time limit for filing such amendments is normally two months from the date of transmittal of the international search report.

   Where? Directly to the International Bureau of WIPO, 34 chemin des Colombettes 1211 Geneva 20, Switzerland, Facsimile No.: +41 22 338 82 70

   For more detailed instructions, see *PCT Applicant's Guide*, International Phase, paragraphs 9.004 – 9.011.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. ☐ **With regard to any protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

   ☐ the protest together with the decision thereon has been transmitted to the International Bureau together with any request to forward the texts of both the protest and the decision thereon to the designated Offices.

   ☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Reminders**

   The applicant may submit comments on an informal basis on the written opinion of the International Searching Authority to the International Bureau. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established. Following the expiration of 30 months from the priority date, these comments will also be made available to the public.

   Shortly after the expiration of **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau before the completion of the technical preparations for international publication (Rules 90*bis*.1 and 90*bis*.3).

   Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices.

   In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months.

   For details about the applicable time limits, Office by Office, see www.wipo.int/pct/en/texts/time_limits.html and the *PCT Applicant's Guide*, National Chapters.

Name and mailing address of the ISA/ Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450	Authorized officer Lee W. Young PCT Helpdesk: 571-272-4300
Facsimile No. 571-273-3201	Telephone No. PCT OSP: 571-272-7774

Form PCT/ISA/220 (July 2010)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 6583-47-PCT	**FOR FURTHER ACTION**	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/US 11/53902	International filing date *(day/month/year)* 29 September 2011 (29.09.2011)	(Earliest) Priority Date *(day/month/year)* 01 October 2010 (01.10.2010)
Applicant MATTHEW R. ELLSWORTHSHERIDAN ROSS P.C.1560 BROADWAY, SUITE 1200DENVER, CO 80202		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 7 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

   a. With regard to the **language**, the international search was carried out on the basis of:

   ☒ the international application in the language in which it was filed.

   ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

   b. ☐ This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6*bis*(a)).

   c. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (see Box No. II).

3. ☐ **Unity of invention is lacking** (see Box No. III).

4. With regard to the **title**,

   ☒ the text is approved as submitted by the applicant.

   ☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

   ☒ the text is approved as submitted by the applicant.

   ☐ the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,

   a. the figure of the **drawings** to be published with the abstract is Figure No. 7

   ☐ as suggested by the applicant.

   ☐ as selected by this Authority, because the applicant failed to suggest a figure.

   ☒ as selected by this Authority, because this figure better characterizes the invention.

   b. ☐ none of the figures is to be published with the abstract.

Form PCT/ISA/210 (first sheet) (July 2009)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 11/53902

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - G09G 5/00 (2012.01)
USPC - 345/1.3
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
USPC:345/1.3

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
USPC:345/1.1, 1.3, 156, 659; 715/765, 781, 792, 802 (keyword limited; terms below)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
Electronic Database Searched: PubWEST(PGPB, USPT, EPAB, JPAB), Google Scholar
Search Terms Used: two, second, multiple, many, plurality, dual, touchscreen, screen, display, multiscreen, multidisplay, orient, rotate, reorient, revolve, spin, turn, configuration, fold, output, show, project, expand, spread, data, movie, application, content, program

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2010/0007603 A1 (Kirkup) 14 January 2010 (14.01.2010), see entire document; especially para [0020]-[0022], [0044]-[0052], Fig. 3A, 6B, 7-8	1-6, 9-15, 17-20
X	US 2010/0085382 A1 (Lundqvist et al.) 08 April 2010 (08.04.2010), see entire document; especially para [0093]-[0095], [0145]-[0150], [0213], Fig. 1, 3-6, 21, 27-31	1, 7-8, 10, 16
A	US 2010/0245209 A1 (Miller et al.) 30 September 2010 (30.09.2010), see entire document	1-20

☐ Further documents are listed in the continuation of Box C. ☐

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

Date of the actual completion of the international search	Date of mailing of the international search report
10 February 2012 (10.02.2012)	22 FEB 2012
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer: Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/210 (second sheet) (July 2009)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To: MATTHEW R. ELLSWORTH
SHERIDAN ROSS P.C.
1560 BROADWAY, SUITE 1200
DENVER, CO 80202

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)*	22 FEB 2012
Applicant's or agent's file reference 6583-47-PCT	**FOR FURTHER ACTION** See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US 11/53902	29 September 2011 (29.09.2011)	01 October 2010 (01.10.2010)

International Patent Classification (IPC) or both national classification and IPC
IPC(8) - G09G 5/00 (2012.01)
USPC - 345/1.3

Applicant MATTHEW R. ELLSWORTHSHERIDAN ROSS P.C.1560 BROADWAY, SUITE 1200DENVER, CO 80202

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1 *bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to th IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Fom PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA/US	Date of completion of this opinion	Authorized officer:
Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	10 February 2012 (10.02.2012)	Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/237 (cover sheet) (July 2011)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 11/53902

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:

   ☒ the international application in the language in which it was filed.

   ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a))

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing filed or furnished:

   a. (means)

      ☐ on paper

      ☐ in electronic form

   b. (time)

      ☐ in the international application as filed

      ☐ together with the international application in electronic form

      ☐ subsequently to this Authority for the purposes of search

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 11/53902

Box No. V **Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	None	YES
	Claims	1-20	NO
Inventive step (IS)	Claims	None	YES
	Claims	1-20	NO
Industrial applicability (IA)	Claims	1-20	YES
	Claims	None	NO

2. Citations and explanations:

Claims 1-6, 9-15 and 17-20 lack novelty under PCT Article 33(2) as being anticipated by US 2010/0007603 A1 (Kirkup).

As per claim 1, Kirkup discloses a method of controlling data displayed by a multi-screen device (see abstract and Fig. 3A), comprising: receiving a first rotation input, the first rotation input corresponding to an indication that the multi-screen device has been rotated a first time from a first open state to a different second open state (see Fig. 6B and para [0044]-[0048] - device can be rotated from an upright portrait orientation, 619, to a landscape orientation, 617) wherein data from a first application is displayed while the device is in the first open state on a first screen of the device and not on a second screen of the device, and wherein data from the first application is displayed on the first and second screens of the device in the second open state (see Fig. 6B and para [0044]-[0048] - data from the movie application is displayed on one screen in portrait orientation, 619, and on two screens in landscape orientation, 617); receiving a second rotation input, the second rotation input corresponding to an indication that the device has been rotated a second time after the first time (see Fig. 6B and para [0044]-[0048] - user can rotate the device clockwise back to portrait orientation, 619, or counterclockwise to portrait orientation, 615); after receiving the second rotation input, referencing display rules for the first application (see Fig. 7-8, para [0021]-[0022] and [0047]-[0051] - user preferences may also correlate the display (or screen) configurations with applications); and displaying the first application on one of the first and second screens according to the display rules for the first application (see Fig. 6B, 7-8, para [0021]-[0022] and [0044]-[0048] - the movie application is displayed according to the rules of the application).

As per claim 2, Kirkup discloses the method of claim 1, wherein the display rules for the first application are stored prior to receiving the second rotation input and correspond to a display configuration of the first application when the device is in the first open state prior to receiving the first rotation input (see Fig. 6B, 7-8, para [0021]-[0022] and [0044]-[0051] - user configuration options can be set prior to the rotations and the configuration of the application after the second rotation is the same as the configuration before the first rotation).

As per claim 3, Kirkup discloses the method of claim 2, wherein the display rules for the first application indicate that the data from the first application is presented substantially identically to the way in which the data from the first application is presented prior to receiving the first rotation input (see Fig. 6B and para [0044]-[0048] - presentation of the application after the second rotation is the same as the presentation before the first rotation, since the phone is in identical state, 619, or substantially similar state, 615).

As per claim 4, Kirkup discloses the method of claim 1, wherein at least one of the first and second rotation inputs are received from an accelerometer (see para [0020] and [0052] - disclosing an accelerometer).

As per claim 5, Kirkup discloses the method of claim 1, further comprising: receiving a first stack-altering input after the first rotation input but before the second rotation input (see Fig. 6B and para [0045]-[0046] - when the user is finished viewing a message or alert in an application after the first rotate, they can close the application); and updating the display rules for the first application to correspond to display rules that are different from display rules for the first application prior to receiving the first rotation input (see Fig. 6B, 7-8, para [0021]-[0022] and [0045] - the orientation display rules depend on the application that triggers them and can change to a different application's rules after the user closes the first application).

As per claim 6, Kirkup discloses the method of claim 5, wherein the first stack-altering input corresponds to at least one of a minimization instruction for the first application and an application navigation instruction (see Fig. 6B and para [0045]-[0046] - when the user is finished viewing a message or alert in an application after the first rotate, they can close the application).

As per claim 9, Kirkup discloses the method of claim 1, wherein the first rotation input corresponds to a rotation of the device by about 90 degrees in a first direction and wherein the second rotation input corresponds to a rotation of the device by about 90 degrees in a second direction that is opposite the first direction (see Fig. 6B and para [0042]-[0048] - the screen configuration changes are triggered based on 90.degree. rotation angles).

---------- SEE SUPPLEMENTAL SHEET ----------

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:
Box V.2 - Citations and Explanations

As per claim 10, Kirkup discloses a non-transitory computer-readable medium having stored thereon instructions that cause a computing system to execute a method (see abstract, para [0055]-[0056] and Fig. 3A), the instructions comprising: instructions configured to receive a first rotation input, the first rotation input corresponding to an indication that the multi-screen device has been rotated a first time from a first open state to a different second open state (see Fig. 6B and para [0044]-[0048] - device can be rotated from an upright portrait orientation, 619, to a landscape orientation, 617), wherein data from a first application is displayed while the device is in the first open state on a first screen of the device and not on a second screen of the device, and wherein data from the first application is displayed on the first and second screens of the device in the second open state (see Fig. 6B and para [0044]-[0048] - data from the movie application is displayed on one screen in portrait orientation, 619, and on two screens in landscape orientation, 617); instructions configured to receive a second rotation input, the second rotation input corresponding to an indication that the device has been rotated a second time after the first time (see Fig. 6B and para [0044]-[0048] - user can rotate the device clockwise back to portrait orientation, 619, or counterclockwise to portrait orientation, 615); instructions configured to reference display rules for the first application after receiving the second rotation input (see Fig. 7-8, para [0021]-[0022] and [0047]-[0051] - .user preferences may also correlate the display (or screen) configurations with applications.); and instructions configured to render a display of the first application on one of the first and second screens according to the display rules for the first application (see Fig. 6B, 7-8, para [0021]-[0022] and [0044]-[0048] - the movie application is displayed according to the rules of the application).

As per claim 11, Kirkup discloses the computer-readable medium of claim 10, wherein the display rules for the first application are stored prior to receiving the second rotation input and correspond to a display configuration of the first application when the device is in the first open state prior to receiving the first rotation input (see Fig. 6B, 7-8, para [0021]-[0022] and [0044]-[0051] - user configuration options can be set prior to the rotations and the configuration of the application after the second rotation is the same as the configuration before the first rotation).

As per claim 12, Kirkup discloses the method of claim 11, wherein the display rules for the first application indicate that the data from the first application is presented substantially identically to the way in which the data from the first application is presented prior to receiving the first rotation input (see Fig. 6B and para [0044]-[0048] - presentation of the application after the second rotation is the same as the presentation before the first rotation, since the phone is in identical state, 619, or substantially similar state, 615).

As per claim 13, Kirkup discloses the computer-readable medium of claim 10, wherein at least one of the first and second rotation inputs are received from an accelerometer (see para [0020] and [0052] - disclosing an accelerometer).

As per claim 14, Kirkup discloses the computer-readable medium of claim 10, further comprising: instructions configured to receive a first stack-altering input after the first rotation input but before the second rotation input (see Fig. 6B and para [0045]-[0046] - when the user is finished viewing a message or alert in an application after the first rotate, they can close the application); and instructions configured to update the display rules for the first application to correspond to display rules that are different from display rules for the first application prior to receiving the first rotation input (see Fig. 6B, 7-8, para [0021]-[0022] and [0045] - the orientation display rules depend on the application that triggers them and can change to a different application's rules after the user closes the first application).

As per claim 15, Kirkup discloses the computer-readable medium of claim 14, wherein the first stack-altering input corresponds to at least one of a minimization instruction for the first application and an application-navigation instruction (see Fig. 6B and para [0045]-[0046] - when the user is finished viewing a message or alert in an application after the first rotate, they can close the application).

As per claim 17, Kirkup discloses a multi-screen user device (see abstract and Fig. 3A), comprising: a first screen including a first display area (see Fig. 3A); a second screen including a second display area (see Fig. 3A); a sensor configured to produce an electrical signal indicative of a rotation of the user device (see para [0020] - accelerometer); and a computer-readable medium (see para [0055]-[0056]) having instructions stored thereon that include: a first set of instructions configured to receive a first rotation input, the first rotation input corresponding to an indication that the multi -screen device has been rotated a first time from a first open state to a different second open state (see Fig. 6B and para [0044]-[0048] - device can be rotated from an upright portrait orientation, 619, to a landscape orientation, 617), wherein data from a first application is displayed while the device is in the first open state on a first screen of the device and not on a second screen of the device, and wherein data from the first application is displayed on the first and second screens of the device in the second open state (see Fig. 6B and para [0044]-[0048] - data from the movie application is displayed on one screen in portrait orientation, 619, and on two screens in landscape orientation, 617); a second set of instructions configured to receive a second rotation input, the second rotation input corresponding to an indication that the device has been rotated a second time after the first time (see Fig. 6B and para [0044]-[0048] - user can rotate the device clockwise back to portrait orientation, 619, or counterclockwise to portrait orientation, 615); a third set of instructions configured to reference display rules for the first application after receiving the second rotation input (see Fig. 7-8, para [0021]-[0022] and [0047]-[0051] - .user preferences may also correlate the display (or screen) configurations with applications.); and a fourth instructions configured to render a display of the first application on one of the first and second screens according to the display rules for the first application (see Fig. 6B, 7-8, para [0021]-[0022] and [0044]-[0048] - the movie application is displayed according to the rules of the application).

---------- SEE SUPPLEMENTAL SHEET ----------

Supplemental Box

In case **the space in any of the preceding boxes is not sufficient.**
Continuation of:
Box V.2 - Citations and Explanations

As per claim 18, Kirkup discloses the device of claim 17, wherein the display rules for the first application are stored prior to receiving the second rotation input and correspond to a display configuration of the first application when the device is in the first open state prior to receiving the first rotation input (see Fig. 6B, 7-8, para [0021]-[0022] and [0044]-[0051] - user configuration options can be set prior to the rotations and the configuration of the application after the second rotation is the same as the configuration before the first rotation) and wherein the display rules for the first application indicate that the data from the first application is presented substantially identically to the way in which the data from the first application is presented prior to receiving the first rotation input (see Fig. 6B and para [0044]-[0048] - presentation of the application after the second rotation is the same as the presentation before the first rotation, since the phone is in identical state, 619, or substantially similar state, 615).

As per claim 19, Kirkup discloses the device of claim 17, wherein the first open state corresponds to an open portrait state and wherein the second state corresponds to an open landscape state (see Fig. 6B and para [0044]-[0048] - the first open state, 619, is a portrait state, and the second open state, 617, is a landscape state).

As per claim 20, Kirkup discloses the device of claim 19, wherein the data from the first application is automatically maximized across both the first and second screens in response to receiving the first rotation input (see Fig. 6B and para [0044]-[0048] - the video application is maximized across both screens in response to the rotation).

Claims 1, 7-8, 10 and 16 lack novelty under PCT Article 33(2) as being anticipated by US 2010/0085382 A1 to Lundqvist et al. (hereinafter 'Lundqvist').

As per claim 1, Lundqvist discloses a method of controlling data displayed by a multi-screen device (see abstract), comprising: receiving a first rotation input, the first rotation input corresponding to an indication that the multi-screen device has been rotated a first time from a first open state to a different second open state (see Fig. 1, 3-6, 21, 27-31, para [0093]-[0095] and [0145]-[0150] - panels of device can be rotated into a second open state with all screens lying flat, and device can be implemented as two screens), wherein data from a first application is displayed while the device is in the first open state on a first screen of the device and not on a second screen of the device, and wherein data from the first application is displayed on the first and second screens of the device in the second open state (see Fig. 1, 3-6, 21, 27-31 and para [0093]-[0095]- when fully extended, the panorama view could automatically display interfaces such as, for example, a wide-screen video or a web browser); receiving a second rotation input, the second rotation input corresponding to an indication that the device has been rotated a second time after the first time (see Fig. 1, 3-6, 21, 27-31, para [0093]-[0095] and [0145]-[0150] - panels of device can be rotated or folded back into an original open state); after receiving the second rotation input, referencing display rules for the first application (see para [0093] - the display layout may be based on application settings); and displaying the first application on one of the first and second screens according to the display rules for the first application (see Fig. 1, 3-6, 21, 27-31, para [0093]-[0095] and [0145]-[0150] - the application and display made be changed back to the original display when the panels are folded into the original state).

As per claim 7, Lundqvist discloses the method of claim 1, wherein data from a first desktop is displayed on the second screen prior to receiving the first rotation input, wherein the data from the first desktop is not displayed after receiving the first rotation input but before receiving the second rotation input, and wherein the data from the first desktop is re-displayed on the second screen after receiving the second rotation input (see para para [0093]-[0095], [0145]-[0150] and [0213] - the desktop can be displayed on one of the screens in a folded configuration, then removed to make room for the panorama view of the application in the extended configuration, and the then returned to one of the screens when the panels are folded again).

As per claim 8, Lundqvist discloses the method of claim 7, wherein the data from the first application is automatically maximized and displayed across both the first and second screens after receiving the first rotation input (see Fig. 1, 3-6, 21, 27-31 and para [0093]-[0095] - when fully extended, the panorama view could automatically display interfaces such as, for example, a wide-screen video or a web browser).

As per claim 10, Lundqvist discloses a non-transitory computer-readable medium having stored thereon instructions that cause a computing system to execute a method (see abstract and para [0101]), the instructions comprising: instructions configured to receive a first rotation input, the first rotation input corresponding to an indication that the multi-screen device has been rotated a first time from a first open state to a different second open state (see Fig. 1, 3-6, 21, 27-31, para [0093]-[0095] and [0145]-[0150] - panels of device can be rotated into a second open state with all screens lying flat, and device can be implemented as two screens), wherein data from a first application is displayed while the device is in the first open state on a first screen of the device and not on a second screen of the device, and wherein data from the first application is displayed on the first and second screens of the device in the second open state (see Fig. 1, 3-6, 21, 27-31 and para [0093]-[0095]- when fully extended, the panorama view could automatically display interfaces such as, for example, a wide-screen video or a web browser); instructions configured to receive a second rotation input, the second rotation input corresponding to an indication that the device has been rotated a second time after the first time (see Fig. 1, 3-6, 21, 27-31, para [0093]-[0095] and [0145]-[0150] - panels of device can be rotated or folded back into an original open state); instructions configured to reference display rules for the first application after receiving the second rotation input (see para [0093] - the display layout may be based on application settings); and instructions configured to render a display of the first application on one of the first and second screens according to the display rules for the first application (see Fig. 1, 3-6, 21, 27-31, para [0093]-[0095] and [0145]-[0150] - the application and display made be changed back to the original display when the panels are folded into the original state).

---------- SEE SUPPLEMENTAL SHEET ----------

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:
Box V.2 - Citations and Explanations

As per claim 16, Lundqvist discloses the computer-readable medium of claim 10, wherein data from a first desktop is displayed on the second screen prior to receiving the first rotation input, wherein the data from the first desktop is not displayed after receiving the first rotation input but before receiving the second rotation input, wherein the data from the first desktop is re-displayed on the second screen after receiving the second rotation input (see para para [0093]-[0095], [0145]-[0150] and [0213] - the desktop can be displayed on one of the screens in a folded configuration, then removed to make room for the panorama view of the application in the extended configuration, and the then returned to one of the screens when the panels are folded again), and wherein the data from the first application is automatically maximized and displayed across both the first and second screens after receiving the first rotation input (see Fig. 1, 3-6, 21, 27-31 and para [0093]-[0095]- when fully extended, the panorama view could automatically display interfaces such as, for example, a wide -screen video or a web browser).

Claims 1-20 have industrial applicability as defined by PCT Article 33(4) because the subject matter can be made or used in industry.

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To:
BRENT P. JOHNSON
SHERIDAN ROSS P.C.
1560 BROADWAY, SUITE 1200
DENVER, CO 80202

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT AND THE WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

Date of mailing *(day/month/year)*	22 FEB 2012
Applicant's or agent's file reference 6583-66-PCT	**FOR FURTHER ACTION** See paragraphs 1 and 4 below
International application No. PCT/US 11/53963	International filing date *(day/month/year)* 29 September 2011 (29.09.2011)
Applicant IMERJ LLC	

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

   Filing of amendments and statement under Article 19:
   The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

   When? The time limit for filing such amendments is normally two months from the date of transmittal of the international search report.

   Where? Directly to the International Bureau of WIPO, 34 chemin des Colombettes 1211 Geneva 20, Switzerland, Facsimile No.: +41 22 338 82 70

   For more detailed instructions, see *PCT Applicant's Guide*, International Phase, paragraphs 9.004 – 9.011.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. ☐ **With regard to any protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

   ☐ the protest together with the decision thereon has been transmitted to the International Bureau together with any request to forward the texts of both the protest and the decision thereon to the designated Offices.

   ☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Reminders**

   The applicant may submit comments on an informal basis on the written opinion of the International Searching Authority to the International Bureau. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established. Following the expiration of 30 months from the priority date, these comments will also be made available to the public.

   Shortly after the expiration of **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau before the completion of the technical preparations for international publication (Rules 90*bis*.1 and 90*bis*.3).

   Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices.

   In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months.

   For details about the applicable time limits, Office by Office, see www.wipo.int/pct/en/texts/time_limits.html and the *PCT Applicant's Guide*, National Chapters.

Name and mailing address of the ISA/ Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450	Authorized officer Lee W. Young PCT Helpdesk: 571-272-4300
Facsimile No. 571-273-3201	Telephone No. PCT OSP: 571-272-7774

Form PCT/ISA/220 (July 2010)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 6583-66-PCT	**FOR FURTHER ACTION**	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/US 11/53963	International filing date *(day/month/year)* 29 September 2011 (29.09.2011)	(Earliest) Priority Date *(day/month/year)* 01 October 2010 (01.10.2010)
Applicant IMERJ LLC		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 7 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

   a. With regard to the **language**, the international search was carried out on the basis of:

   ☒ the international application in the language in which it was filed.

   ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

   b. ☐ This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6*bis*(a)).

   c. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (see Box No. II).

3. ☐ **Unity of invention is lacking** (see Box No. III).

4. With regard to the **title**,

   ☒ the text is approved as submitted by the applicant.

   ☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

   ☒ the text is approved as submitted by the applicant.

   ☐ the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,

   a. the figure of the **drawings** to be published with the abstract is Figure No. 2

   ☐ as suggested by the applicant.

   ☐ as selected by this Authority, because the applicant failed to suggest a figure.

   ☒ as selected by this Authority, because this figure better characterizes the invention.

   b. ☐ none of the figures is to be published with the abstract.

Form PCT/ISA/210 (first sheet) (July 2009)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 11/53963

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - G06F 3/048 (2012.01)
USPC - 715/799
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC(8): G06F 3/048 (2012.01)
USPC: 715/799

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
USPC: 715/863,764-769,792-794 (keyword limited; terms below)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
PubWest; Google Scholar; Google Patents; FreePatentsOnline. Search terms used: device apparatus personal-electronic electronic-device electronic-apparatus, portable handheld PDA smartphone cell-phone mobile-phone memory processor microprocessor graphics-processor image-processor ASIC DSP code software instruction, dual-screen...

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2009/0319672 A1 (REISMAN) 24 December 2009 (24.12.2009) entire document, especially Abstract; para [0042], [0106], [0120], [0482]	1 - 20
Y	US 2010/0064536 A1 (CASKEY et al.) 18 March 2010 (18.03.2010) entire document, especially Abstract; para [0005], [0076], [0077], [0089], [0126], [0131], [0132], [0133], [0135], [0140], [0142], [0150]	1 - 20
Y	US 2010/0211872 A1 (ROLSTON et al.) 19 August 2010 (19.08.2010) entire document, especially Abstract; para [0007], [0101]	1 - 20
Y	US 2009/0143141 A1 (WELLS et al.) 04 June 2009 (04.06.2009) entire document, especially Abstract; para [0016], [0716], [0831], [0866], [0965]	3, 12
A	US 2010/0064244 A1 (KILPATRICK II, et al.) 11 March 2010 (11.03.2010) entire document	1 - 20

☐ Further documents are listed in the continuation of Box C. ☐

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

Date of the actual completion of the international search	Date of mailing of the international search report
13 February 2012 (13.02.2012)	22 FEB 2012
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer: Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/210 (second sheet) (July 2009)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To: BRENT P. JOHNSON
SHERIDAN ROSS P.C.
1560 BROADWAY, SUITE 1200
DENVER, CO 80202

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)*	22 FEB 2012

Applicant's or agent's file reference	FOR FURTHER ACTION
6583-66-PCT	See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US 11/53963	29 September 2011 (29.09.2011)	01 October 2010 (01.10.2010)

International Patent Classification (IPC) or both national classification and IPC
IPC(8) - G06F 3/048 (2012.01)
USPC - 715/799

Applicant IMERJ LLC

1. This opinion contains indications relating to the following items:

- [X] Box No. I Basis of the opinion
- [ ] Box No. II Priority
- [ ] Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- [ ] Box No. IV Lack of unity of invention
- [X] Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- [ ] Box No. VI Certain documents cited
- [ ] Box No. VII Certain defects in the international application
- [ ] Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1 *bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA/US	Date of completion of this opinion	Authorized officer:
Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	13 February 2012 (13.02.2012)	Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/237 (cover sheet) (July 2011)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 11/53963

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:

   ☒ the international application in the language in which it was filed.

   ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a))

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing filed or furnished:

   a. (means)

      ☐ on paper

      ☐ in electronic form

   b. (time)

      ☐ in the international application as filed

      ☐ together with the international application in electronic form

      ☐ subsequently to this Authority for the purposes of search

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 11/53963

Box No. V **Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	1 - 20	YES
	Claims	None	NO
Inventive step (IS)	Claims	None	YES
	Claims	1 - 20	NO
Industrial applicability (IA)	Claims	1 - 20	YES
	Claims	None	NO

2. Citations and explanations:

Claims 1, 2, 4-11 and 13-20 lack an inventive step under PCT Article 33(3) as being obvious over US 2009/0319672 A1 (Reisman) in view of US 2010/0064536 A1 to Caskey et al. (hereinafter, 'Caskey'), and further in view of US 2010/0211872 A1 to Rolston et al. (hereinafter, 'Rolston').

As to claims 1, 13 and 17, Reisman teaches a method, a non-transitory computer-readable medium and a multi-screen user device displaying a plurality of desktops and/or applications, each having at least one window, on a multi-screen device, comprising: receiving, by a processor, a first input that represents an instruction to reveal one of a desktop or application on a first display of the multi-screen device (para [0106], [0482]); selecting, by a processor, a first desktop or application to display on the first display (para [0106]); receiving, by a processor, a second input that represents an instruction to reveal one of a desktop or application on a second display of the multi-screen device (para [0106], [0482]); selecting, by a processor, a second desktop or application to display on the second display (para [0106]); displaying, by a processor, the selected first and second desktops or applications on the first and second displays (para [0106]);

but fails to explicitly disclose receiving, by a processor, a third input that represents an instruction to launch an application manager feature; displaying, by a processor, the applications or desktops on the first and second displays, and displaying a management window showing all other applications or desktops currently running on the device; receiving, by a processor, a fourth input that represents an instruction to selectively move one of said first and second applications or desktops, or said other applications or desktops, within the window stack to a different position; and displaying, by a processor, the window stack in a new order in response to said fourth input; determining, by a processor, a desired order for a window stack comprising the first and second applications or desktops, and said other applications or desktops.

However, Caskey does teach receiving, by a processor, a third input that represents an instruction to launch an application manager feature (para [0126], [0131]); displaying, by a processor, the applications or desktops on the first and second displays, and displaying a management window showing all other applications or desktops currently running on the device (para [0089], [0132]); receiving, by a processor, a fourth input that represents an instruction to selectively move one of said first and second applications or desktops, or said other applications or desktops, within the window stack to a different position (para [0076], [0126]); and displaying, by a processor, the window stack in a new order in response to said fourth input (para [0135] - new layout).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the the method and apparatus for browsing using multiple coordinated device sets of Reisman with the multi-panel electronic device of Caskey, because Reisman and Caskey are directed to systems and methods for repositioning windows in the pop-up window. Furthermore, users and designers benefit from systems and/or methods adapted for allowing any number of panels to be included in a portable electronic device that automatically adjusts a graphical display based on a change of folding configuration, because such systems/methods allow for an electronic device is disclosed that includes multiple folding display panels such that, when fully extended, the electronic device provides an extended larger display (Caskey, para [0005]).

The combination of Reisman and Caskey teaches the foregoing, but fails to explicitly disclose determining, by a processor, a desired order for a window stack comprising the first and second applications or desktops, and said other applications or desktops.

However, Rolston does teach
determining, by a processor, a desired order for a window stack comprising the first and second applications or desktops, and said other applications or desktops (para [0101]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the method and apparatus for browsing using multiple coordinated device sets of Reisman (as enhanced by Caskey) with the user-application interface of Rolston, because Reisman, Caskey and Rolston are directed to systems and methods for repositioning windows in the pop-up window. Furthermore, users and designers benefit from systems and/or methods adapted for allowing one or more of the application stacks to be displayed in the active area (and hence activated) simultaneously, because such systems/methods allow for convenient user interface and content/application management system, or user-application interaction system (Rolston, para [0007]).

As to claim 2, in combination with Reisman and Rolston, Caskey further discloses wherein the fourth input is a user gesture comprising at least one of a flick, tap, long hold, or drag gesture (para [0150] - finger... drag).

As to claims 4, 14 and 18, in combination with Reisman and Rolston, Caskey further discloses wherein said receiving a fourth input step is executed a number of times until the window stack is displayed in the desired order (para [0077], [0126]).

- Please See Supplemental Box -

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:
Box V.2. Citations and explanations:

As to claims 5, 15 and 19, in combination with Caskey and Rolston, Reisman further discloses wherein at least one management window appears on said first and second displays, and the other applications or desktops are arranged linearly within the management window from left to right, and the left to right order of the other applications or desktops corresponds to an order of the other applications or desktops within the window stack (para [0042], [0120]).

As to claim 6, in combination with Reisman and Rolston, Caskey further discloses wherein the rightmost appearing one of the other applications or desktops is the top application or desktop in the group of the other applications or desktops, and the leftmost appearing one of the other applications or desktops is the bottom application or desktop in the group of the other applications or desktops (para [0142]).

As to claim 7, in combination with Caskey and Rolston, Reisman further discloses wherein the first or second applications or desktops are the first two applications or desktops within the window stack (para [0120]).

As to claims 8 and 16, in combination with Reisman and Rolston, Caskey further discloses wherein an order of the first or second applications or desktops within the window stack can be changed by executing a user input gesture, comprising at least one of a flick or drag gesture, on the first and second displays (para [0150] - drag).

As to claim 9, in combination with Reisman and Rolston, Caskey further discloses wherein an order of the other applications or desktops within the window stack can be changed by executing a user input gesture, comprising at least one of a flick or drag gesture executed on a selected one of the other applications or desktops within the management window to thereby move the selected one to another position within the window stack (para [0150] - drag).

As to claim 10, in combination with Reisman and Rolston, Caskey further discloses wherein a flick or drag gesture executed in a left direction causes the selected one to move down in the stack a predetermined number of positions, and a flick or drag gesture executed in a right direction causes the selected one to move up in the stack a predetermined number of positions (para [0133] - change in orientation or movement; para [0140] - right-most portion).

As to claims 11 and 20, in combination with Caskey and Rolston, Reisman further discloses wherein separate management windows appear on said first and second displays denoting a first window stack for the first display and a second window stack for the second display, and wherein the other applications or desktops are arranged linearly within each management window from left to right, and the left to right order of the other applications or desktops correspond to an order of the other applications or desktops within the window stack for each corresponding display (para [0042], [0120]).

Claims 3 and 12 lack an inventive step under PCT Article 33(3) as being obvious over Reisman in view of Caskey, further in view of Rolston, and still further in view of US 2009/0143141 A1 to Wells et al. (hereinafter, 'Wells').

As to claim 3, the combination of Reisman, Caskey and Rolston teaches the method of claim 1, but fails to explicitly disclose wherein the third input is a user gesture comprising a spread gesture, and wherein the spread gesture is executed on off-screen areas of said first and second displays with one finger of a user placed on one screen, and another finger of the user placed on the other screen.

However, Wells does teach wherein the third input is a user gesture comprising a spread gesture, and wherein the spread gesture is executed on off-screen areas of said first and second displays with one finger of a user placed on one screen, and another finger of the user placed on the other screen (para [0716], [0831], [0866]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the method and apparatus for browsing using multiple coordinated device sets of Reisman (as enhanced by Caskey and Rolston) with the intelligent multiplayer gaming system with multi-touch display of Wells, because Reisman, Caskey, Rolston and Wells are directed to systems and methods for repositioning windows in the pop-up window. Furthermore, users and designers benefit from systems and/or methods adapted for allowing a left object to be the thumb and forefinger of the left hand of the user and the right object may be the remaining fingers of the left hand, because such systems/methods allow for facilitating gesture-based interactions with intelligent multi-player electronic gaming systems which include a multi-user, multi-touch input display surface capable of concurrently supporting contact-based and/or non-contact-based gestures performed by one or more users at or near the input display surface (Wells, para [0016]).

As to claim 12, the combination of Reisman, Caskey and Rolston teaches the method of claim 5, but fails to explicitly disclose wherein a selected one of the other applications or desktops is moved to a new position displayed on the first or second displays by executing another user input gesture on the selected one, the another user input gesture comprising at least one of a tap or long hold gesture.

However, Wells does teach wherein a selected one of the other applications or desktops is moved to a new position displayed on the first or second displays by executing another user input gesture on the selected one, the another user input gesture comprising at least one of a tap or long hold gesture (para [0965] - double tap).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the method and apparatus for browsing using multiple coordinated device sets of Reisman (as enhanced by Caskey and Rolston) with the intelligent multiplayer gaming system with multi-touch display of Wells, because Reisman, Caskey, Rolston and Wells are directed to systems and methods for repositioning windows in the pop-up window. Furthermore, users and designers benefit from systems and/or methods adapted for allowing the user to perform a "single digit" double tap gesture by initially contacting the multi-touch input interface with a single finger, lifting the finger up (e.g., to break contact with the multi-touch input interface, thereby completing the first "tap" gesture), contacting the multi-touch input interface again with the single finger, and then lifting the finger up again (e.g., to thereby complete the second "tap" gesture), because such systems/methods allow for facilitating gesture-based interactions with intelligent multi-player electronic gaming systems which include a multi-user, multi-touch input display surface capable of concurrently supporting contact-based and/or non-contact-based gestures performed by one or more users at or near the input display surface (Wells, para [0016]).

Claims 1 - 20 have industrial applicability as defined by PCT Article 33(4) because the subject matter can be made or used in industry.

Electronic Acknowledgement Receipt	
EFS ID:	15635335
Application Number:	13247708
International Application Number:	
Confirmation Number:	8636
Title of Invention:	FULL-SCREEN ANNUNCIATOR
First Named Inventor/Applicant Name:	Sanjiv Sirpal
Customer Number:	22442
Filer:	Tadd Fjelp Wilson/Amy Duarte
Filer Authorized By:	Tadd Fjelp Wilson
Attorney Docket Number:	6583-67
Receipt Date:	29-APR-2013
Filing Date:	28-SEP-2011
Time Stamp:	13:45:59
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	2013-04-29_Z124_GenPOA.pdf	128928 fbc23d29dfca8e3dea8a9dd183a9e58a910df91c	no	1
Warnings:					
Information:					

2	Assignee showing of ownership per 37 CFR 3.73.	2013-04-29_3-73b_Statement.pdf	426763 7a4bffcc1c5e688cfc0c0d3cd89df9574c2da553	no	2

Warnings:	
Information:	
Total Files Size (in bytes):	555691

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/80 (11-08)
Approved for use through 11/30/2011. OMB 0651-0035
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(b).

I hereby appoint:

☑ Practitioners associated with the Customer Number: 111285

OR

☐ Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number	Name	Registration Number

as attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(b).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(b) to:

☑ The address associated with Customer Number: 111285

OR

☐ Firm or Individual Name			
Address			
City		State	Zip
Country			
Telephone		Email	

Assignee Name and Address:

Z124
c/o Maples Corporate Services Limited, P.O. Box 309GT, Ugland House, South Church Street
Georgetown, Grand Cayman KY1-1104, Cayman Islands

A copy of this form, together with a statement under 37 CFR 3.73(b) (Form PTO/SB/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(b) may be completed by one of the practitioners appointed in this form if the appointed practitioner is authorized to act on behalf of the assignee, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee

Signature	Timothy L Stewart	Date	April 26, 2013
Name	Timothy L. Stewart	Telephone	408-576-7746
Title	Secretary		

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

PTO/SB/96 (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
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STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: Z124

Application No./Patent No.: 13/247,708 Filed/Issue Date: September 28, 2011

Titled: Full-Screen Annunciator

Z124 , a corporation

(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that it is:

1. [X] the assignee of the entire right, title, and interest in;

2. [ ] an assignee of less than the entire right, title, and interest in (The extent (by percentage) of its ownership interest is _____ %); or

3. [ ] the assignee of an undivided interest in the entirety of (a complete assignment from one of the joint inventors was made)

the patent application/patent identified above, by virtue of either:

A. [ ] An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy therefore is attached.

OR

B. [X] A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: Sanjiv Sirpal et al. To: Imerj LLC

The document was recorded in the United States Patent and Trademark Office at
Reel 027386 , Frame 0537 , or for which a copy thereof is attached.

2. From: Imerj LLC To: Z124

The document was recorded in the United States Patent and Trademark Office at
Reel 028300 , Frame 0038 , or for which a copy thereof is attached.

3. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
Reel _____ , Frame _____ , or for which a copy thereof is attached.

[ ] Additional documents in the chain of title are listed on a supplemental sheet(s).

[ ] As required by 37 CFR 3.73(b)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (*i.e.*, a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/Tadd F. Wilson/ April 29, 2013

Signature Date

Tadd F. Wilson Patent Attorney - 54,544

Printed or Typed Name Title

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

UNITED STATES PATENT AND TRADEMARK OFFICE

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United States Patent and Trademark Office
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www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/247,708	09/28/2011	Sanjiv Sirpal	6583-67

CONFIRMATION NO. 8636

111285
Sheridan Ross P.C.
1560 Broadway
Suite 1200
Denver, CO 80202

POA ACCEPTANCE LETTER

OC00000060927015

Date Mailed: 05/06/2013

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 04/29/2013.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/tnnguyen/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Application Number	13/247,708
				Filing Date	September 28, 2011
				First Named Inventor	Sanjiv Sirpal
(Use as many sheets as necessary)				Art Unit	2174
				Examiner Name	Steven Paul Sax
Sheet	1	of	2	Attorney Docket Number	6583-67

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No.[1]	Document Number Number-kind Code[2] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1	8108782	01/31/2012	Rajpal et al.	
	2	8290540	10/16/2012	Kittel et al.	
	3	8300022	10/30/2012	Brenneman et al.	
	4	8385057	02/26/2013	Liu et al.	
	5	8423911	04/16/2013	Chaudhri	
	6	2002/0089505	07/11/2002	Ording	
	7	2002/0140698	10/03/2002	Robertson et al.	
	8	2004/0066408	04/08/2004	Meyers et al.	
	9	2009/0113330	04/30/2009	Garrison et al.	
	10	2009/0204925	08/13/2009	Bhat et al.	
	11	2009/0278806	11/12/2009	Duarte et al.	
	12	2010/0144433	06/10/2010	Yamada et al.	
	13	2010/0146422	06/10/2010	Seong et al.	
	14	2010/0188352	07/29/2010	Ikeda	
	15	2010/0289826	11/18/2010	Park et al.	
	16	2011/0143769	06/16/2011	Jones et al.	
	17	2011/0202834	08/18/2011	Mandryk et al.	
	18	2012/0081268	04/05/2012	Sirpal et al.	
	19	2012/0081400	04/05/2012	Schrock et al.	
	20	2012/0117495	05/10/2012	Sirpal et al.	
	21	2012/0266098	10/18/2012	Webber	
	22	2013/0079062	03/28/2013	Sirpal et al.	

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]; Number[4]; Kind Code[5] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]

NON-PATENT LITERATURE DOCUMENTS

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1] Applicant's unique citation designation number (optional). [2] See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6] Applicant is to place a check mark here if English language Translation is attached.

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Application Number	13/247,708
				Filing Date	September 28, 2011
				First Named Inventor	Sanjiv Sirpal
(Use as many sheets as necessary)				Art Unit	2174
				Examiner Name	Steven Paul Sax
Sheet	2	of	2	Attorney Docket Number	6583-67

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
	23	SOEGAARD, "Affordances." Interaction Design Foundation, (2010), 7 pages, [Retrieved May 29, 2013 from www.interaction-design.org/encyclopedia/affordances.html]
	24	International Preliminary Report on Patentability for International (PCT) Patent Application No. PCT/US2011/053942, mailed Apr. 11, 2013 (Attorney's Ref. No. 6583-28-PCT) 7 pages
	25	International Preliminary Report on Patentability for International (PCT) Patent Application No. PCT/US2011/053902, mailed Apr. 11, 2013 (Attorney's Ref. No. 6583-47-PCT) 8 pages
	26	International Preliminary Report on Patentability for International (PCT) Patent Application No. PCT/US2011/053963, mailed Apr. 11, 2013 (Attorney's Ref. No. 6583-66-PCT) 6 pages
	27	Official Action for U.S. Patent Application No. 13/247,982, mailed Aug. 15, 2013 (Attorney's Ref. No. 6583-28) 14 pages
	28	Official Action for U.S. Patent Application No. 13/247,797, mailed Sep. 12, 2013 (Attorney's Ref. No. 6583-47) 13 pages
	29	Notice off Allowance for U.S. Patent Application No. 13/247,797, mailed Oct. 11, 2013 (Attorney's Ref. No. 6583-47) 13 pages
	30	Official Action for U.S. Patent Application No. 13/247,369, mailed Oct. 10, 2013 (Attorney's Ref. No. 6583-66) 16 pages
	31	Official Action for U.S. Patent Application No. 13/223,778, mailed Jun. 06, 2013 (Attorney's Ref. No. 6583-110) 38 pages
	32	Official Action for U.S. Patent Application No. 13/223,778, mailed Nov. 07, 2013 (Attorney's Ref. No. 6583-110) 37 pages

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1] Applicant's unique citation designation number (optional). [2] See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6] Applicant is to place a check mark here if English language Translation is attached.

Electronic Acknowledgement Receipt	
EFS ID:	17400833
Application Number:	13247708
International Application Number:	
Confirmation Number:	8636
Title of Invention:	FULL-SCREEN ANNUNCIATOR
First Named Inventor/Applicant Name:	Sanjiv Sirpal
Customer Number:	111285
Filer:	Douglas W. Swartz/Robert Roe-Pachirat
Filer Authorized By:	Douglas W. Swartz
Attorney Docket Number:	6583-67
Receipt Date:	14-NOV-2013
Filing Date:	28-SEP-2011
Time Stamp:	13:00:56
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		6583-67_IDS_02.pdf	209243 eb15e2dbd6b750c811deb3457419a132df497a1b	yes	5

	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Transmittal Letter		1	3	
	Information Disclosure Statement (IDS) Form (SB08)		4	5	
Warnings:					
Information:					
2	Non Patent Literature	SOEGAARD_Affordances.pdf	360571 7be07a844baad3bd74c90ec5e7c57c47f3b15b38	no	7
Warnings:					
Information:					
3	Non Patent Literature	6583-28-PCT_IPRP_04-11-2013.pdf	710691 efb15d65f5b5832fef0867b91ceeeb28f8a9e37f	no	7
Warnings:					
Information:					
4	Non Patent Literature	6583-47-PCT_IPRP_04-11-2013.pdf	990304 5bf328248f88486fec22ae0b1dc039e46978dcee	no	8
Warnings:					
Information:					
5	Non Patent Literature	6583-66-PCT_IPRP_04-11-2013.pdf	740052 3f41080409e37f77eb1b254fdf4d4bfaa2142c48	no	6
Warnings:					
Information:					
6	Non Patent Literature	6583-28_OA_08-15-2013.pdf	516185 5a359021dc9095eb16d14578d9202bae8763b1d5	no	14
Warnings:					
Information:					
7	Non Patent Literature	6583-47_OA_09-12-2013.pdf	509018 e05890cbc67c76fedcdb5190d6983a503d93f158	no	13
Warnings:					
Information:					
8	Non Patent Literature	6583-47_NOA_10-11-2013.pdf	542718 4071e0efa1dc3648a1119dfc7c321082ba44bdf8	no	13
Warnings:					
Information:					

9	Non Patent Literature	6583-66_OA_10-10-2013.pdf	552403 a48dd21ff455090b65ff4d3f569f26fa7ac3aa72	no	16
Warnings:					
Information:					
10	Non Patent Literature	6583-110_OA_06-06-2013.pdf	1327953 794020be8ac3eaabbedf0e3cd65b367a8bde086d	no	38
Warnings:					
Information:					
11	Non Patent Literature	6583-110_OA_11-07-2013.pdf	1286584 921d1c7fd60488c89be9899bae61200466b72117	no	37
Warnings:					
Information:					
		Total Files Size (in bytes):	7745722		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

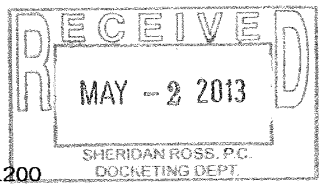
PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION CONCERNING TRANSMITTAL OF COPY OF INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (CHAPTER I OF THE PATENT COOPERATION TREATY)
(PCT Rule 44bis.1(c))

To:



DUPRAY, Dennis, J.
Sheridan Ross P.C.
1560 Broadway, Suite 1200
Denver, CO 80202
ETATS-UNIS D'AMERIQUE

Date of mailing *(day/month/year)*	
11 April 2013 (11.04.2013)	
Applicant's or agent's file reference	IMPORTANT NOTICE
6583-28-PCT	

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2011/053942	29 September 2011 (29.09.2011)	01 October 2010 (01.10.2010)

Applicant
Z124 et al

The International Bureau transmits herewith a copy of the international preliminary report on patentability (Chapter I of the Patent Cooperation Treaty)

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer Athina Nickitas-Etienne
Facsimile No. +41 22 338 82 70	e-mail: pt04.pct@wipo.int

Form PCT/IB/326 (January 2004)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44*bis*)

Applicant's or agent's file reference 6583-28-PCT	**FOR FURTHER ACTION**	See item 4 below
International application No. PCT/US2011/053942	International filing date *(day/month/year)* 29 September 2011 (29.09.2011)	Priority date *(day/month/year)* 01 October 2010 (01.10.2010)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant Z124		

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 *bis*.1(a).

2. This REPORT consists of a total of 6 sheets, including this cover sheet.

   In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

☒	Box No. I	Basis of the report
☐	Box No. II	Priority
☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
☐	Box No. IV	Lack of unity of invention
☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
☐	Box No. VI	Certain documents cited
☐	Box No. VII	Certain defects in the international application
☒	Box No. VIII	Certain observations on the international application

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44*bis*.3(c) and 93*bis*.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44*bis* .2).

	Date of issuance of this report 02 April 2013 (02.04.2013)
The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer Athina Nickitas-Etienne
Facsimile No. +41 22 338 82 70	e-mail: pt04.pct@wipo.int

Form PCT/IB/373 (January 2004)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To: DENNIS J. DUPRAY
SHERIDAN ROSS P.C.
1560 BROADWAY, SUITE 1200
DENVER, CO 80202

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)*	21 FEB 2012
Applicant's or agent's file reference 6583-28-PCT	**FOR FURTHER ACTION** See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US 11/53942	29 September 2011 (29.09.2011)	01 October 2010 (01.10.2010)

International Patent Classification (IPC) or both national classification and IPC
IPC(8) - G06F 3/048 (2012.01)
USPC - 715/778

Applicant IMERJ LLC

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1 *bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to th IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Fom PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA/US	Date of completion of this opinion	Authorized officer:
Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	07 February 2012 (07.02.2012)	Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/237 (cover sheet) (July 2011)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 11/53942

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:

   ☒ the international application in the language in which it was filed.

   ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. ☐ This opinion has been established taking into account **the rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a))

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing filed or furnished:

   a. (means)

   ☐ on paper

   ☐ in electronic form

   b. (time)

   ☐ in the international application as filed

   ☐ together with the international application in electronic form

   ☐ subsequently to this Authority for the purposes of search

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 11/53942

Box No. V **Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	3	YES
	Claims	1, 2, 4-20	NO
Inventive step (IS)	Claims	None	YES
	Claims	1-20	NO
Industrial applicability (IA)	Claims	1-20	YES
	Claims	None	NO

2. Citations and explanations:

Claims 1, 2 and 4-20 lack novelty under PCT Article 33(2) as being anticipated by US 2010/0081475 A1 to Chiang et al. (hereinafter 'Chiang').

Regarding claims 1, 10, and 16, Chiang teaches a method, and corresponding non-transitory computer-readable medium and multi-screen user device, of controlling data displayed by a multi-screen device, comprising: determining that the multi-screen device has moved from a first physical orientation to a different second physical orientation, wherein the first and second physical orientations differ by the first physical orientation being one of: folded or in a landscape orientation (a mobile device having a user interface supporting multiple windows is provided, where the device may be re-oriented so that the device switches between single window or dual window modes automatically in response to a change in the device's physical orientation, Fig. 2B, para [0019], [0028], [0030]); determining whether a first screen and a second screen of the multi-screen device are each displaying content for a same application (an application may run concurrently on both windows in a single window mode so as to have the appearance of full screen, para [0035]-[0036]); changing a display of the application to conform to a predetermined display configuration of the of the application on at least one of the first and second screens, wherein the display configuration is dependent upon the second physical orientation and a result of the step of determining (the mobile device automatically switches between modes when the motion sensor detects a change in orientation of the device, para [0030], [0037]); wherein the step of changing includes a step of modifying a display of the application: from being displayed on only the first screen to being displayed on both the first and second screens at a same time, or from being displayed on both the first and second screens at a same time to being displayed on only the first screen (a coordinator module activates or deactivates the window control modules to switch the mobile device between single window mode and dual window mode, where the dual window mode allows two different applications to be displayed on the different screens, para [0037]).

Regarding claims 2 and 20, Chiang teaches wherein the first screen is determined to be above the second screen (a first window may be above the second window, Fig. 2C, para [0030]).

Regarding claim 4, Chiang teaches determining whether the application is a single-screen application or a multi-screen application, and wherein controlling data displayed on the second screen in an open landscape state is also based on whether the application is a single-screen application or a multi-screen application (various applications are provided, some configured to be launched in dual window mode when the device is positioned in a landscape orientation, para [0030], [0039], [0042], [0046]-[0048]).

Regarding claim 5, Chiang teaches wherein the application is a multi-screen application, the method further comprising: automatically causing data from the application to be displayed on the second screen in a landscape state such that the device is not in a folded closed configuration (an application may be operated in a single window mode where the application is displayed in both windows, para [0041]-[0043], [0046]-[0048]).

Regarding claims 6 and 15, Chiang teaches wherein the application is a single-screen application and wherein data from a different second application is concurrently displayed on the second screen (an application may be operated in a dual window mode where a first application is displayed in the first window and a second application is displayed in the second window, para [0041]-[0043], [0046]-[0048]).

Regarding claims 7 and 19, Chiang teaches wherein: the second physical orientation is a portrait orientation, the first physical orientation is a landscape orientation, prior to the step of changing, the first and second screens each display content for the application, and the step of modifying includes displaying the application on only the first screen (the different orientations include portrait and landscape orientations, where prior to being rotated in a landscape orientation the application is displayed in both windows, and after being rotated in the landscape orientation the application is displayed in one window and another application is displayed in the second window, para [0041]-[0043], [0046]-[0048]).

Regarding claim 8, Chiang teaches wherein data from a second application is displayed on the second screen simultaneous with data from the application being displayed on the first screen (the two applications are displayed concurrently in the two adjacent windows, Fig. 2B, para [0046]-[0048]).

--CONTINUED IN SUPPLEMENTAL BOX--

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 11/53942

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fu lly supported by the description, are made:
Claim 12 should become a "non-transitory computer-readable medium" claim rather than a "method" claim (as written, claim 12 lacks adequate antecedent basis in 10). Therefore, as submitted, claim 12 reads as follows:

12. The method of claim 10, wherein the first screen is determined to be above the second screen, and wherein data displayed on the second display in an open landscape state is also based on whether the application is a single-screen application or a multiscreen application.

For purposes of this international search, claim 12 will be interpreted as follows:

12. The non-transitory computer-readable medium of claim 10, wherein the first screen is determined to be above the second screen, and wherein data displayed on the second display in an open landscape state is also based on whether the application is a single-screen application or a multiscreen application.

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 11/53942

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:
Box No. V. 2. Citations and Explanations:

Regarding claims 9, 14, and 18, Chiang teaches wherein: the second physical orientation is an unfolded orientation of the device, the first physical orientation is a folded orientation (the device may also have a folding form factor, where the screen is located on the inside of the device and is exposed when the user folds the device open, para [0028]), prior to the step of changing, the only first screen displays the content of the application, and the step of modifying includes displaying concurrently at least a portion of the content on each the first and second screens (an application may be operated in a single window mode where the application is displayed in both windows, para [0035]-[0037], [0041]-[0043]).

Regarding claim 11, Chiang teaches wherein the first screen corresponds to a primary screen and wherein the second screen corresponds to a secondary screen (the first window is primary in the sense that it opens an application when the application is launched in a single window configuration, where the second window is secondary, para [0043]).

Regarding claim 12, Chiang teaches wherein the first screen is determined to be above the second screen, and wherein data displayed on the second display in an open landscape state is also based on whether the application is a single-screen application or a multi-screen application (a first window may be above the second window, where various applications are provided, some configured to be launched in dual window mode when the device is positioned in a landscape orientation, Fig. 2C, para [0030], [0039], [0042]).

Regarding claims 13 and 17, Chiang teaches wherein the application is a multi-screen application and wherein the instructions configured to control data displayed on the first and second displays also generates a transition area on the second display that moves across and progressively fills the second display with data from the first application (a transition between modes might be automatically initiated by the application, where the application is configured to split windows when the device transitions from portrait mode to landscape mode, para [0046]-[0048]).

Claim 3 lacks an inventive step under PCT Article 33(3) as being obvious over Chiang in view of US 2010/0085382 A1 to Lundqvist et al. (hereinafter 'Lundqvist').

Regarding claim 3, Chiang fails to teach wherein a relative position of the first to the second screen is determined, at least in part, based on data received from an accelerometer. Lundqvist teaches wherein a relative position of the first to the second screen is determined, at least in part, based on data received from an accelerometer (a group of sensors, including one or more accelerometers, are used to provided information to a processor indicating a folding configuration, a relative or absolute alignment, and/or an inclination of a device, para [0107]). It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the method of Chiang to include wherein a relative position of the first to the second screen is determined, at least in part, based on data received from an accelerometer, as taught by Lundqvist, for the advantage of accurately determining when the device is rotated from a portrait to a landscape orientation.

Claims 1-20 have industrial applicability as defined by PCT Article 33(4), because the subject matter can be made or used in industry.

PATENT COOPERATION TREATY

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From the INTERNATIONAL BUREAU

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NOTIFICATION CONCERNING TRANSMITTAL OF COPY OF INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (CHAPTER I OF THE PATENT COOPERATION TREATY)
(PCT Rule 44bis.1(c))

To:

RECEIVED
APR 29 2013
SHERIDAN ROSS, P.C.
DOCKETING DEPT.

ELLSWORTH, Matthew, R
Sheridan Ross P.C.
1560 Broadway, Suite 1200
Denver, CO 80202
ETATS-UNIS D'AMERIQUE

Date of mailing *(day/month/year)*	
11 April 2013 (11.04.2013)	
Applicant's or agent's file reference	IMPORTANT NOTICE
6583-47-PCT	

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2011/053902	29 September 2011 (29.09.2011)	01 October 2010 (01.10.2010)

Applicant: IMERJ LLC et al

The International Bureau transmits herewith a copy of the international preliminary report on patentability (Chapter I of the Patent Cooperation Treaty)

The International Bureau of WIPO
34, chemin des Colombettes
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Form PCT/IB/326 (January 2004)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44*bis*)

Applicant's or agent's file reference 6583-47-PCT	**FOR FURTHER ACTION**	See item 4 below
International application No. PCT/US2011/053902	International filing date *(day/month/year)* 29 September 2011 (29.09.2011)	Priority date *(day/month/year)* 01 October 2010 (01.10.2010)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant IMERJ LLC		

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 *bis*.1(a).

2. This REPORT consists of a total of 7 sheets, including this cover sheet.

   In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

☒	Box No. I	Basis of the report
☐	Box No. II	Priority
☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
☐	Box No. IV	Lack of unity of invention
☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
☐	Box No. VI	Certain documents cited
☐	Box No. VII	Certain defects in the international application
☐	Box No. VIII	Certain observations on the international application

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44*bis*.3(c) and 93*bis*.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44*bis* .2).

	Date of issuance of this report 02 April 2013 (02.04.2013)
The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. +41 22 338 82 70	Authorized officer Simin Baharlou e-mail: pt09.pct@wipo.int

Form PCT/IB/373 (January 2004)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To: MATTHEW R. ELLSWORTH
SHERIDAN ROSS P.C.
1560 BROADWAY, SUITE 1200
DENVER, CO 80202

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)*	22 FEB 2012

Applicant's or agent's file reference	FOR FURTHER ACTION
6583-47-PCT	See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US 11/53902	29 September 2011 (29.09.2011)	01 October 2010 (01.10.2010)

International Patent Classification (IPC) or both national classification and IPC
IPC(8) - G09G 5/00 (2012.01)
USPC - 345/1.3

Applicant MATTHEW R. ELLSWORTHSHERIDAN ROSS P.C.1560 BROADWAY, SUITE 1200DENVER, CO 80202

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1 *bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA/US	Date of completion of this opinion	Authorized officer:
Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	10 February 2012 (10.02.2012)	Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/237 (cover sheet) (July 2011)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 11/53902

Box No. I Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of:

   ☒ the international application in the language in which it was filed.

   ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. ☐ This opinion has been established taking into account the rectification of an obvious mistake authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a))

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, this opinion has been established on the basis of a sequence listing filed or furnished:

   a. (means)

      ☐ on paper

      ☐ in electronic form

   b. (time)

      ☐ in the international application as filed

      ☐ together with the international application in electronic form

      ☐ subsequently to this Authority for the purposes of search

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 11/53902

Box No. V **Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	None	YES
	Claims	1-20	NO
Inventive step (IS)	Claims	None	YES
	Claims	1-20	NO
Industrial applicability (IA)	Claims	1-20	YES
	Claims	None	NO

2. Citations and explanations:

Claims 1-6, 9-15 and 17-20 lack novelty under PCT Article 33(2) as being anticipated by US 2010/0007603 A1 (Kirkup).

As per claim 1, Kirkup discloses a method of controlling data displayed by a multi-screen device (see abstract and Fig. 3A), comprising: receiving a first rotation input, the first rotation input corresponding to an indication that the multi-screen device has been rotated a first time from a first open state to a different second open state (see Fig. 6B and para [0044]-[0048] - device can be rotated from an upright portrait orientation, 619, to a landscape orientation, 617) wherein data from a first application is displayed while the device is in the first open state on a first screen of the device and not on a second screen of the device, and wherein data from the first application is displayed on the first and second screens of the device in the second open state (see Fig. 6B and para [0044]-[0048] - data from the movie application is displayed on one screen in portrait orientation, 619, and on two screens in landscape orientation, 617); receiving a second rotation input, the second rotation input corresponding to an indication that the device has been rotated a second time after the first time (see Fig. 6B and para [0044]-[0048] - user can rotate the device clockwise back to portrait orientation, 619, or counterclockwise to portrait orientation, 615); after receiving the second rotation input, referencing display rules for the first application (see Fig. 7-8, para [0021]-[0022] and [0047]-[0051] - user preferences may also correlate the display (or screen) configurations with applications); and displaying the first application on one of the first and second screens according to the display rules for the first application (see Fig. 6B, 7-8, para [0021]-[0022] and [0044]-[0048] - the movie application is displayed according to the rules of the application).

As per claim 2, Kirkup discloses the method of claim 1, wherein the display rules for the first application are stored prior to receiving the second rotation input and correspond to a display configuration of the first application when the device is in the first open state prior to receiving the first rotation input (see Fig. 6B, 7-8, para [0021]-[0022] and [0044]-[0051] - user configuration options can be set prior to the rotations and the configuration of the application after the second rotation is the same as the configuration before the first rotation).

As per claim 3, Kirkup discloses the method of claim 2, wherein the display rules for the first application indicate that the data from the first application is presented substantially identically to the way in which the data from the first application is presented prior to receiving the first rotation input (see Fig. 6B and para [0044]-[0048] - presentation of the application after the second rotation is the same as the presentation before the first rotation, since the phone is in identical state, 619, or substantially similar state, 615).

As per claim 4, Kirkup discloses the method of claim 1, wherein at least one of the first and second rotation inputs are received from an accelerometer (see para [0020] and [0052] - disclosing an accelerometer).

As per claim 5, Kirkup discloses the method of claim 1, further comprising: receiving a first stack-altering input after the first rotation input but before the second rotation input (see Fig. 6B and para [0045]-[0046] - when the user is finished viewing a message or alert in an application after the first rotate, they can close the application); and updating the display rules for the first application to correspond to display rules that are different from display rules for the first application prior to receiving the first rotation input (see Fig. 6B, 7-8, para [0021]-[0022] and [0045] - the orientation display rules depend on the application that triggers them and can change to a different application's rules after the user closes the first application).

As per claim 6, Kirkup discloses the method of claim 5, wherein the first stack-altering input corresponds to at least one of a minimization instruction for the first application and an application navigation instruction (see Fig. 6B and para [0045]-[0046] - when the user is finished viewing a message or alert in an application after the first rotate, they can close the application).

As per claim 9, Kirkup discloses the method of claim 1, wherein the first rotation input corresponds to a rotation of the device by about 90 degrees in a first direction and wherein the second rotation input corresponds to a rotation of the device by about 90 degrees in a second direction that is opposite the first direction (see Fig. 6B and para [0042]-[0048] - the screen configuration changes are triggered based on 90.degree. rotation angles).

SEE SUPPLEMENTAL SHEET

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 11/53902

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:
Box V.2 - Citations and Explanations

As per claim 10, Kirkup discloses a non-transitory computer-readable medium having stored thereon instructions that cause a computing system to execute a method (see abstract, para [0055]-[0056] and Fig. 3A), the instructions comprising: instructions configured to receive a first rotation input, the first rotation input corresponding to an indication that the multi-screen device has been rotated a first time from a first open state to a different second open state (see Fig. 6B and para [0044]-[0048] - device can be rotated from an upright portrait orientation, 619, to a landscape orientation, 617), wherein data from a first application is displayed while the device is in the first open state on a first screen of the device and not on a second screen of the device, and wherein data from the first application is displayed on the first and second screens of the device in the second open state (see Fig. 6B and para [0044]-[0048] - data from the movie application is displayed on one screen in portrait orientation, 619, and on two screens in landscape orientation, 617); instructions configured to receive a second rotation input, the second rotation input corresponding to an indication that the device has been rotated a second time after the first time (see Fig. 6B and para [0044]-[0048] - user can rotate the device clockwise back to portrait orientation, 619, or counterclockwise to portrait orientation, 615); instructions configured to reference display rules for the first application after receiving the second rotation input (see Fig. 7-8, para [0021]-[0022] and [0047]-[0051] - .user preferences may also correlate the display (or screen) configurations with applications.); and instructions configured to render a display of the first application on one of the first and second screens according to the display rules for the first application (see Fig. 6B, 7-8, para [0021]-[0022] and [0044]-[0048] - the movie application is displayed according to the rules of the application).

As per claim 11, Kirkup discloses the computer-readable medium of claim 10, wherein the display rules for the first application are stored prior to receiving the second rotation input and correspond to a display configuration of the first application when the device is in the first open state prior to receiving the first rotation input (see Fig. 6B, 7-8, para [0021]-[0022] and [0044]-[0051] - user configuration options can be set prior to the rotations and the configuration of the application after the second rotation is the same as the configuration before the first rotation).

As per claim 12, Kirkup discloses the method of claim 11, wherein the display rules for the first application indicate that the data from the first application is presented substantially identically to the way in which the data from the first application is presented prior to receiving the first rotation input (see Fig. 6B and para [0044]-[0048] - presentation of the application after the second rotation is the same as the presentation before the first rotation, since the phone is in identical state, 619, or substantially similar state, 615).

As per claim 13, Kirkup discloses the computer-readable medium of claim 10, wherein at least one of the first and second rotation inputs are received from an accelerometer (see para [0020] and [0052] - disclosing an accelerometer).

As per claim 14, Kirkup discloses the computer-readable medium of claim 10, further comprising: instructions configured to receive a first stack-altering input after the first rotation input but before the second rotation input (see Fig. 6B and para [0045]-[0046] - when the user is finished viewing a message or alert in an application after the first rotate, they can close the application); and instructions configured to update the display rules for the first application to correspond to display rules that are different from display rules for the first application prior to receiving the first rotation input (see Fig. 6B, 7-8, para [0021]-[0022] and [0045] - the orientation display rules depend on the application that triggers them and can change to a different application's rules after the user closes the first application).

As per claim 15, Kirkup discloses the computer-readable medium of claim 14, wherein the first stack-altering input corresponds to at least one of a minimization instruction for the first application and an application-navigation instruction (see Fig. 6B and para [0045]-[0046] - when the user is finished viewing a message or alert in an application after the first rotate, they can close the application).

As per claim 17, Kirkup discloses a multi-screen user device (see abstract and Fig. 3A), comprising: a first screen including a first display area (see Fig. 3A); a second screen including a second display area (see Fig. 3A); a sensor configured to produce an electrical signal indicative of a rotation of the user device (see para [0020] - accelerometer); and a computer-readable medium (see para [0055]-[0056]) having instructions stored thereon that include: a first set of instructions configured to receive a first rotation input, the first rotation input corresponding to an indication that the multi -screen device has been rotated a first time from a first open state to a different second open state (see Fig. 6B and para [0044]-[0048] - device can be rotated from an upright portrait orientation, 619, to a landscape orientation, 617), wherein data from a first application is displayed while the device is in the first open state on a first screen of the device and not on a second screen of the device, and wherein data from the first application is displayed on the first and second screens of the device in the second open state (see Fig. 6B and para [0044]-[0048] - data from the movie application is displayed on one screen in portrait orientation, 619, and on two screens in landscape orientation, 617); a second set of instructions configured to receive a second rotation input, the second rotation input corresponding to an indication that the device has been rotated a second time after the first time (see Fig. 6B and para [0044]-[0048] - user can rotate the device clockwise back to portrait orientation, 619, or counterclockwise to portrait orientation, 615); a third set of instructions configured to reference display rules for the first application after receiving the second rotation input (see Fig. 7-8, para [0021]-[0022] and [0047]-[0051] - .user preferences may also correlate the display (or screen) configurations with applications.); and a fourth instructions configured to render a display of the first application on one of the first and second screens according to the display rules for the first application (see Fig. 6B, 7-8, para [0021]-[0022] and [0044]-[0048] - the movie application is displayed according to the rules of the application).

SEE SUPPLEMENTAL SHEET

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 11/53902

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:
Box V.2 - Citations and Explanations

As per claim 18, Kirkup discloses the device of claim 17, wherein the display rules for the first application are stored prior to receiving the second rotation input and correspond to a display configuration of the first application when the device is in the first open state prior to receiving the first rotation input (see Fig. 6B, 7-8, para [0021]-[0022] and [0044]-[0051] - user configuration options can be set prior to the rotations and the configuration of the application after the second rotation is the same as the configuration before the first rotation) and wherein the display rules for the first application indicate that the data from the first application is presented substantially identically to the way in which the data from the first application is presented prior to receiving the first rotation input (see Fig. 6B and para [0044]-[0048] - presentation of the application after the second rotation is the same as the presentation before the first rotation, since the phone is in identical state, 619, or substantially similar state, 615).

As per claim 19, Kirkup discloses the device of claim 17, wherein the first open state corresponds to an open portrait state and wherein the second state corresponds to an open landscape state (see Fig. 6B and para [0044]-[0048] - the first open state, 619, is a portrait state, and the second open state, 617, is a landscape state).

As per claim 20, Kirkup discloses the device of claim 19, wherein the data from the first application is automatically maximized across both the first and second screens in response to receiving the first rotation input (see Fig. 6B and para [0044]-[0048] - the video application is maximized across both screens in response to the rotation).

Claims 1, 7-8, 10 and 16 lack novelty under PCT Article 33(2) as being anticipated by US 2010/0085382 A1 to Lundqvist et al. (hereinafter 'Lundqvist').

As per claim 1, Lundqvist discloses a method of controlling data displayed by a multi-screen device (see abstract), comprising: receiving a first rotation input, the first rotation input corresponding to an indication that the multi-screen device has been rotated a first time from a first open state to a different second open state (see Fig. 1, 3-6, 21, 27-31, para [0093]-[0095] and [0145]-[0150] - panels of device can be rotated into a second open state with all screens lying flat, and device can be implemented as two screens), wherein data from a first application is displayed while the device is in the first open state on a first screen of the device and not on a second screen of the device, and wherein data from the first application is displayed on the first and second screens of the device in the second open state (see Fig. 1, 3-6, 21, 27-31 and para [0093]-[0095]- when fully extended, the panorama view could automatically display interfaces such as, for example, a wide-screen video or a web browser); receiving a second rotation input, the second rotation input corresponding to an indication that the device has been rotated a second time after the first time (see Fig. 1, 3-6, 21, 27-31, para [0093]-[0095] and [0145]-[0150] - panels of device can be rotated or folded back into an original open state); after receiving the second rotation input, referencing display rules for the first application (see para [0093] - the display layout may be based on application settings); and displaying the first application on one of the first and second screens according to the display rules for the first application (see Fig. 1, 3-6, 21, 27-31, para [0093]-[0095] and [0145]-[0150] - the application and display made be changed back to the original display when the panels are folded into the original state).

As per claim 7, Lundqvist discloses the method of claim 1, wherein data from a first desktop is displayed on the second screen prior to receiving the first rotation input, wherein the data from the first desktop is not displayed after receiving the first rotation input but before receiving the second rotation input, and wherein the data from the first desktop is re-displayed on the second screen after receiving the second rotation input (see para para [0093]-[0095], [0145]-[0150] and [0213] - the desktop can be displayed on one of the screens in a folded configuration, then removed to make room for the panorama view of the application in the extended configuration, and the then returned to one of the screens when the panels are folded again).

As per claim 8, Lundqvist discloses the method of claim 7, wherein the data from the first application is automatically maximized and displayed across both the first and second screens after receiving the first rotation input (see Fig. 1, 3-6, 21, 27-31 and para [0093]-[0095] - when fully extended, the panorama view could automatically display interfaces such as, for example, a wide-screen video or a web browser).

As per claim 10, Lundqvist discloses a non-transitory computer-readable medium having stored thereon instructions that cause a computing system to execute a method (see abstract and para [0101]), the instructions comprising: instructions configured to receive a first rotation input, the first rotation input corresponding to an indication that the multi-screen device has been rotated a first time from a first open state to a different second open state (see Fig. 1, 3-6, 21, 27-31, para [0093]-[0095] and [0145]-[0150] - panels of device can be rotated into a second open state with all screens lying flat, and device can be implemented as two screens), wherein data from a first application is displayed while the device is in the first open state on a first screen of the device and not on a second screen of the device, and wherein data from the first application is displayed on the first and second screens of the device in the second open state (see Fig. 1, 3-6, 21, 27-31 and para [0093]-[0095]- when fully extended, the panorama view could automatically display interfaces such as, for example, a wide-screen video or a web browser); instructions configured to receive a second rotation input, the second rotation input corresponding to an indication that the device has been rotated a second time after the first time (see Fig. 1, 3-6, 21, 27-31, para [0093]-[0095] and [0145]-[0150] - panels of device can be rotated or folded back into an original open state); instructions configured to reference display rules for the first application after receiving the second rotation input (see para [0093] - the display layout may be based on application settings); and instructions configured to render a display of the first application on one of the first and second screens according to the display rules for the first application (see Fig. 1, 3-6, 21, 27-31, para [0093]-[0095] and [0145]-[0150] - the application and display made be changed back to the original display when the panels are folded into the original state).

---------- SEE SUPPLEMENTAL SHEET ----------

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 11/53902

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:
Box V.2 - Citations and Explanations

As per claim 16, Lundqvist discloses the computer-readable medium of claim 10, wherein data from a first desktop is displayed on the second screen prior to receiving the first rotation input, wherein the data from the first desktop is not displayed after receiving the first rotation input but before receiving the second rotation input, wherein the data from the first desktop is re-displayed on the second screen after receiving the second rotation input (see para para [0093]-[0095], [0145]-[0150] and [0213] - the desktop can be displayed on one of the screens in a folded configuration, then removed to make room for the panorama view of the application in the extended configuration, and the then returned to one of the screens when the panels are folded again), and wherein the data from the first application is automatically maximized and displayed across both the first and second screens after receiving the first rotation input (see Fig. 1, 3-6, 21, 27-31 and para [0093]-[0095]- when fully extended, the panorama view could automatically display interfaces such as, for example, a wide -screen video or a web browser).

Claims 1-20 have industrial applicability as defined by PCT Article 33(4) because the subject matter can be made or used in industry.

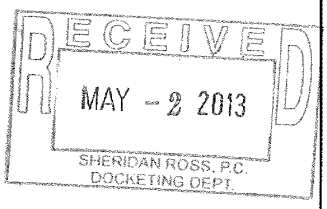
PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION CONCERNING TRANSMITTAL OF COPY OF INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (CHAPTER I OF THE PATENT COOPERATION TREATY)
(PCT Rule 44bis.1(c))

To:



JOHNSON, Brent, P.
Sheridan Ross P.C.
1560 Broadway, Suite 1200
Denver, CO 80202
ETATS-UNIS D'AMERIQUE

Date of mailing *(day/month/year)*
11 April 2013 (11.04.2013)

Applicant's or agent's file reference
6583-66-PCT

IMPORTANT NOTICE

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2011/053963	29 September 2011 (29.09.2011)	01 October 2010 (01.10.2010)

Applicant
IMERJ LLC et al

The International Bureau transmits herewith a copy of the international preliminary report on patentability (Chapter I of the Patent Cooperation Treaty)

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

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Authorized officer
Simin Baharlou

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Form PCT/IB/326 (January 2004)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44*bis*)

Applicant's or agent's file reference 6583-66-PCT	**FOR FURTHER ACTION**	See item 4 below
International application No. PCT/US2011/053963	International filing date *(day/month/year)* 29 September 2011 (29.09.2011)	Priority date *(day/month/year)* 01 October 2010 (01.10.2010)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant IMERJ LLC		

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 *bis*.1(a).

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

   In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

☒	Box No. I	Basis of the report
☐	Box No. II	Priority
☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
☐	Box No. IV	Lack of unity of invention
☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
☐	Box No. VI	Certain documents cited
☐	Box No. VII	Certain defects in the international application
☐	Box No. VIII	Certain observations on the international application

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44*bis*.3(c) and 93*bis*.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44*bis* .2).

	Date of issuance of this report 02 April 2013 (02.04.2013)
The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. +41 22 338 82 70	Authorized officer Simin Baharlou e-mail: pt09.pct@wipo.int

Form PCT/IB/373 (January 2004)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To: BRENT P. JOHNSON
SHERIDAN ROSS P.C.
1560 BROADWAY, SUITE 1200
DENVER, CO 80202

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)*	22 FEB 2012
Applicant's or agent's file reference 6583-66-PCT	**FOR FURTHER ACTION** See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US 11/53963	29 September 2011 (29.09.2011)	01 October 2010 (01.10.2010)

International Patent Classification (IPC) or both national classification and IPC
IPC(8) - G06F 3/048 (2012.01)
USPC - 715/799

Applicant IMERJ LLC

1. This opinion contains indications relating to the following items:

- [X] Box No. I Basis of the opinion
- [ ] Box No. II Priority
- [ ] Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- [ ] Box No. IV Lack of unity of invention
- [X] Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- [ ] Box No. VI Certain documents cited
- [ ] Box No. VII Certain defects in the international application
- [ ] Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1 *bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to th IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Fom PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA/US	Date of completion of this opinion	Authorized officer:
Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	13 February 2012 (13.02.2012)	Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/237 (cover sheet) (July 2011)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 11/53963

Box No. I Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of:

   ☒ the international application in the language in which it was filed.

   ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. ☐ This opinion has been established taking into account the rectification of an obvious mistake authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a))

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, this opinion has been established on the basis of a sequence listing filed or furnished:

   a. (means)

      ☐ on paper

      ☐ in electronic form

   b. (time)

      ☐ in the international application as filed

      ☐ together with the international application in electronic form

      ☐ subsequently to this Authority for the purposes of search

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 11/53963

Box No. V **Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	1 - 20	YES
	Claims	None	NO
Inventive step (IS)	Claims	None	YES
	Claims	1 - 20	NO
Industrial applicability (IA)	Claims	1 - 20	YES
	Claims	None	NO

2. Citations and explanations:

Claims 1, 2, 4-11 and 13-20 lack an inventive step under PCT Article 33(3) as being obvious over US 2009/0319672 A1 (Reisman) in view of US 2010/0064536 A1 to Caskey et al. (hereinafter, 'Caskey'), and further in view of US 2010/0211872 A1 to Rolston et al. (hereinafter, 'Rolston').

As to claims 1, 13 and 17, Reisman teaches a method, a non-transitory computer-readable medium and a multi-screen user device displaying a plurality of desktops and/or applications, each having at least one window, on a multi-screen device, comprising: receiving, by a processor, a first input that represents an instruction to reveal one of a desktop or application on a first display of the multi-screen device (para [0106], [0482]); selecting, by a processor, a first desktop or application to display on the first display (para [0106]); receiving, by a processor, a second input that represents an instruction to reveal one of a desktop or application on a second display of the multi-screen device (para [0106], [0482]); selecting, by a processor, a second desktop or application to display on the second display (para [0106]); displaying, by a processor, the selected first and second desktops or applications on the first and second displays (para [0106]);

but fails to explicitly disclose receiving, by a processor, a third input that represents an instruction to launch an application manager feature; displaying, by a processor, the applications or desktops on the first and second displays, and displaying a management window showing all other applications or desktops currently running on the device; receiving, by a processor, a fourth input that represents an instruction to selectively move one of said first and second applications or desktops, or said other applications or desktops, within the window stack to a different position; and displaying, by a processor, the window stack in a new order in response to said fourth input; determining, by a processor, a desired order for a window stack comprising the first and second applications or desktops, and said other applications or desktops.

However, Caskey does teach receiving, by a processor, a third input that represents an instruction to launch an application manager feature (para [0126], [0131]); displaying, by a processor, the applications or desktops on the first and second displays, and displaying a management window showing all other applications or desktops currently running on the device (para [0089], [0132]); receiving, by a processor, a fourth input that represents an instruction to selectively move one of said first and second applications or desktops, or said other applications or desktops, within the window stack to a different position (para [0076], [0126]); and displaying, by a processor, the window stack in a new order in response to said fourth input (para [0135] - new layout).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the the method and apparatus for browsing using multiple coordinated device sets of Reisman with the multi-panel electronic device of Caskey, because Reisman and Caskey are directed to systems and methods for repositioning windows in the pop-up window. Furthermore, users and designers benefit from systems and/or methods adapted for allowing any number of panels to be included in a portable electronic device that automatically adjusts a graphical display based on a change of folding configuration, because such systems/methods allow for an electronic device is disclosed that includes multiple folding display panels such that, when fully extended, the electronic device provides an extended larger display (Caskey, para [0005]).

The combination of Reisman and Caskey teaches the foregoing, but fails to explicitly disclose determining, by a processor, a desired order for a window stack comprising the first and second applications or desktops, and said other applications or desktops.

However, Rolston does teach
determining, by a processor, a desired order for a window stack comprising the first and second applications or desktops, and said other applications or desktops (para [0101]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the method and apparatus for browsing using multiple coordinated device sets of Reisman (as enhanced by Caskey) with the user-application interface of Rolston, because Reisman, Caskey and Rolston are directed to systems and methods for repositioning windows in the pop-up window. Furthermore, users and designers benefit from systems and/or methods adapted for allowing one or more of the application stacks to be displayed in the active area (and hence activated) simultaneously, because such systems/methods allow for convenient user interface and content/application management system, or user-application interaction system (Rolston, para [0007]).

As to claim 2, in combination with Reisman and Rolston, Caskey further discloses wherein the fourth input is a user gesture comprising at least one of a flick, tap, long hold, or drag gesture (para [0150] - finger... drag).

As to claims 4, 14 and 18, in combination with Reisman and Rolston, Caskey further discloses wherein said receiving a fourth input step is executed a number of times until the window stack is displayed in the desired order (para [0077], [0126]).

- Please See Supplemental Box -

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
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Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of:
Box V.2. Citations and explanations:

As to claims 5, 15 and 19, in combination with Caskey and Rolston, Reisman further discloses wherein at least one management window appears on said first and second displays, and the other applications or desktops are arranged linearly within the management window from left to right, and the left to right order of the other applications or desktops corresponds to an order of the other applications or desktops within the window stack (para [0042], [0120]).

As to claim 6, in combination with Reisman and Rolston, Caskey further discloses wherein the rightmost appearing one of the other applications or desktops is the top application or desktop in the group of the other applications or desktops, and the leftmost appearing one of the other applications or desktops is the bottom application or desktop in the group of the other applications or desktops (para [0142]).

As to claim 7, in combination with Caskey and Rolston, Reisman further discloses wherein the first or second applications or desktops are the first two applications or desktops within the window stack (para [0120]).

As to claims 8 and 16, in combination with Reisman and Rolston, Caskey further discloses wherein an order of the first or second applications or desktops within the window stack can be changed by executing a user input gesture, comprising at least one of a flick or drag gesture, on the first and second displays (para [0150] - drag).

As to claim 9, in combination with Reisman and Rolston, Caskey further discloses wherein an order of the other applications or desktops within the window stack can be changed by executing a user input gesture, comprising at least one of a flick or drag gesture executed on a selected one of the other applications or desktops within the management window to thereby move the selected one to another position within the window stack (para [0150] - drag).

As to claim 10, in combination with Reisman and Rolston, Caskey further discloses wherein a flick or drag gesture executed in a left direction causes the selected one to move down in the stack a predetermined number of positions, and a flick or drag gesture executed in a right direction causes the selected one to move up in the stack a predetermined number of positions (para [0133] - change in orientation or movement; para [0140] - right-most portion).

As to claims 11 and 20, in combination with Caskey and Rolston, Reisman further discloses wherein separate management windows appear on said first and second displays denoting a first window stack for the first display and a second window stack for the second display, and wherein the other applications or desktops are arranged linearly within each management window from left to right, and the left to right order of the other applications or desktops correspond to an order of the other applications or desktops within the window stack for each corresponding display (para [0042], [0120]).

Claims 3 and 12 lack an inventive step under PCT Article 33(3) as being obvious over Reisman in view of Caskey, further in view of Rolston, and still further in view of US 2009/0143141 A1 to Wells et al. (hereinafter, 'Wells').

As to claim 3, the combination of Reisman, Caskey and Rolston teaches the method of claim 1, but fails to explicitly disclose wherein the third input is a user gesture comprising a spread gesture, and wherein the spread gesture is executed on off-screen areas of said first and second displays with one finger of a user placed on one screen, and another finger of the user placed on the other screen.
However, Wells does teach wherein the third input is a user gesture comprising a spread gesture, and wherein the spread gesture is executed on off-screen areas of said first and second displays with one finger of a user placed on one screen, and another finger of the user placed on the other screen (para [0716], [0831], [0866]).
It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the method and apparatus for browsing using multiple coordinated device sets of Reisman (as enhanced by Caskey and Rolston) with the intelligent multiplayer gaming system with multi-touch display of Wells, because Reisman, Caskey, Rolston and Wells are directed to systems and methods for repositioning windows in the pop-up window. Furthermore, users and designers benefit from systems and/or methods adapted for allowing a left object to be the thumb and forefinger of the left hand of the user and the right object may be the remaining fingers of the left hand, because such systems/methods allow for facilitating gesture-based interactions with intelligent multi-player electronic gaming systems which include a multi-user, multi-touch input display surface capable of concurrently supporting contact-based and/or non-contact-based gestures performed by one or more users at or near the input display surface (Wells, para [0016]).

As to claim 12, the combination of Reisman, Caskey and Rolston teaches the method of claim 5, but fails to explicitly disclose wherein a selected one of the other applications or desktops is moved to a new position displayed on the first or second displays by executing another user input gesture on the selected one, the another user input gesture comprising at least one of a tap or long hold gesture.
However, Wells does teach wherein a selected one of the other applications or desktops is moved to a new position displayed on the first or second displays by executing another user input gesture on the selected one, the another user input gesture comprising at least one of a tap or long hold gesture (para [0965] - double tap).
It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the method and apparatus for browsing using multiple coordinated device sets of Reisman (as enhanced by Caskey and Rolston) with the intelligent multiplayer gaming system with multi-touch display of Wells, because Reisman, Caskey, Rolston and Wells are directed to systems and methods for repositioning windows in the pop-up window. Furthermore, users and designers benefit from systems and/or methods adapted for allowing the user to perform a "single digit" double tap gesture by initially contacting the multi-touch input interface with a single finger, lifting the finger up (e.g., to break contact with the multi-touch input interface, thereby completing the first "tap" gesture), contacting the multi-touch input interface again with the single finger, and then lifting the finger up again (e.g., to thereby complete the second "tap" gesture), because such systems/methods allow for facilitating gesture-based interactions with intelligent multi-player electronic gaming systems which include a multi-user, multi-touch input display surface capable of concurrently supporting contact-based and/or non-contact-based gestures performed by one or more users at or near the input display surface (Wells, para [0016]).

Claims 1 - 20 have industrial applicability as defined by PCT Article 33(4) because the subject matter can be made or used in industry.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re the Application of:	)	Group Art Unit: 2174
Sanjiv Sirpal	)	Confirmation No.: 8636
Serial No.: 13/247,708	)	Examiner: Steven Paul Sax
Filed: September 28, 2011	)	SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT
Atty. File No.: 6583-67	)	
Entitled: "Full-Screen Annunciator"	)	*Electronically Submitted*

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

The references cited on attached Form PTO/SB08 are being called to the attention of the Examiner.

☒ Copies of the cited non-patent and/or foreign references are enclosed herewith.

☐ Copies of the cited U.S. patents and/or patent applications are enclosed herewith.

☒ Copies of the cited U.S. patents/patent application publications are not enclosed in accordance with 37 C.F.R. § 1.98(a).

☐ Copies of the cited references are not enclosed, in accordance with 37 C.F.R. § 1.98(d), because the references were cited by or submitted to the U.S. Patent and Trademark Office in prior application Serial No. _____ filed _____, which is relied upon for an earlier filing date under 35 U.S.C. § 120.

☐ To the best of applicants' belief, the pertinence of the foreign-language references is believed to be summarized in the attached English abstracts and/or in the figures, although applicants do not necessarily vouch for the accuracy of the translation.

☐ Examiner's attention is drawn to the following related applications:

Serial No. _____ filed _____ (Attorney Ref. No. _____)

Serial No. _____ filed _____ (Attorney Ref. No. _____)

☐ Other:_____

Submission of the above information is not intended as an admission that any item is citable under the statutes or rules to support a rejection, that any item disclosed represents analogous art, or that those skilled in the art would refer to or recognize the pertinence of any reference without the benefit of hindsight, nor should an inference be drawn as to the pertinence

of the references based on the order in which they are presented. Submission of this statement should not be taken as an indication that a search has been conducted, or that no better art exists.

It is respectfully requested that the cited information be expressly considered during the prosecution of this application and the references made of record therein.

FEES

☒	**37 CFR 1.97(b)**: No fee is believed due in connection with this submission, because the information disclosure statement submitted herewith is satisfied by one of the following conditions ("X" indicates satisfaction): ☐ Within three months of the filing date of a national application other than a continued prosecution application under 37 CFR 1.53(d), or ☐ Within three months of the date of entry of the national stage as set forth in § 1.491 in an international application, or ☒ Before the mailing date of a first Office Action on the merits, or ☐ Before the mailing of a first Office action after the filing of a request for continued examination under 37 CFR 1.114. Although no fee is believed due, if any fee is deemed due in connection with this submission, please charge such fee to Deposit Account 19-1970.
☐	**37 CFR 1.97(c)**: The information disclosure statement transmitted herewith is being filed after all the above conditions (37 CFR 1.97(b)), but before the mailing date of any one of the following conditions: (1) a final action under 37 C.F.R. 1.113, or (2) a notice of allowance under 37 C.F.R. 1.311, or (3) an action that otherwise closes prosecution in the application. This Information Disclosure Statement is accompanied by: ☐ A Certification (below) as specified by 37 C.F.R. 1.97(e). Although no fee is believed due, if any fee is deemed due in connection with this submission, please charge such fee to Deposit Account 19-1970. OR ☐ Please charge Deposit Account 19-1970 in the amount of $180.00 for the fee set forth in 37 C.F.R. 1.17(p) for submission of an information disclosure statement. Please credit any overpayment or charge any underpayment to Deposit Account 19-1970.
☐	**37 CFR 1.97(d)**: This Information Disclosure Statement is being submitted after the period specified in 37 CFR 1.97(c). ☐ This information Disclosure Statement includes a Certification (below) as specified by 37 C.F.R. 1.97(e) AND ☐ Applicants hereby requests consideration of the reference(s) disclosed herein. Please charge Deposit Account 19-1970 in the amount of $180.00 under 37 C.F.R. 1.17(p). Please credit any overpayment or charge any underpayment to Deposit Account 19-1970. Election to pay the fee should not be taken as an indication that applicant(s) cannot execute a certification.

Certification (37 C.F.R. 1.97(e))
(Applicable only if checked)

☐ The undersigned certifies that:

☐ Each item of information contained in this information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this statement. 37 C.F.R. 1.97(e)(1).

☐ A copy of the communication from the foreign patent office is enclosed.

OR

☐ No item of information contained in this information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the undersigned after making reasonable inquiry, no item of information contained in this Information Disclosure Statement was known to any individual designated in 37 C.F.R. 1.56(c) more than three months prior to the filing of this statement. 37 C.F.R. 1.97(e)(2).

Respectfully submitted,

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(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*

— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

Published:

— *with international search report (Art. 21(3))*

(54) Title: MULTI-PANEL ELECTRONIC DEVICE

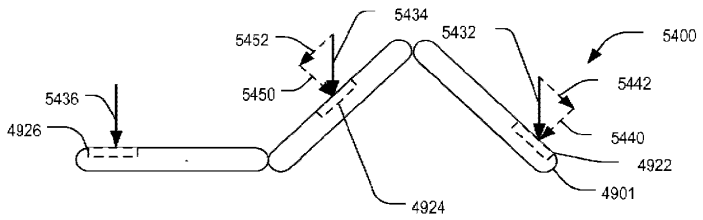


FIG. 54

(57) Abstract: A multi-panel electronic device and method are disclosed. In a particular embodiment, a method includes receiving first acceleration data from a first sensor coupled to a first portion of an electronic device. The method further includes receiving second acceleration data from a second sensor coupled to a second portion of the electronic device, where a position of the first portion is movable with respect to a position of the second portion. The method further includes determining a configuration of the electronic device at least partially based on the first acceleration data and the second acceleration data.

WO 2010/028403 A1

MULTI-PANEL ELECTRONIC DEVICE

Cross-Reference to Related Applications

[0001] The present disclosure claims the benefit of Provisional Application No. 61/095,225, filed September 8, 2008 and 61/182,316, filed May 29, 2009, which is incorporated by reference herein in its entirety and to which priority is claimed.

Field

[0002] The present disclosure is generally related to a multi-panel electronic device.

Description of Related Art

[0003] Advances in technology have resulted in smaller and more powerful computing devices. For example, there currently exist a variety of portable personal computing devices, including wireless computing devices, such as portable wireless telephones, personal digital assistants (PDAs), and paging devices that are small, lightweight, and easily carried by users. More specifically, portable wireless telephones, such as cellular telephones and internet protocol (IP) telephones, can communicate voice and data packets over wireless networks. Further, many such portable wireless telephones include other types of devices that are incorporated therein. For example, a portable wireless telephone can also include a digital still camera, a digital video camera, a digital recorder, and an audio file player. Also, such wireless telephones can process executable instructions, including software applications, such as a web browser application, that can be used to access the Internet. As such, these portable wireless telephones can include significant computing capabilities.

[0004] Although such portable devices may support software application, the usefulness of such portable devices is limited by a size of a display screen of the device. Generally, smaller display screens enable devices to have smaller form factors for easier portability and convenience. However, smaller display screens limit an amount of content that can be displayed to a user and may therefore reduce a richness of the user's interactions with the portable device.

Summary

[0005] In a particular embodiment, an electronic device is disclosed that includes multiple folding display panels. When fully extended, the electronic device can provide an extended larger display. When fully folded to a closed position, the electronic device can provide a small form factor and still provide an abbreviated view similar to a cell phone. In general, the multiple folding display panels enable the electronic device to be used as multiple types of devices depending on how the electronic device is folded or configured. By enabling the electronic device to be positioned in multiple foldable configurations, a user of the electronic device may elect to have a small form factor for easy maneuverability and functionality or may elect an expanded, larger form factor for displaying rich content and to enable interaction with one or more software applications via expanded user interfaces.

[0006] When handling an electronic device that either folds at one or more hinges, or bends in one or more locations, knowing how the electronic device is folded or bent enables the user experience to be customized to the electronic device usage. Using accelerometers, one in each non-bending or non-flexing section of the electronic device, the relative angle between sections may be determined and the overall configuration of the electronic device may be understood. The relative angle between sections suffices to account for the orientation of the electronic device. For example, two panels folded up like a clam shell may have substantially opposite accelerometer angle readings independent of the orientation or angle that they are held. Similarly, two panels fully extended and folded flat may have substantially the same accelerometer angle readings independent of the orientation or angle that they are held.

[0007] In a particular embodiment, a method includes receiving first acceleration data from a first sensor coupled to a first portion of an electronic device. The method further includes receiving second acceleration data from a second sensor coupled to a second portion of the electronic device, where a position of the first portion is movable with respect to a position of the second portion. The method further includes determining a configuration of the electronic device at least partially based on the first acceleration data and the second acceleration data.

[0008] For example, the determined configuration may include a fully folded configuration, a fully extended configuration, a thumbing configuration, a travel clock configuration, a video conferencing configuration, or one or more other configurations. In a particular embodiment, a processor in the electronic device can execute applications across the first, second, and third display surfaces in the fully extended configuration and can execute applications at the first display surface in the fully folded configuration.

[0009] In another particular embodiment, an apparatus is disclosed that includes a first sensor coupled to a first portion of an electronic device. The apparatus further includes a second sensor coupled to a second portion of the electronic device, where a position of the first portion is movable with respect to a position of the second portion. The apparatus further includes an orientation module configured to determine a configuration of the electronic device at least partially based on first acceleration data received from the first sensor and second acceleration data received from the second sensor.

[0010] In another particular embodiment, a computer readable storage medium storing computer executable code includes code for receiving first acceleration data from a first sensor coupled to a first portion of an electronic device. The computer readable storage medium further includes code for receiving second acceleration data from a second sensor coupled to a second portion of the electronic device, where a position of the first portion is movable with respect to a position of the second portion. The computer readable storage medium further includes code for determining a configuration of the electronic device at least partially based on the first acceleration data and the second acceleration data.

[0011] In another particular embodiment, an apparatus includes first sensing means for generating first acceleration data, the first sensing means coupled to a first portion of an electronic device. The apparatus further includes second sensing means for generating second acceleration data, the second sensing means coupled to a second portion of the electronic device, where a position of the first portion is movable with respect to a position of the second portion. The apparatus further includes means for determining a configuration of the electronic device at least partially based on the first acceleration data and the second acceleration data.

[0012] One particular advantage provided by at least one of the disclosed embodiments is that accelerometer sensors can be easier to implement and to satisfy form factor or size constraints than mechanical configuration detectors in the hinges or flexing areas. Another particular advantage is that accelerometer sensors having no moving parts are not subject to breaking because of mechanical wear, and accelerometer sensors are not bound to fixed positions, but offer instead substantially unlimited range of operation.

[0013] Other aspects, advantages, and features of the present disclosure will become apparent after review of the entire application, including the following sections: Brief Description of the Drawings, Detailed Description, and the Claims.

Brief Description of the Drawings

[0014] FIG. 1 is a diagram of a first illustrative embodiment of an electronic device;

[0015] FIG. 2 is a diagram of an illustrative embodiment of the electronic device of FIG. 1 in a fully folded configuration;

[0016] FIG. 3 is a diagram of an illustrative embodiment of the electronic device of FIG. 1 in a thumbing configuration;

[0017] FIG. 4 is a diagram of an illustrative embodiment of the electronic device of FIG. 1 in a travel clock configuration;

[0018] FIG. 5 is a diagram of a first illustrative embodiment of the electronic device of FIG. 1 in a fully extended configuration;

[0019] FIG. 6 is a diagram of a second illustrative embodiment of the electronic device of FIG. 1 in a fully extended configuration;

[0020] FIG. 7 is a diagram of an illustrative embodiment of the electronic device of FIG. 1 in a video conferencing configuration;

[0021] FIG. 8 is a block diagram of a second illustrative embodiment of an electronic device;

[0022] FIG. 9 is a diagram of a third illustrative embodiment of an electronic device;

[0023] FIG. 10 s a partial cross-sectional diagram of the electronic device of FIG. 9;

[0024] FIG. 11 is a diagram of an illustrative embodiment of the electronic device of FIG. 9 in an angled configuration;

[0025] FIG. 12 is a partial cross-sectional diagram of the electronic device in the angled configuration of FIG. 11;

[0026] FIG. 13 is a diagram of an illustrative embodiment of the electronic device of FIG. 9 in a folded configuration;

[0027] FIG. 14 is a partial cross-sectional diagram of the electronic device in the folded configuration of FIG. 13;

[0028] FIG. 15 is a diagram of a fourth illustrative embodiment of an electronic device;

[0029] FIG. 16 is a diagram of the electronic device of FIG. 15 in a travel clock configuration;

[0030] FIG. 17 is a diagram of the electronic device of FIG. 16 in a fully extended configuration;

[0031] FIG. 18 is a diagram of a fifth illustrative embodiment of an electronic device;

[0032] FIG. 19 is a diagram of the electronic device of FIG. 18 in a travel clock configuration;

[0033] FIG. 20 is a diagram of the electronic device of FIG. 18 in a fully extended configuration;

[0034] FIG. 21 is a diagram of a sixth illustrative embodiment of an electronic device;

[0035] FIG. 22 is a diagram of a seventh illustrative embodiment of an electronic device;

[0036] FIG. 23 is a diagram of the electronic device of FIG. 22 in a partially folded configuration;

[0037] FIG. 24 is a diagram of an eighth illustrative embodiment of an electronic device;

[0038] FIG. 25 is a diagram of the electronic device of FIG. 24 in an assembled configuration;

[0039] FIG. 26 is a flowchart of a first illustrative embodiment of a method of changing software states at a multi-panel electronic device;

[0040] FIG. 27 is a diagram of a ninth illustrative embodiment of an electronic device;

[0041] FIG. 28 is a diagram of an illustrative embodiment of the electronic device of FIG. 27 in a thumbing configuration;

[0042] FIG. 29 is a diagram of an illustrative embodiment of the electronic device of FIG. 27 in a fully extended configuration;

[0043] FIG. 30 is a diagram of an illustrative embodiment of the electronic device of FIG. 27 in a travel clock configuration;

[0044] FIG. 31 is a diagram of an illustrative embodiment of the electronic device of FIG. 27 in a video conferencing configuration;

[0045] FIG. 32 is a diagram of a tenth illustrative embodiment of an electronic device;

[0046] FIG. 33 is a diagram of an illustrative embodiment of the electronic device of FIG. 32 in a fully extended configuration;

[0047] FIG. 34 is a diagram of an illustrative embodiment of the electronic device in the fully extended configuration of FIG. 33 showing movement of an application icon in response to a user input;

[0048] FIG. 35 is a diagram of an illustrative embodiment of the electronic device in the fully extended configuration of FIG. 33 displaying an application window;

[0049] FIG. 36 is a diagram of an illustrative embodiment of the electronic device in the fully extended configuration of FIG. 33 showing movement of an application window in response to a user input;

[0050] FIG. 37 is a diagram of an illustrative embodiment of the electronic device of FIG. 36 after a predetermined portion of the application window crosses a gap between display surfaces;

[0051] FIG. 38 is a diagram of a eleventh illustrative embodiment of an electronic device;

[0052] FIG. 39 is a diagram of an illustrative embodiment of the electronic device of FIG. 38 in a landscape orientation;

[0053] FIG. 40 is a diagram of an illustrative embodiment of the electronic device of FIG. 38 in a rotated orientation;

[0054] FIG. 41 is a diagram of an illustrative embodiment of the electronic device of FIG. 38 in a portrait orientation;

[0055] FIG. 42 is a flowchart of a second illustrative embodiment of a method of changing software states at a multi-panel electronic device;

[0056] FIG. 43 is a flowchart of a third illustrative embodiment of a method of changing software states at a multi-panel electronic device;

[0057] FIG. 44 is a flowchart of a fourth illustrative embodiment of a method of changing software states at a multi-panel electronic device;

[0058] FIG. 45 is a flowchart of a fifth illustrative embodiment of a method of changing software states at a multi-panel electronic device;

[0059] FIG. 46 is a flowchart of a sixth illustrative embodiment of a method of changing software states at a multi-panel electronic device;

[0060] FIG. 47 is a flowchart of a seventh illustrative embodiment of a method of changing software states at a multi-panel electronic device;

[0061] FIG. 48 is a flowchart of an eighth illustrative embodiment of a method of changing software states at a multi-panel electronic device;

[0062] FIG. 49 is a diagram of a twelfth illustrative embodiment of an electronic device;

[0063] FIG. 50 is a diagram of an illustrative embodiment of the electronic device of FIG. 49 in a fully extended configuration;

[0064] FIG. 51 is a diagram of an illustrative embodiment of the electronic device of FIG. 49 in a folded configuration;

[0065] FIG. 52 is a diagram of an illustrative embodiment of the electronic device of FIG. 49 in a thumbing configuration;

[0066] FIG. 53 is a diagram of an illustrative embodiment of the electronic device of FIG. 49 in a video conferencing configuration;

[0067] FIG. 54 is a diagram of an illustrative embodiment of the electronic device of FIG. 49 in a travel clock configuration;

[0068] FIG. 55 is a diagram of an illustrative embodiment of the electronic device of FIG. 49 in a dual-panel configuration;

[0069] FIG. 56 is a flowchart of a first illustrative embodiment of a method of determining a configuration of an electronic device;

[0070] FIG. 57 is a flowchart of a second illustrative embodiment of a method of determining a configuration of an electronic device;

[0071] FIG. 58 is a flowchart of a third illustrative embodiment of a method of determining a configuration of an electronic device; and

[0072] FIG. 59 is a block diagram of a thirteenth illustrative embodiment of an electronic device.

Detailed Description

[0073] Referring to FIG. 1, a first illustrated embodiment of an electronic device is depicted and generally designated 100. The electronic device 101 includes a first panel 102, a second panel 104, and a third panel 106. The first panel 102 is coupled to the second panel 104 along a first edge at a first fold location 110. The second panel 104 is coupled to the third panel 106 along a second edge of the second panel 104, at a second fold location 112. Each of the panels 102, 104, and 106 includes a display surface configured to provide a visual display, such as a liquid crystal display (LCD) screen. The electronic device 101 is a wireless communication device having multiple display surfaces and configured to automatically adjust a user interface or to display images when a user changes a physical configuration of the electronic device 101.

[0074] As depicted in FIG. 1 the first panel 102 and the second panel 104 are rotatably coupled at the first fold location 110 to enable a variety of device configurations. For example, the first panel 102 and the second panel 104 may be positioned such that the display surfaces are substantially coplanar to form a substantially flat surface. As another example, the first panel 102 and the second panel 104 may be rotated relative to each other around the first fold location 110 until a back surface of the first panel 102 contacts a back surface of the second panel 104. Likewise, the second panel 104 is rotatably coupled to the third panel 106 along the second fold location 112, enabling a variety of configurations including a fully folded, closed configuration where the display surface of the second panel 104 contacts the display surface of the third panel 106 and a fully extended configuration where the second panel 104 and the third panel 106 are substantially coplanar.

[0075] In a particular embodiment, the first panel 102, the second panel 104, and the third panel 106 may be manually configured into one or more physical folded states, as will be described with respect to FIGS. 2-7. By enabling the electronic device 101 to be positioned in multiple foldable configurations, a user of the electronic device 101 may elect to have a small form factor for easy maneuverability and functionality or may elect an expanded, larger form factor for displaying rich content and to enable more significant interaction with one or more software applications via expanded user interfaces.

[0076] In a particular embodiment, the electronic device 101 includes multiple folding display panels 102, 104, and 106. When fully extended, the electronic device 101 can provide a panorama view similar to a wide screen television. When fully folded to a closed position, the electronic device 101 can provide a small form factor and still provide an abbreviated view similar to a cell phone. In general, the multiple configurable displays 102, 104, and 106 may enable the electronic device 101 to be used as multiple types of devices depending on how the electronic device 101 is folded or configured.

[0077] Referring to FIG. 2, a second embodiment of the electronic device 101 of FIG. 1 in a fully folded configuration is depicted and generally designated 200. The first panel 102 is depicted on an upper surface of the electronic device 101. As illustrated in FIG. 2, the display surface of the first panel 102 is visible, and the first fold location 110 between the first panel 102 and the second panel 104 is fully folded, such that the back surface of the first panel 102 is in contact with the back surface of the second panel 104. The third panel 106 is fully folded against the second panel 104 along the second fold location 112. The second panel 104 is configured such that the second display surface is substantially proximate to the display surface of the third panel 106 within the fully folded configuration. As illustrated in FIG. 2, the electronic device 101 has a substantially rectangular shape or form factor including three stacked layers (i.e., the first panel 102, the second panel 104, and the third panel 106). The display surfaces of the second panel 104 and the third panel 106 are substantially protected from damage from external sources within the fully folded configuration 200 of FIG. 2. Although the embodiment depicted in FIG. 2 illustrates a particular embodiment of the electronic device 101, next to a United States Quarter and a pencil for size comparison purposes it should be clearly understood that FIG. 2, as well as all other figures of the present application, are not necessarily to scale, and should not be interpreted as limiting the scope of the present disclosure.

[0078] Referring to FIG. 3, the electronic device 101 of FIG. 1 in a "thumbing" configuration is depicted and generally designated 300. The first panel 102 and the second panel 104 are coupled at the first fold location 110 in a substantially coplanar configuration. The second panel 104 and the third panel 106 are offset relative to one

another, along the second fold location 112. In a particular embodiment, an angle 318 of rotation from the display surface of the third panel 106 to the display surface of the second panel 104 is an angle greater than 90 degrees and less than 180 degrees. For example, as illustrated in FIG. 3, the angle 318 formed between the second panel 104 and the third panel 106 may be substantially 135 degrees.

[0079] As illustrated in FIG. 3, a back surface 314 of the first panel 106 may rest on a support surface, such as a table surface, desk surface, a user's hand, or the like. In a particular embodiment, the third panel 106 may be weighted such that in the particular configuration depicted in FIG. 3, the electronic device 101 may be stable when maintained in the thumbing configuration 300 on a surface. As illustrated, in the thumbing configuration 300, the third panel 106 may display a keyboard 316, while the first and second panels 102, 104 may display one or more portions of the graphical user interface, such that a user may have a substantially horizontal keyboard 316, and a conveniently angled and located effective 2-panel display surface formed of the display surface of the first panel 102 and the display surface of the second panel 104. In a particular embodiment, the electronic device 101 may be held in the thumbing configuration 300 by a user such that the keyboard 316 can be actuated by one or more of the user's thumbs.

[0080] Referring to FIG. 4, the electronic device 101 of FIG. 1 in a travel clock configuration is depicted and generally designated 400. The first panel 102 is folded with respect to the second panel 104 along the first fold location 110, at an angle 420 that is less than 180 degrees, and greater than 0 degrees. For example, the angle 420 formed by the first panel 102 and the second panel 104 may be substantially 60 degrees. The second panel 104 is oriented with respect to the third panel 106 along the second fold location 112 at an angle 422 that is greater than 90 degrees and less than 180 degrees. As illustrated, the angle 422 along the second fold location 112 may be approximately 135 degrees.

[0081] In a particular embodiment, the travel clock configuration 400 includes a display of clock indicia 418, such as a digital clock indicia or analog clock indicia, at the display surface of the second panel 104. For example, the clock indicia 418 may be an image of a clock face. In a particular embodiment, the display surface of the first panel

102 may be in a powered down configuration, while the display surface 106 of the third panel 106 may display one or more controls typical of a travel clock, such as an alarm set control, a volume control, a radio station tuning control, or other controls (not shown).

[0082] FIG. 5 depicts the electronic device 101 of FIG. 1 in a fully extended configuration 500. The first panel 102 and the second panel 104 are substantially coplanar, and the second panel 104 is substantially coplanar with the third panel 106. The panels 102, 104, and 106 may be in contact at the first fold location 110 and the second fold location 112 such that the display surfaces of the first panel 102, the second panel 104, and the third panel 106 effectively form an extended, three-panel display screen. As illustrated, in the fully extended configuration 500, each of the display surfaces displays a portion of a larger image, with each individual display surface displaying a portion of the larger image in a portrait mode, and the larger image extending across the effective three-panel screen in a landscape mode. In a particular embodiment, the panels 102, 104, and 106 may be lockable to be substantially maintained in the fully extended configuration 500.

[0083] FIG. 6 depicts the electronic device 101 of FIG. 1 in a fully extended configuration 600 having a reduced effective display surface on the first panel 102, the second panel 104, and the third panel 106 as compared to FIG. 5. Like FIG. 5, the panels 102, 104, and 106 are substantially extended, and may be locked into position. However, as illustrated in FIG. 6, an upper and lower surface portion of the portrait mode of each of the panels 102, 104, and 106 may not include the display surface and may instead include one or more hardware features, such as a hinge, microphone, speaker or other hardware features (not shown).

[0084] FIG. 7 shows the electronic device 101 of FIG. 1 in a video conferencing configuration 700. The first panel 102 is coupled to the second panel 104 at the first fold location 110 to be substantially coplanar with the second panel 104. The second panel 104 and third panel 106 are coupled in a folded configuration along the second fold location 112 such that the display surfaces of the second panel 104 and the third panel 106 are substantially proximate to each other, and protected within the interior of the folded configuration. By having the third panel 106 folded over the second panel

104, a back surface 108 of the third panel 106, including a camera 720, is exposed to a user of the electronic device 101. A bottom edge of the third panel 106 includes a microphone 722 and a speaker 724. Although depicted on the bottom edge of the third panel 106, it should be clearly understood that the microphone 722 and the speaker 724 may be located at other positions on the electronic device 101. For example, as will be illustrated with respect to FIG. 32, the microphone 722 may be located at a top of the display surface of the first panel 102, and the speaker 724 may be located at a bottom location of the display surface of the first panel 102. The video conferencing configuration 700 enables a user of the electronic device 101 to view an image on the display surface of the first panel 102 of a participant in the video conferencing call, and to simultaneously be located in a field of view of the camera 720, to capture an image of the user and to provide the captured image of the user to one or more participants of the video conference.

[0085] In a particular embodiment, the electronic device 101 of FIGS. 1-7 uses three separate touch screen displays 102, 104, and 106, that are connected mechanically and capable of folding, that can be used individually or together. This enables multiple user interfaces that can be changed based on the shape or configuration of the electronic device 101. The multiple configurable user interfaces allow the electronic device 101 to be used as multiple types of devices depending on how the electronic device 101 is folded or configured. When using the electronic device 101 a user could start by interacting with a single screen (device completely folded), then have the interface change automatically (based on application or setting) when the electronic device 101 is folded to a different physical configuration. The electronic device 101 may be configured to execute concurrent applications on multiple screens, and to reconfigure applications based on user interaction changing the device configuration. For example, the electronic device 101 may be configured to execute an application at a single display 102, 104, or 106, in one physical configuration, and to execute the application across all three displays 102, 104, and 106 in a different physical configuration.

[0086] For example, when the electronic device 101 is fully folded to the closed position (one screen displayed, such as the fully folded configuration 200 of FIG. 2), the electronic device 101 retains a small form factor and could provide an abbreviated user

interface view. Based on user interaction this fully folded configuration could display applications, such as a phone, short-message-service (SMS), a personal digital assistant (PDA) type browser application, a keypad, menus, other interface elements, or any combination thereof.

[0087] When fully extended (all screens displayed, such as the fully extended configuration 500 of FIG. 5 or 600 of FIG. 6), the electronic device 101 may provide a panorama view. Based on the user's application of choice, the panorama view could automatically display interfaces similar to wide-screen video, a desktop environment with applications (e.g. email, text editor), or a web browser, with or without keyboard, as illustrative, non-limiting examples. The interactions for these interfaces could be similar to their native format instead of confined to a mobile phone-type interaction.

[0088] When displays are folded in a triangular shape (one part of the triangle is a display facing backward, the other part of the triangle a display facing forward, the final folded under or flat in front, such as the travel clock configuration 400 of FIG. 4) the configuration could automatically trigger the display of a directional user interface. In other words, the front display(s) may show a device interface for the particular configuration, such as a gaming application, email, SMS, phone, alarm clock, digital radio, or music player, as illustrative, non-limiting examples, while the back display, the bottom display, or both, may be idled or off.

[0089] When one outside display is configured at approximately a 45 degree angle to the other displays (such as the thumbing configuration 300 of FIG. 3), the electronic device 101 could automatically change the interface. For example, the interface could be a text entry device. The 45 degree display may show a keyboard while the others displayed a text entry application, a non-PDA-type browser, or other desktop-like application.

[0090] Thus, the electronic device 101 may have the ability to automatically change the user interface and interaction method based on a mechanical trigger, sensor information, or the like. The electronic device 101 may provide the advantage of anticipating the user's expectations for the device without the user having to browse multiple menus. When the electronic device 101 is fully extended it may be larger than current mobile

device interfaces, thus overcoming a drawback of conventional mobile devices of insufficient screen area. A user of the electronic device 101 can change the application interfaces to more closely match their needs and preferences at the time of use. Difficulties that may be encountered by users of conventional mobile devices using complicated desktop-like interfaces, like text editors or browsers, may be relieved by the electronic device 101 enabling the interface to spread across multiple displays.

[0091] Referring to FIG. 8, a particular illustrative embodiment of an electronic device is depicted and generally designated 800. The device 800 includes a main board 801 coupled to a first display board 803 and to second display board 805 via set of connections 890 across a hinge (not shown). Each of the boards 801, 803, and 805 may be in separate panels of a multi-panel hinged device, such as the electronic device 101 of FIGS. 1-7.

[0092] The main board 801 includes a display 802, a processor 810 coupled to a memory 832, a display controller 862, a touchscreen controller 852, a wireless controller 840, a short range wireless interface 846, a coder/decoder (CODEC) 834, and a power management integrated circuit (PMIC) 880. The first display board 803 includes a display 804 coupled to a display controller 864, a touchscreen controller 854, and one or more folding configuration/tilt sensors 874. The second display board 805 includes a display 806 coupled to a display controller 866, a touchscreen controller 856, and one or more folding configuration/tilt sensors 876. The first display board 803 is coupled to the main board 801 via a first communication path, such as a first high-speed serial link 892. The second display board 805 is coupled to the main board 801 via a second communication path, such as a second high-speed serial link 894. The first display board 803 and the second display board 805 each have a battery 884 and 886 that is coupled to the PMIC 880 via a power line 896, which may be able to conduct at least 1.5 amps (A) between the PMIC 880 and the batteries 884 and 886. In a particular embodiment, a camera 820 and a power input 882 are also coupled to the main board 801.

[0093] The processor 810 may include one or more processing devices, such as one or more ARM-type processors, one or more digital signal processors (DSPs), other processors, or any combination thereof. The processor 810 can access one or more

computer readable media, such as the representative memory 832. The memory 832 stores data (not shown) and processor executable instructions such as software 833. Generally, the software 833 includes processor executable instructions that are executable by the processor 810, and may include application software, operating system software, other types of program instructions, or any combination thereof. Although the memory 832 is depicted as external to the processor 810, in other embodiments the memory 832 may be internal to the processor 810 such as at a cache, at one or more registers or register files, at other storage devices at the processor 810, or any combination thereof.

[0094] The processor 810 is also coupled to folding configuration sensors, such as the folding configuration and tilt sensors 874 and 876 at the first display panel 803 and the second display panel 805, respectively. In an illustrative example, the device 800 may be the electronic device 101 of FIG. 1, and the sensors 874 and 876 may adapted to detect a folding configuration of the device 800 as one or more of the fully folded configuration illustrated in FIG. 2, the thumbing configuration illustrated in FIG. 3, the travel clock configuration illustrated in FIG. 4, the fully extended configurations illustrated in FIG. 5-6, or the video conferencing configuration illustrated in FIG. 7.

[0095] The display controllers 862, 864, and 866 are configured to control the displays 802, 804, and 806. In a particular embodiment, the displays 802, 804, and 806 may correspond to the display surfaces 102, 104, and 106 illustrated in FIGS. 1-7. The display controllers 862, 864, and 866 may be configured to be responsive to the processor 810 to provide graphical data to display at the displays 802, 804, and 806 according to a configuration of the device 800. For example, when the device 800 is in a fully folded configuration, the display controllers 862, 864, and 866 may control the first display 802 to display a graphical user interface and may power down or not use the other displays 804 and 806. As another example, when the device 800 is in a fully extended configuration, the display controllers 862, 864, and 866 may control the displays 802, 804, and 806 to each display a respective portion of an image to operate as a single effective screen spanning all three displays 802, 804, and 806.

[0096] In a particular embodiment, each of the displays 802, 804, and 806 is responsive to user input via a respective touchscreen that is coupled to a touchscreen controller 852,

854, or 856, respectively. The touchscreen controllers 852, 854, and 856 are configured to receive signals from the displays 802, 804, and 806 representing a user input and to provide data to the processor 810 indicating the user input. For example, the processor 810 may be responsive to a user input indicating a double-tap at an application icon on the first display 802 and may launch an application and display an application window at one or more of the displays 802, 804, or 806 in response to the user input.

[0097] In a particular embodiment, by having each display controller 862, 864, and 866 and each touchscreen controller 852, 854, and 856 with a corresponding display 802, 804, and 806, an amount of data communicated between the panels may be reduced compared to other embodiments having a controller and a corresponding display on separate panels. However, in other embodiments, two or more of the display controllers 862, 864, or 866, or touchscreen controllers 853, 854, or 856, may be combined, such as into a single controller that controls all three displays 802, 804, and 806. Additionally, although three displays 802, 804, and 806 are illustrated, in other embodiments the device 800 may include more or less than three displays.

[0098] The high-speed serial links 892 and 894 may be high speed bi-direction serial links. For example the links 892 and 894 may be Mobile Display Digital Interface (MDDI)-type links. Touchscreen data and sensor data may be embedded in the serial stream to return to the processor 810 from the panels 803 and 805, so that only four differential pairs may be used for signaling across the respective hinges between the panels 801, 803, and 805.

[0099] In a particular embodiment, the sensors 874 and 876 may be adapted detect a folding configuration of the device 800 based on input received at one or more sensors. For example, one or more of the sensors 874 and 876 may include or receive input from one or more accelerometers, inclinometers, hinge detectors, other detectors, or any combination thereof. The sensors 874 and 876 may provide information to the processor 810 indicating a detected folding configuration of the device 800. The sensors 874 and 876 may be responsive to a relative folding position, such as by detecting an angle of rotation of a display panel relative to a neighboring display panel of the device 800. The sensors 874 and 876 may also be responsive to one or more

other sensors such as one or more accelerometers or inclinometers coupled to one or more display panels of the device 800.

[00100] As illustrated in FIG. 8, a coder/decoder (CODEC) 834 can also be coupled to the processor 810. A speaker 822 and a microphone 824 can be coupled to the CODEC 834. FIG. 8 also indicates that a wireless controller 840 can be coupled to the processor 810 and to a wireless antenna 842, and can enable the device 800 to communicate via a wireless network such as a wide area network (WAN). The processor 810 may be responsive to the wireless controller 840 to display call indicia, such as a caller identification or a caller number, at one or more of the displays 802, 804, and 806 when the device 800 receives an incoming call. The processor 810 may determine a size, position, and orientation, as well as a particular display 802, 804, and 806, to display the call indicia at least partially based on the folding configuration of the device 800 that is determined based on input from the sensors 874 and 876. For example the call indicia may be displayed as a pop-up window or text over one or more other applications having a size, location, and orientation based on the folding configuration.

[00101] In a particular embodiment, the device 800 is configured to be operable for wireless telephonic communications in all folding configurations. In a particular embodiment, the processor 810 is coupled to a short-range wireless interface 846 that may be coupled to a headset 850 via an antenna 848. The short-range wireless interface 846 may be wirelessly coupled to the headset 850, such as a device including an earpiece and a microphone, via an ad-hoc wireless network, such as a Bluetooth network. The processor 810 may implement logic to determine whether to display the call indicia or to alert the headset 850 in response to an incoming call. For example, the processor 810 may automatically alert the headset 850 when the device 800 is in a fully expanded configuration and a multimedia file or streaming media is displayed across all displays 802, 804, and 806, and may display the call indicia otherwise.

[00102] In a particular embodiment, one or more components of FIG. 8 may be located proximate to or within one or more of the device panels. For example, the processor 810 may be located within the center panel and the outer panels may each

store a battery 884 and 886. In a particular embodiment, the panels may be weighted in a manner to enable the device to remain upright in a thumbing configuration.

[00103] Referring to FIG. 9, a particular illustrative embodiment of an electronic device is depicted and generally designated 900. The device 900 includes a first panel 902 and a second panel 904. The first panel 902 and the second panel 904 are coupled via a recessed hinge 905, near a top edge and a bottom edge of the panels 902 and 904. In a particular embodiment, the electronic device 900 can be manipulated by a user into a variety of configurations for use, and may automatically adjust a software configuration or displayed image in response to a configuration change. In an illustrated embodiment, the electronic device 900 is a two-panel embodiment of the electronic device 101 of FIG. 1, the electronic device 800 of FIG. 8, or any combination thereof. In a particular embodiment, the recessed hinge 905 includes a coupling member 906. FIG. 9 includes an enlarged view of the recessed hinge 905, showing the coupling member 906 substantially flush with the surfaces of the first panel 902 and the second panel 904, and visible through a first aperture 1040 defined by the first panel and the second aperture 1044 defined by the second panel 904.

[00104] The folding display panels 902 and 904, when fully extended, may provide a panorama view similar to a wide screen television, and when fully folded to a closed position may provide a small form-factor and still provide an abbreviated view similar to a conventional cellular phone. A small hinge, such as the recessed hinge 905, that provides more complex motion, including translation and rotation, could be used to reduce the display panel gap and create a more continuous tiling and may be used in one or more designs with a multitude of displays or panels.

[00105] FIG. 10 illustrates a side partial cross sectional view of the device 900 of FIG. 9. The first panel 902 defines the first aperture 1040 which is in communication with a first cavity 1042 within the first panel 902. The second panel 904 defines the second aperture 1044 which is in communication with a second cavity 1046 in the second panel 904. The coupling member 906 is coupled to a first pivot member, such as a first pin 1010, and to a second pivot member, such as a second pin 1008. The first pin 1010 and the second pin 1008 enable the first panel 902 to be rotatably coupled to the coupling member 906; and the second pin 1008 enables the second panel 904 to be

rotatably coupled to the coupling member 906. As a result, the first panel 902 and the second panel 904 are rotatably coupled to each other. Further, the apertures 1040 and 1044 defined in the first panel 902 and the second panel 904, respectively, are formed to enable the coupling member 906 to be inserted therein, and to enable a range of rotational motion of each of the panels 902 and 904 with respect to the coupling member 906. In addition, the first pin 1010 is engaged within a slot 1012 within the first cavity 1042 to enable a lateral movement of the first panel 902 relative to the second panel 904, such that the first panel 902 has a range of motion relative to the second panel 904 when the recessed hinge 905 is in an extended configuration, with the first pin 1010 at a first end of the slot 1012. Furthermore, the first panel 902 has a second range of motion relative to the second panel 904 when the recessed hinge 905 is in a retracted configuration with the first pin 1010 at a second end of the slot 1012, where the first range of motion is larger than the second range of motion. As will be discussed with respect to FIGS. 15-20, a sensor may be coupled to the recessed hinge 905 to detect a relative orientation of the first panel 902 to the second panel 904.

[00106] As illustrated, the first aperture 1040 is dimensioned to receive at least a first portion of the coupling member 906, the first portion including the portion of the coupling member 906 coupled to the pin 1010. In addition, the second aperture 1044 is dimensioned to receive at least a second portion of the coupling member 906, the second portion including the portion coupled to the second pin 1008. In addition, the first cavity 1042 includes an extended recessed component 1014 to receive coupling member 906 when the first pin 1010 is at an innermost position within the slot 1012.

[00107] FIG. 11 depicts the electronic device 900 of FIG. 9 in an angled configuration 1100. The first panel 902 is oriented at an angle with respect to the second panel 904 via the recessed hinge 905, illustrated as including a coupling member 906. FIG. 11 includes a close-up view of a recessed hinge 905 illustrating the coupling member 906 extending through a different area of the second aperture 1044 of the second panel 904 as compared to FIG. 9.

[00108] FIG. 12 illustrates the first panel 902 rotatably coupled to the second panel 904 via the coupling member 906. The coupling member 906 is rotatably coupled to the first panel 902 via the first pin 1010 engaged in the slot 1012 and rotatably coupled to

the second panel 904 via the second pin 1008. As illustrated in FIG. 12, the second panel 904 is abutted against the first panel 902, to provide an angle stop 1216. In the configuration of FIG. 12, the second panel 904 may be rotated in an inward direction to a position fully folded to lay flat against the surface of the panel 902, and may be rotated in an outward direction to a predetermined angle 1218 relative to the first panel 902 and prevented from further rotational separation via the angle stop 1216. The angle stop 1216 may hold the second panel 904 at the predetermined angle 1218, which is illustrated in the embodiment of FIG. 12 as substantially 135 degrees relative to the first panel 902.

[00109] Referring to FIG. 13, the electronic device 900 depicted in FIG. 9 is illustrated in a fully folded configuration 1300. The fully folded configuration 1300 has the first panel 902 with a first surface, such as a display surface, including a screen, substantially proximate to the second panel 904. The recessed hinges 905 are illustrated in a retracted configuration to enable the first panel 902 to be located substantially proximate to the second panel 904 to reduce a device height in the fully folded configuration 1300. An enlarged view of the recessed hinge 905 is illustrated in FIG. 13 showing the coupling member 906 extending through the first aperture 1040 of the first panel 902 and the second aperture 1044 of the second panel 904.

[00110] FIG. 14 illustrates a side partial cross-sectional view of the fully folded configuration 1300. As illustrated in FIG. 14, the first panel 902 is fully folded against the second panel 904, with the coupling member 906 completely within the first cavity 1042 of the first panel 902 and the second cavity 1046 of the second panel 904. As illustrated, the coupling member 906 has the second pin 1010 engaged in the first cavity 1042 at one extremity of the slot 1012, enabling the first panel 902 and the second panel 904 to be positioned substantially proximate to each other, and as illustrated, substantially flat against each other.

[00111] In a particular embodiment, the recessed hinges 905 may be detented and equipped with sensors so that a multi-fold mobile device can adjust display image orientation and content based on feedback from the hinge sensors, as will be discussed more with respect to FIGS. 15-17 and 18-20. The hinges may use, for example, pressure sensors, electrical contacts, Hall sensors, optics, or induction detection to read

position, as illustrative, non-limiting examples. Feedback may be received from more than one hinge location or rotation. The hinges may enable folding panels to be set in predetermined positions, and a multi-fold mobile device may set a display image orientation and content or user interface at least partially based on detecting the folding panels in a predetermined position. For example, hinges may be ball detented, may have one or more intermediate positions or stops between fully open and fully closed, may be spring-biased, or may have other configurations to enable folding panels to be held in multiple positions. For example, one or more hinges may be spring-biased so that panels can be separated slightly for repositioning and allowed to snap back into a different configuration. In addition, an electronic device may have a first type of hinges at one fold and a second type of hinges at another fold.

[00112] For example, in a particular embodiment a detented hinge may enable the panels to be placed flat, or in one plane, with a display image active and viewable in landscape mode. When the multi-fold device is not flat, then the left panel may contain a touch panel keyboard in portrait orientation and the other displays may be combined in portrait mode. When the multi-fold device is closed, the right display may be active and in portrait orientation with the remaining displays off and inactive. The functional flow could involve the multi-fold device being set in a particular position, one or more smart hinges reading the position, and an image or user interface adjusting in response to reading the position. A wide variety of possible configurations for the display image or user interface may be enabled by detented hinges at a multi-fold device, and in a particular embodiment, a small form factor device may be enabled to expand to be used as a large-screen multimedia device.

[00113] FIG. 15 illustrates a particular illustrative embodiment of a three-panel electronic device in a folded configuration 1500. The three-panel device 1501 includes a first panel 1502, a second panel 1504, and a third panel 1506. The first panel 1502 is coupled to the second panel 1504 via a first hinge 1505, illustrated as a recessed hinge shown with dashed lines. The second panel 1504 is coupled to the third panel 1506 via a second hinge 1507. The first panel 1502 includes a first sensor 1512, a second sensor 1514, and a third sensor 1516, which may include one or more electrodes, pressure sensors, other sensors, or any combination thereof, which in various configurations may

contact a first end 1508 of the second panel 1504. In addition, the second panel 1504 has a second end 1510 that in various configurations may contact with a first sensor 1522, a second sensor 1524, and a third sensor 1526, or any combination thereof, of the third panel 1506. The first panel 1502 includes a first internal sensor 1532, the second panel 1504 includes a second internal sensor 1534, and the third panel 1506 includes a third internal sensor 1536. In an illustrative embodiment, the three-panel device 1501 may be the electronic device 101 of FIGS. 1-7, the electronic device 800 of FIG. 8, a three-panel embodiment of the electronic device 900 of FIGS. 9-14, or any combination thereof.

[00114] In a particular embodiment, the three-panel device 1501 may recognize the configuration based on activities at the sensors 1512 through 1516, and 1522 through 1526. In particular, a relative orientation of the first panel 1502 to the second panel 1504 may be detected at the first hinge, such as via the presence or absence of a contact between the first edge 1508 with one or more of the sensors 1512-1516. In addition, relative orientation of the second panel 1504 with the third panel 1506 may be detected or sensed via a presence or absence of contact between the second edge 1510 and one or more of the sensors 1522-1526. As illustrated, the electronic device 1501 in the configuration 1500 is in a fully folded configuration. Similarly, the one or more of the sensors 1532, 1534, and 1536 may include an accelerometer, an inclinometer sensor to measure an inclination, a sensor to measure a relative movement, such as a gyroscopic sensor, another type of sensor, or any combination thereof. By using sensors at the hinges, such as these sensors 1512-1516, and 1522-1526, as well as the internal sensors 1532-1536, a folding configuration, a relative or absolute alignment, an inclination of the device or other physical configurations may be detected and responded to via a processor controlling the device such as the processor 810 of FIG. 8.

[00115] For example, the sensors 1512-1516, and 1522-1526, and the internal sensors 1532-1536 may be included or fed into the folding configuration sensor 826 of FIG. 8. The device may include a processor such as the processor 810 of FIG. 8, that is responsive to a sensor coupled to a hinge to detect a device configuration from a set of at least three predetermined configurations. The sensor may include at least one of a Hall sensor, an optical sensor, or an inductive sensor. One or more of the hinges may be

detented to enable a stable extended configuration, folded configuration, and intermediate configuration of the first panel relative to the second panel, and the processor may be configured to execute a software application having at least three predetermined operating modes corresponding to the at least three predetermined configurations. The processor may also be adapted to adjust an operating mode of the software application based on the detected device configuration, as well as to adjust a user interface displayed at the first display surface, the second display surface, and the third display surface based on the detected device configuration. For example, in a first predetermined configuration the first display surface, the second display surface, and the third display surface may be configured to emulate a single screen in a landscape configuration, in a second predetermined configuration the first display surface may be active and the second display surface and the third display surface may be inactive, and in a third predetermined configuration a keyboard may be displayed at the third display surface and the first display surface and the second display surface may be configured to emulate a single screen in a portrait configuration. Although the sensors 1532-1536 are depicted as internal sensors, in other embodiments one or more of the sensors need not be internal, and may instead be coupled to a surface of the respective panel, or at other positions relative to the panels.

[00116] FIG. 16 depicts the electronic device 1501 of FIG. 15 in a travel clock configuration 1600. The first panel 1502 includes the sensors 1512-1516 and the first internal sensor 1532. The first sensor 1512 and second sensor 1514 are not in contact with the first end 1508 of the second panel 1504, and the third sensor 1516 is in contact with the first end 1508, indicating that the first panel 1502 is positioned at a first angle stop that is at a substantially 90 degree relative orientation to the second panel 1504. Similarly, the second edge 1510 of the second panel 1504 is in contact with the second sensor 1524 of the third panel 1506, but is not in contact with the first sensor 1522 or the third sensor 1526 of the third panel 1506. Therefore, a processor of the device 1501 may determine that the second panel 1504 is in a relative alignment with the third panel 1506 at a second angle stop, such as at a 135 degree relative orientation as illustrated in FIG. 16. In addition, the internal sensor 1534 of the second panel 1504 may indicate that the second panel 1504 is inclined relative to a gravitational directional pull, and the internal sensor 1536 of the third panel 1506 may indicate that the third panel 1506 is in

a relatively horizontal orientation, and stationary, and therefore the electronic device 1501 may recognize that it has been put into the travel clock configuration 1600.

[00117] FIG. 17 depicts the electronic device 1501 of FIG. 15 in a fully extended configuration 1700. The first panel 1502 and the second panel 1504 are positioned such that the first end 1508 of the second panel 1504 is in substantial contact with the first sensor 1512 and the third sensor 1516 of the first panel 1502, but not in contact with the second sensor 1514, indicating that the first panel 1502 and the second panel 1504 are in a end-to-end alignment at a third angle stop, and substantially coplanar at a relative rotational orientation of approximately 180 degrees. Similarly, the second panel 1504 and the third panel 1506 are also substantially coplanar at the third angle stop, as may be detected due to the second edge 1510 being in contact with first sensor 1522 and the third sensor 1526 of the third panel 1506, but not in contact with the second sensor 1524. In addition, one or more of the internal sensors 1532, 1534 and 1536 may be used to indicate an acceleration, an inclination, one or more relative positions, or any combination thereof. By including sensors, such as electronic sensors, pressure sensors, magnetic field detectors, or any combination thereof, at one or more angle stops or rest positions of the panels 1502, 1504, and 1506, the electronic device 1501 may determine a relative orientation between one or more of the panels 1502-1506, enabling the electronic device 1501 to determine a hardware configuration it is currently in, and to detect a change in a hardware configuration as the sensors 1512-1516 and 1522-1526 are engaged and disengaged, respectively.

[00118] FIG. 18 depicts an electronic device 1801 having a first panel 1802, and second panel 1804, and a third panel 1806 in a fully folded configuration 1800. The first panel 1802 is rotatably coupled to the second panel 1804 via recessed hinge that includes a first sensor 1812. The second panel 1804 is coupled to the third panel 1806 via a recessed hinge that includes a second sensor 1822. The second panel 1804 also includes one or more internal sensors 1834. In a particular embodiment, the first sensor 1812 within the recessed hinge may detect a rotational alignment of the first panel 1802 to the second panel 1804, or a degree of rotation between one or more of the panels 1802 and 1804 relative to a coupling member, relative to one or more of the pins of the hinge, relative to a direction of gravitational force, via other mechanisms, or any

combination thereof, to enable a relative positioning of the first panel 1802 with respect to the second panel 1804 to be detected at the first sensor 1812. The second sensor 1822 may be configured to perform substantially similarly to the first sensor 1812, to detect a relative orientation between the second panel 1804 and the third panel 1806. In contrast to the electronic device 1501 of embodiments depicted in FIGS. 15 through 17, the electronic device 1801 of FIG. 18 in the fully folded configuration 1800 includes a single internal sensor 1834, and two hinge sensors 1812 and 1822, enabling the electronic device 1801 to detect a first parameter, such as an orientation, position, momentum, or acceleration using the internal sensor 1834, and to further detect a folded, unfolded, or partially folded configuration of the panels 1802, 1804, 1806 via the hinge sensors 1812 and 1822. In a particular embodiment, the electronic device 1801 may be the electronic device 101 of FIGS. 1-7, the electronic device 800 of FIG. 8, a three-panel embodiment of the electronic device 900 of FIGS. 9-14, the electronic device 1501 of FIGS. 15-17, or any combination thereof.

[00119] FIG. 19 depicts the electronic device 1801 of FIG. 18 in a travel clock configuration 1900. The first panel 1802 is coupled at approximately a 90 degree angle to the second panel 1804 via a hinge including the first sensor 1812. The second panel 1804 is coupled at approximately 135 degree angle to the third panel 1806 via the hinge including the second sensor 1822. The internal sensor 1834 may detect an inclination of the second panel, which in combination with sensor readings at the first sensor 1812 and the second sensor 1822, may indicate to a processor controlling the electronic device 1801 that the electronic device 1801 is in the travel clock configuration 1900. Also, the electronic device 1801 also includes one or more signal paths 1940 and 1942 to communicate electronic data and control signals between the first panel 1802 and the second panel 1804, and between the second panel 1804 and the third panel 1806, respectively. In a particular embodiment, the signal paths 1940 and 1942 may include flex cable, one or more wires, other signal bearing media, such as fiber optic cable, other electrically conductive material to transmit signals, or any combination thereof. Signals transmitted via the signal paths 1940 and 1942 may be transmitted serially, in parallel, or in combination of serially and in parallel, and may be transmitted according to one or more protocols. In a particular embodiment, one or more of the signaling paths 1940 and 1942 may include a Mobile Display Digital Interface (MDDI) interface.

[00120] FIG. 20 depicts the electronic device 1801 of FIG. 18 in a fully extended configuration 2000. The first panel 1802 is substantially coplanar with the second panel 1804. The second panel 1804 is also substantially coplanar with the third panel 1806. As illustrated, the first sensor 1812 may detect that the first hinge is in a fully extended configuration position, and the second sensor 1822 may detect that the second hinge is in a fully extended configuration position. In addition, the internal sensor 1834 may detect that the second panel 1804 is in a substantially flat or horizontal position or alignment. Based on the sensors 1812, 1822, and 1834, the electronic device 1801 may recognize that it is in a fully extended position, and may configure software or graphical user interfaces to display in a landscape configuration across one or more display surfaces of the adjacent panels 1802-1806.

[00121] Referring to FIG. 21, a particular embodiment of an electronic device is depicted and generally designated 2100. In a particular embodiment, the electronic device 2100 may be the electronic device 101 of FIGS. 1-7, the electronic device 800 of FIG. 8, the electronic device 900 of FIGS. 9-14, the electronic device 1501 of FIGS. 15-17, the electronic device 1801 of FIGS. 18-20, or any combination thereof.

[00122] The device 2100 includes a first display surface 2120 on a first panel 2122 and a second display surface 2130 on a second panel 2132, separated by a recessed hinge. Each display surface 2120 and 2130 has a portrait height 2106, a portrait width 2108, and a diagonal dimension 2110. The display surfaces 2120 and 2130 extend approximately to an edge of each of the panels 2122 and 2132. A gap 2102 indicates a distance between an edge of the first display surface 2120 and an edge of the second display surface 2130. The panels 2122 and 2132 have a height dimension 2104. The electronic device 2100 includes a recessed hinge with a slot that enables a linear range of motion of a pin, illustrated as hinge travel distance 2112. In a particular embodiment, the gap 2102 is designed to be small relative to dimensions of the display surfaces 2120 and 2130. In addition, the height dimension 2104 is designed to be small relative to the display surfaces to result in a convenient size in a fully folded configuration. Further, the hinge travel distance 2112 may be adjusted to enable the panels 2120 and 2130 to extend in order to rotate from a fully extended position to a fully folded position, and to be recessed after reconfiguration into a substantially locked position. In an illustrative

embodiment, the hinge travel distance 2112 may be between 2 millimeters (mm) and 10 mm. For example, the hinge travel distance 2112 may be about 5 mm.

[00123] In a particular embodiment, the portrait height 2106 is between 5-10 centimeters (cm), the portrait width 2108 is between 4-8 cm, and the diagonal dimension 2110 may be between 6 and 13 cm, to enable a convenient size to fit in a pant or jacket pocket when fully folded while providing a large enough display area to provide multiple icons or controls of sufficient size and separation to be individually selected by a user's finger via a touchscreen interface. In an illustrative embodiment, the portrait height 2106 may be approximately 8 cm, the portrait width 2108 may be approximately 6 cm, and the diagonal dimension 2110 may be approximately 10.2 cm (i.e., approximately 4 inches).

[00124] In a particular embodiment, the gap 2102 is between approximately 0 and 2.4 mm. In an illustrative embodiment, the gap 2102 is less than 2 mm, and may be substantially evenly formed of a portion of the first panel 2122 extending beyond the edge of the first display surface 2120 toward the second panel 2132 and a portion of the second panel 2132 extending beyond the edge of the second display surface 2130 toward the first panel 2122. In a particular embodiment, the gap 2102 is dimensioned so that when an image or video is displayed across both display surfaces 2120 and 2130 a human visual system may immediately or eventually ignore, or may not be substantially distracted by, a missing portion corresponding to the gap 2102.

[00125] In a particular embodiment the height dimension 2104 is large enough to include a thickness of the display panels 2120 and 2130, internal electronics, one or more batteries, sensors, or any combination thereof, but small enough to be conveniently placed in a pants pocket when the device 2100 is in a fully folded configuration. For example, in an embodiment, having three panels, the height dimension 2104 may be less than 5.5 mm, so that a height of the device in a three-panel fully folded configuration is no more than 16.5 mm. In an illustrative embodiment, the height dimension 2104 is approximately 5 mm.

[00126] FIG. 22 depicts a particular illustrative embodiment of an electronic device 2201 having five configurable panels. The electronic device 2201 has a first panel

2202, a second panel 2204, a third panel 2206, a fourth panel 2208, and a fifth panel 2210 in a fully extended configuration 2200. In a particular embodiment, each of the panels 2202-2210 may include a respective display surface 2222, 2224, 2226, 2228, and 2230, such that in the fully extended configuration 2200 an effective screen area may be formed by the display surfaces of all of the panels 2202-2210. In a particular embodiment, the electronic device 2201 is a five-panel embodiment of the electronic device 101 of FIGS. 1-7, the electronic device 800 of FIG. 8, the electronic device 900 of FIGS. 9-14, the electronic device 1501 of FIGS. 15-17, the electronic device 1801 of FIGS. 18-20, the electronic device 2100 of FIG. 21, or any combination thereof.

[00127] FIG. 23 depicts a particular embodiment of the electronic device 2201 of FIG. 22 in a transitional configuration 2300. The first panel 2202 is coupled to the second panel 2204 to enable the first panel 2202 and second panel 2204 to rotate from a fully extended position depicted in FIG. 22 to a position where a back side of each panel 2202 and 2204 is proximate to the back side of the other panel. Similarly, the second panel 2204 and the third panel 2206 are rotatably coupled to be positionable from at least a fully extended position to a fully folded position having the display surface 2224 of the panel 2204 proximate to the display surface 2226 of the panel 2206. The panel 2206 and the panel 2208 are rotatably coupled to be positioned from at least the fully extended position to a fully folded position having a back surface of the panel 2206 proximate to a back surface of the panel 2208. The panels 2208 and 2210 are rotatably coupled to be positionable from at least a fully extended position to a fully folded position where the display surface 2228 of the panel 2208 is proximate to the display surface 2230 of the panel 2210. In a particular embodiment, the electronic device 2201 depicted in FIGS. 22 and 23 may be generally analogous to the electronic devices 101, 800, 900, 1501, 1801, or 2100 depicted in Figs. 1-21, and may include one or more configurations, operations, sensors, hinges, or other features of previously disclosed embodiments. It should be understood that any number of panels may be included in a portable electronic device that automatically adjusts a graphical display based on a change of folding configuration and is within the scope of the present disclosure.

[00128] FIG. 24 depicts a particular illustrative embodiment of an electronic device 2401 having three detachable panels in a detached configuration 2400. A first panel

2402 includes a coupling mechanism 2410 that enables the first panel 2402 to couple to the second panel 2404 via a second coupling mechanism 2412 of the second panel 2404. The coupling mechanisms 2410 and 2412 may be configured to provide mechanical and electronic coupling between the first panel 2402 and the second panel 2404. Similarly, the second panel 2404 includes a third coupling mechanism 2414 configured to provide mechanical and electronic coupling to a fourth coupling mechanism 2416 of a third panel 2406. In a particular embodiment, the electronic device 2401 is a detachable-panel embodiment of the electronic device 101 of FIGS. 1-7, the electronic device 800 of FIG. 8, the electronic device 900 of FIGS. 9-14, the electronic device 1501 of FIGS. 15-17, the electronic device 1801 of FIGS. 18-20, the electronic device 2100 of FIG. 21, the electronic device 2201 of FIGS. 22-23, or any combination thereof.

[00129] FIG. 25 depicts the electronic device 2401 of FIG. 24 in a fully attached configuration 2500. The first panel 2402 is fixedly coupled to the second panel 2404 which is fixedly coupled to the third panel 2406. The panels 2402-2406 are in a fully extended configuration. In a particular embodiment, the coupling mechanisms 2410-2416 depicted in FIG. 24 may rigidly couple the panels 2402, 2404, 2406 so that little to no rotational movement is enabled between the panels 2402-2406. However, in other embodiments, the coupling mechanisms 2410-2416 may provide or enable rotational motion of one or more of the panels 2402-2406 relative to each other, to enable functionality as described with respect to Figs. 1-23.

[00130] FIG. 26 is a flowchart of an illustrative embodiment of a method of changing software states at a multi-panel electronic device, generally designated 2600. In a particular embodiment, the method 2600 may be performed at the electronic device 101 of FIGS. 1-7, the electronic device 800 of FIG. 8, the electronic device 900 of FIGS. 9-14, the electronic device 1501 of FIGS. 15-17, the electronic device 1801 of FIGS. 18-20, the electronic device 2100 of FIG. 21, the electronic device 2201 of FIGS. 22-23, the electronic device 2401 of FIGS. 24 and 25, or any combination thereof.

[00131] In a particular embodiment, the electronic device may include well-defined hardware configurations including a folded mode, a fully unfolded mode, a thumbing mode, a video conferencing mode, and a travel clock mode. A sensor in each panel or fold between panels may detect and report a change in panel or hinge position. A panel

or hinge position may be reported in degree of fold, such as within a range of between approximately -180 degrees to approximately 180 degrees. One or more sensors in a middle panel, such as the internal sensor 1834 depicted in FIGS. 18-20, may detect and report orientation changes. A software controller may collect and analyze sensor input and can decide to take one or more actions in response to the sensor input. For example, the software controller may initiate a change of a size of an application, such as an application window or user interface element, initiate a change of an orientation of an application, initiate an auto-launch of an application, initiate an auto-exit of an application, initiate a state change of an application, or a combination of actions.

[00132] As illustrated in FIG. 26, the electronic device has a defined software state at 2602. For example, the defined software state may indicate one or more parameters such as whether an application is running or waiting, whether the application receives user input such as keyboard input, one or more application window sizes, positions, orientations, and a type of user interface provided for the application. The defined software state 2602 may indicate a number of panels and a display mode available to an application. For example, the device may be in a folded configuration and the software controller may have launched an application in a one-panel portrait mode. The application may define or include one or more predetermined states to be responsive to the available number of panels and display mode and to improve a user experience.

[00133] A sensor input 2604 is received, and the panel positions are analyzed at 2606. In a particular embodiment, the sensor input 2604 may indicate a change in one or more of a hinge position, an orientation, or a movement. For example, a change in hinge position may be detected by hinge sensors, such as the sensors 1512-1516 of FIGS. 15-17 or the sensors 1812 and 1822 of FIGS. 18-20, while a change in orientation or movement may be detected by one or more internal sensors, such as the internal sensors 1532-1536 of FIGS. 15-17 or the internal sensor 1834 of FIGS. 18-20. In addition, a change in hinge position can be detected indirectly by sensors other than hinge sensors, such as via a change in relative orientation of adjacent panels that is detected by inclinometers coupled to the adjacent panels.

[00134] Moving to decision 2608, a determination is made whether the electronic device is in a defined hardware state. Where the electronic device is not in a defined

hardware state, processing returns to 2602. For example, if the determined hardware configuration is not one the predefined hardware configurations, the software controller may assume that the device is in transition to a known state and may wait for additional sensor inputs.

[00135] Where the electronic device is determined to be in a defined hardware state, at 2608, the electronic device enters a new software state at 2610. For example where the electronic device is determined to be in a fully unfolded hardware configuration, the software controller may reconfigure the application with new layout requirements, such as three-panel landscape mode or a three-panel portrait mode.

[00136] In a particular embodiment, the software controller may be implemented by circuitry or other hardware, firmware, one or more processors executing program instructions, such as the processor 810 of FIG. 8, a general purpose processor or dedicated processor, or any combination thereof. In a particular embodiment, an application such as the software 834 of FIG. 8 may be written to support multiple predefined states of operation, and may be responsive to a control signal such as an interrupt or a semaphore indicating a particular hardware state or change of state. In a particular embodiment, the software is responsible for querying the hardware configuration and for self-adjusting a software state. In another embodiment, the software is responsible for supporting an interface to receive hardware state change messages from the software controller.

[00137] FIGS. 27-31 depict a particular embodiment of automatically configuring a keyboard in response to a detected hardware configuration of an electronic device 2701. In a particular embodiment, the electronic device 2701 is the electronic device 101 of FIGS. 1-7, the electronic device 800 of FIG. 8, a three-panel version of the electronic device 900 of FIGS. 9-14, the electronic device 1501 of FIGS. 15-17, the electronic device 1801 of FIGS. 18-20, the electronic device 2100 of FIG. 21, the electronic device 2201 of FIGS. 22-23, the electronic device 2401 of FIGS. 24 and 25, or any combination thereof. In a particular embodiment, the electronic device 2701 is configured to operate according to the method 2600 of FIG. 26.

[00138] FIG. 27 depicts the electronic device 2701 in the fully folded configuration 2700. The electronic device 2701 in the fully folded configuration 2700 has a single panel display surface exposed, showing a display window 2704 and a keyboard area 2702. In a particular embodiment, the keyboard area 2702 is an image displayed as part of a display surface that also includes the display window, and may be actuated via key presses as detected at a touch screen surface. As illustrated, the image including the display window 2704 and the keyboard area 2702 is displayed in a portrait orientation on the single exposed display surface. In another embodiment, the electronic device 2701 may be configured to display an image including a display window and a keyboard area in a landscape orientation. The electronic device 2701 may be responsive to one or more sensors to selectively display the keyboard area in a portrait orientation or a landscape orientation based on a detected orientation of the electronic device 2701.

[00139] FIG. 28 depicts the electronic device 2701 of FIG. 27 in a thumbing configuration 2800. In the thumbing configuration 2800, the bottom panel has a display surface displaying a larger keyboard area 2802 than the smaller keyboard area 2702 depicted in FIG. 27. A first display surface 2804 of a middle panel, and a second display surface 2806 of a top panel may form two separate display windows, or may be combined to form a 2-panel effective screen. The keyboard area 2802, as being larger than the keyboard area 2702 of FIG. 27, may enable easier use and move effective data input via a touch screen at the display surface showing the keyboard area 2802.

[00140] FIG. 29 illustrates the electronic device 2701 of FIG. 27 in a fully extended configuration 2900. In the fully extended configuration 2900, the keyboard is illustrated as extended across all three panels, which form an effective display screen three panels wide and one panel tall. The effective display screen, in a landscape mode, is wider than it is tall, although each of the panels comprising the effective screen display a respective portion of a displayed landscape image in a portrait configuration. A right-most portion of a keyboard 2902 is displayed under a right-most portion 2908 of a display area at a right-most panel. A center panel displays a center portion 2904 of the keyboard beneath a center portion 2910 of the display area. A left-most panel displays a left-most portion 2906 of the keyboard under a left-most portion 2912 of the display area.

[00141] FIG. 30 depicts the electronic device 2701 of FIG. 27 in a travel clock configuration 3000. A first horizontal panel displays a keyboard area 3002, which may be actuated via touch that is recognized by a touch screen surface. A second display surface 3004 of the center panel may be used for visual display of application windows, icons, other controls, as well as a clock indicia. A third display surface 3006 may have a display area that is powered down, or that performs other functions, such as a night light, displaying one or more ornamental designs, a user specified display, or any combination thereof.

[00142] FIG. 31 illustrates the device 2701 of FIG. 27 in a video conferencing configuration 3100. A camera 3104 is illustrated on a back surface of the left-most panel, which is depicted in a folded configuration. The back surface of the leftmost panel may include additional user interface mechanisms, such as an additional display 3102. In addition, the right-most panel may be divided to provide a keyboard area 3106 at a bottom portion of a display surface, and a display area 3108 that may show an image of a participant in a video conference call, located above the keyboard area 3106. In general, the electronic device 2701 may be programmable to recognize a configuration of the device 2701, such as via one or more sensors internal to the panels, internal to the hinges, or other sensors, and may automatically reconfigure a display of a keyboard at an appropriate portion of one or more appropriate display surfaces, as illustrated in FIGS. 27-31. The reconfiguration, redisplay, and reorientation of the display panels, and in particular the keyboard, may be performed automatically in response to a user configuration, folding, hardware adjustment, inclination, orientation, acceleration, or any combination thereof, without any further input required of or detected from the user.

[00143] FIGS. 32-37 illustrate an electronic device 3201 having an icon control panel that is responsive to a configuration of the electronic device 3201, and that is further responsive to user input to open and close applications. In a particular embodiment, the electronic device 3201 is the electronic device 101 of FIGS. 1-7, the electronic device 800 of FIG. 8, a three-panel version of the electronic device 900 of FIGS. 9-14, the electronic device 1501 of FIGS. 15-17, the electronic device 1801 of FIGS. 18-20, the electronic device 2100 of FIG. 21, the electronic device 2201 of FIGS. 22-23, the

electronic device 2401 of FIGS. 24 and 25, the electronic device 2701 of FIGS. 27-31, or any combination thereof. In a particular embodiment, the electronic device 3201 is configured to operate according to the method 2600 of FIG. 26.

[00144] FIG. 32 depicts the electronic device 3201 in a fully folded configuration 3200. A display surface of the left-most panel illustrates one or more controls or other indicia 3204 such as, for example, wireless phone indicia, including a power indicator, a signal strength indicator, an alarm signal, a digital network bandwidth indication, indicia, or any combination thereof. The upper display surface further includes multiple application icons, such as the representative application icon 3206. The application icons may be responsive to user input via a touch sensitive surface at the display surface. The electronic device 3201 may be usable for telephonic telecommunications, and may include a microphone 3240, a speaker 3242, other hardware elements to enable one or more functions of the electronic device 3201, or any combination thereof.

[00145] FIG. 33 depicts the electronic device 3201 of FIG. 32 in a fully extended configuration 3300. When the device 3201 is extended from the fully folded configuration 3200 of FIG. 32 to the fully extended configuration 3300 of FIG. 33, a display screen 3308 of the center panel and a display screen 3310 of the right-most panel are exposed and viewable by a user. The display screens 3308 and 3310 may show a desktop area while the left-most panel may continue to show an icon panel including the representative application icon 3206.

[00146] FIG. 34 depicts a movement of the representative application icon 3206 toward a gap 3414 between a left-most display surface and the center display surface 3308 in response to a user input. For example, the user input may be a dragging operation indicating a movement of the representative application icon 3206 toward the gap 3414, and may indicate, via a speed and direction of movement of the application icon 3206, that the representative application icon 3206 is to be moved across the gap 3414. A movement of the representative application icon 3206 is illustrated as an arrow 3412, where a speed of movement is illustrated as a length of the arrow 3412, and direction of movement is indicated as a direction of the arrow 3412. The speed and direction of movement of the application icon 3206 may be used to make a prediction of a user's intention associated with the user input, such as when the user input is received

as a dragging operation at a touchscreen. For example, the speed and direction of movement of the application icon 3206 may be used to predict that a user input is intended to move the application icon 3206 across the gap 3414, even if the user input ends before reaching the gap 3206. In a particular embodiment, one or more physical laws may be simulated for user interface elements, such as momentum and friction, such that a user may initiate a motion of a user interface element and the user interface element may continue its motion according to the simulated physics of the interface. For example, an interface element set into motion by a dragging operation and then released may slow down and stop in a manner that is predictable to the user and that may be perceived as natural or intuitive by the user.

[00147] As illustrated in FIG. 34, as the speed and direction of movement provided by the user input indicates an instruction for the icon 3206 to cross the gap 3414, at least a portion of the icon 3206 may be displayed at the center display panel 3308, while the remaining portion of the icon 3206 may be displayed at the left-most display panel. In this way, a user may maintain a visual reference of the representative application icon 3206 having a continuous motion across the gap 3414. In a particular embodiment, such as shown when the icon 3206 is moved relatively slowly, the representative application icon 3206 may be moved across the gap 3414, and may be positioned in the center display area 3308. However, when the application icon 3206 is moved with sufficient speed across the gap 3414, the electronic device 3201 may interpret the user input indicating the movement of the representative application icon 3206 across the gap 3414 as a launch instruction for an application associated with the representative application icon 3206.

[00148] As illustrated in FIG. 35, in a particular embodiment, when application icon 3206 of FIGS. 32-34 is pulled across the gap 3414 with sufficient speed, an application is launched that is associated with the application icon 3206, such as by opening an application window 3516 in the center display area 3308. In another embodiment, the application window 3516 may extend to cover both the center display surface 3308 and the right-most display surface 3310, which may be configured to operate as a 2-panel effective display screen.

[00149] As illustrated in FIG. 36, in a particular embodiment, a user may instruct the electronic device to close the application window 3516 by providing user input directing the application window 3516 to have a movement, illustrated by an arrow 3618, toward the gap 3414. The application window 3516 may be displayed as traveling toward the gap 3414, and may also be displayed as having at least a portion displayed in the first display surface of the left-most panel to provide visual continuity to the user of the electronic device 3201 to appear as if the application window 3516 is at least partially across the gap 3414. In a particular embodiment, when the application window 3516 has been instructed by a user input to move a sufficient distance toward the gap 3414, such as when a particular motion of the application window 3516 across the gap 3414 has occurred or will occur, the electronic device 3201 may interpret the user input as a command to close the application displayed at the application window 3516, close the application and the application window 3516, and return the representative application icon 3206 to its original position in left-most surface panel as depicted in FIG. 37.

[00150] FIGS. 32-37 illustrate a method of interaction using the gaps between touch screens on a multi-screen electronic device to trigger an event or interaction with the user interface. By knowing the location and size of the gaps, the application or software can use the gap as another method of interaction. As an example, a browser could be launched from one screen to display on the remaining screens. The first screen could contain application icons including one for a browser, such as the application icon 3206 of FIG. 33. A user could place their finger on the icon for the browser then drag the icon in the direction of the screen gap, such as the gap 3414 of FIG. 34. As the user reaches the gap, an interaction could be initiated and visualized showing the browser opening up in the remaining screens. A reverse use of this trigger could include dragging some part of an open application, such as the application window 3516 of FIG. 35, across a given gap that initiates a close or hide feature back to the originating screen.

[00151] As illustrated in FIG. 34 and FIG. 36, a visual cue may be used on a forward side of a user interface element to both show direction and location across gaps while the user is dragging across multiple screens. When being dragged, the user interface element (such as an icon or application window) may shift a number of pixels in the

forward direction so it is still visible to the user and cues the direction. When dragging across a gap between multiple screens, such as to auto-launch an application or to move a user interface element to another screen, the user interface element may shift forward the same distance as the measured gap to both show direction and the ability to move across screens. By showing the direction, location, and ability to cross gaps, the electronic device 3201 may provide the user with a continuous cue while dragging user interface elements. As a result, user errors may be reduced and usability of the electronic device 3201 may be improved.

[00152] Referring to FIG. 38, a particular illustrative embodiment of an electronic device 3801 having an accelerometer and an inclinometer is depicted and generally designated 3800. In a particular embodiment, the electronic device 3801 is the electronic device 101 of FIGS. 1-7, the electronic device 800 of FIG. 8, a three-panel version of the electronic device 900 of FIGS. 9-14, the electronic device 1501 of FIGS. 15-17, the electronic device 1801 of FIGS. 18-20, the electronic device 2100 of FIG. 21, the electronic device 2201 of FIGS. 22-23, the electronic device 2401 of FIGS. 24 and 25, the electronic device 2701 of FIGS. 27-31, the electronic device 3201 of FIGS. 32-37, or any combination thereof. In a particular embodiment, the electronic device 3801 is configured to operate according to the method 2600 of FIG. 26.

[00153] The electronic device 3801 includes a first panel 3802 having a first display surface 3832, a second panel 3804 having a second display surface 3834, and a third panel 3806 having a third display surface 3836. The three display surfaces 3832-3836 are controlled to emulate a single display screen that extends across all three display surfaces 3832-3836. The first panel 3802 is rotatably coupled to a first edge of the second panel 3804 and the third panel 3806 is rotatably coupled to a second edge of the second panel 3804. An inclinometer 3810 is located at the second panel 3810, and an accelerometer 3820 is offset from a longitudinal axis 3814 of the second panel. A controller, such as a processor 3830, is coupled to the inclinometer 3810 and to the accelerometer 3820.

[00154] The inclinometer 3810 is configured to detect a change in an inclination of the second panel 3804. For example, the inclinometer 3810 may be configured to detect a change in an orientation caused by a longitudinal rotation direction 3812 about a

longitudinal axis 3814. The accelerometer 3820 may be configured to detect an in-plane rotation direction 3822 of the second panel 3804 from a landscape orientation to a portrait orientation.

[00155] In a particular embodiment, the processor 3830 is configured to execute at least one software application having a graphical user interface. The processor 3830 is responsive to the inclinometer 3810 and the accelerometer 3820 to redraw an image displayed at the first display surface 3832, the second display surface 3834, the third display surface 3836, or any combination thereof, from a landscape-type display of the image to a portrait-type display of the image when the first panel 3832, the second panel 3834, and the third panel 3836 are in at least one predetermined folding configuration and the change in the inclination of the second panel 3834 does not exceed a threshold during the rotation of the second panel 3834. For example, the threshold may be an angle in a range between 5 degrees and 30 degrees (or -5 degrees and -30 degrees) and may be approximately 15 degrees (or -15 degrees).

[00156] For example, the controller may be configured to calculate that a detected acceleration is faster than an expected acceleration that would be expected to be detected for a person walking and carrying the device 3801, and that the inclinometer 3810 has detected no change (or less than a threshold change) in inclination. The controller may hold the content in place as the device 3801 turns around the content. Because the display may change positions compared to an original position of the display, the controller may continually redraw the content until the acceleration stops. For example, this would enable a user of the device 3801 to lay the device 3801 on a desk and to spin the device 3801 clockwise or counterclockwise to switch the display from portrait to landscape or any position in between.

[00157] FIGS. 39-41 illustrate an operation of the electronic device 3801 of FIG. 38 as the device 3801 is rotated from a landscape orientation to a portrait orientation.

[00158] In FIG. 39, the electronic device 3801 is depicted in a landscape mode 3900 where a web browser application image is displayed as a landscape-type display across all three display surfaces. The device 3801 may be rotated counterclockwise through a transitional position 4000 shown in FIG. 40 to a profile mode position 4100 shown in

FIG. 41 without substantially changing an inclination of the middle panel. For example the device 3801 may be placed flat on a surface such as a table or desk and rotated. As another example, the device 3801 may be held at a substantially constant inclination, such as a vertical inclination, as the device 3801 is rotated.

[00159] As illustrated in FIG. 40, as the processor 3830 receives inputs from the accelerometer 3820 and the inclinometer 3810 indicating that the device 3801 is rotating in the in-plane rotation direction 3822 but not significantly in the longitudinal rotation direction 3812, the image displayed at the display panels may be continually redrawn to maintain an orientation of the image with respect to a viewer. Such redrawing may provide an appearance to a user that the display surfaces function as a window to an underlying image, where the window rotates and the image remains stationary. FIG. 41 illustrates the electronic device 3801 at a portrait-type orientation that is attained by rotating the device a quarter-turn counterclockwise from the landscape-type configuration of FIG. 39. Thus, the user may continually rotate the device 3801 until a user is satisfied with an orientation for viewing of the content.

[00160] In a particular embodiment, a gaming application may be executed by the device 3801 such that a user provides control input by rotating the device 3801. For example, a driving application may display a driver's view of a racetrack across the extended display panels and a user may rotate the device 3801 as a steering wheel to control a steering of a vehicle on the racetrack, where the view does not rotate with the device and instead remains at a substantially stationary orientation, from the user's perspective. In addition, under certain circumstances a detected rotation of the device 3801 may be used to initiate specific processes in addition to a continual redrawing of the display. For example, when the device 3801 is executing a gaming application, a detected rotation may trigger one or more vibration actuators (not shown) or other hardware elements of the device 3801.

[00161] FIG. 42 is a flowchart of a second illustrative embodiment of a method 4200 of changing software states at a multi-panel electronic device. In a particular embodiment, the method 4200 may be performed at the electronic device 101 of FIGS. 1-7, the electronic device 800 of FIG. 8, the electronic device 900 of FIGS. 9-14, the electronic device 1501 of FIGS. 15-17, the electronic device 1801 of FIGS. 18-20, the

electronic device 2100 of FIG. 21, the electronic device 2201 of FIGS. 22-23, the electronic device 2401 of FIGS. 24 and 25, the electronic device 2701 of FIGS. 27-31, the electronic device 3201 of FIGS. 32-37, the electronic device 3801 of FIGS. 38-41, or any combination thereof.

[00162] The method 4200 illustrates a default state of an electronic device when no user interfaces for executing applications are displayed, such as after the device is powered on and before a user launches an application. A sensor input 4202 is received and used to detect a new hardware configuration at 4204. For example, the sensor input 4202 may indicate a relative orientation, or a change in orientation, of one or more panels of a multi-panel device, such as via one or more hinge sensors, inclinometers, accelerometers, one or more other sensors, or any combination thereof.

[00163] Moving to decision 4206, a determination is made whether the device is in a fully folded configuration, at 4206. Where the device is determined to be in the fully folded configuration, an icon panel may be displayed on an active screen, and other screens may be powered down, at 4208.

[00164] Where the device is determined to not be in the fully folded configuration, a determination is made whether the device is in a thumbing configuration, at decision 4210. Where the device is determined to be in the thumbing configuration, desktop icons may be displayed on a top two viewing screens, and a keyboard may be displayed on a bottom screen, at 4212.

[00165] Where the device is determined to not be in the thumbing configuration, a determination is made whether the device is in a travel clock configuration, at decision 4214. Where the device is determined to be in the travel clock configuration, a clock may be displayed at a middle screen, clock-mode controls may be displayed at a horizontal screen, and a back screen may be powered down, at 4216.

[00166] Where the device is determined to not be in the travel clock configuration, a determination is made whether the device is in a fully extended configuration, at decision 4218. Where the device is determined to be in the fully extended

configuration, an icon panel may be displayed at a leftmost screen, and the other two screens may be left clear for applications, at 4220.

[00167] Where the device is determined to not be in the fully extended configuration, a determination is made whether the device is in a video conferencing configuration, at decision 4222. Where the device is determined to be in the video conferencing configuration, a video conference video may be displayed at a top portion of an active screen, video conferencing mode controls may be displayed at a bottom portion of the active screen, and the other screens may be powered down, at 4224.

[00168] Where the device is determined to not be in the video conferencing configuration, a determination may be made, at 4226, that the device is in a transitional configuration, and no change may be performed at the display panels, and processing may return to 4204.

[00169] Although the method 4200 illustrates five hardware configurations, in other embodiments, more than five configurations, or less than five configurations, may be used. For example, an upright configuration resembling a folding screen may cause the electronic device to automatically begin displaying streaming real-time news, stock quotes, and blog feeds received via a wireless data network, for use as a secondary desktop appliance, or to launch an audio or video file player to begin playing a playlist stored at the device or received via the data network, or to automatically launch other applications according to a user configuration, or any combination thereof. In addition, custom configurations may be programmed into the electronic device and tested against when the sensor input 4202 is received.

[00170] FIG. 43 is a flowchart of a third illustrative embodiment of a method 4300 of changing software states at a multi-panel electronic device. In a particular embodiment, the method 4300 may be performed at the electronic device 101 of FIGS. 1-7, the electronic device 800 of FIG. 8, the electronic device 900 of FIGS. 9-14, the electronic device 1501 of FIGS. 15-17, the electronic device 1801 of FIGS. 18-20, the electronic device 2100 of FIG. 21, the electronic device 2201 of FIGS. 22-23, the electronic device 2401 of FIGS. 24 and 25, the electronic device 2701 of FIGS. 27-31, the

electronic device 3201 of FIGS. 32-37, the electronic device 3801 of FIGS. 38-41, or any combination thereof.

[00171] The method 4300 illustrates a default state of an electronic device when an application is executing that supports multiple software states and that is responsive to a configuration change of the electronic device. A sensor input 4302 is received and used to detect a new hardware configuration, while running the active application, at 4304. For example, the sensor input 4302 may indicate a relative orientation, or a change in orientation, of one or more panels of a multi-panel device, such as via one or more hinge sensors, inclinometers, accelerometers, one or more other sensors, or any combination thereof.

[00172] Moving to decision 4306, a determination is made whether the device is in a fully folded configuration, at 4306. Where the device is determined to be in the fully folded configuration, if the application supports a single-screen configuration, the application window of the application in a single-screen mode is displayed on the active screen and the other screens are powered down, at 4308. Where the application does not support a single-screen mode, the application may be suspended and not displayed at the active screen.

[00173] Where the device is determined to not be in the fully folded configuration, a determination is made whether the device is in a thumbing configuration, at decision 4310. Where the device is determined to be in the thumbing configuration, an application window may be displayed in a two-panel effective screen and a keyboard is displayed at the bottom screen, at 4312.

[00174] Where the device is determined to not be in the thumbing configuration, a determination is made whether the device is in a travel clock configuration, at decision 4314. Where the device is determined to be in the travel clock configuration, if the application supports the travel clock configuration, an application interface is displayed with a clock on the middle screen or with clock-mode controls on the horizontal screen, or both, and the back screen is powered down, at 4316. If the application does not support the travel clock configuration, the application may be suspended and not displayed.

[00175] Where the device is determined to not be in the travel clock configuration, a determination is made whether the device is in a fully extended configuration, at decision 4318. Where the device is determined to be in the fully extended configuration, if the application supports the fully extended configuration, an application window may be displayed across all three screens, at 4320. If the application does not support the fully extended configuration, an application window may be displayed on one or more screens.

[00176] Where the device is determined to not be in the fully extended configuration, a determination is made whether the device is in a video conferencing configuration, at decision 4322. Where the device is determined to be in the video conferencing configuration, if the application supports the video conferencing configuration, an application interface may be displayed with video at a top portion of the active screen and/or with video conferencing mode controls in a bottom portion of the active screen, and the other screens may be powered down, at 4324. If the application does not support the video conferencing configuration, the application may be suspended.

[00177] Where the device is determined to not be in the video conferencing configuration, a determination may be made, at 4326, that the device is in a transitional configuration, and no change may be performed at the display panels, and processing may return to 4304.

[00178] In a particular embodiment, in one or more configurations not supported by the application and where the application is suspended, one or more icons or other indicators may be displayed to indicate the application has been suspended. In another embodiment, instead of suspending the application, the application may continue to be executed although no graphical user interface may be displayed. For example, an interface for an audio file player may not be displayed, but the audio file player may continue playing a playlist, when the device is changed to a configuration not supported by the audio file player. In another embodiment, the application may be auto-exited rather than suspended in response to a transition to a configuration not supported by the application. In another embodiment, the application may include configuration data to control whether the application is to be suspended or auto-exited.

[00179] In a particular embodiment, the device may perform other operations based on detecting a configuration change. For example, as will be discussed with respect to FIG. 48, when a browser window is open and displays content from a particular website, the device may automatically request the website to resend content based on an available screen size or resolution increasing or decreasing due to a configuration change. As another example, a video player may automatically change from a widescreen display mode to reduced resolution narrow display mode when an available screen size is reduced due to a configuration change, such as from a fully extended configuration to a fully folded, travel clock, or thumbing configuration.

[00180] Although the method 4300 illustrates five hardware configurations, in other embodiments, more than five configurations, or less than five configurations, may be used. For example, an upright configuration resembling a folding screen may cause the electronic device to display an application interface for the application in a left-most panel, and may automatically begin displaying streaming real-time news, stock quotes, and blog feeds received via a wireless data network in the center and right-most panel, for use as a secondary desktop appliance. In addition, custom configurations may be programmed to the electronic device and tested against when the sensor input 4302 is received.

[00181] In addition, one or both of the embodiments depicted in FIGS. 42 and 43 may include additional configuration determinations. For example, the method 4200, 4300, or both, may include one or more determinations whether the device is in a portrait orientation, a landscape orientation, or a rotating orientation (for example, as described with respect to FIGS. 38-41). Based on the determination, the device may make additional software configuration and user interface changes. To illustrate, when the sensor input 4202 or 4302 indicates the device is in the fully extended configuration and the active application is a video player, the video may be displayed across all three screens when the device is detected to be in a landscape orientation (e.g., the device is held so that the device is longer in a side-to-side direction than in an up-and-down direction) but may be displayed in only an upper two screens when the device is detected to be in a portrait orientation (e.g., the device is held so that the device is longer in an up-and-down direction than in a side-to-side direction). In a particular

embodiment, the video may be stretched to cover the available display area, while in another embodiment an aspect ratio of the video may be preserved during display.

[00182] FIG. 44 is a flowchart of a fourth illustrative embodiment of a method 4400 of changing software states at a multi-panel electronic device. In a particular embodiment, the method 4400 may be performed at the electronic device 101 of FIGS. 1-7, the electronic device 800 of FIG. 8, the electronic device 900 of FIGS. 9-14, the electronic device 1501 of FIGS. 15-17, the electronic device 1801 of FIGS. 18-20, the electronic device 2100 of FIG. 21, the electronic device 2201 of FIGS. 22-23, the electronic device 2401 of FIGS. 24 and 25, the electronic device 2701 of FIGS. 27-31, the electronic device 3201 of FIGS. 32-37, the electronic device 3801 of FIGS. 38-41, or any combination thereof.

[00183] At 4402, a hardware configuration change from a first configuration to a second configuration is detected at an electronic device. The electronic device includes at least a first panel having a first display surface and a second panel having a second display surface. The hardware configuration change includes a change in a relative orientation of the first display panel to the second display panel. Advancing to 4404, a graphical user interface displayed at the first display surface and the second display surface is automatically modified at least partially based on the second configuration.

[00184] In a particular embodiment, the first panel is rotatably coupled to the second panel along a first hinged edge of the second panel, a third panel is rotatably coupled to the second panel along a second hinged edge of the second panel, and the third panel has a third display surface.

[00185] In a particular embodiment, the first panel has a first back surface opposite the first display surface, the second panel has a second back surface opposite the second display surface, and the third panel has a third back surface opposite the third display surface. The second configuration may include a folded configuration having the first back surface proximate to the second back surface and the second display surface proximate to the third display surface. The graphical user interface may be automatically modified to display at the first display surface and not to display at the

second display surface or the third display surface. For example, the second configuration may be the fully folded configuration 200 of FIG. 2.

[00186] In another embodiment, the second configuration includes a fully extended configuration having the first panel substantially coplanar with the second panel and having the second panel substantially coplanar with the third panel. The first display surface, the second display surface, and the third display surface may form a substantially continuous display surface extending across the first panel, the second panel, and the third panel. The graphical user interface may be automatically modified to expand a displayed graphical element across the substantially continuous display surface. For example, the second configuration may be the fully extended configurations 500 of FIGS. 5 or 6, respectively.

[00187] In another embodiment, the second configuration includes the first panel substantially coplanar with the second panel to form a substantially continuous two-panel display surface. The second configuration may also include the third panel positioned such that an angle formed by the second display surface and the third display surface is greater than ninety degrees and less than one hundred eighty degrees. The angle is approximately one hundred thirty five degrees. The graphical user interface may be automatically modified to display a keyboard at the third display surface and to display other interface elements at the substantially continuous two-panel display surface. For example, the second configuration may be the thumbing configuration 300 of FIG. 3.

[00188] In another embodiment, the second configuration includes the first panel and the second panel positioned such that a first angle formed by the first display surface and the second display surface is approximately two hundred seventy degrees, and a second angle formed by the second display surface and the third display surface is approximately one hundred thirty five degrees. The graphical user interface may be automatically modified to display a clock at the second display panel. For example, the second configuration may be the travel clock configuration 400 of FIG. 4.

[00189] In another embodiment, the second configuration is a video conferencing configuration, where the first panel and the second panel are substantially coplanar, the

third panel is folded onto the second panel such that the second display surface is proximate to the third display surface, and a camera housed within a back surface of the third panel has a field of view to capture an image of a user of the device. The graphical user interface may be automatically modified to display video images at the first display surface and not at the second display surface or the third display surface. For example the second configuration may be the video conferencing configuration 700 of FIG. 7.

[00190] FIG. 45 is a flowchart of a fifth illustrative embodiment of a method 4500 of changing software states at a multi-panel electronic device. In a particular embodiment, the method 4500 may be performed at the electronic device 101 of FIGS. 1-7, the electronic device 800 of FIG. 8, the electronic device 900 of FIGS. 9-14, the electronic device 1501 of FIGS. 15-17, the electronic device 1801 of FIGS. 18-20, the electronic device 2100 of FIG. 21, the electronic device 2201 of FIGS. 22-23, the electronic device 2401 of FIGS. 24 and 25, the electronic device 2701 of FIGS. 27-31, the electronic device 3201 of FIGS. 32-37, the electronic device 3801 of FIGS. 38-41, or any combination thereof.

[00191] At 4502, a user input is received to move a graphical user interface element at a first display surface of an electronic device. The electronic device further includes a second display surface that is separated from the first display surface by a gap. Moving to 4504, a determination is made that at least a portion of the graphical user interface element is to be moved off an edge of the first display surface toward the gap. Continuing to 4506, the at least a portion of the graphical user interface element is displayed at the second display surface based on a location and a direction of movement of the graphical user interface element at the first display surface.

[00192] For example, the graphical user interface element may be an application icon such as the icon 3206 displayed in FIG. 34 as having a first portion displayed at the leftmost display surface and having a second portion displayed at the center display surface during the movement 3412 across the gap 3414. As another example, the graphical user interface element may be an application window such as the window 3516 displayed in FIG. 36 as having a first portion displayed at the left-most display surface and having a second portion displayed at the center display surface during the movement 3618 across the gap 3414.

[00193] FIG. 46 is a flowchart of a sixth illustrative embodiment of a method 4600 of changing software states at a multi-panel electronic device. In a particular embodiment, the method 4600 may be performed at the electronic device 101 of FIGS. 1-7, the electronic device 800 of FIG. 8, the electronic device 900 of FIGS. 9-14, the electronic device 1501 of FIGS. 15-17, the electronic device 1801 of FIGS. 18-20, the electronic device 2100 of FIG. 21, the electronic device 2201 of FIGS. 22-23, the electronic device 2401 of FIGS. 24 and 25, the electronic device 2701 of FIGS. 27-31, the electronic device 3201 of FIGS. 32-37, the electronic device 3801 of FIGS. 38-41, or any combination thereof.

[00194] At 4602, a user input is received to move an application icon at a first display surface of an electronic device. The electronic device further includes a second display surface that is separated from the first display surface by a gap. For example, the user input may include a drag operation of the application icon at a touch screen at the first display surface. In an illustrative embodiment, the application icon is the icon 3206 of FIGS. 32-35.

[00195] Advancing to 4604, a determination is made that the application icon is to be moved off an edge of the first display surface toward the gap based on the user input. For example, the icon 3206 may be moved toward the gap 3414 as illustrated in FIG. 34. Continuing to 4606, an application associated with the application icon is launched in response to the application icon being moved off the edge of the first display toward the gap. Proceeding to 4608, at least a portion of a user interface for the application associated with the application icon is displayed at the second display surface, such as the application window 3516 at the second display surface 3308 depicted in FIG. 35.

[00196] FIG. 47 is a flowchart of a seventh illustrative embodiment of a method 4700 of changing software states at a multi-panel electronic device. In a particular embodiment, the method 4700 may be performed at the electronic device 101 of FIGS. 1-7, the electronic device 800 of FIG. 8, the electronic device 900 of FIGS. 9-14, the electronic device 1501 of FIGS. 15-17, the electronic device 1801 of FIGS. 18-20, the electronic device 2100 of FIG. 21, the electronic device 2201 of FIGS. 22-23, the electronic device 2401 of FIGS. 24 and 25, the electronic device 2701 of FIGS. 27-31,

the electronic device 3201 of FIGS. 32-37, the electronic device 3801 of FIGS. 38-41, or any combination thereof.

[00197] At 4702, a plurality of application icons are displayed at a first display surface of an electronic device and an application interface window for an application is displayed at a second display surface of the electronic device. The first display surface is separated from the second display surface by a gap. In an illustrative embodiment, the application interface window may be the application window 3516 at the second display surface 3308 separated from the application icons by the gap 3414, as depicted in FIG. 35.

[00198] Moving to 4704, a user input is received to move at least a portion of the application interface window at the second display surface. For example, the user input may include a drag operation of the application icon at a touch screen at the second display surface. Continuing to 4706, a determination is made that at least a portion of the application interface window is to be moved off an edge of the second display surface toward the gap based on the user input. Advancing to 4708, the application interface window is closed in response to the portion of the application interface window being moved off the edge of the second display, such as is illustrated as the application window 3516 is moved across the gap 3414 in FIGS. 36-37.

[00199] Proceeding to 4710, in a particular embodiment, an application icon associated with the application is displayed at the first display surface in response to the portion of the application interface window being moved off the edge of the second display. For example, the application icon 3206 is displayed in FIG. 37 after a portion of the application window 3516 is moved across the gap 3414. Continuing to 4712, in a particular embodiment, the application is closed in response to the portion of the application interface window being moved off the edge of the second display.

[00200] FIG. 48 is a flowchart of an eighth illustrative embodiment of a method 4800 of changing software states at a multi-panel electronic device. Depending on screen size and resolution, a web browser at a multi-panel electronic device may automatically change the way the web browser presents itself to a web server. When the screen size and/or screen resolution changes, such as by folding or unfolding panels of the

electronic device, the current web site may be automatically refreshed with a web site served for the new browser identification parameters. The user changes the parameters of the device by changing a folding configuration, and the device may automatically transmit information that enables the web sites to automatically serve web content that may be appropriate to the new parameters of the device.

[00201] In a particular embodiment, the method 4800 may be performed at the electronic device 101 of FIGS. 1-7, the electronic device 800 of FIG. 8, the electronic device 900 of FIGS. 9-14, the electronic device 1501 of FIGS. 15-17, the electronic device 1801 of FIGS. 18-20, the electronic device 2100 of FIG. 21, the electronic device 2201 of FIGS. 22-23, the electronic device 2401 of FIGS. 24 and 25, the electronic device 2701 of FIGS. 27-31, the electronic device 3201 of FIGS. 32-37, the electronic device 3801 of FIGS. 38-41, or any combination thereof.

[00202] At 4802, a hardware configuration change from a first configuration to a second configuration is detected at an electronic device. The electronic device includes at least a first panel having a first display surface and a second panel having a second display surface. At least one of an effective screen size or a screen resolution corresponding to a viewing area of the first display surface and the second display surface is modified in response to the hardware configuration change. For example, the first panel may be coupled to the second panel via a hinge, and the hardware configuration change may include a change of a relative orientation of the first panel with respect to the second panel.

[00203] Moving to 4804, at least one parameter is sent to a web server in response to the hardware configuration change, the at least one parameter based on at least one of the modified effective screen size or the modified screen resolution.

[00204] In a particular embodiment, the at least one parameter indicates a browser setting. Advancing to 4806, a browser interface may be automatically modified based on the hardware configuration change. Continuing to 4808, modified content may be received from the web server, the modified content formatted to be displayed based on the browser setting. Proceeding to 4810, the modified content may be displayed at the modified browser interface.

[00205] The electronic device may be configured to send the at least one parameter, to automatically modify the browser interface, and to display the modified content in response to detecting the hardware configuration change without receiving additional user input. To illustrate, when the electronic device 101 of FIG. 1 is folded into the fully folded configuration 200 of FIG. 2 while a browser application is executing, the device 101 may automatically configure the browser to display at the first surface 102 and may transmit a request for a mobile device webpage with reduced page content to a web server providing content that is displayed at the browser, such as by identifying the web browser as a mobile browser type. When the device 101 is changed to the fully extended configuration 500 of FIG. 5 or 600 of FIG. 6, the device 101 may automatically configure the browser to display across all three display surfaces 102-106 and may transmit to the web server providing a request for a desktop-type webpage with more content, such as by identifying the web browser as a desktop or laptop browser type.

[00206] Referring to FIG. 49, a particular illustrative embodiment of an electronic device 4901 having accelerometers is depicted and generally designated 4900. In a particular embodiment, the electronic device 4901 is the electronic device 101 of FIGS. 1-7, the electronic device 800 of FIG. 8, a three-panel version of the electronic device 900 of FIGS. 9-14, the electronic device 1501 of FIGS. 15-17, the electronic device 1801 of FIGS. 18-20, the electronic device 2100 of FIG. 21, the electronic device 2201 of FIGS. 22-23, the electronic device 2401 of FIGS. 24 and 25, the electronic device 2701 of FIGS. 27-31, the electronic device 3201 of FIGS. 32-37, the electronic device 3801 of FIGS. 38-41, or any combination thereof. In a particular embodiment, the electronic device 4901 is configured to operate according to the method 2600 of FIG. 26, the method 4200 of FIG. 42, the method 4300 of FIG. 43, the method 4400 of FIG. 44, the method 4500 of FIG. 45, the method 4600 of FIG. 46, the method 4700 of FIG. 47, the method 4800 of FIG. 48, or any combination thereof.

[00207] The electronic device 4901 includes a first panel 4902 having a first display surface 4908, a second panel 4904 having a second display surface 4910, and a third panel 4906 having a third display surface 4912. The three display surfaces 4908-4912 may be controlled to emulate a single display screen that extends across all three display

surfaces 4908-4912. The first panel 4902 is rotatably coupled to a first edge of the second panel 4904 and the third panel 4906 is rotatably coupled to a second edge of the second panel 4904. A first accelerometer 4922 is located at the first panel 4902, a second accelerometer 4924 is located at the second panel 4904, and a third accelerometer 4926 is located at the third panel 4906. An orientation module 4994 is coupled to receive first acceleration data 4982 from the first accelerometer 4922. The orientation module 4994 is coupled to receive second acceleration data 4984 from the second accelerometer 4924. The orientation module 4994 is coupled to receive third acceleration data 4986 from the third accelerometer 4926. A controller, such as a processor 4998, is coupled to the orientation module 4994 as shown by the arrow 4996. Mutually orthogonal axes X1, Y1, and Z1 are associated with the first accelerometer 4922. Mutually orthogonal axes X2, Y2, and Z2 are associated with the second accelerometer 4924. Mutually orthogonal axes X3, Y3, and Z3 are associated with the third accelerometer 4926.

[00208] The first accelerometer 4922 is coupled to the first panel 4902 and may be configured to generate the first acceleration data 4982 related to an acceleration of the first panel 4902. The second accelerometer 4924 is coupled to the second panel 4904 and may be configured to generate the second acceleration data 4984 related to an acceleration of the second panel 4904. The third accelerometer 4926 is coupled to the third panel 4906 and may be configured to generate the third acceleration data 4986 related to an acceleration of the third panel 4906. The orientation module 4994 may be configured to determine a configuration of the electronic device 4901 at least partially based on the first acceleration data 4982 received from the first accelerometer 4922, the second acceleration data 4984 received from the second accelerometer 4924, and the third acceleration data 4986 received from the third accelerometer 4926.

[00209] In a particular embodiment, the orientation module 4994 is configured to determine the configuration of the electronic device 4901 based on a first orientation of the first display surface 4908 relative to a direction of gravity, a second orientation of the second display surface 4910 relative to the direction of gravity, and a third orientation of the third display surface 4912 relative to the direction of gravity. In a particular embodiment, the processor 4998 is configured to automatically adjust a

graphical user interface (GUI) provided to at least one of the first display surface 4908, the second display surface 4910, and the third display surface 4912, based on a detected change of the configuration of the electronic device 4901.

[00210] Referring to FIG. 50, the electronic device 4901 of FIG. 49 in a fully extended configuration is depicted and generally designated 5000. In the fully extended configuration 5000, the acceleration sensed by the first accelerometer 4922 is shown by the arrow 5032, the acceleration sensed by the second accelerometer 4924 is shown by the arrow 5034, and the acceleration sensed by the third accelerometer 4926 is shown by the arrow 5036. The accelerations 5032-5036 are due to gravity and are all in the direction of gravity, in the negative Z1 direction according to the first accelerometer 4922, in the negative Z2 direction according to the second accelerometer 4924, and in the negative Z3 direction according to the third accelerometer 4926. The accelerations 5032-5036 are also of substantially the same magnitude, as represented by the respective lengths of the arrows 5032-5036.

[00211] Referring to FIG. 51, the electronic device 4901 of FIG. 49 in a fully folded configuration is depicted and generally designated 5100. In the fully folded configuration 5100, the acceleration sensed by the first accelerometer 4922 is shown by the arrow 5132, the acceleration sensed by the second accelerometer 4924 is shown by the arrow 5134, and the acceleration sensed by the third accelerometer 4926 is shown by the arrow 5136. The accelerations 5132-5136 are due to gravity and are all in the direction of gravity, in the negative Z1 direction according to the first accelerometer 4922, in the positive Z2 direction according to the second accelerometer 4924, and in the negative Z3 direction according to the third accelerometer 4926. The direction of the acceleration 5134 sensed by the second accelerometer 4924 is opposite to the direction of the acceleration 5132 sensed by the first accelerometer 4922 and is opposite to the direction of the acceleration 5136 sensed by the third accelerometer 4926. In the fully folded configuration 5100, the second accelerometer 4924 is "upside down" with respect to the first accelerometer 4922 and with respect to the third accelerometer 4926. The accelerations 5132-5136 are all of substantially the same magnitude, as represented by the respective lengths of the arrows 5132-5136.

[00212] Referring to FIG. 52, the electronic device 4901 of FIG. 49 in a thumbing configuration is depicted and generally designated 5200. In the thumbing configuration 5200, the acceleration sensed by the first accelerometer 4922 is shown by the arrow 5232, the acceleration sensed by the second accelerometer 4924 is shown by the arrow 5234, and the acceleration sensed by the third accelerometer 4926 is shown by the arrow 5236. The accelerations 5232-5236 are due to gravity and are all in the direction of gravity, in the negative Z1 direction according to the first accelerometer 4922, with a gravitational component 5250 in the negative Z2 direction and a gravitational component 5252 in the negative X2 direction according to the second accelerometer 4924, and with a gravitational component 5240 in the negative Z3 direction and a gravitational component 5242 in the negative X3 direction according to the third accelerometer 4926. The accelerations 5232-5236 are all of substantially the same magnitude, as represented by the respective lengths of the arrows 5232-5236.

[00213] The magnitude of the gravitational component 5240 is equal to the product of the sine of the angle between the acceleration 5236 and the gravitational component 5242 with the magnitude of the acceleration 5236. For example, if the angle is thirty degrees, then the magnitude of the gravitational component 5240 is one half the magnitude of the acceleration 5236 and is also one half the magnitude of the acceleration 5232 because the magnitude of the acceleration 5232 is the same as the magnitude of the acceleration 5236. Similarly, the magnitude of the gravitational component 5250 is equal to the product of the sine of the angle between the acceleration 5234 and the gravitational component 5252 with the magnitude of the acceleration 5234. For example, if the angle is thirty degrees, then the magnitude of the gravitational component 5250 is one half the magnitude of the acceleration 5234 and is also one half the magnitude of the acceleration 5232 because the magnitude of the acceleration 5234 is the same as the magnitude of the acceleration 5232.

[00214] Referring to FIG. 53, the electronic device 4901 of FIG. 49 in a video conferencing configuration is depicted and generally designated 5300. In the video conferencing configuration 5300, the acceleration sensed by the first accelerometer 4922 is shown by the arrow 5332, the acceleration sensed by the second accelerometer 4924 is shown by the arrow 5334, and the acceleration sensed by the third

accelerometer 4926 is shown by the arrow 5336. The accelerations 5332-5336 are due to gravity and are all in the direction of gravity, in the negative Z1 direction according to the first accelerometer 4922, in the negative Z2 direction according to the second accelerometer 4924, and in the positive Z3 direction according to the third accelerometer 4926. The direction of the acceleration 5336 sensed by the third accelerometer 4926 is opposite to the direction of the acceleration 5332 sensed by the first accelerometer 4922 and is opposite to the direction of the acceleration 5334 sensed by the second accelerometer 4924. In the video conferencing configuration 5300, the third accelerometer 4926 is "upside down" with respect to the first accelerometer 4922 and with respect to the second accelerometer 4924. The accelerations 5332-5336 are all of substantially the same magnitude, as represented by the respective lengths of the arrows 5332-5336.

[00215] Referring to FIG. 54, the electronic device 4901 of FIG. 49 in a travel clock configuration is depicted and generally designated 5400. In the travel clock configuration 5400, the acceleration sensed by the first accelerometer 4922 is shown by the arrow 5432, the acceleration sensed by the second accelerometer 4924 is shown by the arrow 5434, and the acceleration sensed by the third accelerometer 4926 is shown by the arrow 5436. The accelerations 5432-5436 are due to gravity and are all in the direction of gravity, with a gravitational component 5440 in the negative Z1 direction and a gravitational component 5442 in the negative X1 direction according to the first accelerometer 4922, with a gravitational component 5450 in the negative Z2 direction and a gravitational component 5452 in the positive X2 direction according to the second accelerometer 4924, and in the negative Z3 direction according to the third accelerometer 4926. The accelerations 5432-5436 are all of substantially the same magnitude, as represented by the respective lengths of the arrows 5432-5436.

[00216] The magnitude of the gravitational component 5440 is equal to the product of the sine of the angle between the acceleration 5432 and the gravitational component 5442 with the magnitude of the acceleration 5432. For example, if the angle is thirty degrees, then the magnitude of the gravitational component 5440 is one half the magnitude of the acceleration 5432 and is also one half the magnitude of the acceleration 5436 because the magnitude of the acceleration 5432 is the same as the

magnitude of the acceleration 5436. Similarly, the magnitude of the gravitational component 5450 is equal to the product of the sine of the angle between the acceleration 5434 and the gravitational component 5452 with the magnitude of the acceleration 5434. For example, if the angle is thirty degrees, then the magnitude of the gravitational component 5450 is one half the magnitude of the acceleration 5434 and is also one half the magnitude of the acceleration 5436 because the magnitude of the acceleration 5434 is the same as the magnitude of the acceleration 5436.

[00217] Referring to FIG. 55, the electronic device 4901 of FIG. 49 in a dual-panel configuration is depicted and generally designated 5500. In the dual-panel configuration 5500, the acceleration sensed by the first accelerometer 4922 is shown by the arrow 5532, the acceleration sensed by the second accelerometer 4924 is shown by the arrow 5534, and the acceleration sensed by the third accelerometer 4926 is shown by the arrow 5536. The accelerations 5532-5536 are due to gravity and are all in the direction of gravity, in the positive Z1 direction according to the first accelerometer 4922, in the negative Z2 direction according to the second accelerometer 4924, and in the negative Z3 direction according to the third accelerometer 4926. The direction of the acceleration 5532 sensed by the first accelerometer 4922 is opposite to the direction of the acceleration 5534 sensed by the second accelerometer 4924 and is opposite to the direction of the acceleration 5536 sensed by the third accelerometer 4926. In the dual-panel configuration 5500, the first accelerometer 4922 is "upside down" with respect to the second accelerometer 4924 and with respect to the third accelerometer 4926. The accelerations 5532-5536 are all of substantially the same magnitude, as represented by the respective lengths of the arrows 5532-5536.

[00218] In a particular embodiment, the dual-panel configuration illustrated in FIG. 55 may function as a "book mode," and the panels that include the second accelerometer 4924 and the third accelerometer 4926 may simulate the two sides of a book. In such a book mode configuration, the panel that includes the first accelerometer 4922 may be folded back away from the user during normal operation and turned off to conserve energy (e.g., energy supplied by the batteries 884 and 886 of FIG. 8). It should be noted that although the particular configuration illustrated in FIG. 55 depicts the book mode

panels as substantially coplanar, the panels may instead be slightly bent towards each other, further simulating the viewing of text and images in a book.

[00219] Furthermore, one or more of the electronic device 101 of FIGS. 1-7, the electronic device 800 of FIG. 8, a three-panel version of the electronic device 900 of FIGS. 9-14, the electronic device 1501 of FIGS. 15-17, the electronic device 1801 of FIGS. 18-20, the electronic device 2100 of FIG. 21, the electronic device 2201 of FIGS. 22-23, the electronic device 2401 of FIGS. 24 and 25, the electronic device 2701 of FIGS. 27-31, the electronic device 3201 of FIGS. 32-37, and the electronic device 3801 of FIGS. 38-41, may also be configured to operate in a book mode configuration in addition to one or more predetermined configurations previously described.

[00220] FIG. 56 is a flowchart of a first illustrative embodiment of a method 5600 of determining a configuration of an electronic device. In a particular embodiment, the method 5600 may be performed at the electronic device 101 of FIGS. 1-7, the electronic device 800 of FIG. 8, the electronic device 900 of FIGS. 9-14, the electronic device 1501 of FIGS. 15-17, the electronic device 1801 of FIGS. 18-20, the electronic device 2100 of FIG. 21, the electronic device 2201 of FIGS. 22-23, the electronic device 2401 of FIGS. 24 and 25, the electronic device 2701 of FIGS. 27-31, the electronic device 3201 of FIGS. 32-37, the electronic device 3801 of FIGS. 38-41, the electronic device 4901 of FIGS. 49-55, or any combination thereof.

[00221] A sensor input 5602 is received and used to detect a new hardware configuration at 5604. The new hardware configuration is detected based on acceleration data using the magnitude (M) and direction (D) of gravity relative to the first panel (g1), the second panel (g2), and the third panel (g3). For example, the sensor input 4202 may indicate a relative orientation, or a change in orientation, of one or more panels of a multi-panel device, such as via one or more accelerometers.

[00222] Moving to decision 5606, a determination is made whether the direction of gravity relative to the first panel D(g1) is substantially the same as the direction of gravity relative to the third panel D(g3) and is substantially opposite to the direction of gravity relative to the second panel D(g2), at 5606. Where it is determined that D(g1) is substantially the same as D(g3) and is substantially opposite to D(g2), the device is

determined to be in the fully folded configuration, at 5608. For example, the device may be in the fully folded configuration 5100 of FIG. 51. When the magnitude of the acceleration data in the y-direction (i.e., in the direction Y1 of FIG. 49) is greater than the magnitude of the acceleration data in the x-direction (i.e., in the direction X1 of FIG. 49), the device is determined to be in the portrait configuration. When the magnitude of the acceleration data in the x-direction (i.e., in the direction X1 of FIG. 49) is greater than the magnitude of the acceleration data in the y-direction (i.e., in the direction Y1 of FIG. 49), the device is determined to be in the landscape configuration. If the configuration has changed (e.g., the previously detected configuration was not the fully folded configuration 5100 of FIG. 51), the graphic user interface is revised according to the configuration change and processing may return to detecting a new configuration at 5604.

[00223] Where it is determined that D(g1) is not substantially the same as D(g3) and/or is not substantially opposite to D(g2), a determination is made whether D(g1) is substantially the same as D(g2) and is substantially the same as D(g3) and whether the magnitude of the z-component of gravity (i.e., the component of gravity in the direction Z1 of FIG. 49) relative to the first panel M(g1) is substantially the same as the magnitude of the z-component of gravity (i.e., the component of gravity in the direction Z2 of FIG. 49) relative to the second panel M(g2) and is substantially the same as the magnitude of the z-component of gravity (i.e., the component of gravity in the direction Z3 of FIG. 49) relative to the third panel M(g3), at decision 5610. Where it is determined that D(g1) is substantially the same as D(g2) and is substantially the same as D(g3) and that M(g1) is substantially the same as M(g2) and is substantially the same as M(g3), the device is determined to be in the fully extended configuration, at 5612. For example, the device may be in the fully extended configuration 5000 of FIG. 50. When the magnitude of the acceleration data in the x-direction (i.e., in the direction X1 of FIG. 49) is greater than the magnitude of the acceleration data in the y-direction (i.e., in the direction Y1 of FIG. 49), the device is determined to be in the portrait configuration. When the magnitude of the acceleration data in the y-direction (i.e., in the direction Y1 of FIG. 49) is greater than the magnitude of the acceleration data in the x-direction (i.e., in the direction X1 of FIG. 49), the device is determined to be in the landscape configuration. If the configuration has changed (e.g., the previously detected

configuration was not the fully extended configuration 5000 of FIG. 50), the graphic user interface is revised according to the configuration change and processing may return to detecting a new configuration at 5604.

[00224] Where it is determined that D(g1) is not substantially the same as D(g2) and/or is not substantially the same as D(g3) and/or that M(g1) is not substantially the same as M(g2) and/or is not substantially the same as M(g3), a determination is made whether D(g1) is substantially the same as D(g2) and is substantially the same as D(g3) and whether two times M(g1) is substantially the same as two times M(g2) and is substantially the same as M(g3), at decision 5614. Where it is determined that D(g1) is substantially the same as D(g2) and is substantially the same as D(g3) and that two times M(g1) is substantially the same as two times M(g2) and is substantially the same as M(g3), the device is determined to be in the travel clock configuration, at 5616. For example, the device may be in the travel clock configuration 5400 of FIG. 54 where the angle between the first panel and the second panel is sixty degrees. In alternative embodiments, the angle between the first panel and the second panel may be more or less than sixty degrees. If the configuration has changed (e.g., the previously detected configuration was not the travel clock configuration 5400 of FIG. 54), the graphic user interface is revised according to the configuration change and processing may return to detecting a new configuration at 5604.

[00225] Where it is determined that D(g1) is not substantially the same as D(g2) and/or is not substantially the same as D(g3) and/or that two times M(g1) is not substantially the same as two times M(g2) and/or is not substantially the same as M(g3), a determination is made whether D(g1) is substantially the same as D(g2) and is substantially opposite to D(g3) and whether M(g1) is substantially the same as M(g2) and is substantially the same as M(g3), at decision 5618. Where it is determined that D(g1) is substantially the same as D(g2) and is substantially opposite to D(g3) and that M(g1) is substantially the same as M(g2) and is substantially the same as M(g3), the device is determined to be in the video conferencing configuration, at 5620. For example, the device may be in the video conferencing configuration 5300 of FIG. 53. If the configuration has changed (e.g., the previously detected configuration was not the video conferencing configuration 5300 of FIG. 53), the graphic user interface is revised

according to the configuration change and processing may return to detecting a new configuration at 5604.

[00226] Where it is determined that D(g1) is not substantially the same as D(g2) and/or is not substantially opposite to D(g3) and/or that M(g1) is not substantially the same as M(g2) and/or is not substantially the same as M(g3), a determination is made whether D(g1) is substantially opposite to D(g2) and is substantially opposite to D(g3) and whether M(g1) is substantially the same as M(g2) and is substantially the same as M(g3), at decision 5622. Where it is determined that D(g1) is substantially opposite to D(g2) and is substantially opposite to D(g3) and that M(g1) is substantially the same as M(g2) and is substantially the same as M(g3), the device is determined to be in the dual-screen configuration, at 5624. For example, the device may be in the dual-screen configuration 5500 of FIG. 55. When the magnitude of the acceleration data in the x-direction (i.e., in the direction X1 of FIG. 49) is greater than the magnitude of the acceleration data in the y-direction (i.e., in the direction Y1 of FIG. 49), the device is determined to be in the portrait configuration. When the magnitude of the acceleration data in the y-direction (i.e., in the direction Y1 of FIG. 49) is greater than the magnitude of the acceleration data in the x-direction (i.e., in the direction X1 of FIG. 49), the device is determined to be in the landscape configuration. If the configuration has changed (e.g., the previously detected configuration was not the dual-screen configuration 5500 of FIG. 55), the graphic user interface is revised according to the configuration change and processing may return to detecting a new configuration at 5604.

[00227] Where it is determined that D(g1) is not substantially opposite to D(g2) and/or is not substantially opposite to D(g3) and/or that M(g1) is not substantially the same as M(g2) and/or is not substantially the same as M(g3), a determination is made whether D(g1) is substantially the same as D(g2) and is substantially the same as D(g3) and whether M(g1) is substantially the same as two times M(g2) and is substantially the same as two times M(g3), at decision 5626. Where it is determined that D(g1) is substantially the same as D(g2) and is substantially the same as D(g3) and that M(g1) is substantially the same as two times M(g2) and is substantially the same as two times M(g3), the device is determined to be in the thumbing configuration, at 5628. For

example, the device may be in the thumbing configuration 5200 of FIG. 52 where the angle between the first panel and the second panel is one-hundred-twenty degrees. In alternative embodiments, the angle between the first panel and the second panel may be more or less than one-hundred-twenty degrees. If the configuration has changed (e.g., the previously detected configuration was not the thumbing configuration 5200 of FIG. 52), the graphic user interface is revised according to the configuration change and processing may return to detecting a new configuration at 5604.

[00228] Where a determination is made that D(g1) is not substantially the same as D(g2) and/or is not substantially the same as D(g3) and/or that M(g1) is not substantially the same as two times M(g2) and/or is not substantially the same as two times M(g3), a determination may be made, at 5630, that the device is in a transitional configuration, and no change may be performed at the display panels, and processing may return to detecting a new configuration at 5604.

[00229] In various illustrative embodiments, an orientation may not be considered to be a changed orientation until the new orientation has been consistent for some period of time, for example, about 200 milliseconds (ms). If the magnitude of the acceleration data in the z-direction (i.e., in the direction Z1 of FIG. 49) is substantially zero, it may be difficult to determine the orientations of the panels from the magnitude of the acceleration in the z-direction. The magnitude of the acceleration data in the x-direction (i.e., in the direction X1 of FIG. 49) may be used instead, if the magnitude of the acceleration data in the x-direction is greater than zero. If the magnitudes of the acceleration data in the x-direction and in the z-direction are both substantially zero, the magnitude of the acceleration data in the y-direction (i.e., in the direction Y1 of FIG. 49) may be used instead.

[00230] FIG. 57 is a flowchart of a second illustrative embodiment of a method 5700 of determining a configuration of an electronic device. In a particular embodiment, the method 5700 may be performed at the electronic device 101 of FIGS. 1-7, the electronic device 800 of FIG. 8, the electronic device 900 of FIGS. 9-14, the electronic device 1501 of FIGS. 15-17, the electronic device 1801 of FIGS. 18-20, the electronic device 2100 of FIG. 21, the electronic device 2201 of FIGS. 22-23, the electronic device 2401 of FIGS. 24 and 25, the electronic device 2701 of FIGS. 27-31, the

electronic device 3201 of FIGS. 32-37, the electronic device 3801 of FIGS. 38-41, the electronic device 4901 of FIGS. 49-55, or any combination thereof.

[00231] The method 5700 includes receiving first acceleration data from a first sensor coupled to a first portion of an electronic device, at 5702. For example, the orientation module 4994 may receive the first acceleration data 4982 from the first accelerometer 4922 coupled to the first panel 4902 of the electronic device 4901 of FIG. 49. The method further includes receiving second acceleration data from a second sensor coupled to a second portion of the electronic device, where a position of the first portion is movable with respect to a position of the second portion, at 5704. For example, the orientation module 4994 may receive the second acceleration data 4984 from the second accelerometer 4924 coupled to the second panel 4904 of the electronic device 4901 of FIG. 49, where the position of the first panel 4902 is movable with respect to the position of the second panel 4904.

[00232] The method further includes determining a configuration of the electronic device at least partially based on the first acceleration data and the second acceleration data, at 5706. For example, if the first acceleration data 4982 indicates a direction of gravity in the negative Z1 direction at the first accelerometer 4922 and the second acceleration data 4984 indicates a direction of gravity in the positive Z2 direction at the second accelerometer 4924, the orientation module 4994 may determine that the first panel 4902 is fully folded against the second panel 4904 so that the device 4901 of FIG. 49 may be in the fully folded configuration 5100 of FIG. 51. Similarly, if the first acceleration data 4982 indicates a direction of gravity in the negative Z1 direction at the first accelerometer 4922 and the second acceleration data 4984 indicates a direction of gravity in the negative Z2 direction at the second accelerometer 4924, the orientation module 4994 may determine that the first panel 4902 is fully extended with respect to the second panel 4904 so that the device 4901 of FIG. 49 may be in the fully extended configuration 5000 of FIG. 50.

[00233] FIG. 58 is a flowchart of a third illustrative embodiment of a method 5800 of determining a configuration of an electronic device. In a particular embodiment, the method 5800 may be performed at the electronic device 101 of FIGS. 1-7, the electronic device 800 of FIG. 8, the electronic device 900 of FIGS. 9-14, the electronic

device 1501 of FIGS. 15-17, the electronic device 1801 of FIGS. 18-20, the electronic device 2100 of FIG. 21, the electronic device 2201 of FIGS. 22-23, the electronic device 2401 of FIGS. 24 and 25, the electronic device 2701 of FIGS. 27-31, the electronic device 3201 of FIGS. 32-37, the electronic device 3801 of FIGS. 38-41, the electronic device 4901 of FIGS. 49-55, or any combination thereof.

[00234] The method 5800 includes receiving first acceleration data from a first sensor coupled to a first portion of an electronic device, at 5802. For example, the orientation module 4994 may receive the first acceleration data 4982 from the first accelerometer 4922 coupled to the first panel 4902 of the electronic device 4901 of FIG. 49. The method further includes receiving second acceleration data from a second sensor coupled to a second portion of the electronic device, where a position of the first portion is movable with respect to a position of the second portion, at 5804. For example, the orientation module 4994 may receive the second acceleration data 4984 from the second accelerometer 4924 coupled to the second panel 4904 of the electronic device 4901 of FIG. 49, where the position of the first panel 4902 is movable with respect to the position of the second panel 4904. The method further includes receiving third acceleration data from a third sensor coupled to a third portion of the electronic device, the third portion including a third panel rotatably coupled to the second panel, where the configuration is determined further based on the third acceleration data, at 5806. For example, the orientation module 4994 may receive the third acceleration data 4986 from the third accelerometer 4926 coupled to the third panel 4906 of the electronic device 4901 of FIG. 49, where the third panel 4906 is rotatably coupled to the second panel 4904. If the first acceleration data 4982 indicates a direction of gravity in the negative Z1 direction at the first accelerometer 4922, the second acceleration data 4984 indicates a direction of gravity in the positive Z2 direction at the second accelerometer 4924, and the third acceleration data 4986 indicates a direction of gravity in the negative Z3 direction at the third accelerometer 4926, the orientation module 4994 may determine that the device 4901 of FIG. 49 may be in the fully folded configuration 5100 of FIG. 51. Similarly, if the first acceleration data 4982 indicates a direction of gravity in the negative Z1 direction at the first accelerometer 4922, the second acceleration data 4984 indicates a direction of gravity in the negative Z2 direction at the second accelerometer 4924, and the third acceleration data 4986

indicates a direction of gravity in the negative Z3 direction at the third accelerometer 4926, the orientation module 4994 may determine that the device 4901 of FIG. 49 may be in the fully extended configuration 5000 of FIG. 50.

[00235] The method further includes determining a first orientation of the first portion based on a first gravitational component of the first acceleration data, at 5808. For example, the first acceleration data 4982 may indicate the acceleration 5432 of FIG. 54 due to gravity in the direction of gravity, with a gravitational component 5440 in the negative Z1 direction and a gravitational component 5442 in the negative X1 direction, according to the first accelerometer 4922. The magnitude of the gravitational component 5440 is equal to the product of the sine of the angle between the acceleration 5432 and the gravitational component 5442 with the magnitude of the acceleration 5432. For example, if the angle is thirty degrees, then the magnitude of the gravitational component 5440 is one half the magnitude of the acceleration 5432. The orientation of the first panel 4902 may be that shown in the travel clock configuration 5400 of FIG. 54.

[00236] The method further includes determining a second orientation of the second portion based on a second gravitational component of the second acceleration data, at 5810. For example, the second acceleration data 4984 may indicate the acceleration 5434 of FIG. 54 due to gravity in the direction of gravity, with a gravitational component 5450 in the negative Z2 direction and a gravitational component 5452 in the positive X2 direction, according to the second accelerometer 4924. The magnitude of the gravitational component 5450 is equal to the product of the sine of the angle between the acceleration 5434 and the gravitational component 5452 with the magnitude of the acceleration 5434. For example, if the angle is thirty degrees, then the magnitude of the gravitational component 5450 is one half the magnitude of the acceleration 5434. The orientation of the second panel 4904 may be that shown in the travel clock configuration 5400 of FIG. 54.

[00237] The method further includes determining a third orientation of the third portion based on a third gravitational component of the third acceleration data, at 5812. For example, the third acceleration data 4986 may indicate the acceleration 5236 of FIG. 52 due to gravity in the direction of gravity, with a gravitational component 5240

in the negative Z3 direction and a gravitational component 5242 in the negative X3 direction, according to the third accelerometer 4926. The magnitude of the gravitational component 5240 is equal to the product of the sine of the angle between the acceleration 5236 and the gravitational component 5242 with the magnitude of the acceleration 5236. For example, if the angle is thirty degrees, then the magnitude of the gravitational component 5240 is one half the magnitude of the acceleration 5236. The orientation of the third panel 4906 may be that shown in the thumbing configuration 5200 of FIG. 52. The method further includes determining a configuration of the electronic device based on the first acceleration data, the second acceleration data, and the third acceleration data, at 5814. For example, the configuration of the electronic device 4901 of FIG. 49 may be determined according to the method 5600 of FIG. 56 based on the first acceleration data 4982, the second acceleration data 4984, and the third acceleration data 4986.

[00238] Referring to FIG. 59, a particular illustrative embodiment of an electronic device having folding configuration/tilt sensor, such as accelerometers, is depicted and generally designated 5900. In a particular embodiment, the electronic device 5900 is the electronic device 101 of FIGS. 1-7, the electronic device 800 of FIG. 8, a three-panel version of the electronic device 900 of FIGS. 9-14, the electronic device 1501 of FIGS. 15-17, the electronic device 1801 of FIGS. 18-20, the electronic device 2100 of FIG. 21, the electronic device 2201 of FIGS. 22-23, the electronic device 2401 of FIGS. 24 and 25, the electronic device 2701 of FIGS. 27-31, the electronic device 3201 of FIGS. 32-37, the electronic device 3801 of FIGS. 38-41, the electronic device 4901 of FIGS. 49-55, or any combination thereof. In a particular embodiment, the electronic device 5900 is configured to operate according to the method 2600 of FIG. 26, the method 4200 of FIG. 42, the method 4300 of FIG. 43, the method 4400 of FIG. 44, the method 4500 of FIG. 45, the method 4600 of FIG. 46, the method 4700 of FIG. 47, the method 4800 of FIG. 48, the method 5600 of FIG. 56, the method 5700 of FIG. 57, the method 5800 of FIG. 58, or any combination thereof.

[00239] The device 5900 includes a main board 5901 coupled to a first display board 5903 and to second display board 5905 via set of connections 5990 across a hinge (not

shown). Each of the boards 5901, 5903, and 5905 may be in separate panels of a multi-panel hinged device, such as the electronic device 101 of FIGS. 1-7.

[00240] The main board 5901 includes a display 5902, a processor 5910 coupled to a memory 5932, an orientation module 5970 coupled to one or more folding configuration/tilt sensors 5972, a display controller 5962, a touchscreen controller 5952, a wireless controller 5940, a short range wireless interface 5946, a coder/decoder (CODEC) 5934, and a power management integrated circuit (PMIC) 5980. The first display board 5903 includes a display 5904 coupled to a display controller 5964, a touchscreen controller 5954, and one or more folding configuration/tilt sensors 5974. The second display board 5905 includes a display 5906 coupled to a display controller 5966, a touchscreen controller 5956, and one or more folding configuration/tilt sensors 5976. The first display board 5903 is coupled to the main board 5901 via a first communication path, such as a first high-speed serial link 5992. The second display board 5905 is coupled to the main board 5901 via a second communication path, such as a second high-speed serial link 5994. The first display board 5903 and the second display board 5905 each have a battery 5984 and 5986 that is coupled to the PMIC 5980 via a power line 5996, which may be able to conduct at least 1.5 amps (A) between the PMIC 5980 and the batteries 5984 and 5986. In a particular embodiment, a camera 5920 and a power input 5982 are also coupled to the main board 5901.

[00241] The processor 5910 may include one or more processing devices, such as one or more ARM-type processors, one or more digital signal processors (DSPs), other processors, or any combination thereof. The processor 5910 can access one or more computer readable media, such as the representative memory 5932. The memory 5932 stores data (not shown) and processor executable instructions such as software 5933. Generally, the software 5933 includes processor executable instructions that are executable by the processor 5910, and may include application software, operating system software, other types of program instructions, or any combination thereof. Although the memory 5932 is depicted as external to the processor 5910, in other embodiments the memory 5932 may be internal to the processor 5910 such as at a cache, at one or more registers or register files, at other storage devices at the processor 5910, or any combination thereof.

[00242] The processor 5910 is also coupled to folding configuration sensors, such as the folding configuration and tilt sensors 5972, 5974, and 5976 at the main board 5901, the first display panel 5903, and the second display panel 5905, respectively. In an illustrative example, the device 5900 may be the electronic device 4901 of FIG. 49, and the sensors 5972, 5974, and 5976 may adapted to detect a folding configuration of the device 5900 as one or more of the fully folded configuration illustrated in FIG. 51, the thumbing configuration illustrated in FIG. 52, the travel clock configuration illustrated in FIG. 54, the fully extended configuration illustrated in FIG. 50, the dual-screen configuration illustrated in FIG. 55, or the video conferencing configuration illustrated in FIG. 53. In a particular embodiment, the sensors 5972, 5974, and 5976 include accelerometers, such as the first accelerometer 4922, the second accelerometer 4924, and the third accelerometer 4986 of FIG. 49. The orientation module 5970 can be the orientation module 4994 of FIG. 49 and can implement the method 5600 of FIG. 56, the method 5700 of FIG. 57, the method 5800 of FIG. 58, or any combination thereof. The orientation module 5970 can be hardware, the software 5933 being executed by the processor 5910, or any combination thereof.

[00243] The display controllers 5962, 5964, and 5966 are configured to control the displays 5902, 5904, and 5906. In a particular embodiment, the displays 5902, 5904, and 5906 may correspond to the display surfaces 102, 104, and 106 illustrated in FIGS. 1-7. The display controllers 5962, 5964, and 5966 may be configured to be responsive to the processor 5910 to provide graphical data to display at the displays 5902, 5904, and 5906 according to a configuration of the device 5900. For example, when the device 5900 is in a fully folded configuration, the display controllers 5962, 5964, and 5966 may control the first display 5902 to display a graphical user interface and may power down or not use the other displays 5904 and 5906. As another example, when the device 5900 is in a fully extended configuration, the display controllers 5962, 5964, and 5966 may control the displays 5902, 5904, and 5906 to each display a respective portion of an image to operate as a single effective screen spanning all three displays 5902, 5904, and 5906.

[00244] In a particular embodiment, each of the displays 5902, 5904, and 5906 is responsive to user input via a respective touchscreen that is coupled to a touchscreen

controller 5952, 5954, or 5956, respectively. The touchscreen controllers 5952, 5954, and 5956 are configured to receive signals from the displays 5902, 5904, and 5906 representing a user input and to provide data to the processor 5910 indicating the user input. For example, the processor 5910 may be responsive to a user input indicating a double-tap at an application icon on the first display 5902 and may launch an application and display an application window at one or more of the displays 5902, 5904, or 5906 in response to the user input.

[00245] In a particular embodiment, by having each display controller 5962, 5964, and 5966 and each touchscreen controller 5952, 5954, and 5956 with a corresponding display 5902, 5904, and 5906, an amount of data communicated between the panels may be reduced compared to other embodiments having a controller and a corresponding display on separate panels. However, in other embodiments, two or more of the display controllers 5962, 5964, or 5966, or touchscreen controllers 5953, 5954, or 5956, may be combined, such as into a single controller that controls all three displays 5902, 5904, and 5906. Additionally, although three displays 5902, 5904, and 5906 are illustrated, in other embodiments the device 5900 may include more or less than three displays.

[00246] The high-speed serial links 5992 and 5994 may be high speed bi-direction serial links. For example the links 5992 and 5994 may be Mobile Display Digital Interface (MDDI)-type links. Touchscreen data and sensor data may be embedded in the serial stream to return to the processor 5910 from the panels 5903 and 5905, so that only four differential pairs may be used for signaling across the respective hinges between the panels 5901, 5903, and 5905.

[00247] In a particular embodiment, the sensors 5972, 5974, and 5976 may be adapted detect a folding configuration of the device 5900 based on input received at one or more sensors. For example, one or more of the sensors 5972, 5974, and 5976 may include or receive input from one or more accelerometers, inclinometers, hinge detectors, other detectors, or any combination thereof. The sensors 5972, 5974, and 5976 may provide information to the orientation module 5970 and to the processor 5910 indicating a detected folding configuration of the device 5900. The sensors 5972, 5974, and 5976 may be responsive to a relative folding position, such as by detecting an angle

of rotation of a display panel relative to a neighboring display panel of the device 5900. The sensors 5972, 5974, and 5976 may also be responsive to one or more other sensors such as one or more accelerometers or inclinometers coupled to one or more display panels of the device 5900.

[00248] As illustrated in FIG. 59, a coder/decoder (CODEC) 5934 can also be coupled to the processor 5910. A speaker 5922 and a microphone 5924 can be coupled to the CODEC 5934. FIG. 59 also indicates that a wireless controller 5940 can be coupled to the processor 5910 and to a wireless antenna 5942, and can enable the device 5900 to communicate via a wireless network such as a wide area network (WAN). The processor 5910 may be responsive to the wireless controller 5940 to display call indicia, such as a caller identification or a caller number, at one or more of the displays 5902, 5904, and 5906 when the device 5900 receives an incoming call. The processor 5910 may determine a size, position, and orientation, as well as a particular display 5902, 5904, and 5906, to display the call indicia at least partially based on the folding configuration of the device 5900 that is determined based on input from the sensors 5972, 5974, and 5976. For example the call indicia may be displayed as a pop-up window or text over one or more other applications having a size, location, and orientation based on the folding configuration.

[00249] In a particular embodiment, the device 5900 is configured to be operable for wireless telephonic communications in all folding configurations. In a particular embodiment, the processor 5910 is coupled to a short-range wireless interface 5946 that may be coupled to a headset 5950 via an antenna 5948. The short-range wireless interface 5946 may be wirelessly coupled to the headset 5950, such as a device including an earpiece and a microphone, via an ad-hoc wireless network, such as a Bluetooth network. The processor 5910 may implement logic to determine whether to display the call indicia or to alert the headset 5950 in response to an incoming call. For example, the processor 5910 may automatically alert the headset 5950 when the device 5900 is in a fully expanded configuration and a multimedia file or streaming media is displayed across all displays 5902, 5904, and 5906, and may display the call indicia otherwise.

[00250] In a particular embodiment, one or more components of FIG. 59 may be located proximate to or within one or more of the device panels. For example, the processor 5910 may be located within the center panel and the outer panels may each store a battery 5984 and 5986. In a particular embodiment, the panels may be weighted in a manner to enable the device to remain upright in a thumbing configuration.

[00251] Those of skill would further appreciate that the various illustrative logical blocks, configurations, modules, circuits, and algorithm steps described in connection with the embodiments disclosed herein may be implemented as electronic hardware, computer software, or combinations of both. Various illustrative components, blocks, configurations, modules, circuits, and steps have been described above generally in terms of their functionality. Whether such functionality is implemented as hardware or software depends upon the particular application and design constraints imposed on the overall system. Skilled artisans may implement the described functionality in varying ways for each particular application, but such implementation decisions should not be interpreted as causing a departure from the scope of the present disclosure.

[00252] The steps of a method or algorithm described in connection with the embodiments disclosed herein may be embodied directly in hardware, in a software module executed by a processor, or in a combination of the two. A software module may reside in a tangible storage medium such as a random access memory (RAM), flash memory, read-only memory (ROM), programmable read-only memory (PROM), erasable programmable read-only memory (EPROM), electrically erasable programmable read-only memory (EEPROM), registers, hard disk, a removable disk, a compact disc read-only memory (CD-ROM), or any other form of tangible storage medium known in the art. An exemplary storage medium is coupled to the processor such that the processor can read information from, and write information to, the storage medium. In the alternative, the storage medium may be integral to the processor. The processor and the storage medium may reside in an application-specific integrated circuit (ASIC). The ASIC may reside in a computing device or a user terminal. In the alternative, the processor and the storage medium may reside as discrete components in a computing device or user terminal.

[00253] The previous description of the disclosed embodiments is provided to enable any person skilled in the art to make or use the disclosed embodiments. Various modifications to these embodiments will be readily apparent to those skilled in the art, and the principles defined herein may be applied to other embodiments without departing from the scope of the disclosure. Thus, the present disclosure is not intended to be limited to the embodiments shown herein but is to be accorded the widest scope possible consistent with the principles and novel features as defined by the following claims.

CLAIMS:

1. A method comprising:
receiving first acceleration data from a first sensor coupled to a first portion of an electronic device;
receiving second acceleration data from a second sensor coupled to a second portion of the electronic device, wherein a position of the first portion is movable with respect to a position of the second portion; and
determining a configuration of the electronic device at least partially based on the first acceleration data and the second acceleration data.

2. The method of claim 1, further comprising:
determining a first orientation of the first portion based on a first gravitational component of the first acceleration data; and
determining a second orientation of the second portion based on a second gravitational component of the second acceleration data.

3. The method of claim 1, wherein the first portion includes a first panel and the second portion includes a second panel, and wherein the first panel is rotatably coupled to the second panel.

4. The method of claim 3, wherein a first gravitational component of the first acceleration data has a first magnitude and a first direction relative to the first panel, wherein a second gravitational component of the second acceleration data has a second magnitude and a second direction relative to the second panel,
wherein the first panel is determined to be folded against the second panel when the first magnitude is substantially equal to the second magnitude and the first direction is substantially opposite to the second direction, and
wherein the first panel is determined to be extended from the second panel when the first magnitude is substantially equal to the second magnitude and the first direction is substantially equal to the second direction.

5. The method of claim 3, further comprising receiving third acceleration data from a third sensor coupled to a third portion of the electronic device, the third portion including a third panel rotatably coupled to the second panel, wherein the configuration is determined further based on the third acceleration data.

6. The method of claim 5, wherein a first gravitational component of the first acceleration data has a first magnitude and a first direction relative to the first panel, wherein a second gravitational component of the second acceleration data has a second magnitude and a second direction relative to the second panel,
wherein a third gravitational component of the third acceleration data has a third magnitude and a third direction relative to the third panel, and
wherein the configuration of the electronic device is determined at least partially based on the first direction, the second direction, and the third direction.

7. The method of claim 6, wherein the configuration is determined to be a folded configuration when the first direction is substantially the same as the third direction and the first direction is substantially opposite to the second direction.

8. The method of claim 6, wherein the configuration is determined to be an extended configuration when the first direction is substantially the same as the second direction and substantially the same as the third direction and the first magnitude is substantially the same as the second magnitude and substantially the same as the third magnitude.

9. The method of claim 6, wherein the configuration is determined to be a dual-screen configuration when the first direction is substantially opposite to the second direction and the third direction is substantially the same as the second direction.

10. The method of claim 6, wherein the configuration is determined to be a video conferencing configuration when the first direction is substantially the same as the second direction and the third direction is substantially opposite to the second direction.

11. The method of claim 6, wherein the configuration is determined to be a travel clock configuration when the first direction is substantially equal to the second direction and

substantially equal to the third direction, the third magnitude is approximately twice the first magnitude, and the third magnitude is approximately twice the second magnitude.

12. An apparatus comprising:
a first sensor coupled to a first portion of an electronic device;
a second sensor coupled to a second portion of the electronic device, wherein a position of the first portion is movable with respect to a position of the second portion; and
an orientation module configured to determine a configuration of the electronic device at least partially based on first acceleration data received from the first sensor and second acceleration data received from the second sensor.

13. The apparatus of claim 12, wherein the first sensor includes a first accelerometer and wherein the second sensor includes a second accelerometer.

14. The apparatus of claim 12, further comprising:
a third sensor coupled to a third portion of the electronic device, wherein the first portion is rotatably coupled to the second portion, wherein the third portion is rotatably coupled to the second portion, and wherein the orientation module is configured to determine the configuration of the electronic device further based on third acceleration data received from the third sensor.

15. The apparatus of claim 14, wherein the first portion includes a first panel having a first display surface, wherein the second portion includes a second panel having a second display surface, wherein the third portion includes a third panel having a third display surface, and wherein the first panel is hinged to a first edge of the second panel and wherein the third panel is hinged to a second edge of the second panel.

16. The apparatus of claim 15, wherein the orientation module is configured to determine the configuration based on a first orientation of the first display surface relative to a direction of gravity, a second orientation of the second display surface relative to the direction of gravity, and a third orientation of the third display surface relative to the direction of gravity.

17. The apparatus of claim 16, further comprising:
a processor configured to automatically adjust a graphical user interface provided to at least one of the first display surface, the second display surface, and the third display surface, based on a detected change of the configuration.

18. A computer readable storage medium storing computer executable code comprising:
code for receiving first acceleration data from a first sensor coupled to a first portion of an electronic device;
code for receiving second acceleration data from a second sensor coupled to a second portion of the electronic device, wherein a position of the first portion is movable with respect to a position of the second portion; and
code for determining a configuration of the electronic device at least partially based on the first acceleration data and the second acceleration data.

19. The computer readable storage medium of claim 18, wherein the computer executable code further comprises:
code for determining a first orientation of the first portion based on a first gravitational component of the first acceleration data; and
code for determining a second orientation of the second portion based on a second gravitational component of the second acceleration data.

20. The computer readable storage medium of claim 18, wherein the first portion includes a first panel and the second portion includes a second panel, and wherein the first panel is rotatably coupled to the second panel.

21. The computer readable storage medium of claim 20, wherein a first gravitational component of the first acceleration data has a first magnitude and a first direction relative to the first panel,
wherein a second gravitational component of the second acceleration data has a second magnitude and a second direction relative to the second panel,

wherein the first panel is determined to be folded against the second panel when the first magnitude is substantially equal to the second magnitude and the first direction is substantially opposite to the second direction, and
wherein the first panel is determined to be extended from the second panel when the first magnitude is substantially equal to the second magnitude and the first direction is substantially equal to the second direction.

22. The computer readable storage medium of claim 20, wherein the computer executable code further comprises code for receiving third acceleration data from a third sensor coupled to a third portion of the electronic device, the third portion including a third panel rotatably coupled to the second panel, wherein the configuration is determined further based on the third acceleration data.

23. An apparatus comprising:
first sensing means for generating first acceleration data, the first sensing means coupled to a first portion of an electronic device;
second sensing means for generating second acceleration data, the second sensing means coupled to a second portion of the electronic device, wherein a position of the first portion is movable with respect to a position of the second portion; and
means for determining a configuration of the electronic device at least partially based on the first acceleration data and the second acceleration data.

24. The apparatus of claim 23, wherein the first sensing means includes a first accelerometer and wherein the second sensing means includes a second accelerometer.

25. The apparatus of claim 23, further comprising:
third sensing means for generating third acceleration data, the third sensing means coupled to a third portion of the electronic device, wherein the first portion is rotatably coupled to the second portion, wherein the third portion is rotatably coupled to the second portion, and wherein the means for determining the configuration of the electronic device is configured to determine the configuration of the electronic device further based on the third acceleration data.

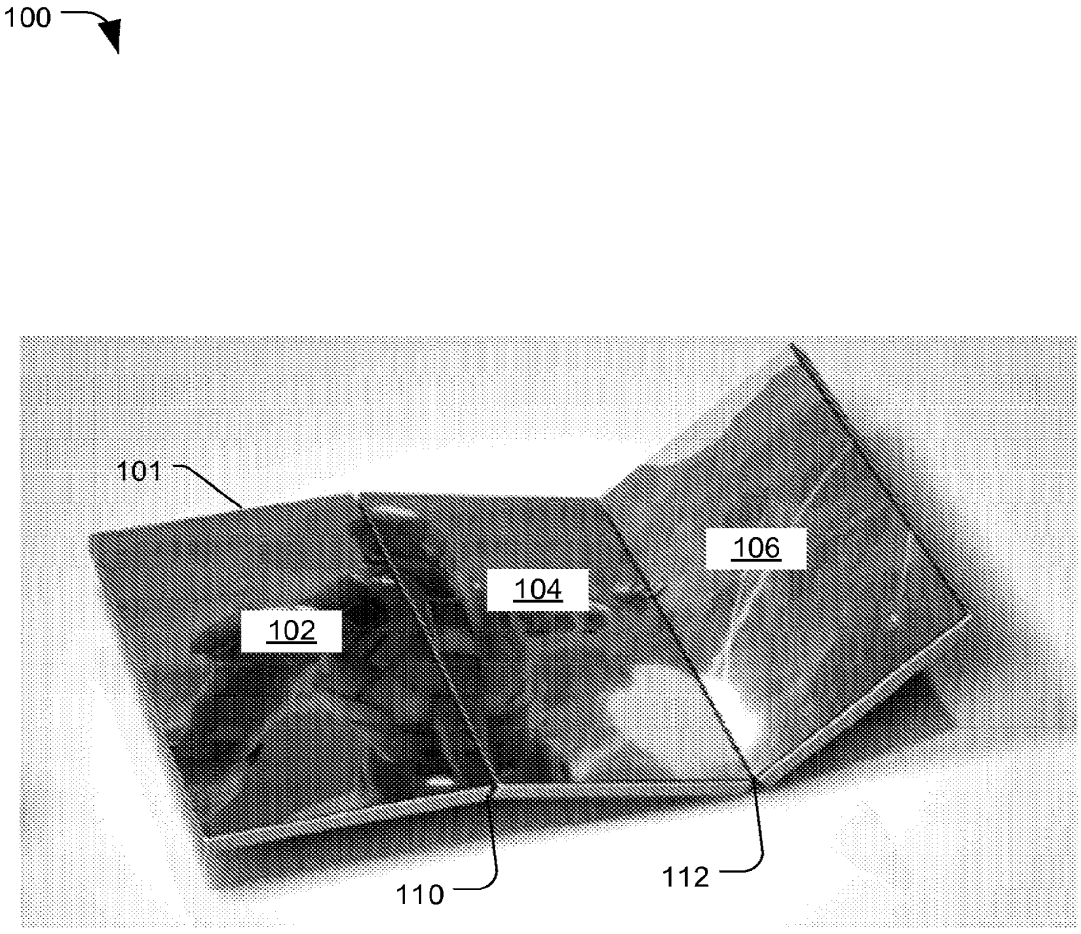


FIG. 1

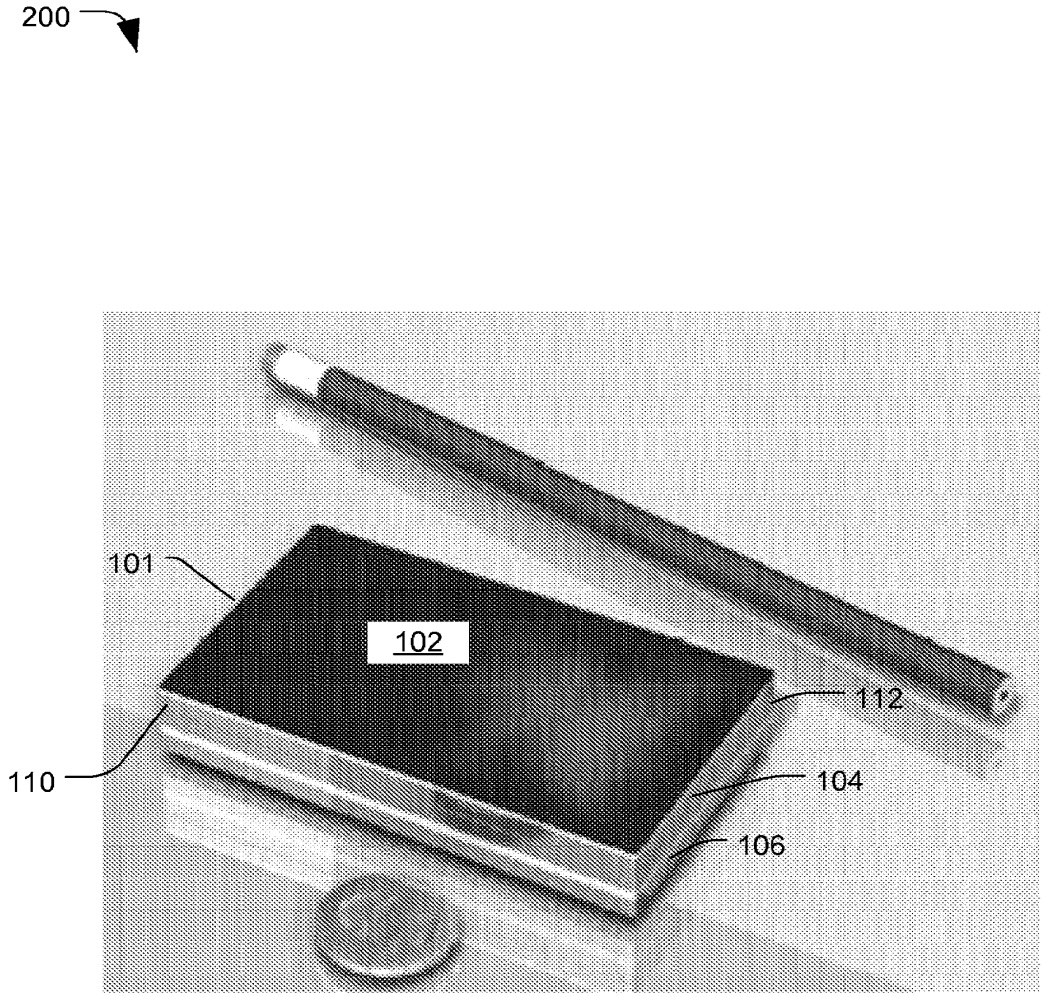


FIG. 2

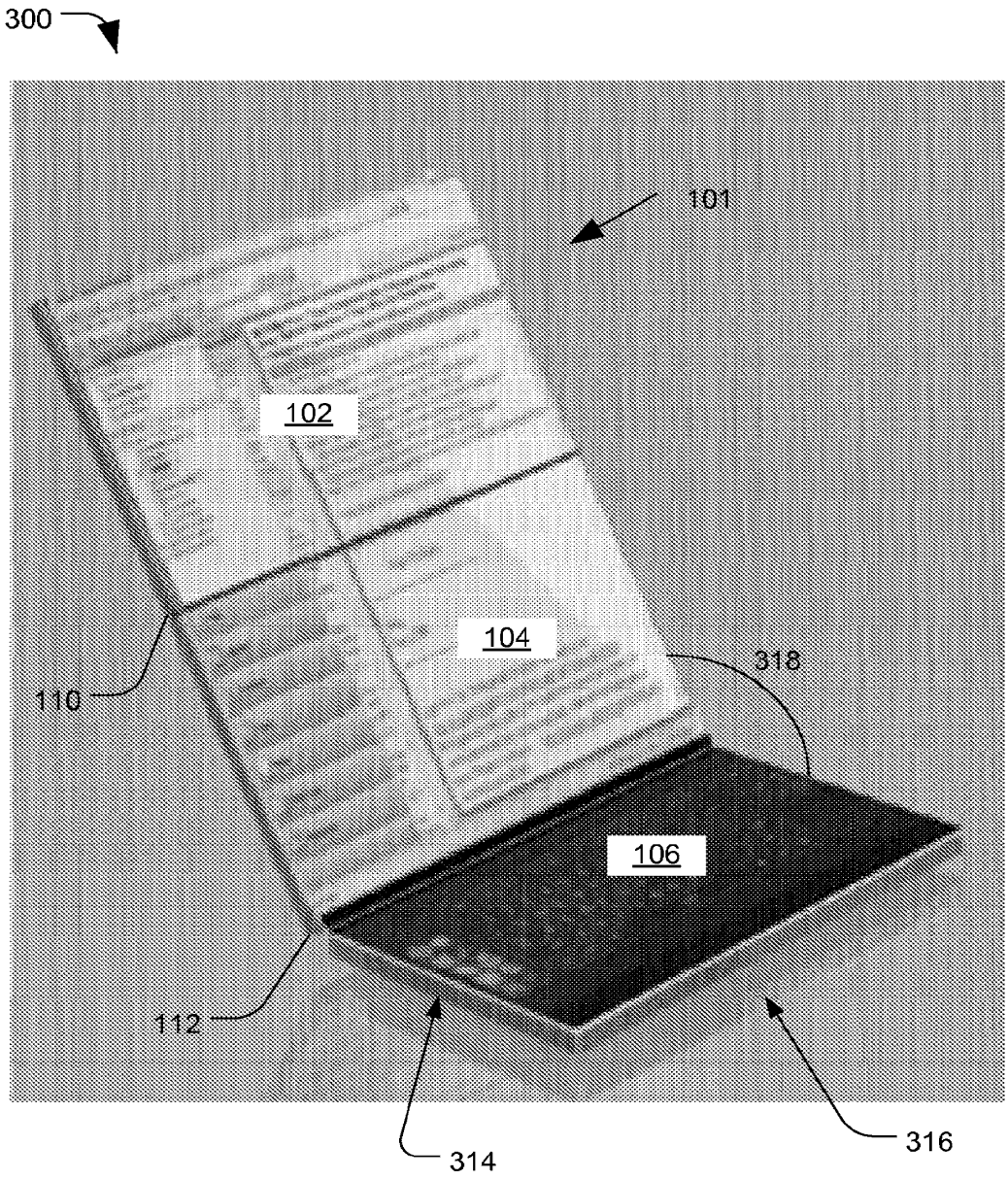


FIG. 3

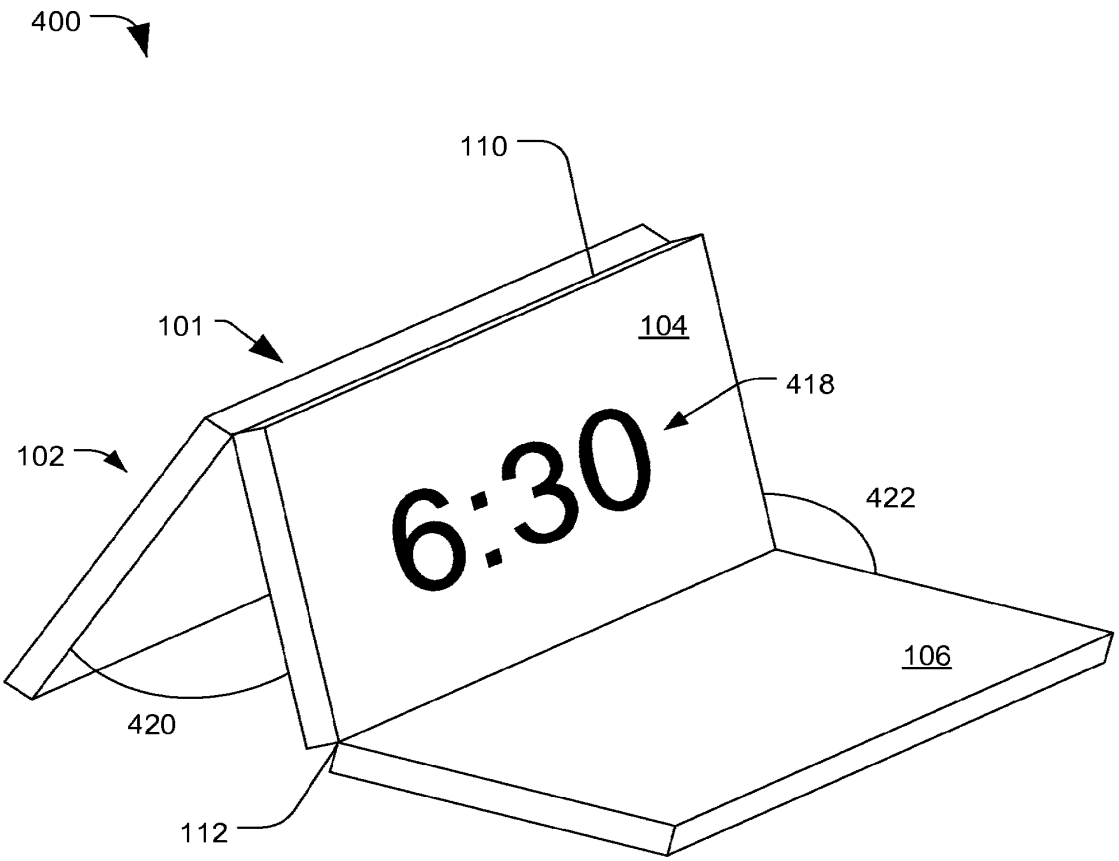


FIG. 4

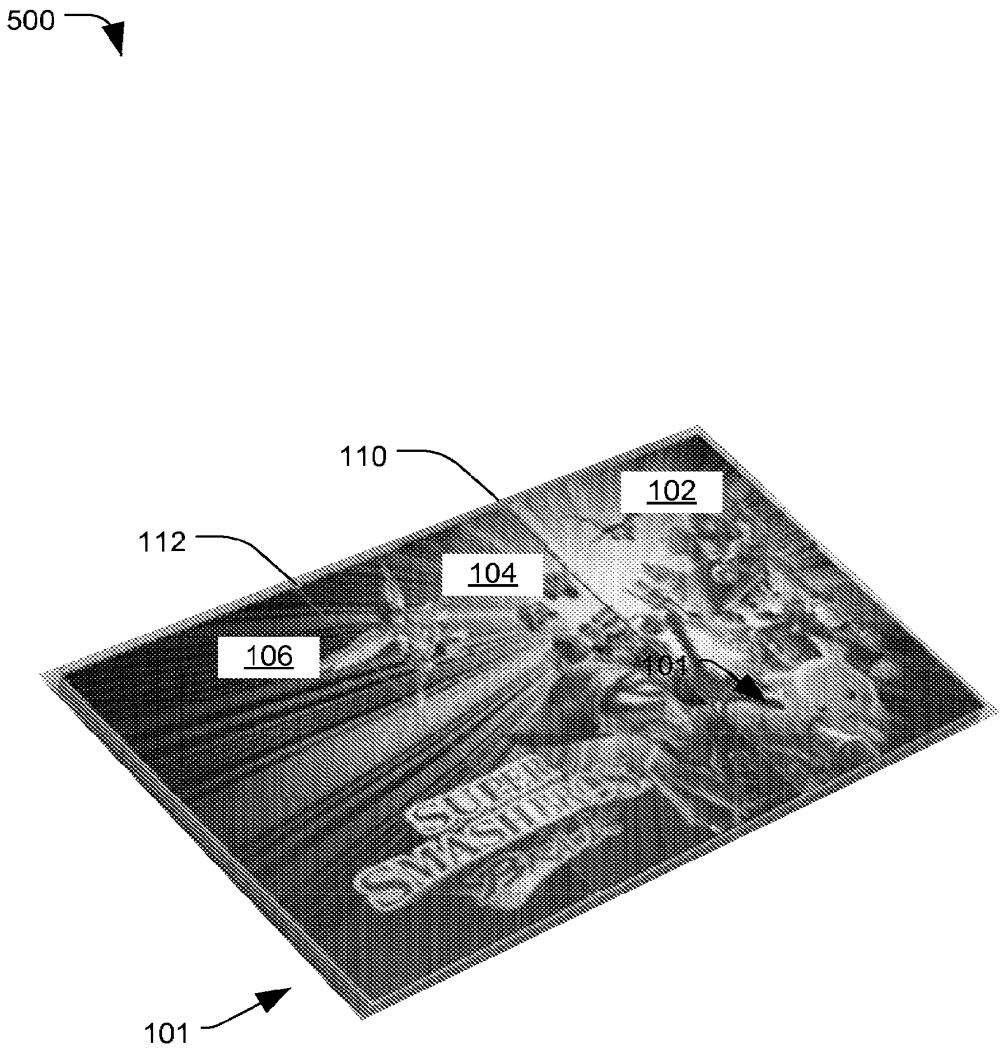


FIG. 5

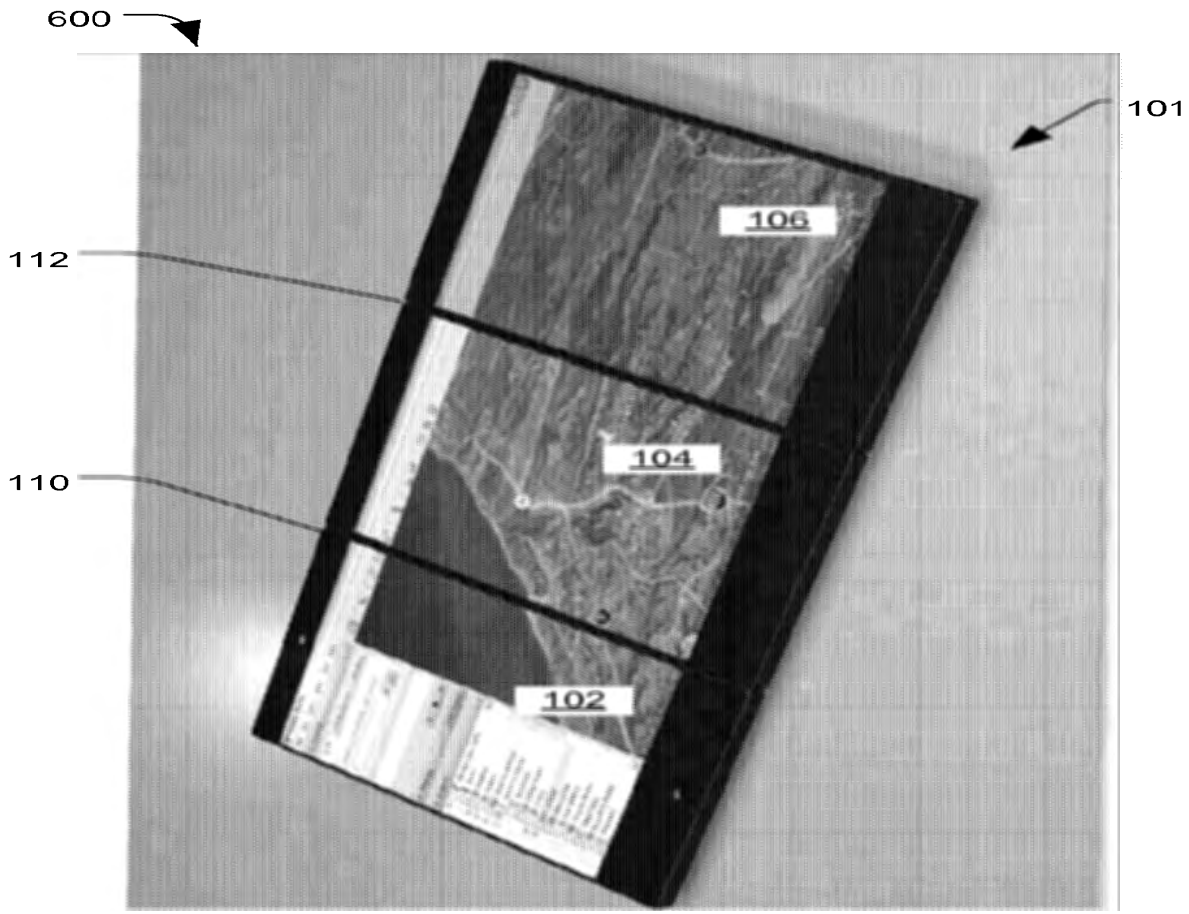


FIG. 6

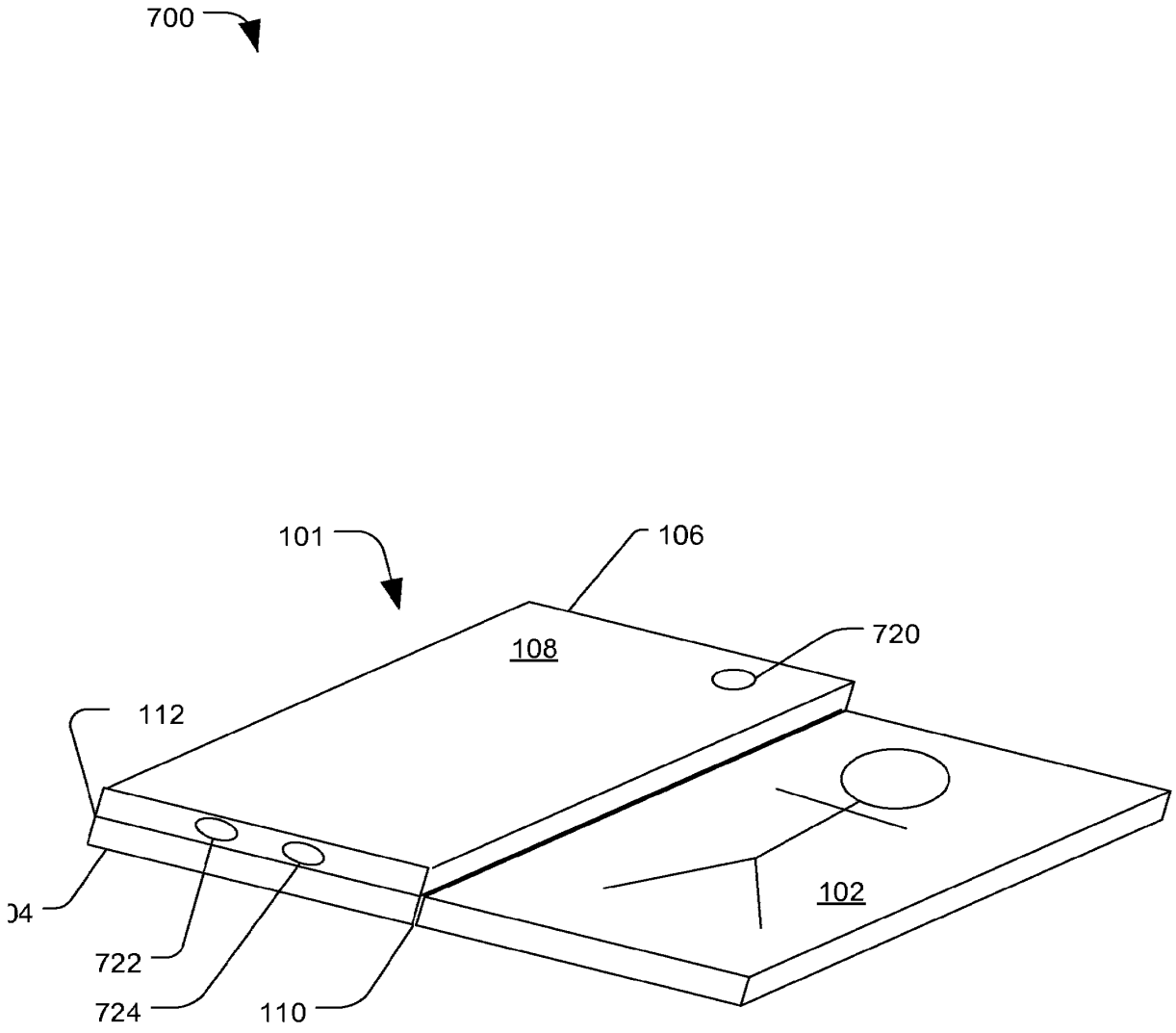


FIG. 7

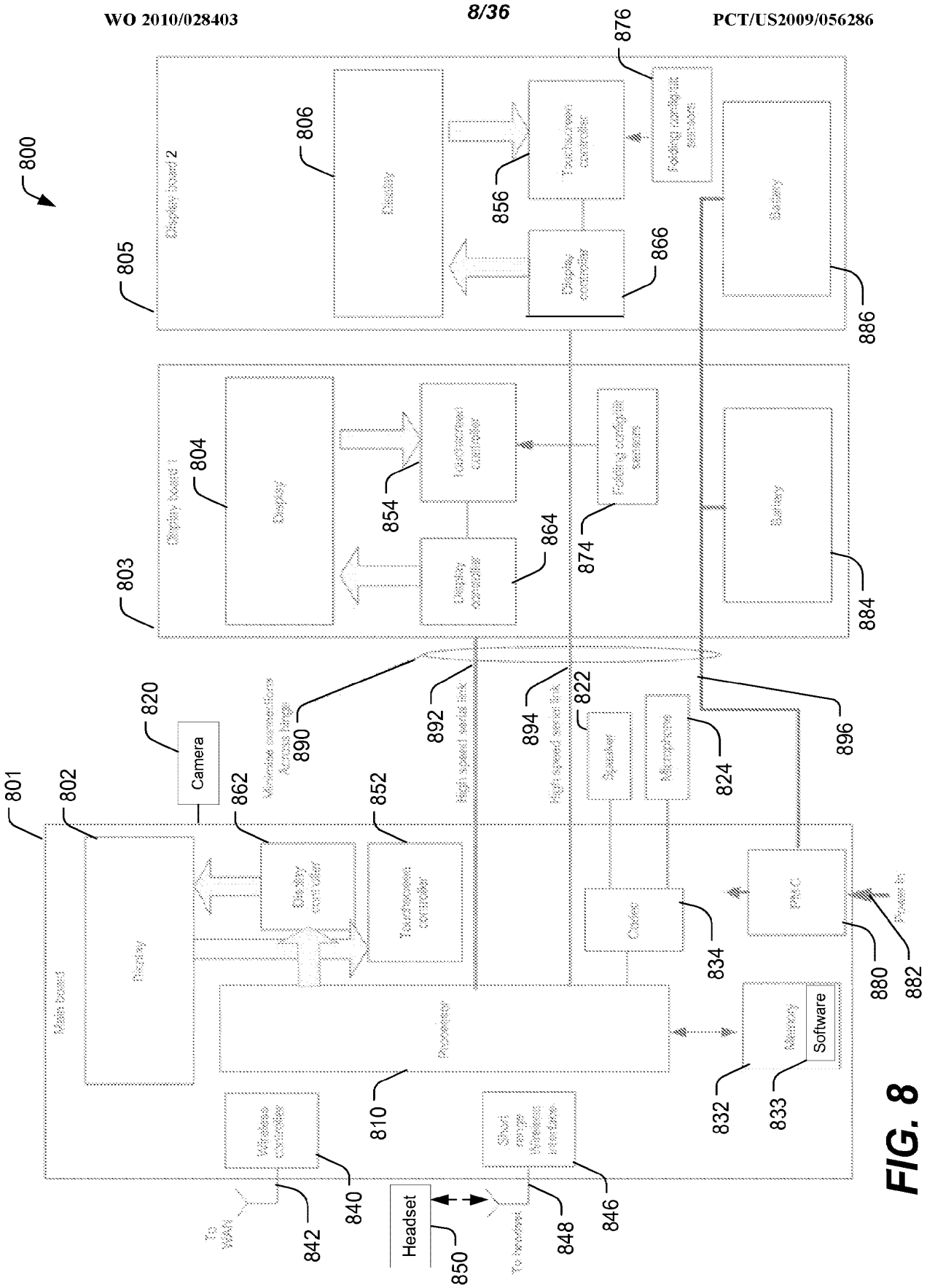

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854
856
862
864
866
874
876
880
882
884
886
890
892
894
896
Main board
Display board 1
Display board 2
Display
Camera
Speaker
Microphone
Touchscreen controller
Display controller
Folding configuration sensor
Battery
Processor
Memory
Software
Codec
PMIC
Headset
To WAN
To headset
To display
To touch
To sensor
Wireless connection
Wireless connection
High speed serial link
High speed serial link

FIG. 8

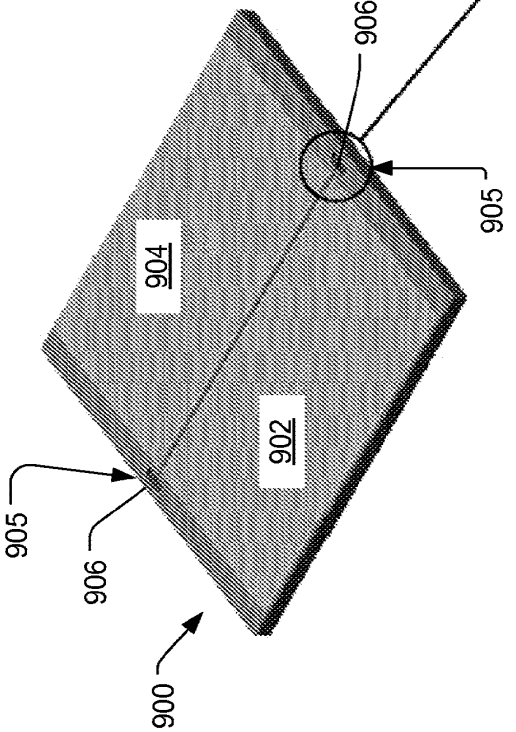

900
905
906
902
904
905
906

FIG. 9

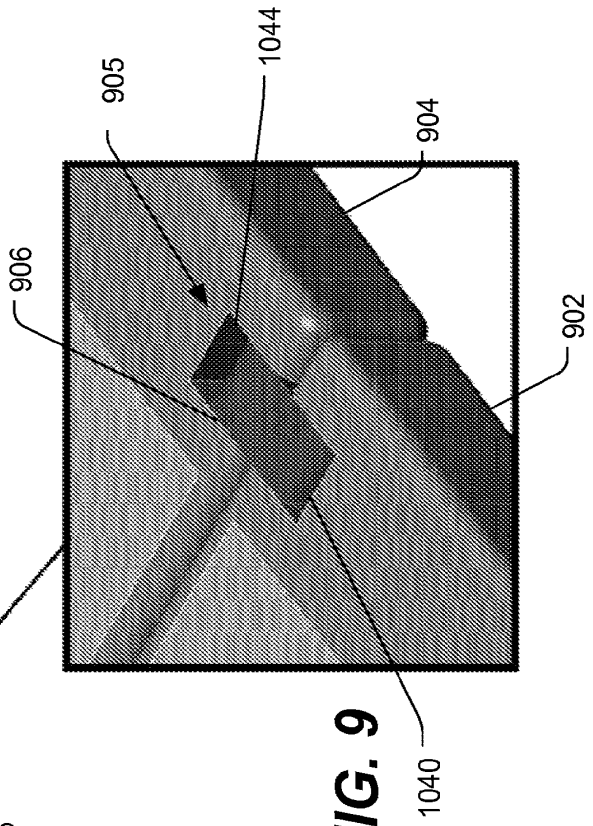
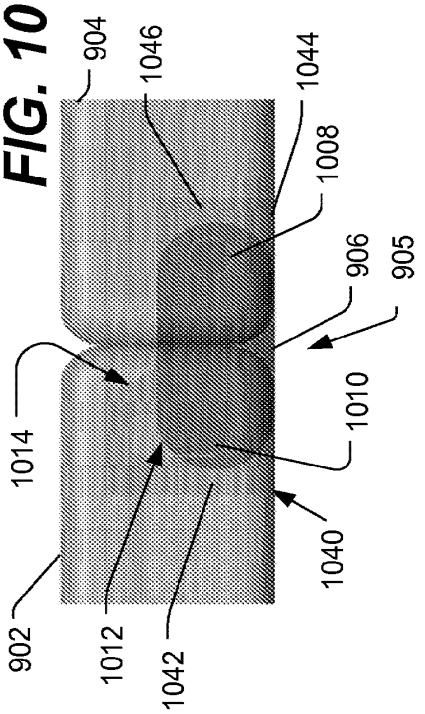

1040
902
906
904
905
1044

FIG. 10


902
1014
1012
1042
1040
1010
906
905
1008
1044
1046
904

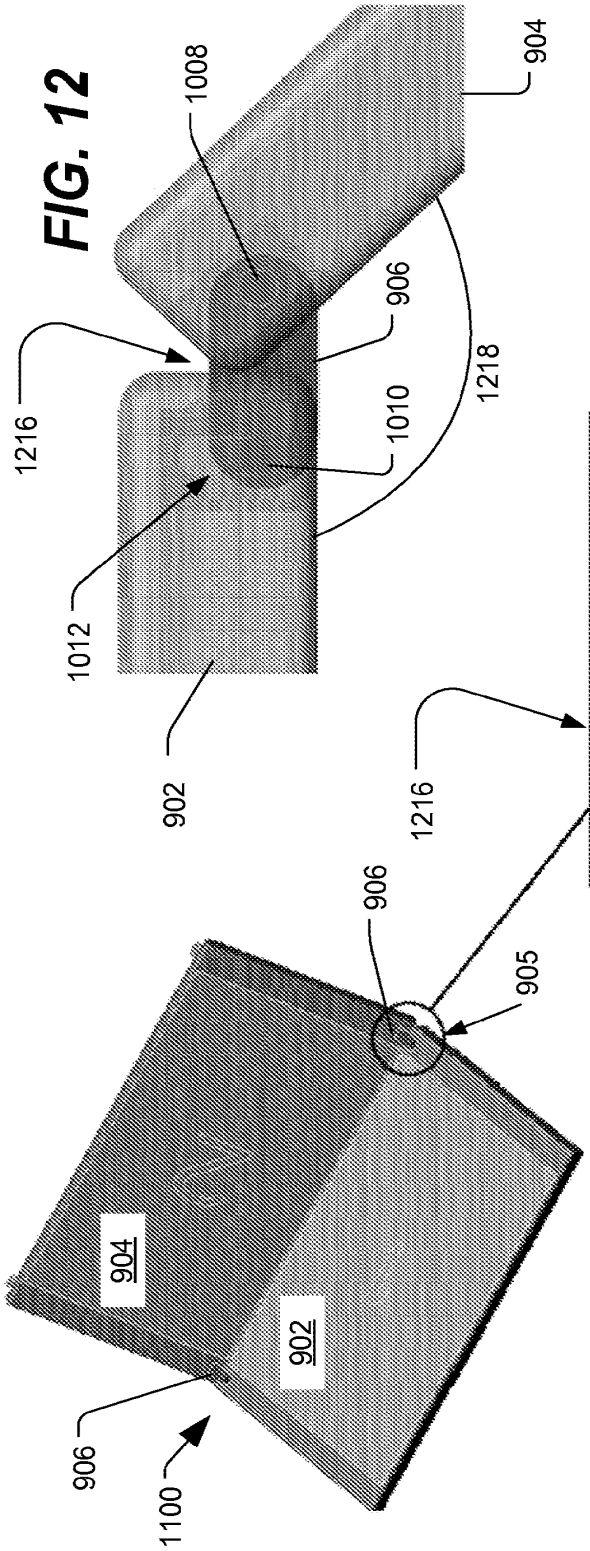
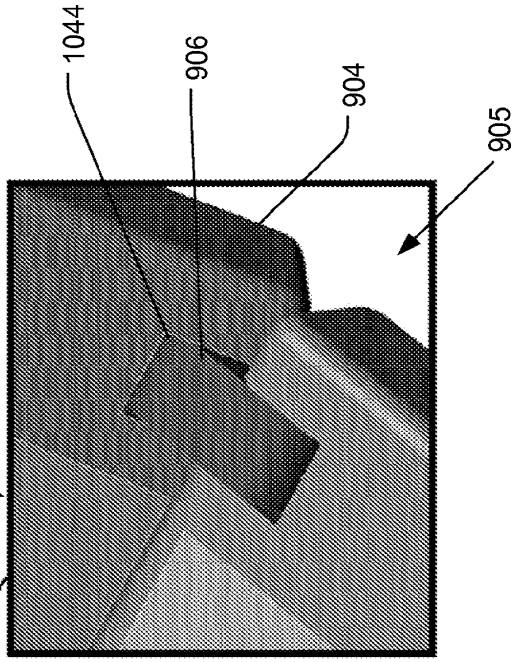

904
902
906
1100

FIG. 11

1008
904
906
1216
1010
1218
1012
902

FIG. 12


1044
906
904
905
1216

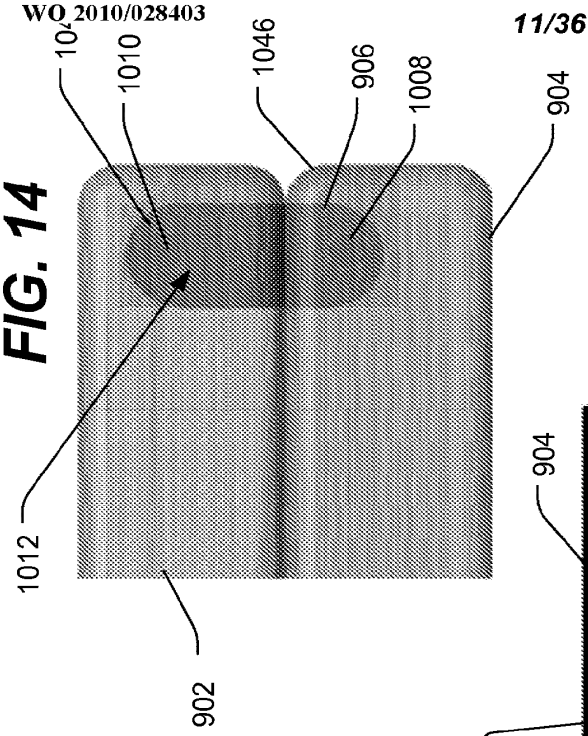

1012
1010
1046
906
1008
904
902

FIG. 14

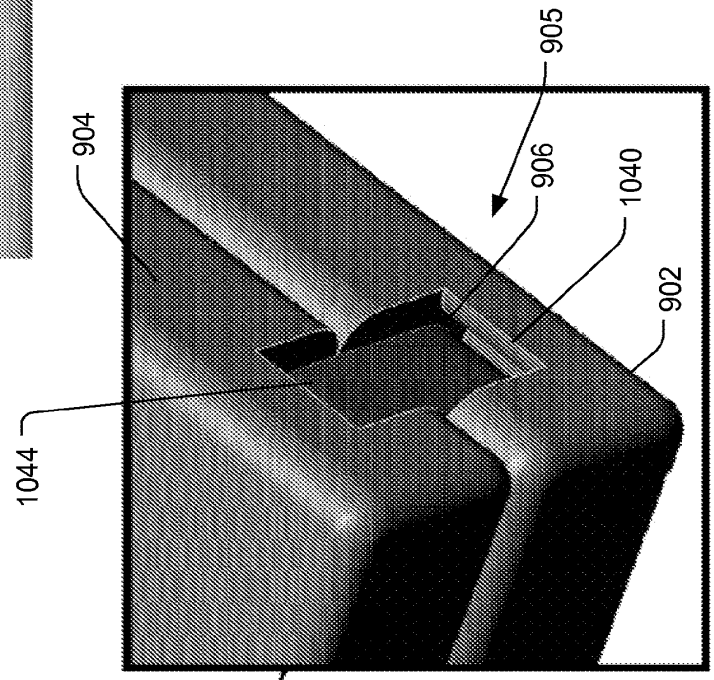
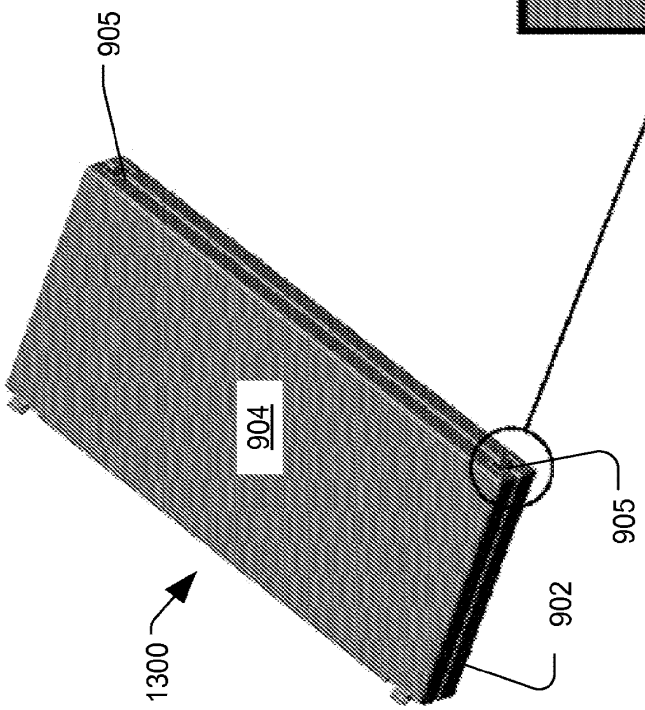

905
904
906
1040
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1044

FIG. 13


905
904
905
902
1300

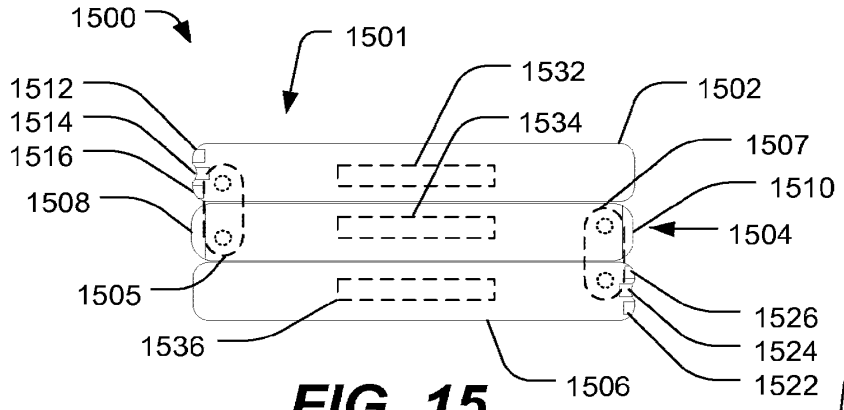


FIG. 15

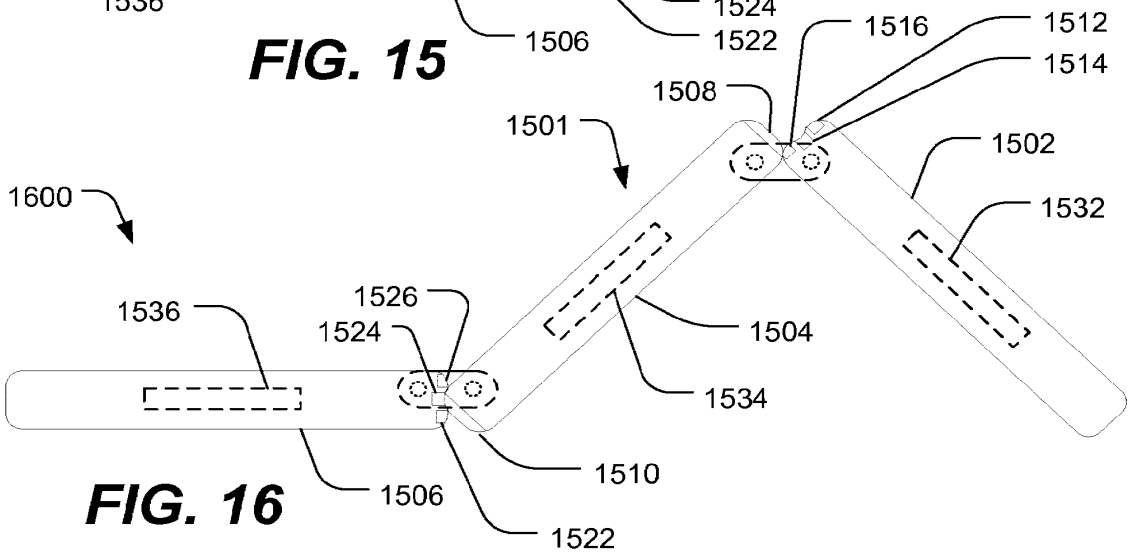


FIG. 16

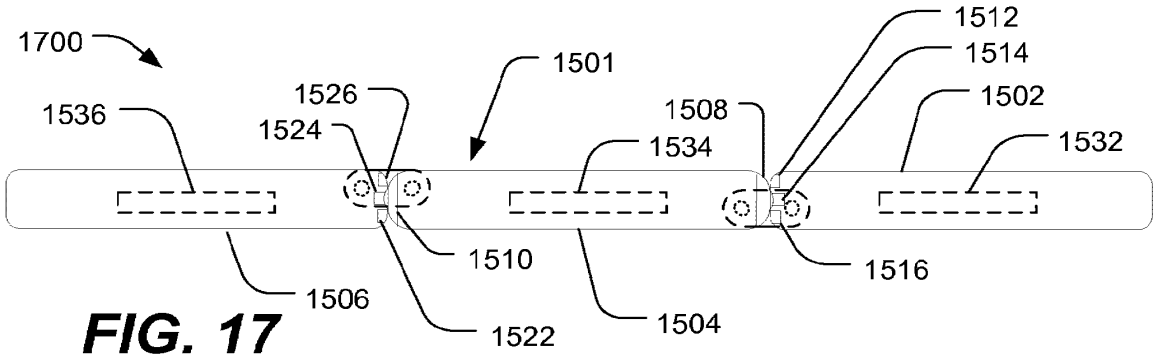


FIG. 17

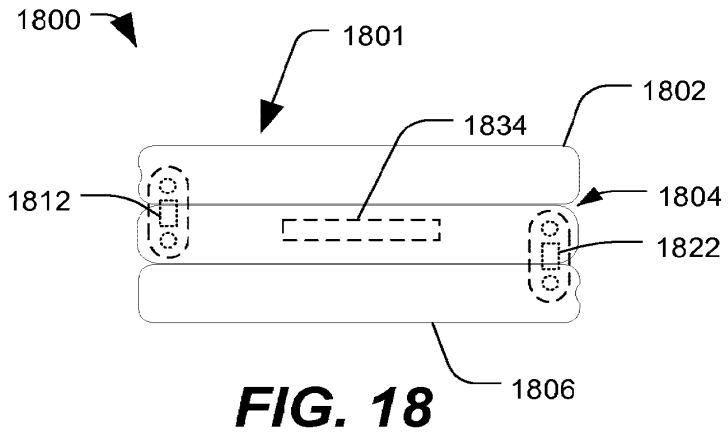


FIG. 18

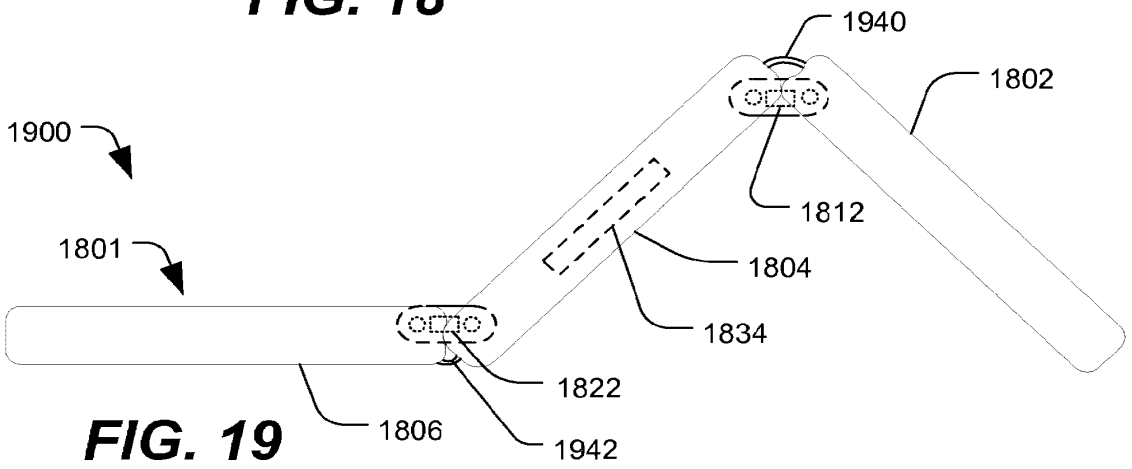


FIG. 19

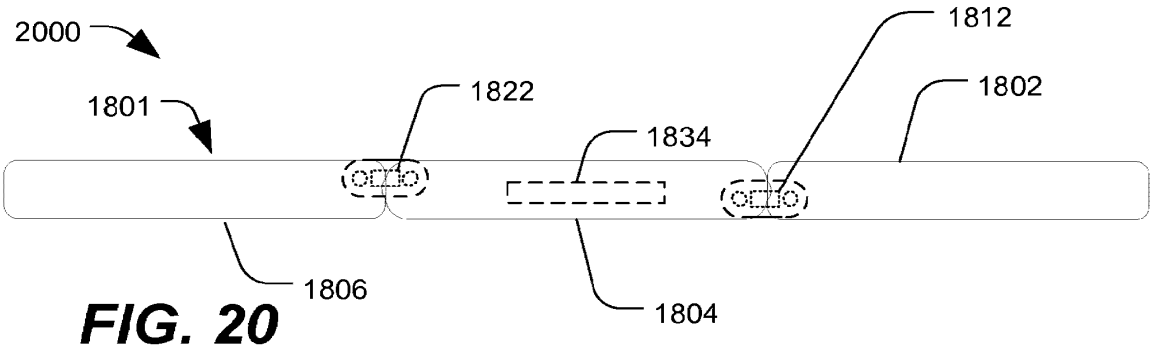


FIG. 20

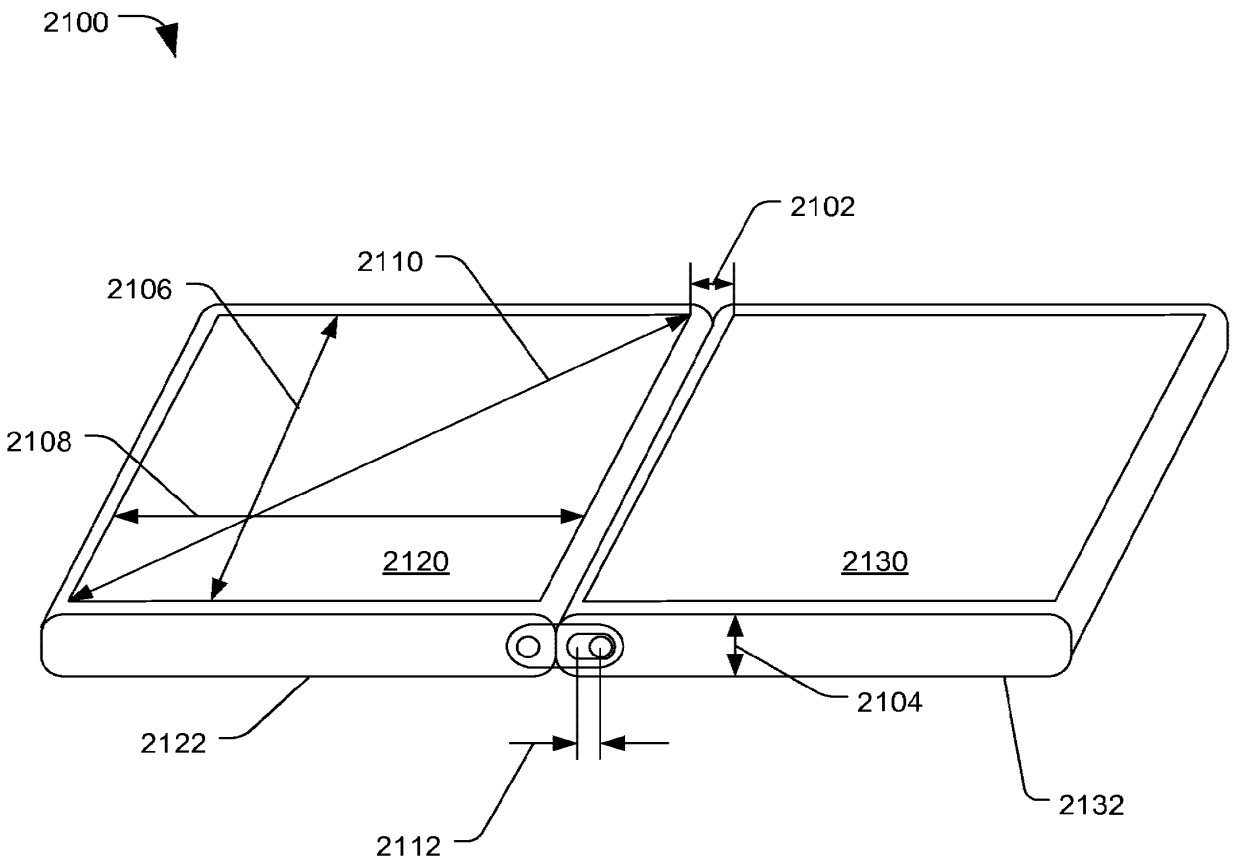


FIG. 21

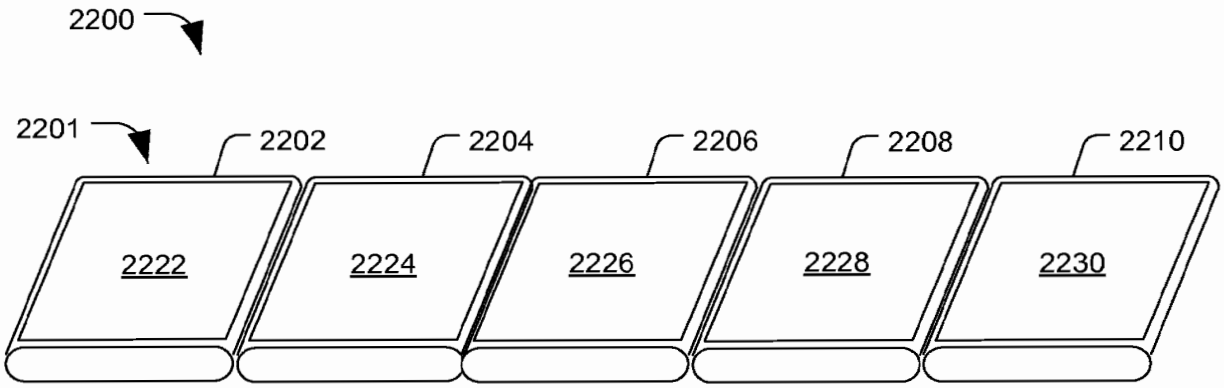

2200
2201
2202
2204
2206
2208
2210
2222
2224
2226
2228
2230

FIG. 22

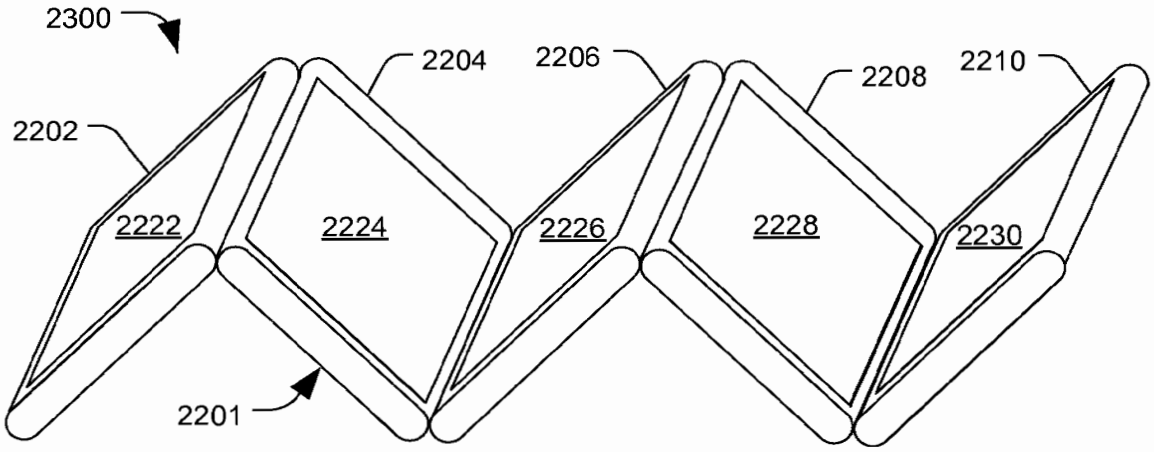

2300
2202
2204
2206
2208
2210
2222
2224
2226
2228
2230
2201

FIG. 23

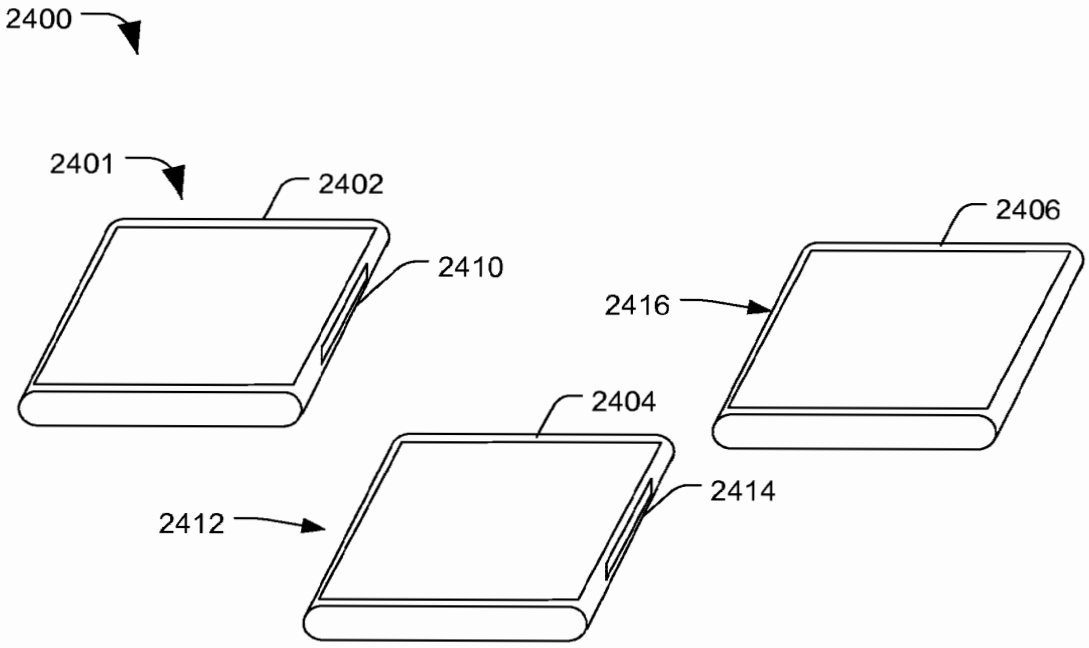

2400
2401
2402
2410
2406
2416
2404
2414
2412

FIG. 24

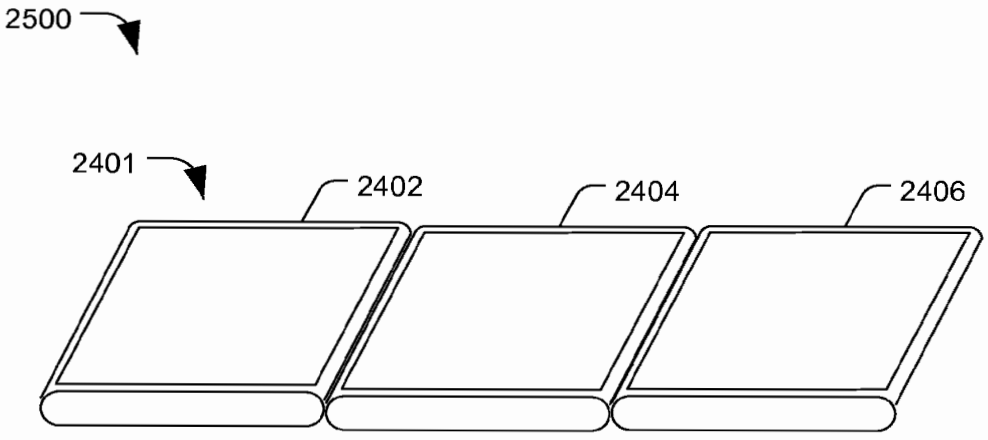

2500
2401
2402
2404
2406

FIG. 25

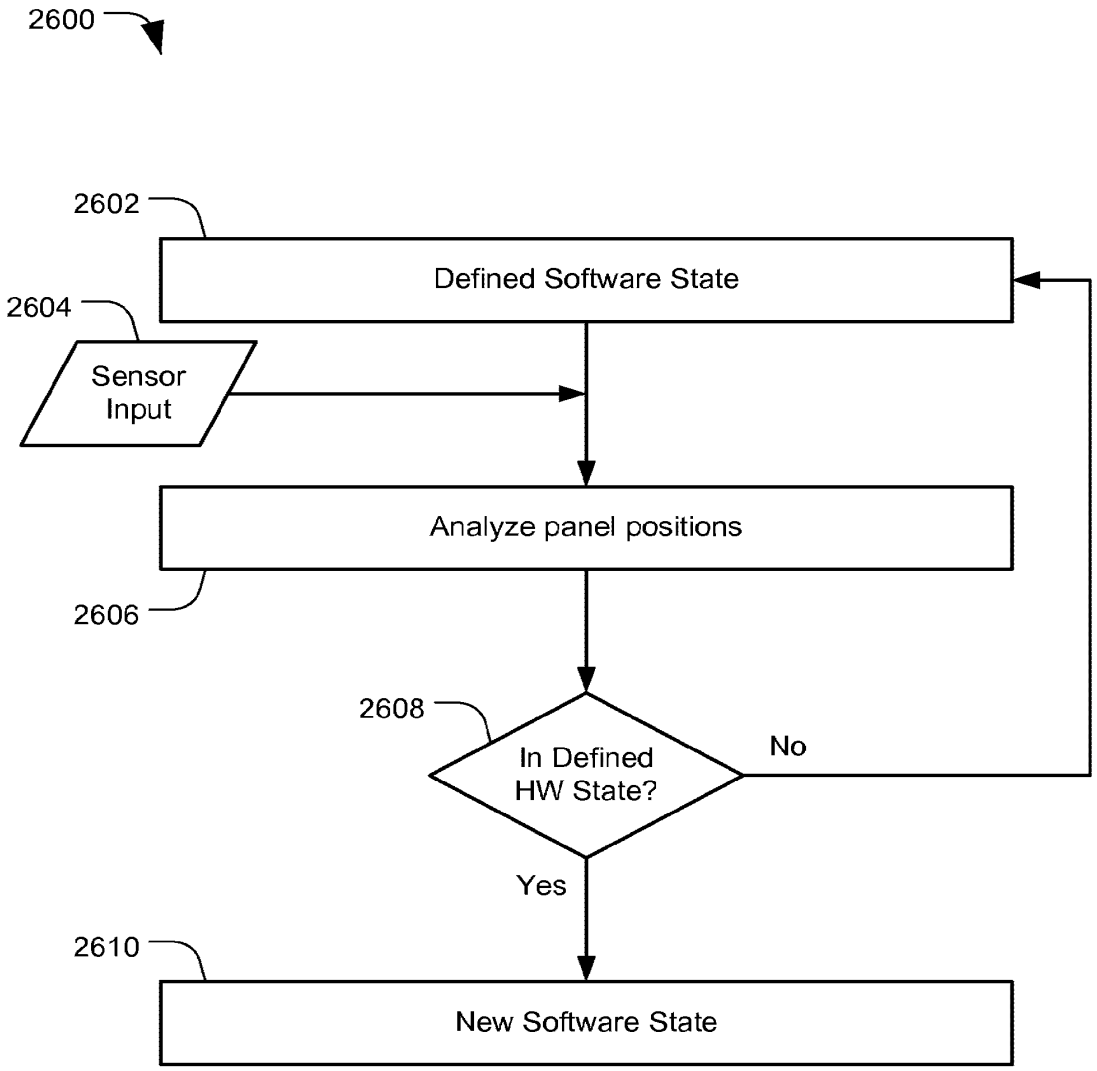

2600
2602
Defined Software State
2604
Sensor Input
Analyze panel positions
2606
2608
In Defined HW State?
No
Yes
2610
New Software State

FIG. 26

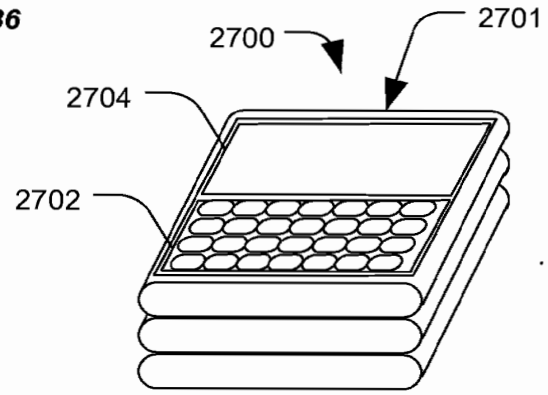


FIG. 27

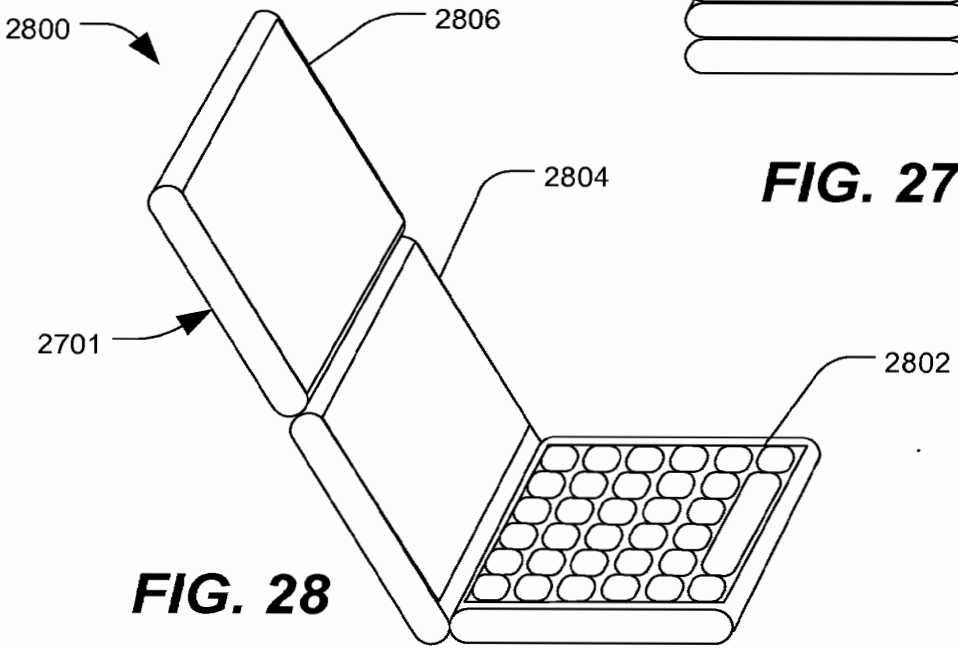


FIG. 28

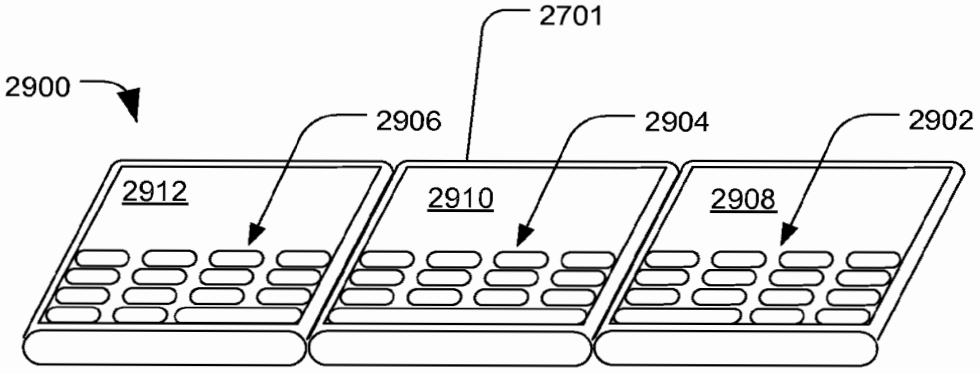


FIG. 29

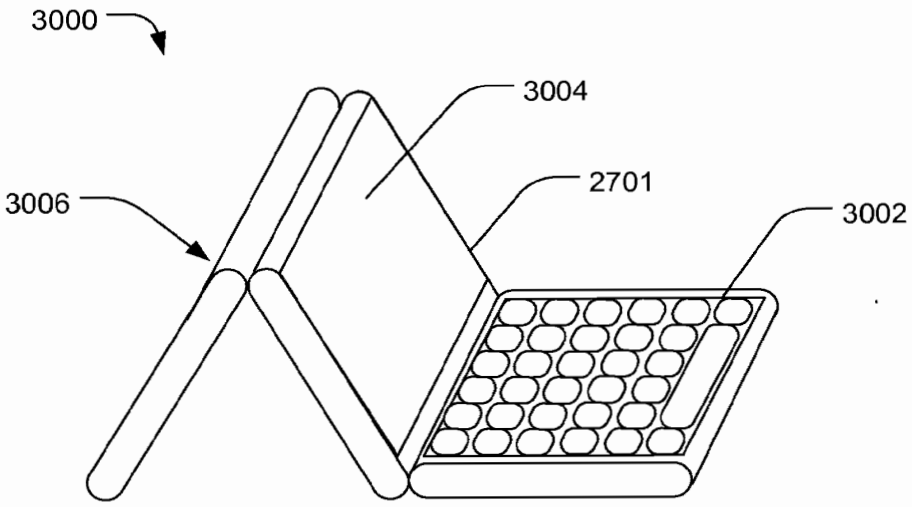


FIG. 30

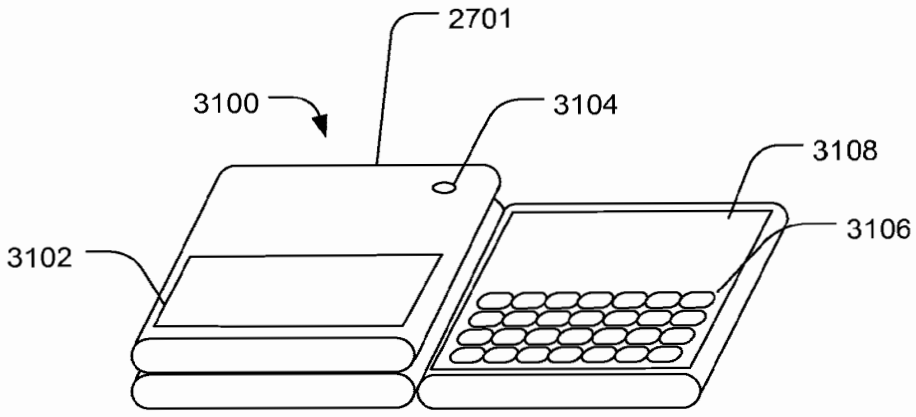


FIG. 31

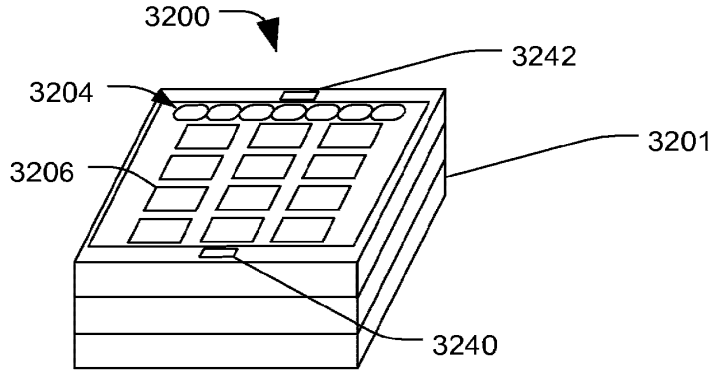


FIG. 32

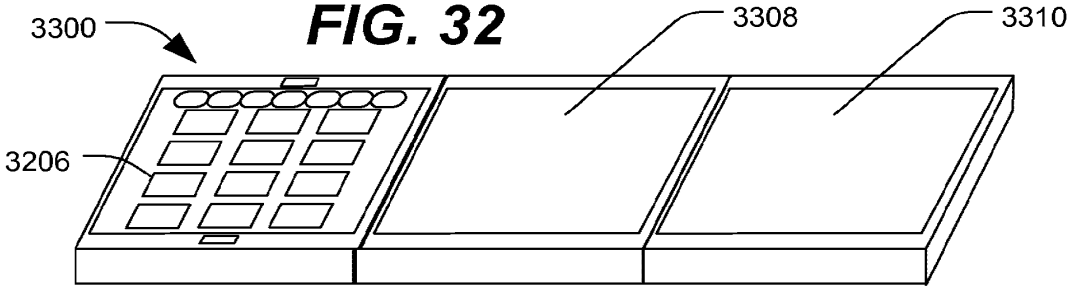


FIG. 33

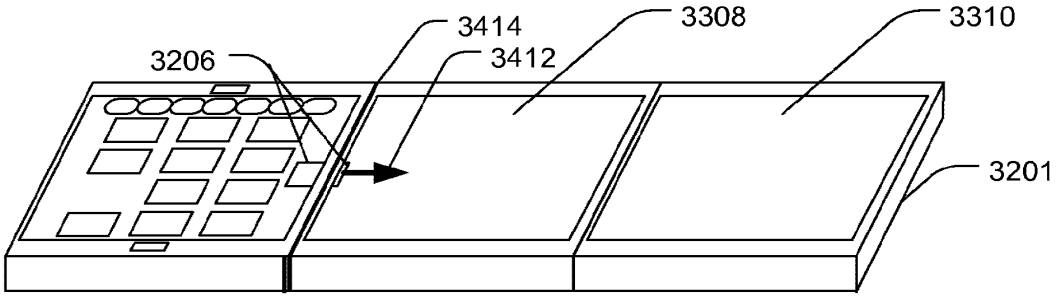


FIG. 34

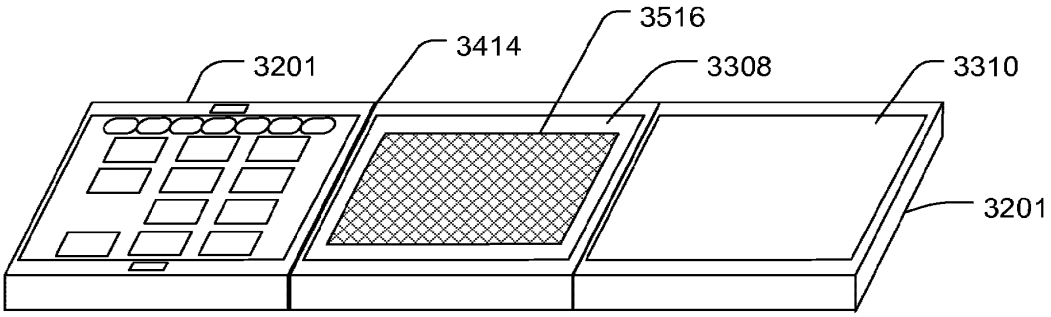


FIG. 35

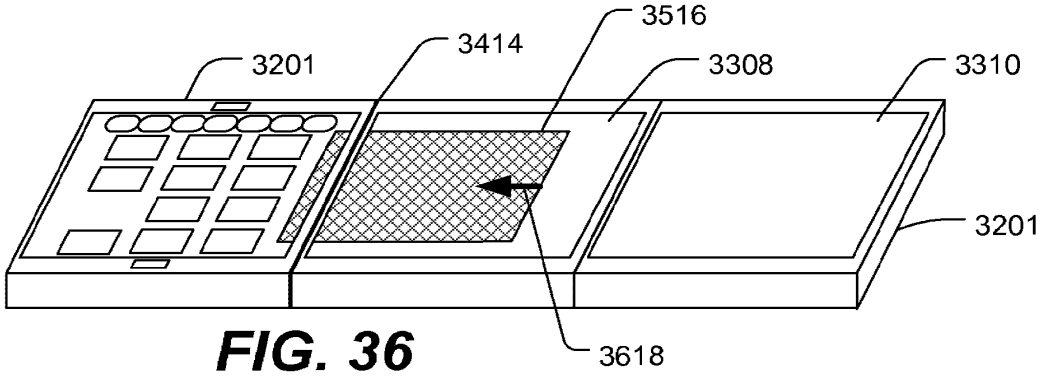


FIG. 36

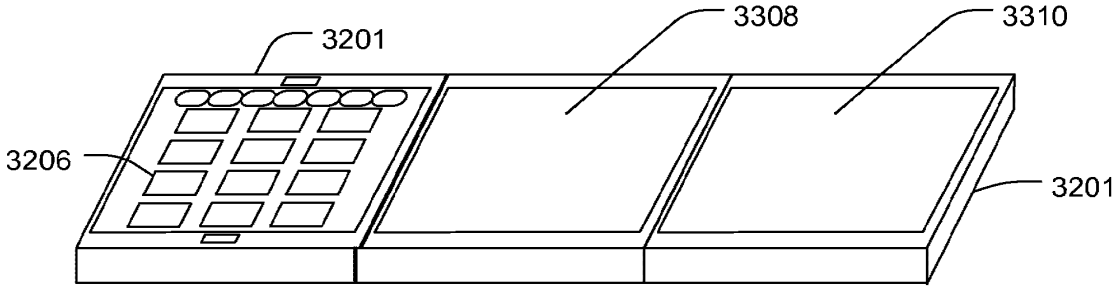


FIG. 37

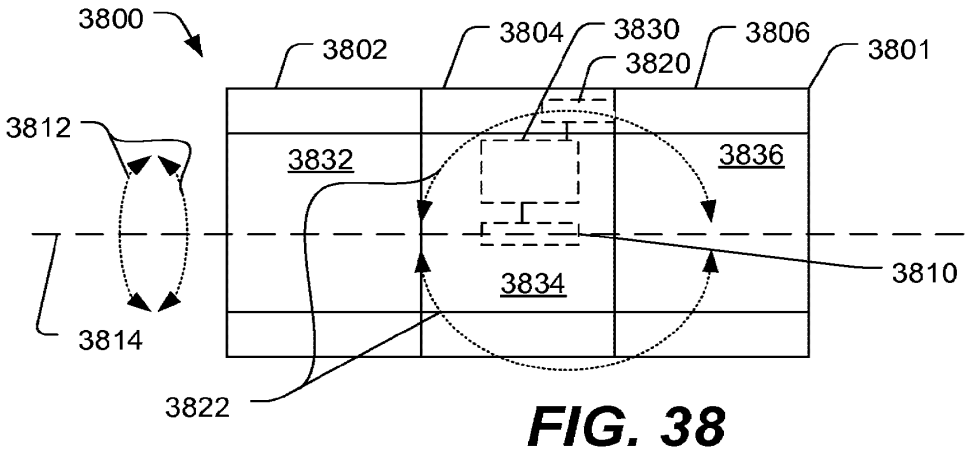


FIG. 38

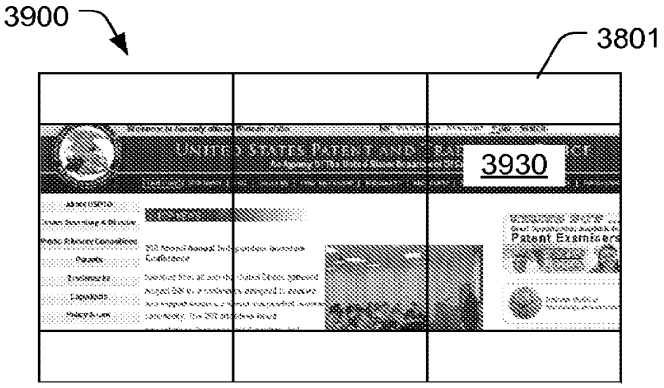


FIG. 39

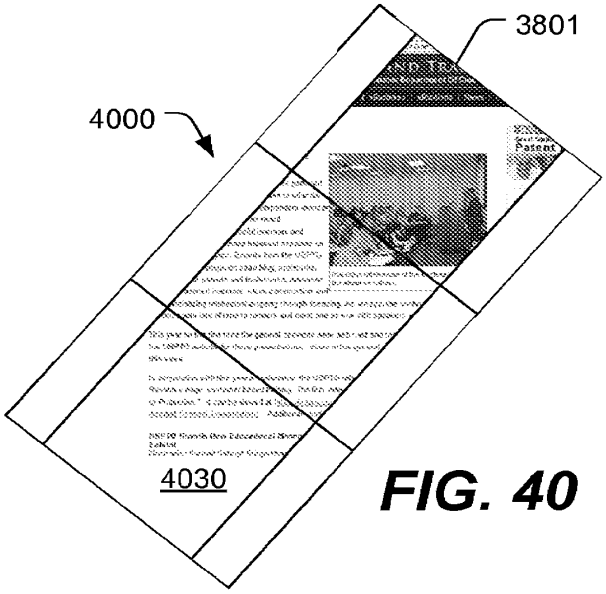


FIG. 40

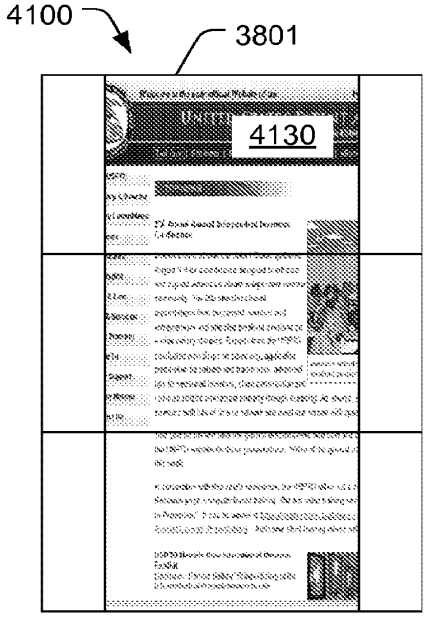


FIG. 41

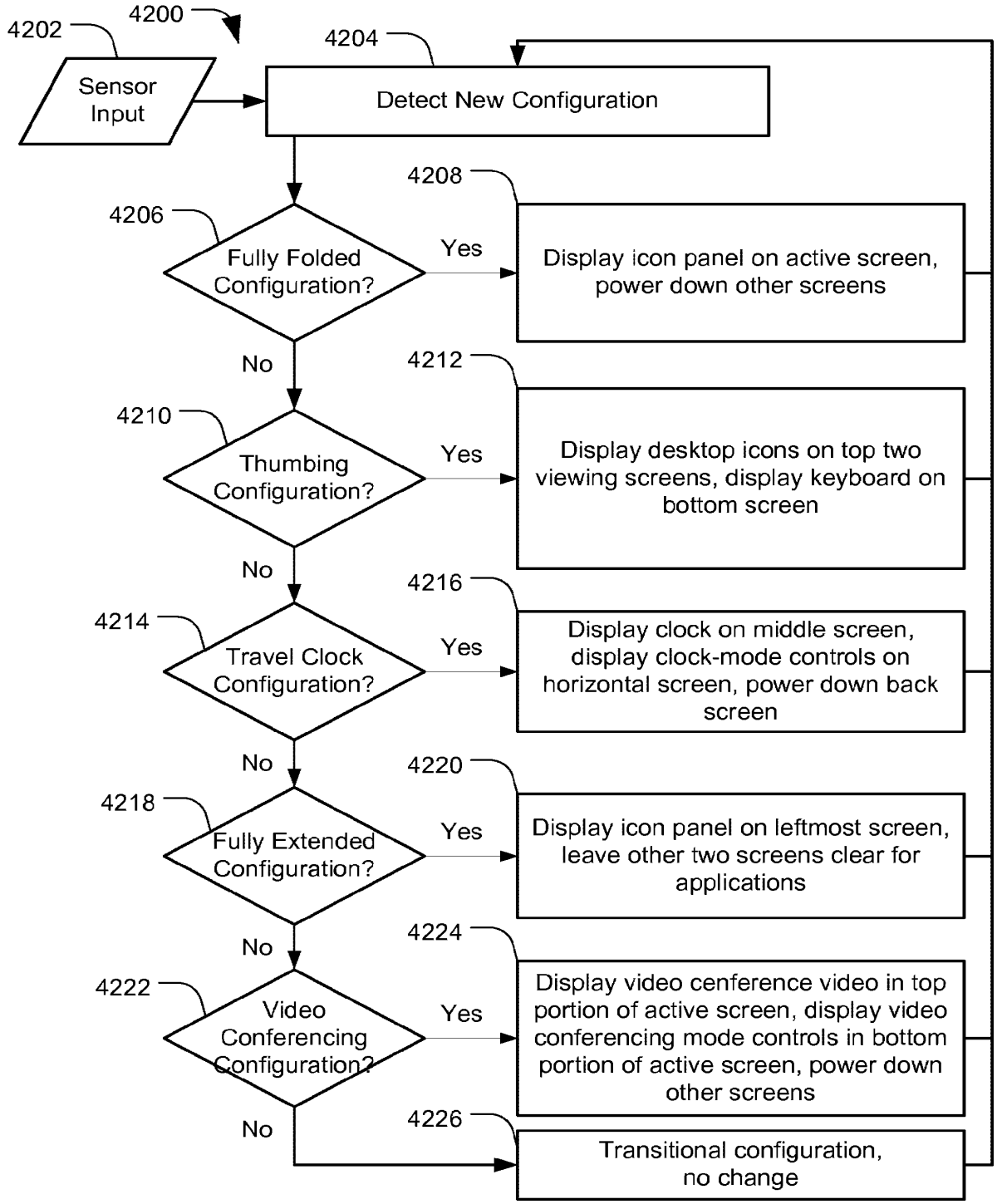

4200
4202
Sensor Input
4204
Detect New Configuration
4206
Fully Folded Configuration?
Yes
4208
Display icon panel on active screen, power down other screens
No
4210
Thumbing Configuration?
Yes
4212
Display desktop icons on top two viewing screens, display keyboard on bottom screen
No
4214
Travel Clock Configuration?
Yes
4216
Display clock on middle screen, display clock-mode controls on horizontal screen, power down back screen
No
4218
Fully Extended Configuration?
Yes
4220
Display icon panel on leftmost screen, leave other two screens clear for applications
No
4222
Video Conferencing Configuration?
Yes
4224
Display video cenference video in top portion of active screen, display video conferencing mode controls in bottom portion of active screen, power down other screens
No
4226
Transitional configuration, no change

FIG. 42

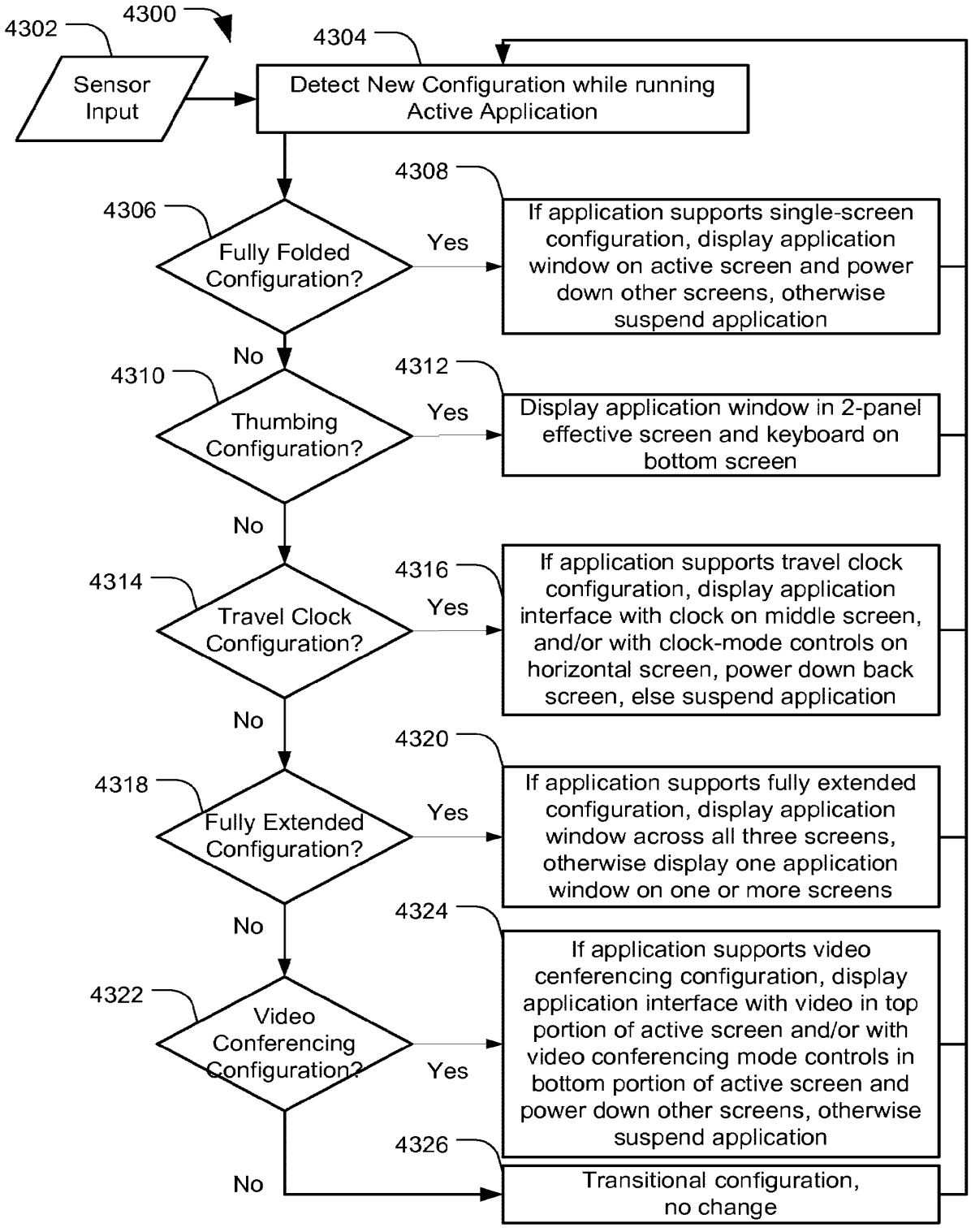

4300
4302
Sensor Input
4304
Detect New Configuration while running Active Application
4306
Fully Folded Configuration?
Yes
4308
If application supports single-screen configuration, display application window on active screen and power down other screens, otherwise suspend application
No
4310
Thumbing Configuration?
Yes
4312
Display application window in 2-panel effective screen and keyboard on bottom screen
No
4314
Travel Clock Configuration?
Yes
4316
If application supports travel clock configuration, display application interface with clock on middle screen, and/or with clock-mode controls on horizontal screen, power down back screen, else suspend application
No
4318
Fully Extended Configuration?
Yes
4320
If application supports fully extended configuration, display application window across all three screens, otherwise display one application window on one or more screens
No
4322
Video Conferencing Configuration?
Yes
4324
If application supports video cenferencing configuration, display application interface with video in top portion of active screen and/or with video conferencing mode controls in bottom portion of active screen and power down other screens, otherwise suspend application
No
4326
Transitional configuration, no change

FIG. 43

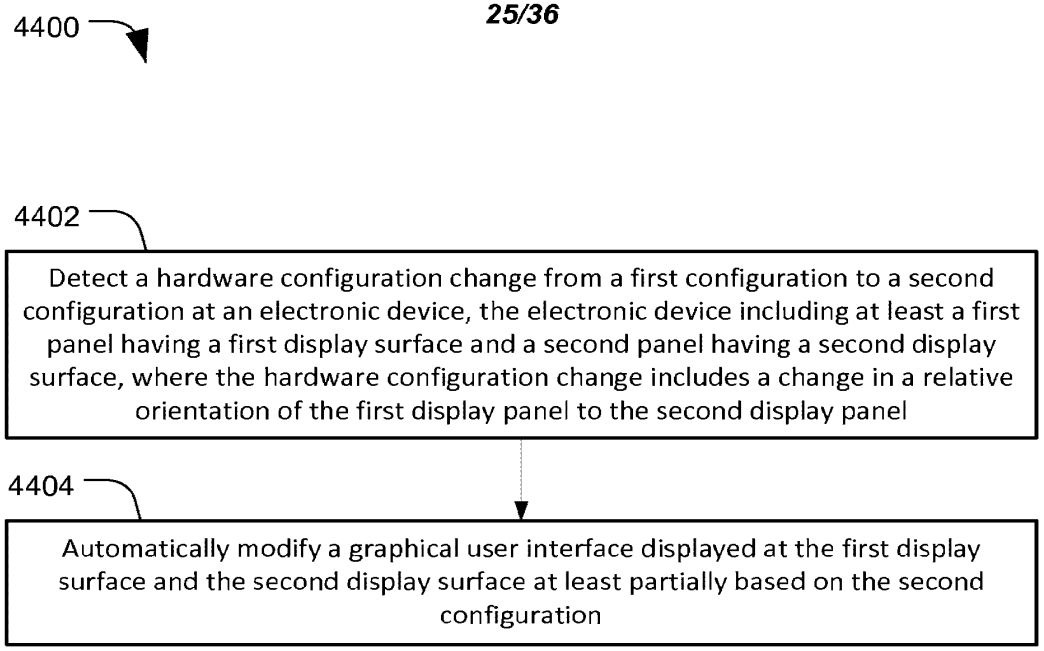

4400
4402
Detect a hardware configuration change from a first configuration to a second configuration at an electronic device, the electronic device including at least a first panel having a first display surface and a second panel having a second display surface, where the hardware configuration change includes a change in a relative orientation of the first display panel to the second display panel
4404
Automatically modify a graphical user interface displayed at the first display surface and the second display surface at least partially based on the second configuration

FIG. 44

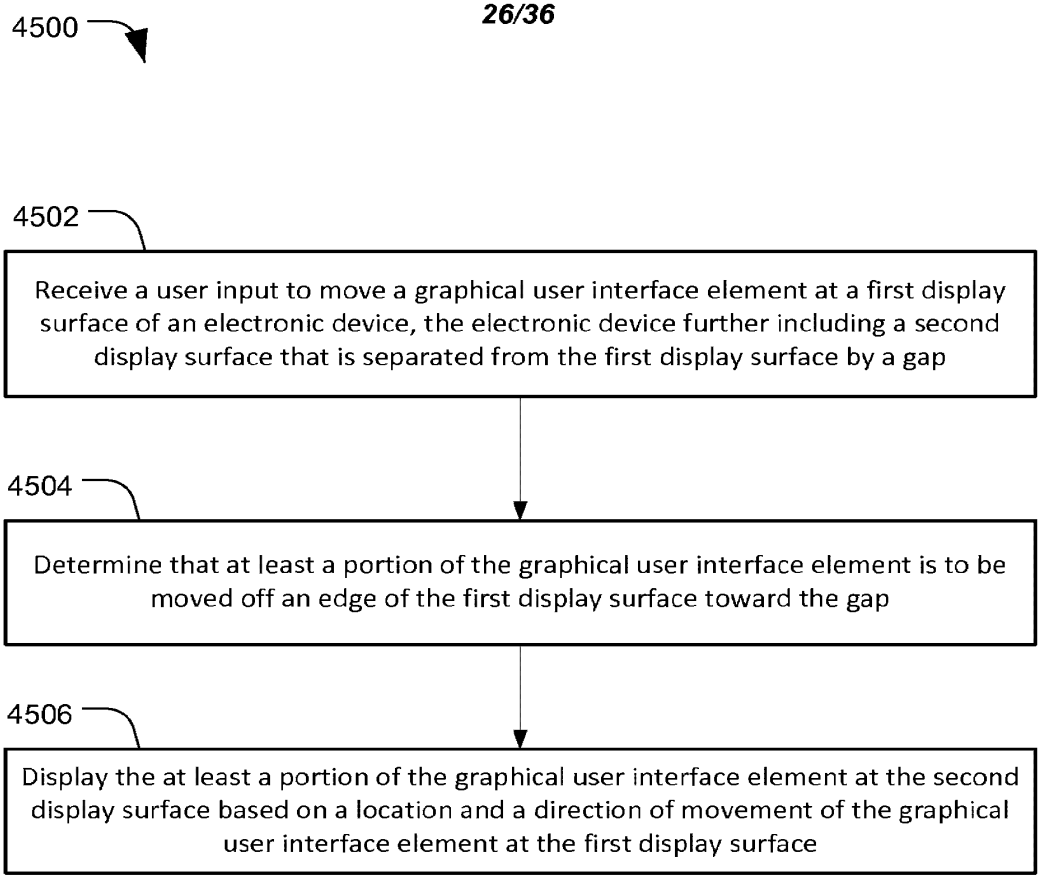

4500
4502
Receive a user input to move a graphical user interface element at a first display surface of an electronic device, the electronic device further including a second display surface that is separated from the first display surface by a gap
4504
Determine that at least a portion of the graphical user interface element is to be moved off an edge of the first display surface toward the gap
4506
Display the at least a portion of the graphical user interface element at the second display surface based on a location and a direction of movement of the graphical user interface element at the first display surface

FIG. 45

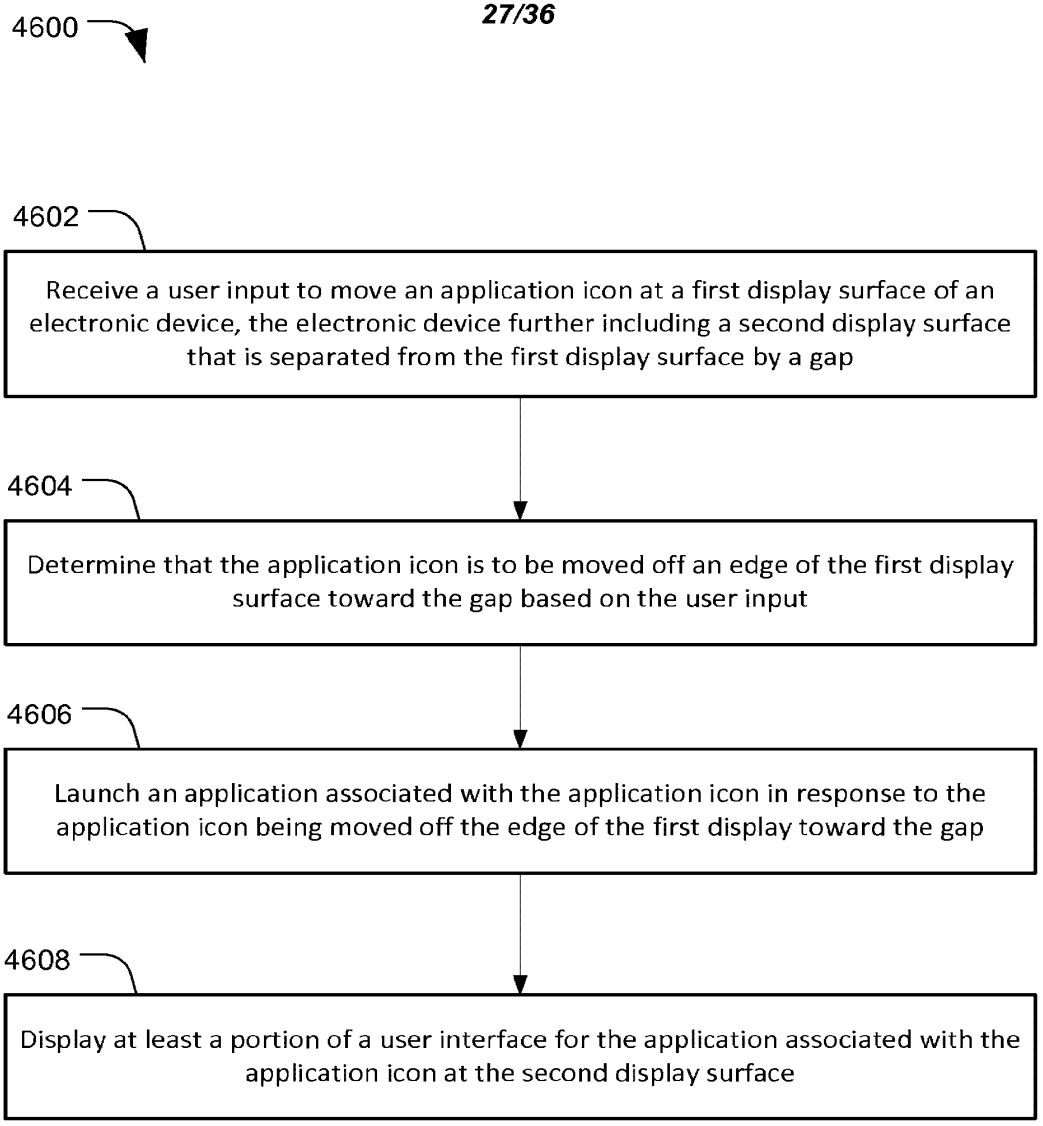

4600
4602
Receive a user input to move an application icon at a first display surface of an electronic device, the electronic device further including a second display surface that is separated from the first display surface by a gap
4604
Determine that the application icon is to be moved off an edge of the first display surface toward the gap based on the user input
4606
Launch an application associated with the application icon in response to the application icon being moved off the edge of the first display toward the gap
4608
Display at least a portion of a user interface for the application associated with the application icon at the second display surface

FIG. 46

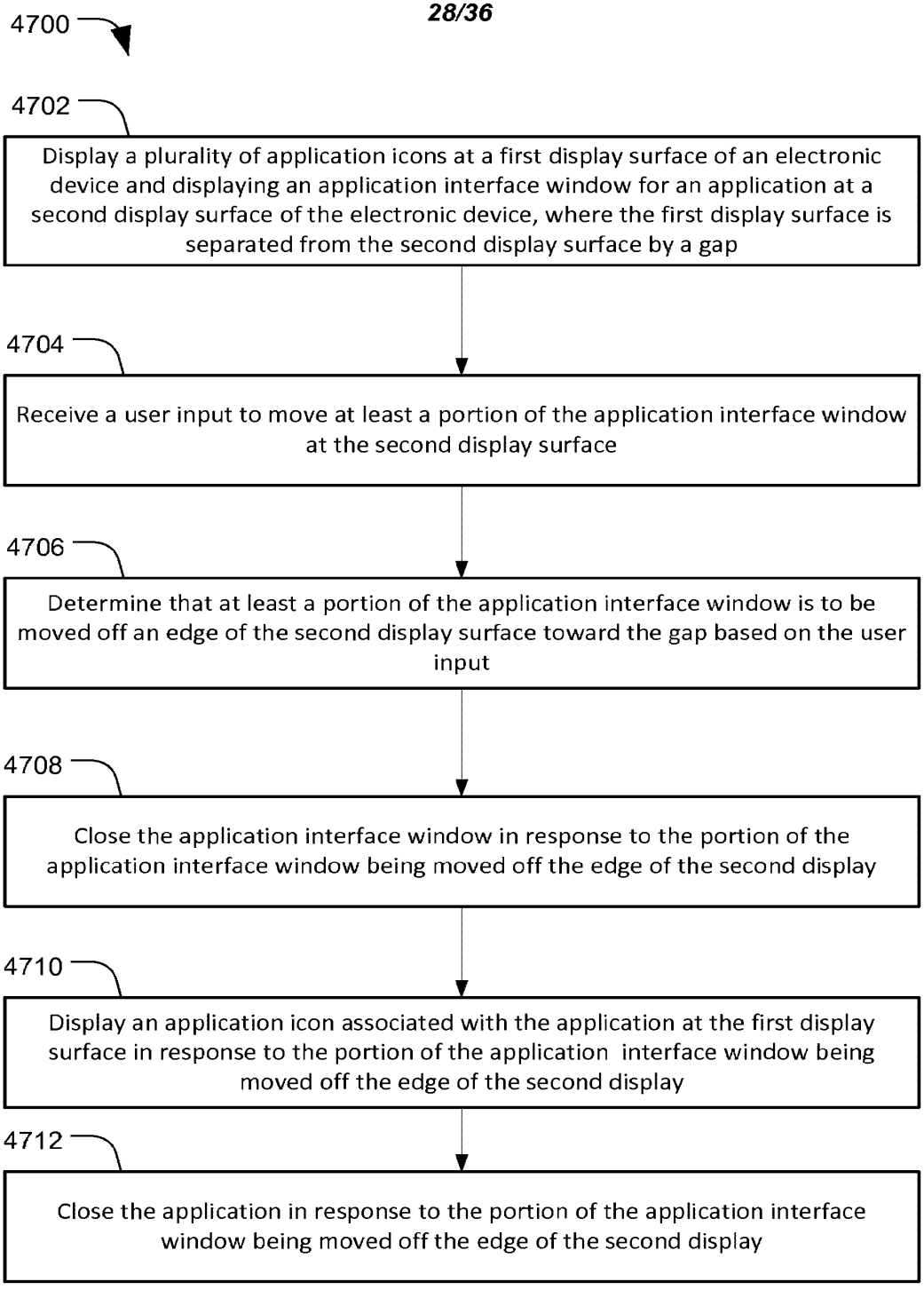

4700
4702
Display a plurality of application icons at a first display surface of an electronic device and displaying an application interface window for an application at a second display surface of the electronic device, where the first display surface is separated from the second display surface by a gap
4704
Receive a user input to move at least a portion of the application interface window at the second display surface
4706
Determine that at least a portion of the application interface window is to be moved off an edge of the second display surface toward the gap based on the user input
4708
Close the application interface window in response to the portion of the application interface window being moved off the edge of the second display
4710
Display an application icon associated with the application at the first display surface in response to the portion of the application interface window being moved off the edge of the second display
4712
Close the application in response to the portion of the application interface window being moved off the edge of the second display

FIG. 47

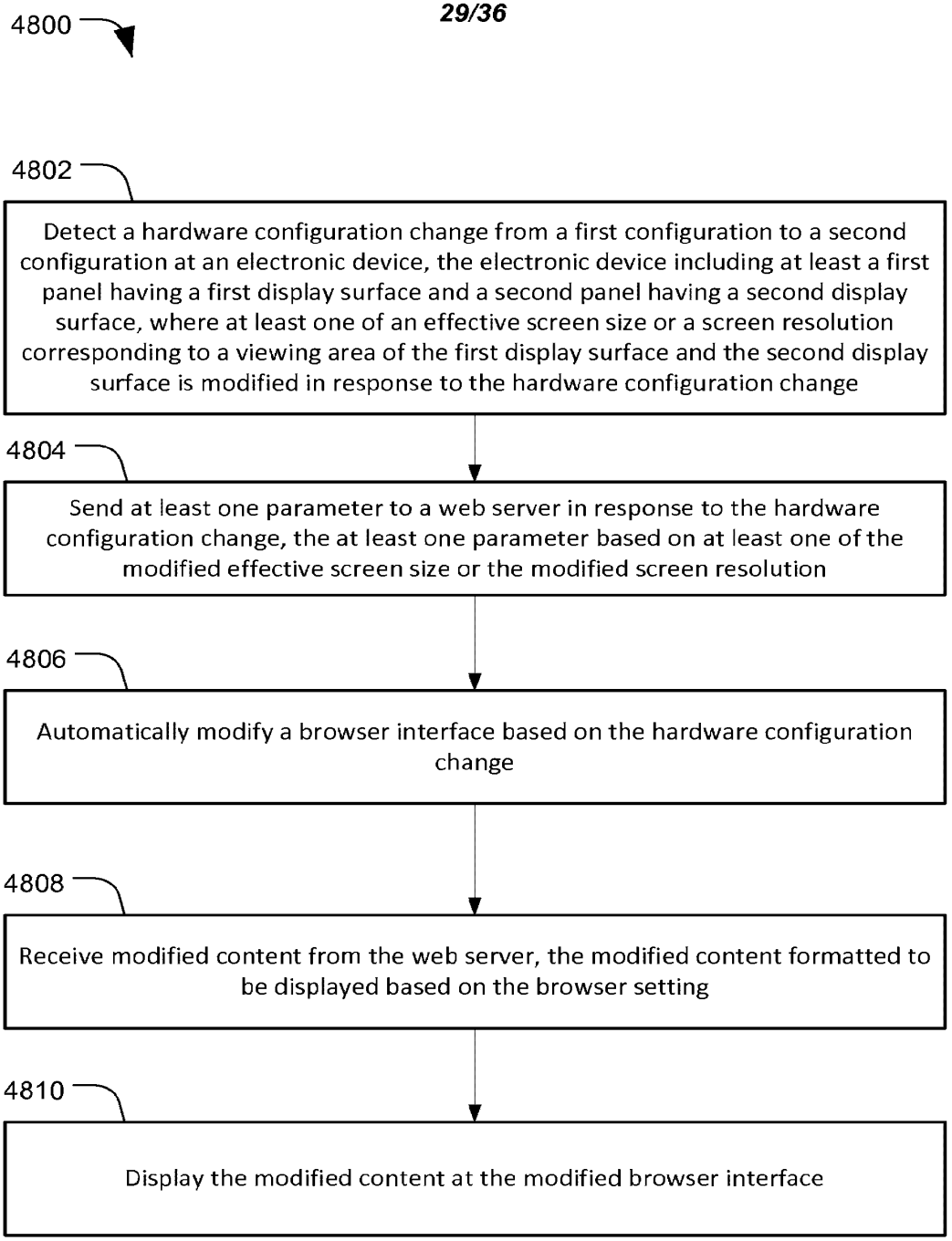

4800
4802
Detect a hardware configuration change from a first configuration to a second configuration at an electronic device, the electronic device including at least a first panel having a first display surface and a second panel having a second display surface, where at least one of an effective screen size or a screen resolution corresponding to a viewing area of the first display surface and the second display surface is modified in response to the hardware configuration change
4804
Send at least one parameter to a web server in response to the hardware configuration change, the at least one parameter based on at least one of the modified effective screen size or the modified screen resolution
4806
Automatically modify a browser interface based on the hardware configuration change
4808
Receive modified content from the web server, the modified content formatted to be displayed based on the browser setting
4810
Display the modified content at the modified browser interface

FIG. 48

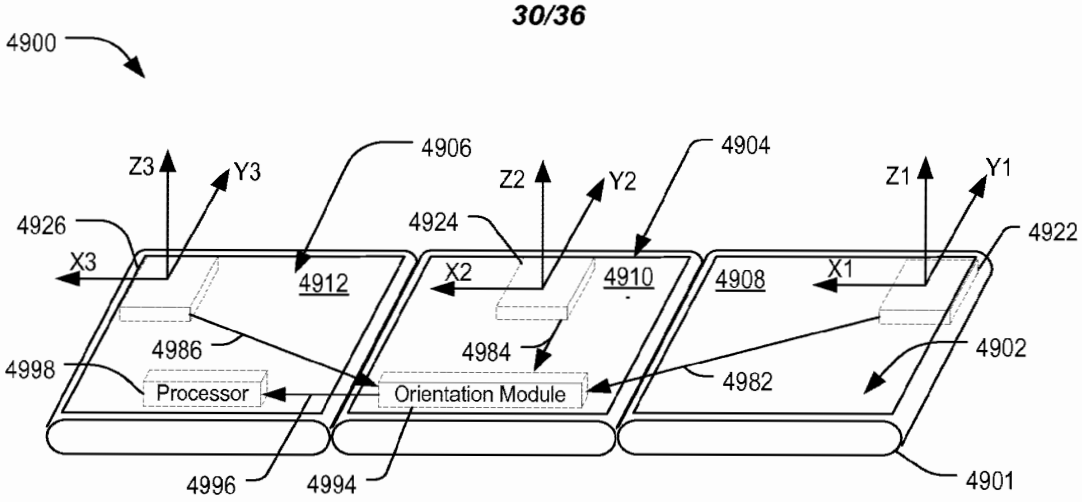


FIG. 49

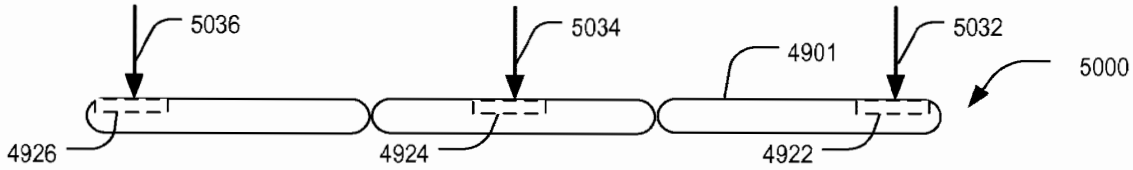


FIG. 50

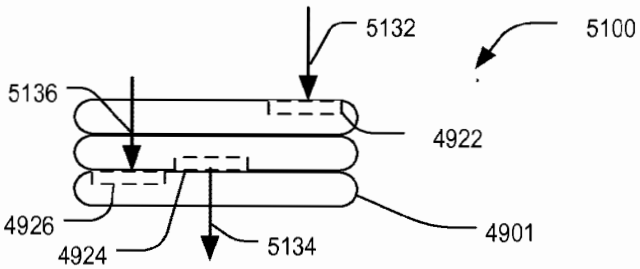


FIG. 51

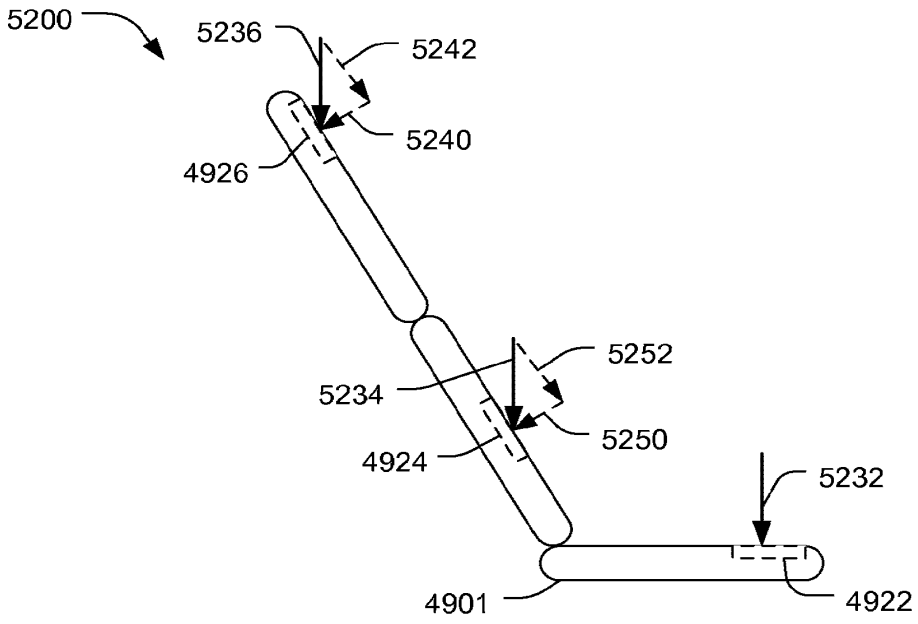

5200
5236
5242
5240
4926
5252
5234
5250
4924
5232
4901
4922

FIG. 52

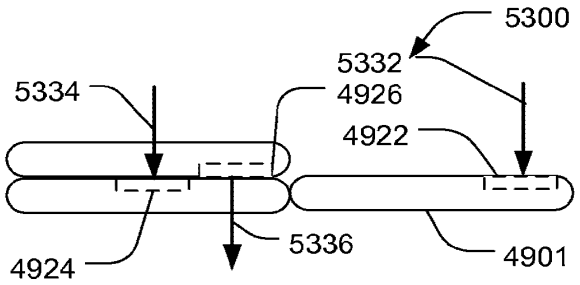

5300
5332
5334
4926
4922
5336
4924
4901

FIG. 53

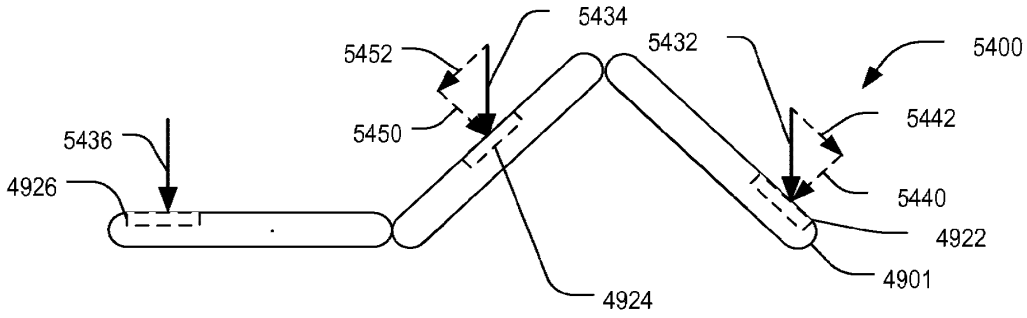

5434
5452
5432
5400
5450
5442
5436
4926
5440
4922
4924
4901

FIG. 54

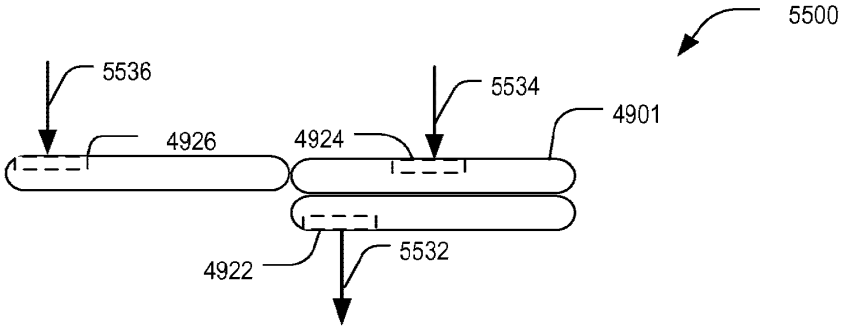

5500
5536
5534
4901
4926
4924
4922
5532

FIG. 55

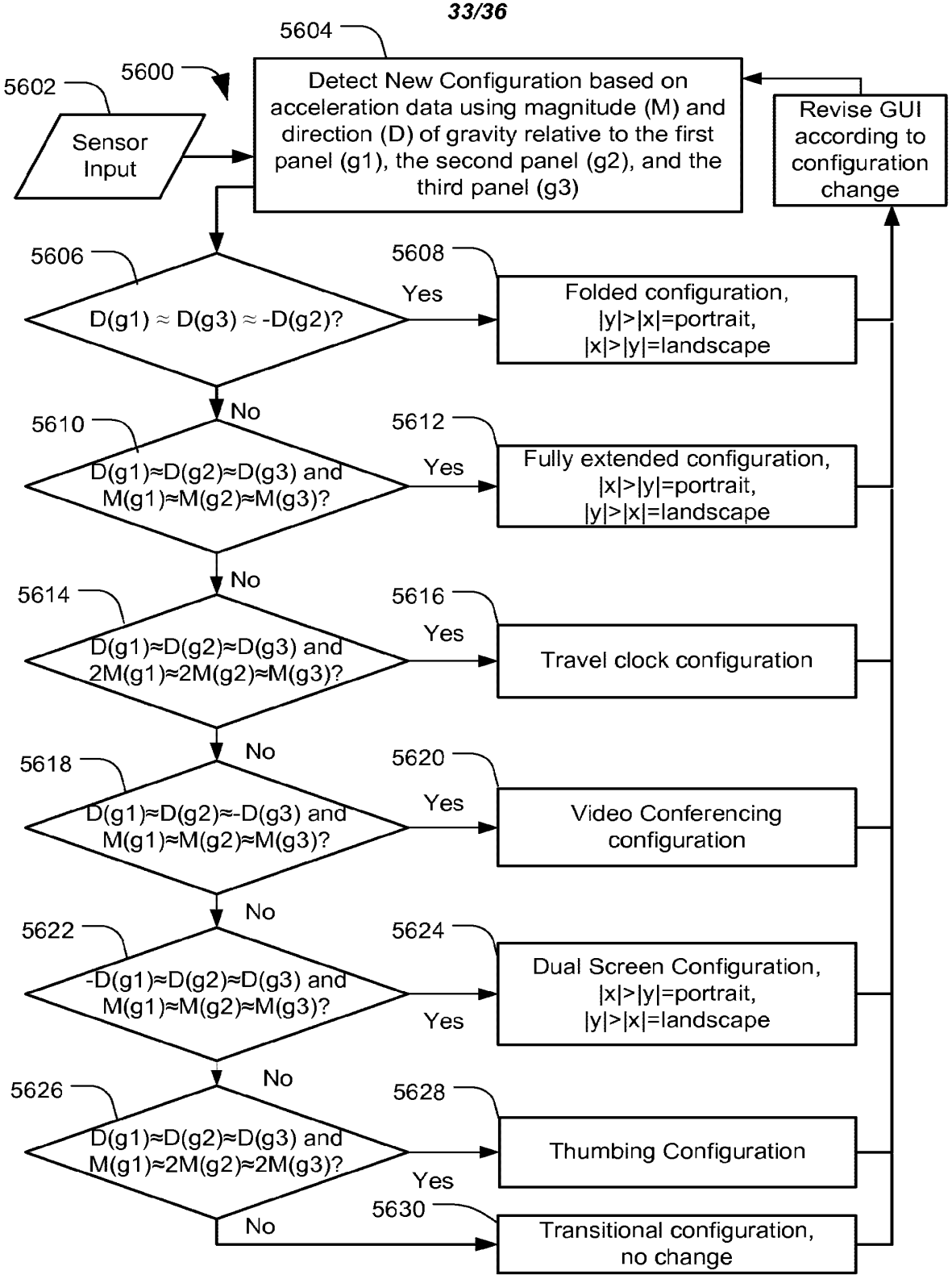

5604
5600
5602
Sensor Input
Detect New Configuration based on acceleration data using magnitude (M) and direction (D) of gravity relative to the first panel (g1), the second panel (g2), and the third panel (g3)
Revise GUI according to configuration change
5606
D(g1) ≈ D(g3) ≈ -D(g2)?
Yes
5608
Folded configuration, |y|>|x|=portrait, |x|>|y|=landscape
No
5610
D(g1)≈D(g2)≈D(g3) and M(g1)≈M(g2)≈M(g3)?
Yes
5612
Fully extended configuration, |x|>|y|=portrait, |y|>|x|=landscape
No
5614
D(g1)≈D(g2)≈D(g3) and 2M(g1)≈2M(g2)≈M(g3)?
Yes
5616
Travel clock configuration
No
5618
D(g1)≈D(g2)≈-D(g3) and M(g1)≈M(g2)≈M(g3)?
Yes
5620
Video Conferencing configuration
No
5622
-D(g1)≈D(g2)≈D(g3) and M(g1)≈M(g2)≈M(g3)?
Yes
5624
Dual Screen Configuration, |x|>|y|=portrait, |y|>|x|=landscape
No
5626
D(g1)≈D(g2)≈D(g3) and M(g1)≈2M(g2)≈2M(g3)?
Yes
5628
Thumbing Configuration
No
5630
Transitional configuration, no change

FIG. 56

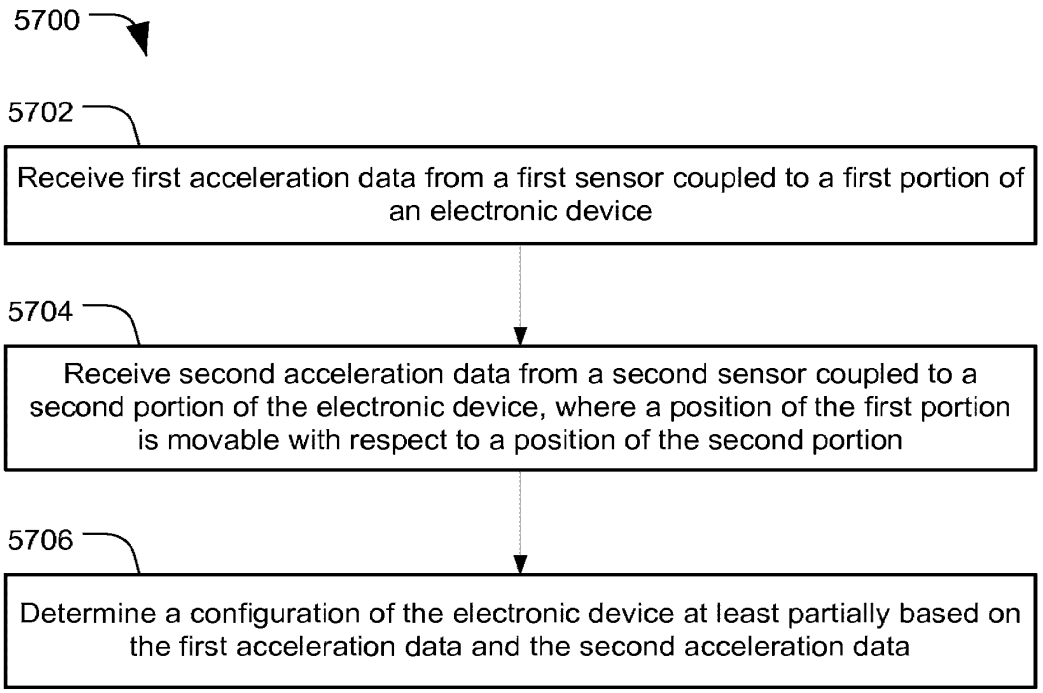

5700
5702
Receive first acceleration data from a first sensor coupled to a first portion of an electronic device
5704
Receive second acceleration data from a second sensor coupled to a second portion of the electronic device, where a position of the first portion is movable with respect to a position of the second portion
5706
Determine a configuration of the electronic device at least partially based on the first acceleration data and the second acceleration data

FIG. 57

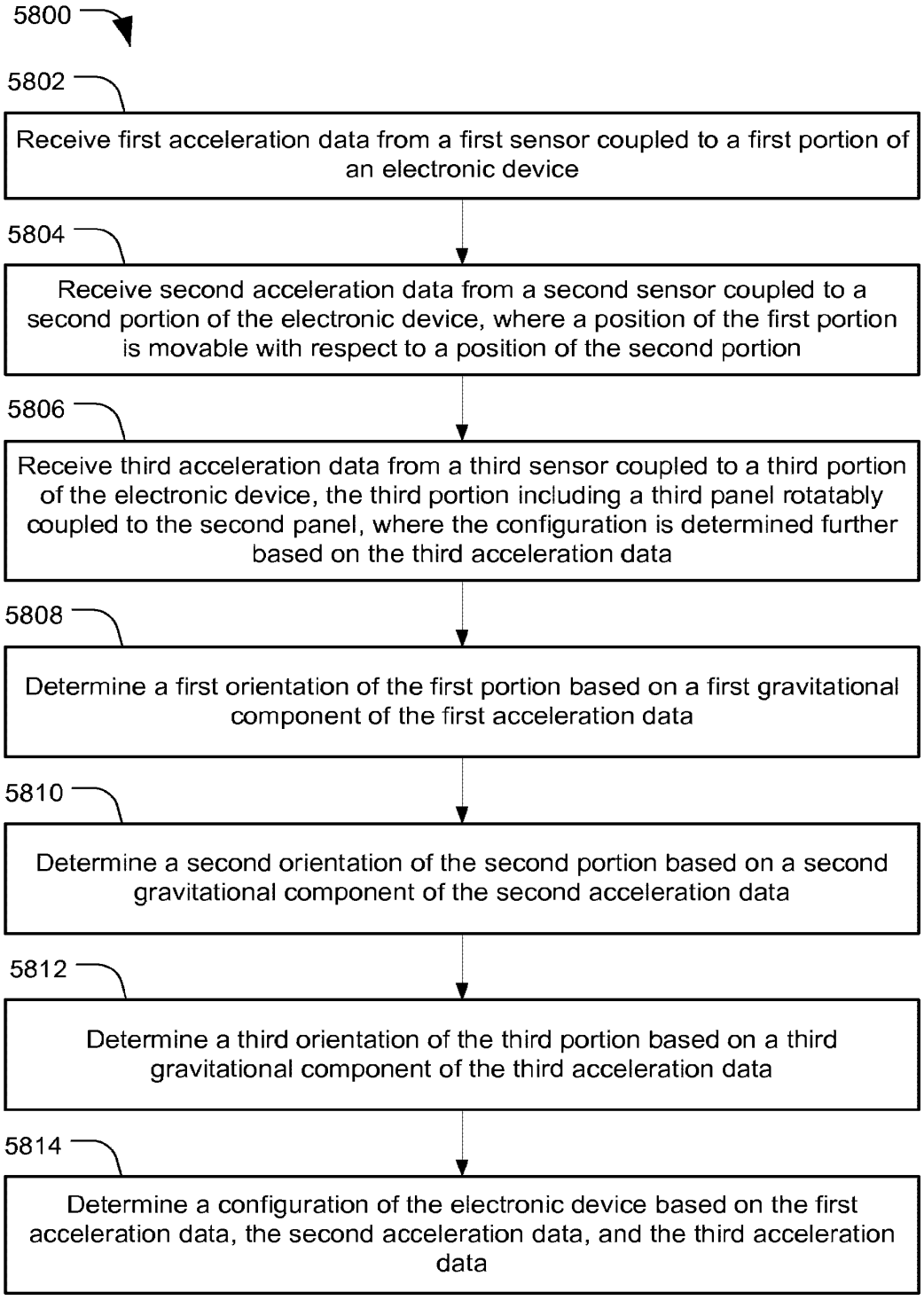

5800
5802
Receive first acceleration data from a first sensor coupled to a first portion of an electronic device
5804
Receive second acceleration data from a second sensor coupled to a second portion of the electronic device, where a position of the first portion is movable with respect to a position of the second portion
5806
Receive third acceleration data from a third sensor coupled to a third portion of the electronic device, the third portion including a third panel rotatably coupled to the second panel, where the configuration is determined further based on the third acceleration data
5808
Determine a first orientation of the first portion based on a first gravitational component of the first acceleration data
5810
Determine a second orientation of the second portion based on a second gravitational component of the second acceleration data
5812
Determine a third orientation of the third portion based on a third gravitational component of the third acceleration data
5814
Determine a configuration of the electronic device based on the first acceleration data, the second acceleration data, and the third acceleration data

FIG. 58

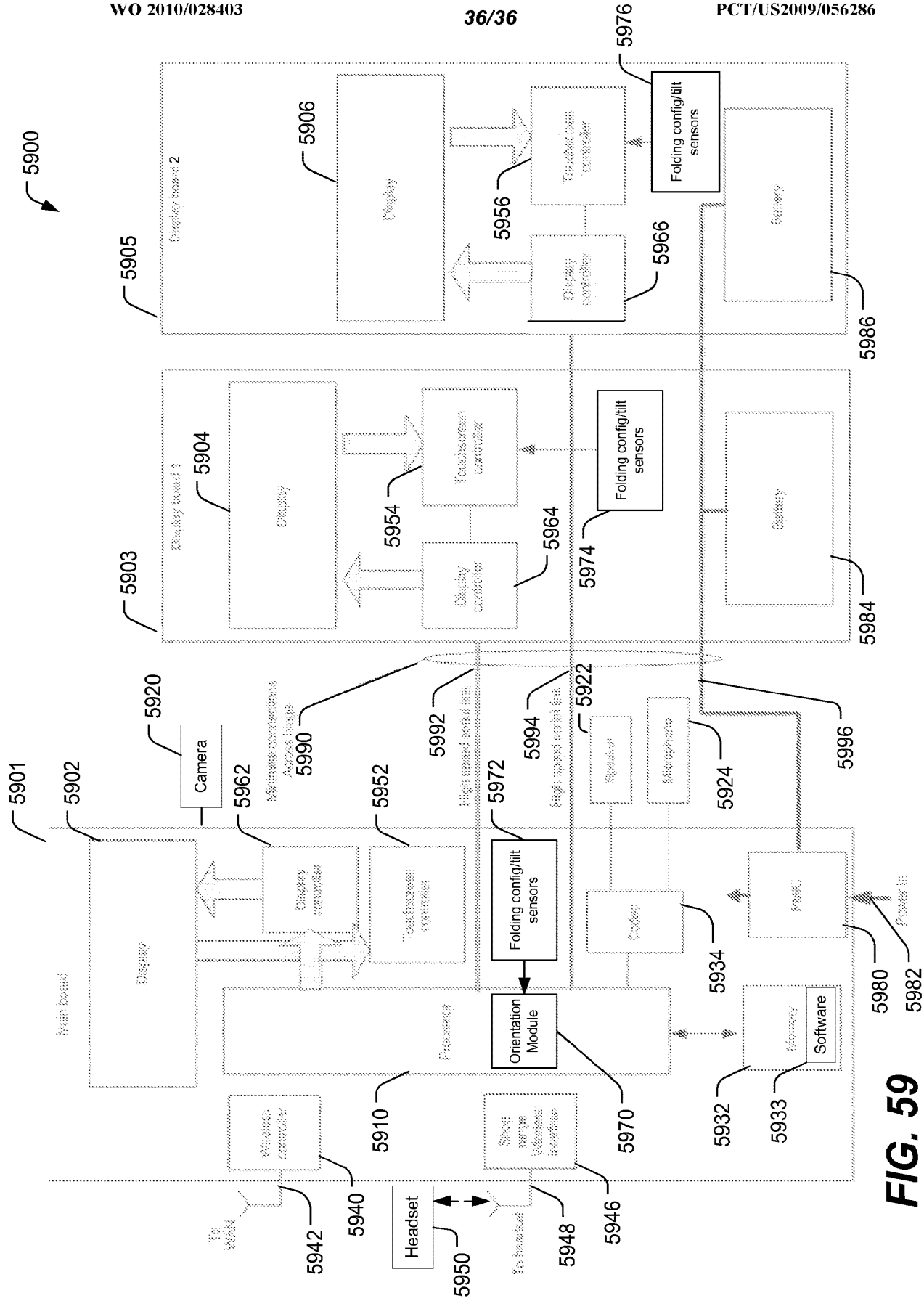

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5992
5994
5996
Camera
Display
Folding config/tilt sensors
Orientation Module
Software
Headset

FIG. 59

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2009/056286

A. CLASSIFICATION OF SUBJECT MATTER
INV. G06F1/16

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2005/121930 A (MOTOROLA INC [US]; ONG DEE NAI [SG]) 22 December 2005 (2005-12-22) paragraphs [0036] - [0067] figures 1-12	1-25
X	EP 0 929 027 A (XEROX CORP [US]) 14 July 1999 (1999-07-14) paragraph [0023] paragraphs [0112] - [0117] figures 30-32	1-25
A	US 2004/203520 A1 (SCHIRTZINGER TOM [US] ET AL) 14 October 2004 (2004-10-14) paragraphs [0032] - [0044] figures 2,4-7	1,12,18, 23

-/--

[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
10 December 2009	17/12/2009

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Baldan, Marco

Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2009/056286

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2005/099361 A1 (MAJER VLADIMIR [HR]) 12 May 2005 (2005-05-12) the whole document -----	5,14-17, 22,25

Form PCT/ISA/210 (continuation of second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2009/056286

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2005121930 A	22-12-2005	US 2006007139 A1	12-01-2006
EP 0929027 A	14-07-1999	JP 4065618 B2	26-03-2008
		JP 11312040 A	09-11-1999
		US 6160540 A	12-12-2000
US 2004203520 A1	14-10-2004	NONE	
US 2005099361 A1	12-05-2005	NONE	

Form PCT/ISA/210 (patent family annex) (April 2005)

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT *(Use as many sheets as necessary)*				Application Number	13/247,708
				Filing Date	September 28, 2011
				First Named Inventor	Sanjiv Sirpal
				Art Unit	2174
				Examiner Name	Steven Paul Sax
Sheet	1	of	1	Attorney Docket Number	6583-67

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No.[1]	Document Number Number-kind Code [2] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1	2009/0061970	03/05/2009	Wylie et al.	
	2	2010/0245106	09/30/2010	Miller et al.	
	3	2011/0193806	08/11/2011	Kim et al.	

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]; Number[4]; Kind Code[5] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]
	4	WO 2010/028403	03/11/2010	QUALCOMM INCORPORATED		

NON-PATENT LITERATURE DOCUMENTS		
Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
	5	Extended European Search Report for European Patent Application No. 11829892.6 dated Jul. 2, 2014 (Attorney Ref. No. 6583-28-PEP), 7 pages.
	6	Official Action for U.S. Patent Application No. 13/247,982 mailed Feb. 5, 2014 (Attorney's Ref. No. 6583-28). 13 pages.
	7	Official Action for U.S. Patent Application No. 13/247,369 mailed May 2, 2014 (Attorney's Ref. No. 6583-66) 21 pages
	8	Official Action for U.S. Patent Application No. 13/366,483 mailed May 23, 2014 (Attorney's Ref. No. 6583-120), 18 pages.
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	10	"iPhone User Guide For iPhone OS 3.1 Software," Apple Inc., 2009, 217 pages.
	11	RITCHIE, "iOS 4 features: Background app killing," imore.com, Aug. 10, 2010 [retrieved 12/14/2013], 3 pages. Retrieved from: www.imore.com/ios-4-features-background-app-killing

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1] Applicant's unique citation designation number (optional). [2] See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6] Applicant is to place a check mark here if English language Translation is attached.

Electronic Acknowledgement Receipt	
EFS ID:	19605436
Application Number:	13247708
International Application Number:	
Confirmation Number:	8636
Title of Invention:	FULL-SCREEN ANNUNCIATOR
First Named Inventor/Applicant Name:	Sanjiv Sirpal
Customer Number:	111285
Filer:	Douglas W. Swartz/David Voegtle
Filer Authorized By:	Douglas W. Swartz
Attorney Docket Number:	6583-67
Receipt Date:	17-JUL-2014
Filing Date:	28-SEP-2011
Time Stamp:	12:04:31
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Foreign Reference	WO2010028403.pdf	6239506 ae33bbae645a038610ff44d27f7033ed397d6bd2	no	117
Warnings:					
Information:					

2	Non Patent Literature	6583-28-PEP_EESR_07-02-2014.pdf	478805 55a6420ac411dcd3cc93c99a2dcfc7f95fafbdb8	no	7
Warnings:					
Information:					
3	Non Patent Literature	6583-28_OA_02-05-2014.pdf	510297 936154006111f0f0695278fc07569fe42855da611	no	13
Warnings:					
Information:					
4	Non Patent Literature	6583-66_OA_05-02-2014.pdf	726071 76a3527663d641e67198bb84f16e1929bd318a95	no	21
Warnings:					
Information:					
5	Non Patent Literature	6583-120_OA_05-23-2014.pdf	572561 c3820651eedccd85ba44470466b62fcd55dcaa0b	no	18
Warnings:					
Information:					
6	Non Patent Literature	6583-312_OA_04-17-2014.pdf	481055 e571f9694286dd56b5c96c64d3b93a2a7e5106ec	no	14
Warnings:					
Information:					
7	Non Patent Literature	iPhone_User_Guide_OS3-1_Software.pdf	7450038 75989c95d97e2bbdc153fd9ee761d557d3f48d4f	no	217
Warnings:					
Information:					
8	Non Patent Literature	RITCHIE_iOS_4_features.pdf	242494 b00a60ec781f4dadaee093ff9e3e679025b74bd5	no	3
Warnings:					
Information:					
9		IDS_03.pdf	388343 2041923c49247dd3a640e274110c31e124db95c5	yes	4

Multipart Description/PDF files in .zip description

Document Description	Start	End
Transmittal Letter	1	3
Information Disclosure Statement (IDS) Form (SB08)	4	4

Warnings:	
Information:	
Total Files Size (in bytes):	17089170

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re the Application of:	)	Group Art Unit: 2174
Sanjiv Sirpal	)	Confirmation No.: 8636
Serial No.: 13/247,708	)	Examiner: Steven Paul Sax
Filed: September 28, 2011	)	SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT
Atty. File No.: 6583-67	)	
Entitled: "Full-Screen Annunciator"	)	*Electronically Submitted*

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

The references cited on attached Form PTO/SB08 are being called to the attention of the Examiner.

☒ Copies of the cited non-patent and/or foreign references are enclosed herewith.

☐ Copies of the cited U.S. patents and/or patent applications are enclosed herewith.

☒ Copies of the cited U.S. patents/patent application publications are not enclosed in accordance with 37 C.F.R. § 1.98(a).

☐ Copies of the cited references are not enclosed, in accordance with 37 C.F.R. § 1.98(d), because the references were cited by or submitted to the U.S. Patent and Trademark Office in prior application Serial No. _____ filed _____, which is relied upon for an earlier filing date under 35 U.S.C. § 120.

☐ To the best of applicants' belief, the pertinence of the foreign-language references is believed to be summarized in the attached English abstracts and/or in the figures, although applicants do not necessarily vouch for the accuracy of the translation.

☐ Examiner's attention is drawn to the following related applications:

Serial No. _____ filed _____ (Attorney Ref. No. _____)

Serial No. _____ filed _____ (Attorney Ref. No. _____)

☐ Other:_____

Submission of the above information is not intended as an admission that any item is citable under the statutes or rules to support a rejection, that any item disclosed represents analogous art, or that those skilled in the art would refer to or recognize the pertinence of any reference without the benefit of hindsight, nor should an inference be drawn as to the pertinence

of the references based on the order in which they are presented. Submission of this statement should not be taken as an indication that a search has been conducted, or that no better art exists.

It is respectfully requested that the cited information be expressly considered during the prosecution of this application and the references made of record therein.

FEES

☒	**37 CFR 1.97(b)**: No fee is believed due in connection with this submission, because the information disclosure statement submitted herewith is satisfied by one of the following conditions ("X" indicates satisfaction): ☐ Within three months of the filing date of a national application other than a continued prosecution application under 37 CFR 1.53(d), or ☐ Within three months of the date of entry of the national stage as set forth in § 1.491 in an international application, or ☒ Before the mailing date of a first Office Action on the merits, or ☐ Before the mailing of a first Office action after the filing of a request for continued examination under 37 CFR 1.114. Although no fee is believed due, if any fee is deemed due in connection with this submission, please charge such fee to Deposit Account 19-1970.
☐	**37 CFR 1.97(c)**: The information disclosure statement transmitted herewith is being filed after all the above conditions (37 CFR 1.97(b)), but before the mailing date of any one of the following conditions: (1) a final action under 37 C.F.R. 1.113, or (2) a notice of allowance under 37 C.F.R. 1.311, or (3) an action that otherwise closes prosecution in the application. This Information Disclosure Statement is accompanied by: ☐ A Certification (below) as specified by 37 C.F.R. 1.97(e). Although no fee is believed due, if any fee is deemed due in connection with this submission, please charge such fee to Deposit Account 19-1970. OR ☐ Please charge Deposit Account 19-1970 in the amount of $180.00 for the fee set forth in 37 C.F.R. 1.17(p) for submission of an information disclosure statement. Please credit any overpayment or charge any underpayment to Deposit Account 19-1970.
☐	**37 CFR 1.97(d)**: This Information Disclosure Statement is being submitted after the period specified in 37 CFR 1.97(c). ☐ This information Disclosure Statement includes a Certification (below) as specified by 37 C.F.R. 1.97(e) AND ☐ Applicants hereby requests consideration of the reference(s) disclosed herein. Please charge Deposit Account 19-1970 in the amount of $180.00 under 37 C.F.R. 1.17(p). Please credit any overpayment or charge any underpayment to Deposit Account 19-1970. Election to pay the fee should not be taken as an indication that applicant(s) cannot execute a certification.

Certification (37 C.F.R. 1.97(e))
(Applicable only if checked)

☐ The undersigned certifies that:

☐ Each item of information contained in the Information Disclosure Statement submitted herewith was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this statement. 37 C.F.R. 1.97(e)(1).

☐ A copy of the communication from the foreign patent office is enclosed.

OR

☐ No item of information contained in the Information Disclosure Statement submitted herewith was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the undersigned after making reasonable inquiry, no item of information contained in the Information Disclosure Statement was known to any individual designated in 37 C.F.R. 1.56(c) more than three months prior to the filing of this statement. 37 C.F.R. 1.97(e)(2).

Respectfully submitted,

SHERIDAN ROSS P.C.

DWS

By: /Douglas W. Swartz/
Douglas W. Swartz
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Denver, Colorado 80202-5141
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Date: July 14, 2014

Notice of References Cited	Application/Control No. 13/247,708	Applicant(s)/Patent Under Reexamination SIRPAL ET AL.	
	Examiner STEVEN SAX	Art Unit 2174	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-2010/0079355	04-2010	Kilpatrick et al.	345/1.3
*	B	US-7,636,899	12-2009	Purcell et al.	715/790
*	C	US-2013/0097532	04-2013	Reeves et al.	715/761
*	D	US-2012/0084675	04-2012	Sirpal et al.	715/761
*	E	US-2009/0177617	07-2009	Lee, Michael M.	707/1
*	F	US-2007/0234222	10-2007	Yamaguchi et al.	715/761
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Application Number	13/247,708
				Filing Date	September 28, 2011
				First Named Inventor	Sanjiv Sirpal
(Use as many sheets as necessary)				Art Unit	2174
				Examiner Name	Steven Paul Sax
Sheet	1	of	2	Attorney Docket Number	6583-67

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-kind Code[2] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1	8108782	01/31/2012	Rajpal et al.	
	2	8290540	10/16/2012	Kittel et al.	
	3	8300022	10/30/2012	Brenneman et al.	
	4	8385057	02/26/2013	Liu et al.	
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	7	2002/0140698	10/03/2002	Robertson et al.	
	8	2004/0066408	04/08/2004	Meyers et al.	
	9	2009/0113330	04/30/2009	Garrison et al.	
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	12	2010/0144433	06/10/2010	Yamada et al.	
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	21	2012/0266098	10/18/2012	Webber	
	22	2013/0079062	03/28/2013	Sirpal et al.	

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]; Number[4]; Kind Code[5] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]

NON-PATENT LITERATURE DOCUMENTS

Examiner Signature	/Steven Sax/	Date Considered	09/08/2014

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /S.S./

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Application Number	13/247,708
				Filing Date	September 28, 2011
				First Named Inventor	Sanjiv Sirpal
(Use as many sheets as necessary)				Art Unit	2174
				Examiner Name	Steven Paul Sax
Sheet	2	of	2	Attorney Docket Number	6583-67

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
	23	SOEGAARD, "Affordances." Interaction Design Foundation, (2010), 7 pages, [Retrieved May 29, 2013 from www.interaction-design.org/encyclopedia/affordances.html]
	24	International Preliminary Report on Patentability for International (PCT) Patent Application No. PCT/US2011/053942, mailed Apr. 11, 2013 (Attorney's Ref. No. 6583-28-PCT) 7 pages
	25	International Preliminary Report on Patentability for International (PCT) Patent Application No. PCT/US2011/053902, mailed Apr. 11, 2013 (Attorney's Ref. No. 6583-47-PCT) 8 pages
	26	International Preliminary Report on Patentability for International (PCT) Patent Application No. PCT/US2011/053963, mailed Apr. 11, 2013 (Attorney's Ref. No. 6583-66-PCT) 6 pages
	27	Official Action for U.S. Patent Application No. 13/247,982, mailed Aug. 15, 2013 (Attorney's Ref. No. 6583-28) 14 pages
	28	Official Action for U.S. Patent Application No. 13/247,797, mailed Sep. 12, 2013 (Attorney's Ref. No. 6583-47) 13 pages
	29	Notice off Allowance for U.S. Patent Application No. 13/247,797, mailed Oct. 11, 2013 (Attorney's Ref. No. 6583-47) 13 pages
	30	Official Action for U.S. Patent Application No. 13/247,369, mailed Oct. 10, 2013 (Attorney's Ref. No. 6583-66) 16 pages
	31	Official Action for U.S. Patent Application No. 13/223,778, mailed Jun. 06, 2013 (Attorney's Ref. No. 6583-110) 38 pages
	32	Official Action for U.S. Patent Application No. 13/223,778, mailed Nov. 07, 2013 (Attorney's Ref. No. 6583-110) 37 pages

Examiner Signature	/Steven Sax/	Date Considered	09/08/2014

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. Applicant's unique citation designation number (optional). [2] See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6] Applicant is to place a check mark here if English language Translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /S.S./

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT *(Use as many sheets as necessary)*				Application Number	13/247,708
				Filing Date	September 28, 2011
				First Named Inventor	Sanjiv Sirpal
				Art Unit	2174
				Examiner Name	Steven Paul Sax
Sheet	1	of	1	Attorney Docket Number	6583-67

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No.[1]	Document Number Number-kind Code [2] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1	2009/0061970	03/05/2009	Wylie et al.	
	2	2010/0245106	09/30/2010	Miller et al.	
	3	2011/0193806	08/11/2011	Kim et al.	

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]; Number[4]; Kind Code[5] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]
	4	WO 2010/028403	03/11/2010	QUALCOMM INCORPORATED		

NON-PATENT LITERATURE DOCUMENTS		
Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
	5	Extended European Search Report for European Patent Application No. 11829892.6 dated Jul. 2, 2014 (Attorney Ref. No. 6583-28-PEP), 7 pages.
	6	Official Action for U.S. Patent Application No. 13/247,982 mailed Feb. 5, 2014 (Attorney's Ref. No. 6583-28). 13 pages.
	7	Official Action for U.S. Patent Application No. 13/247,369 mailed May 2, 2014 (Attorney's Ref. No. 6583-66) 21 pages
	8	Official Action for U.S. Patent Application No. 13/366,483 mailed May 23, 2014 (Attorney's Ref. No. 6583-120), 18 pages.
	9	Official Action for U.S. Patent Application No. 13/629,211 mailed Apr. 17, 2014 (Attorney Ref. No. 6583-312), 14 pages.
	10	"iPhone User Guide For iPhone OS 3.1 Software," Apple Inc., 2009, 217 pages.
	11	RITCHIE, "iOS 4 features: Background app killing," imore.com, Aug. 10, 2010 [retrieved 12/14/2013], 3 pages. Retrieved from: www.imore.com/ios-4-features-background-app-killing

Examiner Signature	/Steven Sax/	Date Considered	09/08/2014

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1] Applicant's unique citation designation number (optional). [2] See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6] Applicant is to place a check mark here if English language Translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /S.S./

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Application Number	13/247,708
				Filing Date	September 28, 2011
				First Named Inventor	Sanjiv Sirpal
(Use as many sheets as necessary)				Art Unit	2172
				Examiner Name	Steven Paul Sax
Sheet	1	of	3	Attorney Docket Number	6583-67

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-kind Code[2] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1	2002/0021278	02/21/2002	Hinckley et al.	
	2	2008/0165152	07/10/2008	Forstall et al.	
	3	2009/0143141	06/04/2009	Wells et al.	
	4	2009/0319672	12/24/2009	Reisman	
	5	2010/0007603	01/14/2010	Kirkup	
	6	2010/0064244	03/11/2010	Kilpatrick, II et al.	
	7	2010/0064536	03/18/2010	Caskey et al.	
	8	2010/0081475	04/01/2010	Chiang et al.	
	9	2010/0085274	04/08/2010	Kilpatrick, II et al.	
	10	2010/0085382	04/08/2010	Lundqvist et al.	
	11	2010/0211872	08/19/2010	Rolston et al.	
	12	2010/0245209	09/30/2010	Miller et al.	
	13	2012/0081271	04/05/2012	Gimpl et al.	
	14	2012/0081280	04/05/2012	Schrock et al.	
	15	2012/0081309	04/05/2012	Sirpal et al.	
	16	2012/0081311	04/05/2012	Sirpal et al.	
	17	2012/0084710	04/05/2012	Sirpal et al.	

UNPUBLISHED U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-kind Code[2] (if known)	Application Date MM-DD-YYYY	Name of First Named Inventor or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	18	13/187026	07/20/2011	Chen	
	19	13/366483	02/06/2012	Sirpal et al.	
	20	13/624591	09/21/2012	Sirpal et al.	
	21	13/627577	09/26/2012	Sirpal et al.	
	22	13/629211	09/27/2012	Reeves et al.	

Examiner Signature	/Steven Sax/	Date Considered	09/08/2014

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1] Applicant's unique citation designation number (optional). [2] See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6] Applicant is to place a check mark here if English language Translation is attached.

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Application Number	13/247,708
				Filing Date	September 28, 2011
				First Named Inventor	Sanjiv Sirpal
(Use as many sheets as necessary)				Art Unit	2172
				Examiner Name	Steven Paul Sax
Sheet	2	of	3	Attorney Docket Number	6583-67

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]; Number[4]; Kind Code[5] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]
	23	WO 2012/044780	04/05/2012	IMERJ LLC		
	24	WO 2012/044801	04/05/2012	IMERJ LLC		
	25	WO 2012/044809	04/05/2012	IMERJ LLC		

NON-PATENT LITERATURE DOCUMENTS		
Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
	26	BURNS, "Motorola ATRIX 4G Laptop Dock Review," at www.androidcommunity.com/motorola-atrix-4g-laptop-dock-review-20110220/, Feb. 20, 2011, 5 pages
	27	CATACCHIO, "This smartphone has two huge screens...that rotate," The Next Web at www.thenextweb.com/asia/2010/10/07/this-smartphone-has-two-huge-screens-that-rotate/, Jul. 21, 2011, 2 pages
	28	Google images, accessed Apr. 18, 2011, 6 pages
	29	Harman03, "Kyocera Echo Dual-screen Android Phone," posted 4 weeks from Apr. 18, 2011, 3 pages
	30	"Lapdock™ for MOTOROLA ATRIX," at www.motorola.com/Consumers/US-EN/Consumer-Product-and-Services/Mobile..., accessed Apr. 18, 2011, 1 page
	31	"Motorola ATRIX 4G Laptop Dock Review," at www.phonearena.com/reviews/Motorola-ATRIX-4G-Laptop-Dock-Review_id2667, Mar. 2, 2011, 6 pages
	32	STEIN, S., "How does the Motorola Atrix 4G Lapdock compare with a laptop?" Crave - CNET, at www.news.cnet.com/8301-17938_105-20031251-1.html, Feb. 9, 2011, 7 pages
	33	Website entitled, "Kyocera Echo," at www.echobykyocera.com/, 2011, 6 pages
	34	Website entitled, "Sony Tablet," at www.store.sony.com/webapp/wcs/stores/servlet/CategoryDisplay?catalogId=10551&storeId=10151&langId=-1&categoryId=8198552921644795521, 2011, 3 pages
	35	International Search Report and Written Opinion for International Patent Application No. PCT/US11/53942, mailed Feb. 21, 2012 (Attorney Ref. No. 6583-28-PCT), 8 pages

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1] Applicant's unique citation designation number (optional). [2] See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6] Applicant is to place a check mark here if English language Translation is attached.

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				Filing Date	September 28, 2011
(Use as many sheets as necessary)				First Named Inventor	Sanjiv Sirpal
				Art Unit	2172
				Examiner Name	Steven Paul Sax
Sheet	3	of	3	Attorney Docket Number	6583-67

	36	International Search Report and Written Opinion for International Patent Application No. PCT/US11/53902, mailed Feb. 22, 2012 (Attorney Ref. No. 6583-47-PCT), 9 pages
	37	International Search Report and Written Opinion for International Patent Application No. PCT/US11/53963, mailed Feb. 22, 2012 (Attorney Ref. No. 6583-66-PCT), 7 pages

Examiner Signature	/Steven Sax/	Date Considered	09/08/2014

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1] Applicant's unique citation designation number (optional). [2] See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6] Applicant is to place a check mark here if English language Translation is attached.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re the Application of:	Group Art Unit: 2172
Sanjiv Sirpal	Confirmation No.: 8636
Serial No.: 13/247,708	Examiner: Steven Paul Sax
Filed: September 28, 2011	
Atty. File No.: 6583-67	INFORMATION DISCLOSURE STATEMENT
Entitled: "Full-Screen Annunciator"	*Electronically Submitted*

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

The references cited on attached Form PTO/SB08 are being called to the attention of the Examiner.

☒ Copies of the cited non-patent and/or foreign references are enclosed herewith.

☐ Copies of the cited U.S. patents and/or patent applications are enclosed herewith.

☒ Copies of the cited U.S. patents/patent application publications/unpublished patent applications are not enclosed in accordance with 37 C.F.R. § 1.98(a).

☐ Copies of the cited references are not enclosed, in accordance with 37 C.F.R. § 1.98(d), because the references were cited by or submitted to the U.S. Patent and Trademark Office in prior application Serial No. _____ filed _____, which is relied upon for an earlier filing date under 35 U.S.C. § 120.

☐ To the best of applicants' belief, the pertinence of the foreign-language references is believed to be summarized in the attached English abstracts and/or in the figures, although applicants do not necessarily vouch for the accuracy of the translation.

☒ Examiner's attention is drawn to the following related applications:

- Serial No. 13/247982 filed 09/28/2011 (Attorney Ref. No. 6583-28)
- Serial No. 13/247797 filed 09/28/2011 (Attorney Ref. No. 6583-47)
- Serial No. 13/247369 filed 09/28/2011 (Attorney Ref. No. 6583-66)
- Serial No. 13/223778 filed 09/01/2011 (Attorney Ref. No. 6583-110)
- Serial No. 13/366483 filed 02/06/2012 (Attorney Ref. No. 6583-120)
- Serial No. 13/624591 filed 09/21/2012 (Attorney Ref. No. 6583-122)
- Serial No. 13/627577 filed 09/26/2012 (Attorney Ref. No. 6583-253)

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /S.S./

- Serial No. 13/629211 filed 09/27/2012 (Attorney Ref. No. 6583-312)

☐ Other:_____

Submission of the above information is not intended as an admission that any item is citable under the statutes or rules to support a rejection, that any item disclosed represents analogous art, or that those skilled in the art would refer to or recognize the pertinence of any reference without the benefit of hindsight, nor should an inference be drawn as to the pertinence of the references based on the order in which they are presented. Submission of this statement should not be taken as an indication that a search has been conducted, or that no better art exists.

It is respectfully requested that the cited information be expressly considered during the prosecution of this application and the references made of record therein.

FEES

☒	**37 CFR 1.97(b)**: No fee is believed due in connection with this submission, because the information disclosure statement submitted herewith is satisfied by one of the following conditions ("X" indicates satisfaction): ☐ Within three months of the filing date of a national application other than a continued prosecution application under 37 CFR 1.53(d), or ☐ Within three months of the date of entry of the national stage as set forth in § 1.491 in an international application, or ☒ Before the mailing date of a first Office Action on the merits, or ☐ Before the mailing of a first Office action after the filing of a request for continued examination under 37 CFR 1.114. Although no fee is believed due, if any fee is deemed due in connection with this submission, please charge such fee to Deposit Account 19-1970.
☐	**37 CFR 1.97(c)**: The information disclosure statement transmitted herewith is being filed after all the above conditions (37 CFR 1.97(b)), but before the mailing date of any one of the following conditions: (1) a final action under 37 C.F.R. 1.113, or (2) a notice of allowance under 37 C.F.R. 1.311, or (3) an action that otherwise closes prosecution in the application. This Information Disclosure Statement is accompanied by: ☐ A Certification (below) as specified by 37 C.F.R. 1.97(e). Although no fee is believed due, if any fee is deemed due in connection with this submission, please charge such fee to Deposit Account 19-1970. OR ☐ Please charge Deposit Account 19-1970 in the amount of $180.00 for the fee set forth in 37 C.F.R. 1.17(p) for submission of an information disclosure statement. Please credit any overpayment or charge any underpayment to Deposit Account 19-1970.
☐	**37 CFR 1.97(d)**: This Information Disclosure Statement is being submitted after the period specified in 37 CFR 1.97(c). ☐ This information Disclosure Statement includes a Certification (below) as specified by 37 C.F.R. 1.97(e) AND ☐ Applicants hereby requests consideration of the reference(s) disclosed herein. Please charge Deposit Account 19-1970 in the amount of $180.00 under 37 C.F.R. 1.17(p). Please credit any overpayment or charge any underpayment to Deposit Account 19-1970. Election to pay the fee should not be taken as an indication that applicant(s) cannot execute a certification.

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Certification (37 C.F.R. 1.97(e))
(Applicable only if checked)

☐ The undersigned certifies that:

☐ Each item of information contained in this information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this statement. 37 C.F.R. 1.97(e)(1).

☐ A copy of the communication from the foreign patent office is enclosed.

OR

☐ No item of information contained in this information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the undersigned after making reasonable inquiry, no item of information contained in this Information Disclosure Statement was known to any individual designated in 37 C.F.R. 1.56(c) more than three months prior to the filing of this statement. 37 C.F.R. 1.97(e)(2).

Respectfully submitted,

SHERIDAN ROSS P.C.

By: _____

Brent P. Johnson
Registration No. 38031
1560 Broadway, Suite 1200
Denver, Colorado 80202-5141
(303) 863-9700

Date: 1/22/13

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UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/247,708	09/28/2011	Sanjiv Sirpal	6583-67	8636

111285 7590 09/12/2014

Sheridan Ross P.C.
1560 Broadway
Suite 1200
Denver, CO 80202

EXAMINER	
SAX, STEVEN PAUL	
ART UNIT	PAPER NUMBER
2174	

NOTIFICATION DATE	DELIVERY MODE
09/12/2014	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

flexpatents@sheridanross.com
edocket@sheridanross.com

Office Action Summary	Application No. 13/247,708	Applicant(s) SIRPAL ET AL.	
	Examiner STEVEN SAX	Art Unit 2174	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) 1-14 is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) 1-14 is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☒ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date *see attached*.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-14 are pending.

2. The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-14 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Purcell et al (7636899) and Lee (2009/0177617).

4. Regarding claim 1, Purcell et al show a method of displaying information on a multi-screen device including a plurality of desktops and/or applications each having at least one window (abstract), the method comprising:
receiving, by a processor, a first input that represents an instruction to reveal one of a desktop or application on a first display of the multi-screen device and selecting a first desktop or application to display on the first display (column 2 lines 10-67, column 3 lines 32-54); receiving, by a processor, a second input that represents an instruction to reveal one of a desktop or application on a second display of the multi-screen device and selecting a second desktop or application to display on the second display (column 2 lines 10-67, column 3 lines 32-54); displaying, by a processor, the selected first and

second desktops or applications on the first and second displays (column 2 lines 10-67, column 3 lines 32-54); displaying, by a processor, a pre-configured window having information therein and configuring by a processor, the window to extend across both said first and second displays (Figure 2, column 4 lines 31-54); modifying, by a processor, the display of the window in response to a changed state, wherein the modified display of the window displays information selectively across substantially all or part of said window (column 4 lines 6-31 and 50-67, column 5 lines 11-65). Purcell et al do not go into the details that the pre-configured window is an annunciator window per se such that the information specifically shows at least one of a device status, connectivity status, and messaging status - and thus the changed state pertains to at least one of device status, connectivity status, and messaging status – but Purcell et al do mention the additional spanning window to display specific information to the user in a noticeable way. Furthermore, Lee shows an annunciator window with information showing a messaging status (note the alternative form of this feature and thus only the messaging status need be shown), and that the changed state resulting in modification of the displayed window content pertains to messaging status (Figures 5-8, para 60-62) to display specific information to the user in a noticeable way. It would have been obvious to a person with ordinary skill in the art to have the pre-configured window in Purcell et al be the annunciator window like in Lee, because it would provide an efficient way to utilize a spanning window to display specific information in a noticeable way.

5. Regarding claim 2, said modifying step includes displaying the changed state including text corresponding to at least one of a phone message, email message, or text message (see Figures 5-7 of Lee. Motivation to combine with Purcell et al is the same as that mentioned for claim 1).

6. Regarding claim 3, said modifying step includes displaying the changed state across a portion of said annunciator window and masking at least one icon representing said device status, a connectivity status, or messaging status (Lee para 49, 68, 78, 80, 84. Motivation to combine with Purcell et al is the same as that mentioned for claim 1).

7. Regarding claim 4, said modifying step includes displaying the changed state across substantially all of said annunciator window (Lee Figures 6, 8, para 61. Motivation to combine with Purcell et al is the same as that mentioned for claim 1).

8. Regarding claim 5, neither Purcell et al nor Lee show the annunciator window being located across adjacent upper or lower edges of the first and second displays, but Purcell et al do show the annunciator window is located across adjacent right or left edges of said first and second displays (Purcell et Figure 2). Furthermore, Examiner takes Official Notice that the orientation of the window in Purcell et al can easily be rotated and that that the displays can be aligned physically to be one on top of the other, as a convenient design choice (see also Purcell et al Figure 2 and column 1

lines 45-60). It would have been obvious to a person with ordinary skill in the art to have this in Purcell et al (and especially when combined with Lee), because it would provide a convenient design choice with which to display another orientation the window.

9. Claims 6-9 show the same features as claims 1-3 and 5 respectively, and are rejected for the same reasons.

10. Claims 10-14 show the same features as claims 1-5 respectively, and are rejected for the same reasons.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to STEVEN SAX whose telephone number is (571)272-4072. The examiner can normally be reached on Monday thru Friday, 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dennis Chow can be reached on (571) 272-7767. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/STEVEN SAX/
Primary Examiner, Art Unit 2174

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13247708	SIRPAL ET AL.
	Examiner	**Art Unit**
	STEVEN SAX	2174

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	09/02/2014								
	1	✓								
	2	✓								
	3	✓								
	4	✓								
	5	✓								
	6	✓								
	7	✓								
	8	✓								
	9	✓								
	10	✓								
	11	✓								
	12	✓								
	13	✓								
	14	✓								

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13247708	SIRPAL ET AL.
	Examiner	Art Unit
	STEVEN SAX	2174

CPC- SEARCHED		
Symbol	Date	Examiner

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
715	761, 803-806, 790, 792	9/14	SS
715	769	9/14	SS

SEARCH NOTES		
Search Notes	Date	Examiner
East (attached)	9/14	SS

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L7	2	(message or email or voicemail) with (indicat$ or alert or annunciator) with (fill or filling or filled or cover or covering or covered or across) with (entire or all) with window and @ad<"20101010"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/09/08 13:03
L8	24	(message or email or voicemail) with (indicat$ or alert or annunciator) and 715/761.ccls. and @ad<"20101010"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/09/08 13:05
L9	3	(message or email or voicemail) with (indicat$ or alert or annunciator) with window and 715/761.ccls. and @ad<"20101010"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/09/08 13:05

9/ 8/ 2014 1:07:08 PM
C:\ Users\ ssax\ Documents\ EAST\ Workspaces\ 12556723.wsp

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L5	39	715/761.ccls. and window with (cover or covering or covered or span or spanning or spanned or extend or extended or extending) with both with (display or screen)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/09/08 10:23
L6	2	715/761.ccls. and window with (cover or covering or covered or span or spanning or spanned or extend or extended or extending) with both with (display or screen) and @ad<"20101010"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/09/08 10:24

9/8/2014 10:29:54 AM
C:\Users\ssax\Documents\EAST\Workspaces\12556723.wsp

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/247,708	09/28/2011	Sanjiv Sirpal	6583-67	8636

111285 7590 10/09/2014

Sheridan Ross P.C.
1560 Broadway
Suite 1200
Denver, CO 80202

EXAMINER	
SAX, STEVEN PAUL	
ART UNIT	PAPER NUMBER
2174	

NOTIFICATION DATE	DELIVERY MODE
10/09/2014	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

flexpatents@sheridanross.com
edocket@sheridanross.com

Applicant-Initiated Interview Summary	Application No.	Applicant(s)	
	13/247,708	SIRPAL ET AL.	
	Examiner	Art Unit	
	STEVEN SAX	2174	

All participants (applicant, applicant's representative, PTO personnel):

(1) *Mr. Dean Reinhardt*. (3)_____.

(2) *Mr. Steve Sax*. (4)_____.

Date of Interview: *02 October 2014*.

Type: ☒ Telephonic ☐ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☐ No.
If Yes, brief description: _____.

Issues Discussed ☐101 ☐112 ☐102 ☒103 ☐Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: *proposed amended claim 1*.

Identification of prior art discussed: *Purcell, Lee*.

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

Applicant's representative proposed amended claims to bring out concepts of the invention. Applicant's representative and Examiner further discussed the invention and the prior art. Examiner suggested further changes and clarifications, such as the mobile, attached screens. No agreement was reached, but applicant will most likely file the amendment incorporating at least some of the suggestions..

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☐ Attachment

/STEVEN SAX/ Primary Examiner, Art Unit 2174	

Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record
A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews
Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.
All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:
- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:
1) A brief description of the nature of any exhibit shown or any demonstration conducted,
2) an identification of the claims discussed,
3) an identification of the specific prior art discussed,
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
5) a brief identification of the general thrust of the principal arguments presented to the examiner,
   (The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re the Application of:	)	Group Art Unit: 2174
Sanjiv Sirpal	)	Confirmation No.: 8636
Serial No.: 13/247,708	)	Examiner: Steven Paul Sax
Filed: September 28, 2011	)	
Atty. File No.: 6583-67	)	**AMENDMENT AND RESPONSE**
Entitled: "Full-Screen Annunciator"	)	
	)	***Electronically Submitted***

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Dear Commissioner:

Applicant submits this Amendment and Response to address the Office Action having a mailing date of September 12, 2014. While Applicants believe no fees are due with the filing of this Amendment and Response, the undersigned hereby authorizes the Commissioner to charge any fees deemed necessary to Deposit Account No. 19-1970.

Amendments to the Claims are reflected in the listing of claims which begins on **page 2** of this paper.

Remarks/Arguments begin on **page 7** of this paper.

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A method of displaying information on a mobile ~~multi-screen~~ multi-display device including a plurality of desktops and/or applications each having at least one window, and an annunciator window, the method comprising:

placing the multi-display device in an open state with a first display and a second display facing in a same direction;

receiving, by a processor, a first input that represents an instruction to reveal one of a desktop or application ~~on a~~ on the first display of the multi-display ~~multi-screen~~ device and selecting a first desktop or application to display on the first display;

receiving, ~~by a~~ by the processor, a second input that represents an instruction to reveal one of a desktop or application ~~on a~~ on the second display of the ~~multi-screen~~ multi-display device and selecting a second desktop or application to display on the second display;

displaying, ~~by a~~ by the processor, the selected first and second desktops or applications on the first and second displays;

displaying, ~~by a~~ by the processor, a pre-configured annunciator window having information therein showing at least one of a device status, a connectivity status, and a messaging status;

configuring, ~~by a~~ by the processor, the annunciator window to extend across a first portion of ~~both~~ said first display and a second portion of said ~~and~~ second ~~displays~~ display, wherein said first portion and said second portion do not degrade the display of information by the selected first and second desktops or applications;

modifying, ~~by a~~ by the processor, the display of the annunciator window in response to a changed state of at least one of said device status, ~~a connectivity~~ connectivity status, and messaging status; and

wherein the modified display of the annunciator window displays information selectively across substantially all or part of said annunciator window.

2. (Currently Amended) The method of claim 1, wherein ~~said~~ modifying ~~step~~ the display of the annunciator window includes displaying the changed state including text corresponding to at least one of a calendar notification, a phone message, an email message, or a text message, and wherein the first display and the second display are on a common first screen of the multi-display device.

3. (Currently Amended) The method of claim 1, wherein ~~said~~ modifying ~~step~~ the display of the annunciator window includes displaying the changed state across a portion of said annunciator window and masking at least one icon representing said device status, ~~a connectivity~~ connectivity status, or messaging status, wherein the first display is on a first screen of the multi-display device, and wherein the second display is on a different second screen of the multi-display device.

4. (Currently Amended) The method of claim 1, wherein ~~said~~ modifying ~~step~~ the display of the annunciator window includes displaying information related to the changed state across substantially all of said annunciator window.

5. (Original) The method of claim 1, wherein said annunciator window is located across adjacent upper or lower edges of said first and second displays.

6. (Currently Amended) A non-transitory computer-readable medium having stored thereon instructions executable by a processor of a mobile multi-display device, the instructions causing the processor ~~that cause a computing system~~ to execute a method, the instructions comprising:

instructions configured to receive a first predetermined input that represents an instruction to determine and reveal a first desktop or application on a first display of the ~~multi-screen~~ multi-display device;

instructions configured to receive a second predetermined input that represents an instruction to determine and reveal a second desktop or application on a second display of the ~~multi-screen~~ multi-display device;

instructions configured to respond to the first and second predetermined inputs with outputs that cause the first desktop or application to be displayed on the first display and cause the second desktop or application to be displayed on the second display, wherein the

multi-display device is in an open state with the first display and the second display facing in a same direction;

instructions configured to receive a third predetermined input that represents an instruction to display a pre-configured annunciator window having information therein showing at least one of a device status, a connectivity status, and a messaging status; and

instructions configured to respond to the third predetermined input with an output that causes the annunciator window to be displayed in a configuration extending across ~~both of~~ a first portion of said first display and a second portion of said second ~~displays~~ display, wherein said first portion and said second portion do not degrade the display of information by the first and second desktops or applications displayed on the first and second displays.

7. (Currently Amended) The non-transitory computer-readable medium of claim 6, further including:

instructions configured to receive a fourth input that represents instructions to display a changed state of said multi-display device including text corresponding to at least one of a calendar notification, a phone message, an email message, or a text message; and

instructions configured to respond to the fourth input with an output that causes the annunciator window to be displayed in a changed configuration extending across both of said first and second displays.

8. (Currently Amended) The non-transitory computer-readable medium of claim 7, wherein said instructions configured to respond to the fourth input ~~cause a~~ cause the changed configuration to be displayed masking at least one icon representing said device status, [[a]] connectivity status, or messaging status, and wherein the first display and the second display are on a common first screen of the multi-display device.

9. (Currently Amended) The non-transitory computer-readable medium of ~~claim 7~~ claim 6, wherein said instructions configured to respond to the third predetermined input causes said annunciator window to be displayed across adjacent upper or lower edges of said first and second displays, wherein the first display is on a first screen of the multi-display device, and wherein the second display is on a different second screen of the multi-display device.

10. (Currently Amended) A mobile ~~multi-screen~~ multi-display user device, comprising:

~~a first display including~~ a first display ~~area~~;

~~a second display including~~ a second display ~~area~~;

a first user input gesture area ~~of the first display~~;

a second user input gesture area ~~of the second display~~, wherein the first and second user input gesture areas are configured to accept input from a user, and wherein the first and second user input gesture areas are not capable of performing a display function;

an annunciator ~~display~~ window extending across a first portion of said first display and a second portion of said second display ~~areas of said first and second displays~~ for displaying at least one of a device status, a connectivity status, and a messaging status;

a computer-readable medium having instructions stored thereon that include:

a first set of instructions configured to determine a number and identity of desktops or applications selected to be run by a user, wherein the multi-display device is in an open state with the first display and the second display facing in a same direction; and

a second set of instructions configured to determine information to be displayed in said annunciator ~~display~~ window based on selected user gestures and respective states of said device status, [[a]] connectivity status, and [[a]] messaging status[[;]], wherein said first portion and said second portion do not degrade the display of information by the first and second desktops or applications displayed on the first and second displays.

11. (Currently Amended) The device of claim 10, wherein: the second set of instructions include information regarding a changed state of one of said ~~statuses~~ device status, connectivity status, and messaging status including text corresponding to at least one of a calendar notification, a phone message, an email message, or a text message, and wherein the first display, the first user input gesture area, the second display, and the second user input gesture area are on a common first screen of the mobile multi-display user device.

12. (Original) The device of claim 10, wherein said second set of instructions result in displaying a changed state of said annunciator window across a portion of said

annunciator window and masking at least one icon representing said device status, [[a]] connectivity status, or messaging status.

13. (Original) The device of claim 10, wherein said second set of instructions result in displaying a changed state of said annunciator window across substantially all of said annunciator window.

14. (Currently Amended) The device of claim 10, wherein said second set of instructions result in displaying said annunciator display across adjacent upper or lower edges of said first and second ~~screens~~ displays, wherein the first display and the first user input gesture area are on a first screen of the mobile multi-display user device, and wherein the second display and the second user input gesture area are on a different second screen of the mobile multi-display user device.

15. (New) The device of claim1, wherein the first and second displays are both in a portrait mode.

16. (New) The device of claim 3, further comprising a hinge configured to connect the first screen with the second screen.

17. (New) The device of claim 1, further comprising displaying the messaging status on the first display in the annunciator window.

18. (New) The device of claim 1, wherein the messaging status includes information about one or more of a phone call, an email message, a text message, and a calendar item.

19. (New) The device of claim 1, wherein the information showing the device status and the connectivity status are in physical proximity.

20. (New) The device of claim 1, wherein modifying the display of the annunciator window does not include changing a size of the annunciator window, and wherein the annuncitor window appears to be a unitary window displayed on each of the first portion of the first display and the second portion of the second display.

Electronic Acknowledgement Receipt

EFS ID:	20905974
Application Number:	13247708
International Application Number:	
Confirmation Number:	8636
Title of Invention:	FULL-SCREEN ANNUNCIATOR
First Named Inventor/Applicant Name:	Sanjiv Sirpal
Customer Number:	111285
Filer:	Dean Reinhardt/Ginger Bovenkamp
Filer Authorized By:	Dean Reinhardt
Attorney Docket Number:	6583-67
Receipt Date:	09-DEC-2014
Filing Date:	28-SEP-2011
Time Stamp:	13:43:05
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		AMENDMENT_12SEP2014.pdf	211130 602ccd4ff4919846566c0849d9f52381190adfc0	yes	14

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment/Req. Reconsideration-After Non-Final Reject	1	1
	Claims	2	6
	Applicant Arguments/Remarks Made in an Amendment	7	14
Warnings:			
Information:			
	Total Files Size (in bytes):	211130	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

REMARKS/ARGUMENTS

Status of the Claims

In the non-final Office Action mailed September 12, 2014, claims 1-14 were pending in the application. Claims 1-4, 6-11, and 14 are amended and claims 15-20 have been added. Support for these amendments and for the new claims may be found at least at paragraphs 6-7, 18, 83, and 157-161 and Figs. 7-8 of the Specification, as filed. No new matter has been added. Claims 1-20 are currently pending and claims 1, 6, and 10 are independent claims. Applicant respectfully requests reconsideration of this application as amended.

Interview Summary

Applicant thanks the Examiner for the courtesies extended during the telephonic interview of October 2, 2014. During the Interview, Examiner Sax and Applicant's representative, Mr. Dean Reinhardt, discussed the Purcell and Lee references and proposed amendments to the claims. Applicant's representative presented arguments regarding allowability of the amended claims. Examiner Sax stated that the claim amendments included in the present amendment may overcome the rejections cited in the Office Action and that a new search would be required. Applicant requests that the Examiner contact Applicant's representative if an Examiner amendment will result in allowable subject matter.

Applicant believes that no additional written statements pursuant to MPEP § 713.04 are necessary. If this belief is incorrect, the Examiner is requested to call the undersigned or his associates at the telephone number listed below.

Claim Rejections Under 35 U.S.C. §103

Claims 1-14 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 7,636,899 to Purcell et al. ("Purcell") and U.S. Patent Application Publication No. 2009/0177617 to Lee ("Lee"). Applicant respectfully requests that the Examiner reconsider and withdraw the rejections made under 35 U.S.C. § 103 for at least the following reasons. When determining whether a claim is obvious under 35 U.S.C. § 103, an examiner must make "a searching comparison of the claimed invention – ***including all its limitations*** – with the teaching of the prior art." *In re Ochiai*, 71 F.3d 1565, 1572 (Fed. Cir. 1995) (emphasis added). Thus, "obviousness requires a suggestion of all limitations in a claim." *CFMT, Inc. v. Yieldup Intern. Corp.*, 349 F.3d 1333, 1342 (Fed. Cir. 2003) (citing *In re Royka*, 490 F.2d 981, 985 (CCPA 1974) (holding that to establish prima facie obviousness of a claimed invention, all the claim features must be taught or suggested by the prior art)). Applicant respectfully submits that several features in the pending claims are neither taught nor suggested, either expressly or inherently, in any of the cited references.

Claim 1:

Neither Purcell nor Lee teach at least the following element of claim 1:

> modifying, by the processor, the display of the annunciator window in response to a changed state of at least one of said device status, [[a]] connectivity status, and messaging status;

Purcell generally describes a "screen sharing function enables a main executable application, which typically uses more than one monitor, to switch to single-monitor usage as necessary to allow a user to directly interact with other applications that the main executable application invokes." *See* Purcell, Abstract. The Examiner generally cites column 4 lines 6-31 and 50-67 and column 5 lines 11-65 of Purcell as teaching this element. *See* Office Action, page 3. These portions of Purcell are reproduced below:

> An executable application as used herein comprises code or machine readable instruction for implementing predetermined functions including those of an operating system, healthcare information system or other information processing system, for example, in response user command or input. An executable procedure is a segment of code (machine readable instruction), sub-routine, or other distinct section of code or portion of an executable application for performing one or more particular processes and may include performing operations on received input parameters (or in response to received input parameters) and provide resulting output

parameters. A processor as used herein is a device and/or set of machine readable instructions for performing tasks. A processor comprises any one or combination of, hardware, firmware, and/or software. A processor acts upon information by manipulating, analyzing, modifying, converting or transmitting information for use by an executable procedure or an information device, and/or by routing the information to an output device. A processor may use or comprise the capabilities of a controller or microprocessor, for example. A display processor or generator is a known element comprising electronic circuitry or software or a combination of both for generating data representing display images or portions thereof. A user interface comprises one or more display images enabling user interaction with a processor or other device.

FIG. 2 illustrates image format determination system operation.

Purcell, column 4 lines 6-31.

In system 100, a software application whose main window, which runs full-size on two monitors, automatically dynamically changes size to accommodate other applications to use screen real estate in a seamless fashion. FIG. 2 illustrates that system 100 dynamically changes size of a 2560 by 1024 pixel image window 201 of a primary application spanning both display screens of monitors 115 and 117 to a 1280 by 1024 pixel image window 203 for display on left monitor 115. System 100 initiates display of a 1280 by 1024 pixel image window 205 of a secondary application on right monitor 117. System 100 initiates the dynamic re-sizing in response to detection of a command to initiate execution of a secondary application or to initiate display of an image window associated with a secondary application. The specific resolution image windows described herein are exemplary only. System 100 works with any image resolution.

The system 100 may be employed by a workstation in display of medical images, and series of medical images comprising still images or as video clips. System 100 may be used, for example, in imaging modality devices including ….

Purcell, column 4 lines 47-67.

FIG. 3 shows a flowchart of a process used by an image format determination system (system 100 of FIG. 1). In step 702 following the start at step 701, input processor 120 in system 100 receives command data representing a command to initiate execution of a function of a second application and display of an associated second image window in response to user entry of a command via a first image window associated with a first application. The function of the second application comprises at least one of, initiation of execution of the second application and initiation of display or access to the second image window. In one embodiment, the first image window encompasses multiple display screens of the plurality of monitors

(e.g., first and second display screens of respective first and second monitors). In another embodiment, the first image window comprises a first size image on a first display monitor.

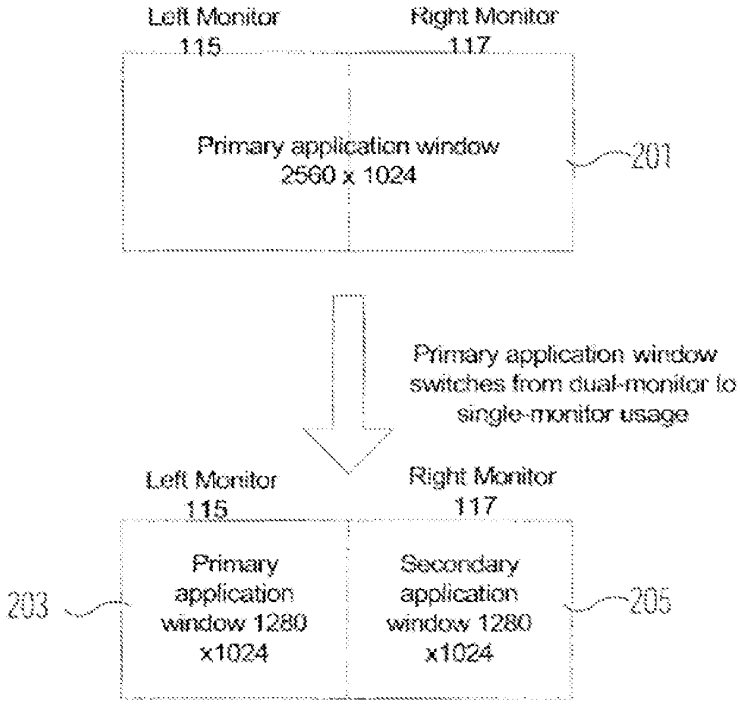
In step 704, image format selection processor 105 in system 100, in response to the received command data, automatically initiates reduction in size of the first image window to fit a screen of the plurality of display monitors and to prevent mutual overlap of the reduced size first image window and the second image window. In one embodiment, the first image window comprises a reduced size version of the first size image on the first display monitor of the plurality of display monitors to prevent mutual overlap of the reduced size first image window and the second image window on the first display monitor. In another embodiment, the first image window comprises a reduced size version of the first size image on a first display monitor and the second image window is displayed on a screen of a second monitor of the plurality of display monitors to prevent mutual overlap of the reduced size first image window and the second image window. The image format selection processor, in response to the received command data, automatically initiates reduction in at least one of, (a) horizontal number of image pixels and (b) vertical number of image pixels, of the first image window to fit a screen of the plurality of display monitors.

Display processor 110 in system 100 in one embodiment in step 707, initiates generation of data representing the first image window comprising a reduced size version of the first size image on the first display monitor of the plurality of display monitors to prevent mutual overlap of the reduced size first image window and the second image window on the first display monitor. In another embodiment display processor 110 in system 100 initiates generation of data representing the reduced size first image window and the second image window, for presentation on the plurality of display monitors. The reduced size first image window is presented on a first monitor of the plurality of display monitors and the second image window is presented on a different second monitor of the plurality of display monitors. The first image window prior to the size reduction encompasses the first monitor and the different second monitor. In response to a user command to terminate execution of the second application or a function of the second application, the image format selection processor automatically initiates increase in size of the first image …

Purcell, column 5 lines 12-67.

Very clearly, Purcell describes a first application with a primary application window (201) that runs full-size on two monitors (115, 117) that is resized to a smaller state (203) to accommodate a second window (205) of a second application. *See* Purcell, column 4 lines 47- 51. The second application is launched in response to a user input in

the primary application window of the first application. *See* Purcell, column 5 lines 13-19. This is illustrated in Fig. 2 of Purcell, below:



Purcell, Fig. 2.

There is no description, at least in the cited sections of Purcell, that states the display of the annunciator window is modified in response to a changed state of at least one of the device status, connectivity status, and messaging status. This is apparently recognized by the Examiner who states

> "Purcell et al do not go into details that the pre-configured window is an annunciator window per such such that the information specifically show at least one of a device status, connectivity status, and messaging status – and thus the changed state pertains to at least one of device status, connectivity status, and messaging status – but Purcell et all do mention the additional spanning window to display specific information to the user in a noticeable way."

See Office Action, page 3.

Lee does not overcome the deficiency of Purcell with respect to claim 1. Lee is generally related to a system, apparatus, and method of providing message alerts to a user

prior to that user communicating with a second party. *See* Lee, Abstract. Although Lee illustrates several examples of prompt windows and alert windows, the windows of Lee are not modified by the process in response to a changed state of at least one of the device status, the connectivity status, and the messaging status.

Although neither Purcell nor Lee teach, describe, or suggest all of the elements of claim 1, in the interest of expediting the prosecution of this application, claim 1 has been amended to further include:

> configuring, by the processor, the annunciator window to extend across a first portion of said first display and a second portion of said second display, wherein said first portion and said second portion do not degrade the display of information by the selected first and second desktops or applications;

The Examiner concludes Fig. 2 and column 4, lines 31-54 teach "the window to extend across both said first and second displays." However, Fig. 2 of Purcell, above, shows the primary application window (201, 203) of the first application completing filling one or both monitors (115, 117). More specifically,

> FIG. 2 illustrates image format determination system operation. The primary application typically runs with a single full-size image window spanning both monitors 115 and 117 of the system 100 dual-monitor system. As a top-level image window, it obscures image windows of a desktop application and any other executing applications. In order to permit another application to execute concurrently and display an image window adjacent to an image window of the primary application, system 100 dynamically changes the primary application image window size to match that of a left monitor (monitor 115).

Purcell, Column 4, lines 31-41 (emphasis added). Thus, Purcell does not teach at least this element of claim 1. Additionally, Purcell teaches away from the annunciator window of claim 1 because the window of the primary application of Purcell "obscures images windows" of desktops and "any other executing applications." Thus, the window of Purcell would degrade the display of information of all other desktops or applications, contrary to the requirements of claim 1. Further, it would not be obvious combine Purcell with Lee because Purcell teaches altering the size of a first application when a second application is launched by a user and Lee teaches presenting an alert to a user prior to a user communicating with a second party.

For each of these reasons, the rejection of claim 1 and all claims that depend therefrom should be reconsidered and withdrawn.

Claims 6 and 10

Claims 6 and 10 have been amended to include include elements the same as, or similar to, the elements of claim 1. Therefore, for the same or similar reasons, the Examiner should withdraw the rejections of claims 6 and 10 and their dependent claims.

Accordingly, Applicant respectfully requests withdrawal of the 35 U.S.C. § 103(a) rejections of claims 1-14. Since none of the other prior art of record, whether taken alone or in any combination, discloses or suggests all the features of the claimed invention, Applicant respectfully submits that independent claims 1, 6, and 10, and all the claims that depend therefrom are allowable.

New Claims

Claims 15-20 are presented and are believed to be allowable at least because they depend from allowable claim 1.

Conclusion

In view of the foregoing, Applicant believes all claims now pending in this Application are in a condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested. Applicant does not acquiesce to any objection, rejection, or argument not specifically addressed herein. Rather, the Applicant believes the amendments and arguments contained herein overcome all objections, rejections, or arguments.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 719.439-4747.

The Commissioner is hereby authorized to charge to deposit account number 19-1970 any fees under 37 CFR § 1.16 and 1.17 that may be required by this paper and to credit any overpayment to that Account. If any extension of time is required in connection with the filing of this paper and has not been separately requested, such extension is hereby petitioned.

Respectfully submitted,

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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/247,708	Filing Date 09/28/2011	☐ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)		
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT	12/09/2014	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 20	Minus	** 20	= 0	X $80 =	0
	Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X $420 =	0
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	0

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
/SHARON HARRIS/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**
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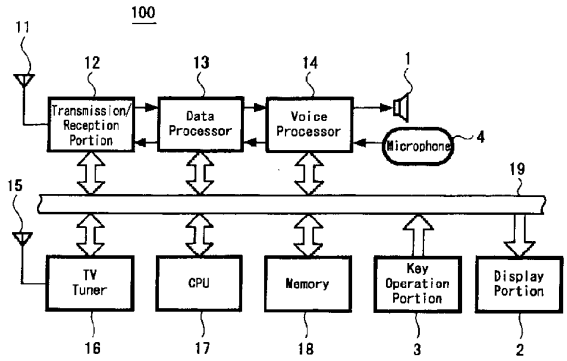
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(54) Portable terminal device with two reception portions for two respective applications being adapted to work in concert with each other and corresponding reception method

(57) When data received separately in first and second reception processing is processed separately by first and second application programs, and when data received by the first reception processing contains specific data specifying processing by the second application program, and the specific data has regional properties, the current region where the second application program is executed is judged, and if the region does not match a region to which processing specified by the specific data belongs, the content specified by the specific data is converted based on data in a predetermined table, and processing is executed by the second application program. Accordingly, two application programs can be linked in a mobile phone unit or other terminal devices, and problems when executing one application with regional properties under control of the other application can be resolved.

FIG. 2



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Description

CROSS REFERENCES TO RELATED APPLICATIONS

[0001] The present invention contains subject matter related to Japanese Patent Application JP 2004-300485, filed in the Japanese Patent Office on October 14, 2004, the entire contents of which being incorporated herein by reference.

BACKGROUND OF THE INVENTION

Field of the Invention:

[0002] This invention relates to a portable terminal device such as a mobile phone unit and to a reception method used by such a portable terminal, and in particular relates to technology to display content on a portable terminal device.

Description of the Related Art:

[0003] The spread of mobile phone units and other portable terminals in recent years has been accompanied by commercialization of mobile phone units which, in addition to typical transmission and reception functions for conversation as well as e-mail transmission/reception functions and Internet connection functions, also incorporate such varied functions as television (hereafter "TV") reception functions, video game functions, and camera functions. In the case of a unit incorporating TV reception functions, a tuner for broadcast reception is built-in.

[0004] The various above-described functions are obtained through control and processing based on application programs (hereafter "applications") stored in internal memory of the mobile phone unit in advance. Applications have their own unique functions, and may be used either independently or in concert with other applications. For example, in addition to conversation processing in use as a telephone set, games may be displayed on-screen, the unit may be used as a camera, music may be output, and various other processing may be performed. For example, in the case of applications related to display, an application may be read from memory corresponding to an instruction input by user operation of a select/execute button or the like on the mobile phone unit; the application is interpreted and executed by the CPU (Central Processing Unit) which controls the various devices incorporated into the unit, causing content to be displayed in the display portion of the unit.

[0005] When an application related to display is executed in a mobile phone unit, there are cases in which two applications are executed simultaneously, and displays based on the two applications are displayed simultaneously. As an example of simultaneous displays based on two applications, for example, a Web browser and mailer may be started. A Web browser is an application which connects to the Internet and causes the contents of a web page or the like to be displayed. A Web browser may be used to specify a particular URL (Uniform Resource Locator); or, by using a search engine or the like, the contents of a object resource may be found through the Internet connection. Also, a mailer is an application to send and receive e-mail. By using a mailer, a sender and a receiver can specify each other's mail address to send and receive e-mail.

[0006] Upon simultaneously starting these two applications, and simultaneously causing the contents of each to be displayed on a single screen, for example, the Web browser can be used to enjoy the Internet connection while viewing e-mail displayed within the mailer.

[0007] Patent Reference 1 discloses a mobile phone unit which uses two types of display screens, which are a main display portion and a secondary display portion, and which can simultaneously process a plurality of applications and cause application content to be displayed on the different display screens.

[0008] Patent Reference 1: Published Japanese Patent Application No. 2003-204378 (FIG. 2)

SUMMARY OF THE INVENTION

[0009] However, when two applications are started simultaneously and made to display content, settings related to the display of one application may be made based on processing by the other application. For example, in a mobile phone unit incorporating a tuner for TV broadcast reception, when an application to send and receive e-mail is started, in the processing of the started applications, it may occur that e-mail is received containing a list of recommended TV broadcast programs and link information to the channels of the stations broadcasting the recommended programs.

[0010] When causing mail text and images of the received e-mail to be displayed by the mobile phone unit, by performing an operation to select the link location to the channel of a station broadcasting a recommended program in the displayed mail text, for example, an application in the mobile phone unit to receive TV broadcasts may be started, and the channel broadcasting from the specified station is received, with the received images displayed in the display portion, and received audio output from a speaker.

[0011] Thus there are cases in which, based on an instruction in one application, processing in another application may be linked and executed. However, depending on the current location of the user in possession of the mobile phone unit, cases are conceivable in which accommodation of the link in the e-mail is not possible.

[0012] Specifically, when for example there is link data in a received e-mail to the station of a TV broadcast program broadcast in Hokkaido, if the user who has received the mail is in a region other than Hokkaido, the link data is meaningless. Even if there is automatic reception of a specific channel based on link data, there is a strong

possibility that the station broadcasting using the channel number is a different station, and so the link function is not valid.

[0013] Here, a case is explained in which two applications, which are an e-mail function and a TV broadcast reception function, operate in concert; but when two other applications operate in concert also, a similar problem arises when execution of one of the applications is limited by region.

[0014] This invention was devised in light of such circumstances, and is to provide the resolution of problems in cases in which two applications operate in concert, with one application used to execute another application having regional properties.

[0015] An embodiment of the present invention is a portable terminal device and reception method thereof in which, when performing first reception processing to receive data based on a first application program, second reception processing to receive data based on a second application program, and application program execution processing by the first and second application programs, and when specific data specifying processing by the second application program is included in data received by the first reception processing and the specific data has regional properties, the application program execution processing is performed such that the current region in which the second application program is executed is judged, and when the current region does not match a region of processing specified by the specific data, content indicated by the specific data is converted based on predetermined table data, and the processing of the second application program is executed.

[0016] By this means, when data specified by processing of the first application program has regional properties, and the current region does not match a region of processing specified by the data, data conversion is performed, so that processing in which regional properties match can be performed by the second application program.

[0017] According to the embodiment of the present invention, two application programs can be operated in concert, and when processing having regional properties is specified for one of the application programs based on the other application program, if the current region does not match the regional properties, the contents specifying processing having regional properties are converted; hence when executing processing having regional properties, processing corresponding to the current location at that time can be performed, and processing in accordance with the region becomes possible regardless of the current location.

[0018] In this case, the first reception processing is processing to receive data via a wireless telephone line; the second reception processing is processing to receive broadcast content; and by performing processing to convert the reception channel or reception frequency for the second reception processing, which is specified by data received by the first reception processing, into another reception channel or reception frequency, cases in which the channel or frequency of broadcast of a program differs among regions can be accommodated.

[0019] Further, when performing conversion of the reception channel or reception frequency, by making the table to perform conversions of reception channels or reception frequencies based on electronic program guide information contained in broadcast data received in the second reception processing, broadcast channels or frequencies for different regions can be judged simply from the electronic program guide information.

BRIEF DESCRIPTION OF THE DRAWINGS

[0020]

FIG. 1 is a plan view showing an example of the external shape of a mobile phone unit according to an embodiment of the invention;

FIG. 2 is a block diagram showing an example of the internal configuration of a mobile phone unit according to an embodiment of the invention;

FIG. 3 is a flowchart showing an example of content conversion processing according to an embodiment of the invention;

FIG. 4 is an explanatory drawing showing an example of the configuration of a TV channel table according to an embodiment of the invention;

FIG. 5 is an explanatory drawing showing an example of description of a channel switching source according to an embodiment the invention; and

FIGS. 6A and 6B are explanatory drawing showing an example of screen transition of a mobile phone unit according to an embodiment of the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0021] Hereinafter, an embodiment of the present invention is explained referring to the attached drawings. This embodiment is an example of application to a portable terminal device which, in addition to conversation send/receive functions, e-mail functions, Internet connection functions and similar, is provided with functions for reception of TV broadcasts. Here, an example is explained of application to a digital cellular-type mobile phone unit as the portable terminal device.

[0022] First, an example is explained of the external shape of the mobile phone unit of this example. FIG. 1 shows an example of the external shape of a mobile phone unit 100 of this example. The mobile phone unit 100 is configured to have an upper housing 5 and lower housing 7, connected by a hinge portion 6 as a support point and to be capable of being folded. FIG. 1 shows

the opened state. In FIG. 1, the inner-side surfaces which are opposed when the telephone is folded are shown.

[0023] In the upper housing 5 are positioned a speaker 1 for audio output of the voice of the remote communication partner during conversation and of call-received ringtones and similar, as well as a display portion 2 which uses a liquid crystal display panel or the like to display characters and numbers, symbols, icons, cursors, still images, video, and similar. In the mobile phone unit 100 of this example, the display portion 2 is divided into two portions of arbitrary size, and it is possible to display different content in the two display screens (multi-window display). In the lower housing 7 are provided a key operation portion 3 as input means, in which are placed dial keys for the numbers 1, 2, ..., 9, 0 as well as the "#" and "*" symbols, various function keys, a direction-specifying key to manipulate a cursor or the like, and an enter key or the like to confirm operations, as well as a microphone 4 for audio input. As the direction-specifying key and enter key, a jog-dial key may be used, which can be operated rotationally and by pressing down.

[0024] In the upper part of the display portion 2 is a pictograph display area 20, which displays various state icons for the mobile phone unit 100, and in this pictograph display area 20 is reserved an area for display of a battery icon 21 indicating the remaining amount of battery power and an antenna icon 22 indicating the radio wave reception level. In this example, the display portion 2 of the mobile phone unit 100 is configured with two screens, above and below, to separately display images for different applications. Specifically, as shown in FIG. 1, images for each of the different applications can be displayed in the first display area 23 and second display area 25, resulting from the division into two portions, upper and lower, of the display area of the display portion 2. Details of the display states in each of the display areas 23 and 25 are explained below. In the lower part of the display portion 2 are a left-operation icon 27 for left operation and a right-operation icon 28 for right operation, which can be used to specify content, make onscreen movements, and similar.

[0025] In this example, a foldable-type mobile phone unit is used in explanations; but a straight-type terminal, revolver-type terminal, or various other shape configurations may be used.

[0026] Next, an example of the internal configuration of the mobile phone unit 100 is explained referring to the block diagram of FIG. 2.

[0027] First, the reception system during voice conversation of the mobile phone unit 100 is explained. An antenna 11 is connected to a transmission/reception portion 12, and receives signals transmitted by a predetermined communication method from an external remote station, not shown in the figure, at the transmission/reception portion 12. As the wireless communication method used by the transmission/reception portion 12 for transmission and reception, for example, CDMA (Code Division Multiple Access) is used.

[0028] Reception signals received and demodulated by the transmission/reception portion 12 are supplied to a data processor 13, and a reception packet is extracted; from the packet are retrieved the voice data, control data, and other necessary data. The retrieved voice data is supplied to a voice processor 14, converted from digital data into analog voice signals, subjected to amplification and other voice processing, and supplied to the speaker 1, to output the voice of the remote communication partner.

[0029] The transmission system during voice conversation is explained below. Voice signals supplied from the microphone 4 are converted into digital voice data in the voice processor 14, the converted voice data is supplied to the data processor 13, and the voice data is arranged in the transmission packet. Control data and other data are also arranged within the transmission packet. The transmission packet generated in the data processor 13 is supplied to the transmission/reception portion 12, and after predetermined modulation processing has been performed, frequency-conversion into transmission signals at a predetermined transmission frequency is performed, and the frequency-converted transmission signals are transmitted wirelessly from the antenna 11. Those reception processing and transmission processing are executed under the control of the CPU (Central Processing Unit) 17 of the terminal 100, and any necessary information is displayed on the display portion 2. Programs required for control by the CPU 17 are stored in a memory 18.

[0030] When performing data reception and data transmission in the mobile phone unit 100 of this example in order to send and receive e-mail, to access the Internet or the like, the necessary data is extracted from received packets and the necessary data is arranged into transmission packets in the data processor 13 under control by the CPU 17. Processing of received data and processing of data for transmission are performed through execution by the CPU 17 of applications with various functions, stored in memory 18.

[0031] For example, when sending and receiving e-mail, e-mail data reception or transmission is performed under control by the CPU 17, and display of received e-mail data by the display portion 2, as well as input processing of e-mail for transmission by the key operation portion 3, are performed through execution by the CPU 17 of an e-mail application stored in memory 18. When accessing the Internet using a web browser also, a web browser application stored in memory 18 is executed by the CPU 17, and downloaded images and the like are displayed on the display portion 2. Control and other data are exchanged between the CPU 17 and other portions via a system bus 19.

[0032] Next, functions to receive TV broadcasts, incorporated into the mobile phone unit 100 of this example, are explained. The terminal 100 is provided with a TV antenna 15, either externally or internally, as well as a TV tuner 16 connected to the TV antenna 15. The TV

tuner 16 of this example is configured as a TV tuner capable of receiving ground-wave digital broadcast signals. Reception processing by the TV tuner 16 is executed under control of the CPU 17, and image signals obtained from the received broadcast signals are displayed on the display portion 2, while audio signals obtained from the received broadcast signals are output from the speaker 1 (or from an earphone, not shown).

[0033] In the TV tuner 16, in addition to reception of the image signals and audio signals which are the main content data of a TV broadcast, various other accompanying data is also received. For example, EPG (Electronic Program Guide) data, used to display program tables and similar, is also received. Processing to display a program table or the like based on received EPG data is performed through execution by the CPU 17 of an application for TV broadcast reception, stored in memory 18. EPG data received in a digital broadcast includes not only data for display of program tables for various channels, but data relating to the stations for each channel. Data relating to a station may be, for example, data relating to the system (broadcast network with which a station is affiliated) to which the station belongs. In this example, when EPG data is received, data relating to the systems to which stations included in EPG data belong is stored as a table in memory 18. The state of storage in memory 18 is explained below.

[0034] The mobile phone unit 100 of this example is designed to be capable of simultaneous execution of at least two among a plurality of applications, under control of the CPU 17. That is, of the plurality of applications stored in memory 18, the CPU 17 can simultaneously execute at least two applications selected by key operations by the user or by other means, and data can be displayed simultaneously based on processing by each. For example, an e-mail application and a TV broadcast reception application can be simultaneously processed, with received e-mail displayed in the display area 25 of the display portion 2 (FIG. 1), and received TV broadcast programs displayed in the display area 23 of the display portion 2 (FIG. 1). Or, an application for connection to the Internet and a TV broadcast reception application can be processed simultaneously, with content displayed separately in the display areas 23 and 25.

[0035] Further, when simultaneously starting two applications, processing by one application may be linked with processing by the other application. For example, when link data specifying a program (content) broadcast by a specific station is contained in e-mail received by an e-mail application, if the user performs an operation to select the location displayed by the mail text corresponding to the link data, the CPU 17 starts an application to receive TV broadcasts, causes the channel over which the program is broadcast to be received by the TV tuner 16, and displays the images and outputs the audio received. The CPU 17 judges the correspondence between the link data and the actually received channel by referring to the received EPG data.

[0036] However, when broadcasts by a station broadcasting a program specified by link data in a received e-mail cannot be received by the mobile phone unit 100 at its current position, the reception channel specified by the link data is converted into another channel reception of which is possible at the current position. At the time of this conversion, the received EPG data is referenced to specify the conversion channel. That is, based on the EPG data received by the TV tuner 16, the CPU 17 forms a list (table) of stations which can be received in the region, and stores this list in memory 18. The data in this table is referenced, and when a station exists which broadcasts the specified program (that is, when the region of broadcast of a program specified by link data matches the region of a station which can be received at the current position), this station is received. When the station broadcasting the specified program does not exist among the stations in the table which can be received (that is, when the region of broadcast of the program specified by the link data does not match the regions of stations which can be received at the current position), the station most suitable for reception is selected from the data in the table. When selecting the station most suitable for reception, a station is selected for which systems match among the station appended to the link data and a station indicated by data in the table.

[0037] FIG. 4 shows an example of a case in which EPG data is received under control of the CPU 17, and a list of stations which can be received in the region is formed as a TV channel table. As indicated in FIG. 4, the EPG data includes the names of stations which can be received in the region, the names of regions in which the stations can be received, data relating to system stations with which a station is affiliated, and data relating to the channel numbers of stations; this data is stored as a table. When there is a change to this data, which is contained in EPG data received by the TV tuner 16 (for example, when the position of the terminal 100 changes, and the stations which can be received change), the data stored in the table is updated. The table may be always stored in memory 18, or the table may be stored only while EPG data received from TV broadcasts by the tuner 16 can be obtained, based on the received data.

[0038] Next, an example of processing when two different applications in the mobile phone unit 100 of this example are started simultaneously is explained. In this example, an application to process e-mail and an application to receive a TV broadcast are started simultaneously. Specifically, an application to cause display of received e-mail is for example started, and with received mail text displayed in the second display area 25 of the display portion 2, if the user operates the key operation portion 3 to select the location at which program link data in the mail text is displayed, then processing by the application to receive TV broadcasts causes the TV tuner 16 to receive the channel on which the program is broadcast, and processing is performed to display received images in the first display area 23 of the display portion

2 and to output received audio.

[0039] FIG. 3 is a flowchart showing an example of processing when an application to process e-mail and an application to receive TV broadcasts are started simultaneously. Processing is explained according to the flowchart of FIG. 3 as follows. First, when e-mail is received in processing by the application to receive e-mail, it is supposed that link data to a specific program is received (step ST41). As the link data, for example, the station transmitting the program or other transmitter information, and information on the region of the broadcast is included. The transmitter information includes the station, as well as data on the system to which the station belongs.

[0040] FIG. 5 shows an example of the configuration of broadcast program link data. The link data is written in, for example, HTML (Hyper Text Markup Language) or another markup language, and includes a place d1 to describe the program name, a place d2 to describe the assumed broadcast region, broadcast network information d3, and a place d4 to describe the address at which the program is broadcast (that is, data specifying the receiving station). In the description example of FIG. 5, the explanation of the link data has been simplified, and the configuration differs from the actual configuration.

[0041] Returning to the explanation of the flowchart in FIG. 3, suppose that such link data was received, and the mail text containing the link data (content address before modification) was displayed (step ST42). At this time, for example, the program name is displayed as mail text. Then the CPU 17 judges whether there has been a user operation to select the displayed program name (step ST43). If there has been no such user operation, the application to receive TV broadcasts does not set (change) the reception channel, and processing ends.

[0042] If in step ST43 there has been such a user operation, the CPU 17 causes the reception channel of the tuner 16 to be set (changed) so as to receive the station contained in the link data (step ST44). As the processing to set the reception channel, a judgment is made as to whether the station is contained in a list of receivable stations indicated by the EPG data received at the time, and if contained in the list, the station is selected such that the channel for the relevant station is received. If on the other hand, the station is not contained in the list, a judgment is made as to whether there is a station with a system matching the system data of the station contained in the link data, and if there is a matching station, the station with the matching system is received.

[0043] Images of the broadcast program (content) of the station received in step ST44 are then displayed in the first display area 23 of the display portion 2, while audio is output from the speaker 1 (step ST45).

[0044] Here a specific example of operation is considered, and an example of a screen transition due to content switching of the mobile phone unit 100 is explained, referring to FIGS. 6A and 6B. FIG. 6A is an example of the display on the screen before the transition; FIG. 6B is an example of the screen display after switching.

[0045] In the example of FIGS. 6A and 6B, one of the applications among the two applications started simultaneously is a digital TV viewing application, and as indicated in FIG. 6A, images from a digital TV broadcast program are displayed, as the content display obtained from the application processing, in the first display area 23 of the display portion 2. The other application is a mailer, and as indicated in FIG. 6A, received e-mail text is displayed as the content display in the second display area 25 of the display portion 2. The e-mail displays, for example, the title of "Today's program information (Sapporo)" and titles of a TV program 26a (news) of XXX TV, a TV program 26b (documentary) of YYY TV, and a TV program 26c (variety) of ZZZ TV. FIG. 6A is an example in which the station names are not displayed; but these may be displayed together with the program titles. Here, when a program title is selected and confirmed among the TV programs 26a to 26c, the channel on which the desired program is broadcast is selected, and a link is set so as to display the TV program of the channel in the first display area 23.

[0046] In this state, when, for example, the user performs an operation to select the title of TV program 26b among the TV programs 26a to 26c displayed in the second display area 25, the title of TV program 26b (documentary) highlighted is displayed, as shown in FIG. 6B, and received images of the channel (the channel of YYY TV) on which the TV program 26b is broadcast are displayed in the first display area 23. If the time frame is that for display of the TV program 26b, the relevant documentary program is displayed.

[0047] However, direct selection of the channel of the station specified by such link data is possible when the broadcast region of the program indicated by the e-mail matches the current region of the mobile phone unit 100. For example, suppose that the broadcast region of the program indicated by the e-mail is Sapporo, and the current region of the unit 100 is Tokyo. At this time, a TV channel table 101 has been formed based on the EPG data received by the mobile phone unit 100; and by performing the reception channel modification processing previously explained in the flowchart of FIG. 3, so as to receive a station for which station data contained in this TV channel table 101 matches station data indicated by the link data for the selected TV program 26b, any region can be accommodated.

[0048] Thus, there is the advantageous result that, even when the TV channel of the station described in e-mail differs from the TV channels of stations in the region of the user, a channel broadcasting the program recommended by the e-mail can be viewed, without awareness of differences in region. In the example up to this point, an example has been explained of using link data for switching processing of the TV broadcast channel; however, a hard disk drive device or mass-storage memory may, for example, be incorporated in the mobile phone unit, in a configuration enabling recording of broadcast

programs by the unit itself, and based on the program data, the reception channel when reserving recording of the broadcast program may be performed by similar processing, with channel changed as necessary based on link data.

[0049] In the above-described embodiment, an example was explained in which one of the applications was an application for TV viewing, and the other application was a mailer; however, other applications are possible, and connection to an objective TV program from a TV program address described on a web site or the like is possible. For example, in processing by an application for connection to the Internet, a web site displaying a TV program table is accessed, the TV program table is displayed, and when a program or channel is selected from the program table, the mobile phone unit may change the reception channel according to the region in which the mobile phone unit is located.

[0050] In the above-described embodiment, judgment of whether a region to which data having regional properties belongs matches the region of the unit was performed based on EPG data received together with broadcast data; but this judgment may be made using data other than EPG data. For example, a function to measure the position of the mobile phone unit may be employed. Even when EPG data is used, EPG data downloaded from the Internet or otherwise acquired by means other than a broadcast may also be used.

[0051] In the above-described embodiment, an example of using a mobile phone unit was explained; but the invention is not limited thereto, and other portable terminal devices may be used. For example, a PDA (Personal Digital Assistant) equipped with a TV tuner and mail receiver functions may be used as the portable information terminal, and similar processing is performed.

[0052] In the above-described embodiment, an example was explained of an application for viewing TV broadcast programs as an application acquiring content with regional properties; but application to other applications which acquire content with regional properties is possible. For example, a receiver portion to receive radio broadcasts may be incorporated into the terminal, and when another application is used to obtain link data to specify a radio broadcast program, the reception frequency may be changed according to the regions in which the radio station can be received.

[0053] It should be understood by those skilled in the art that various modifications, combinations, sub-combinations and alterations may occur depending on design requirements and other factors, insofar as they are within the scope of the appended claims or the equivalents thereof.

Claims

1. A portable terminal device comprising:

a first reception portion (12), which receives data based on a first application program;
a second reception portion (16), which receives data based on a second application program; and
an application program execution portion (17), which processes data received by said first and second reception portions by means of said first and second application programs;
wherein when data received by said first reception portion (12) includes specific data specifying processing by said second application program and when said specific data has regional properties,
said application program execution portion (17) judges the current region where the second application program is executed, and when the current region does not match the region to which processing specified by the specific data belongs, converts the content specified by said specific data based on predetermined table data, and executes the processing of the second application program.

2. The portable terminal device according to claim 1, wherein said first reception portion (12) is a reception portion which receives data via a wireless telephone line,
said second reception portion (16) is a reception portion which receives broadcast content, and
said application program execution portion (17) performs processing to convert a reception channel or reception frequency in said second reception portion, which is specified by data received by said first reception portion, into another reception channel or reception frequency.

3. The portable terminal device according to claim 2, wherein the table for converting said reception channels or reception frequencies is formed based on electronic program guide information included in broadcast data received by said second reception portion.

4. A reception method comprising the steps of:

performing first reception processing to receive data based on a first application program,
performing second reception processing to receive data based on a second application program, and
performing application program execution processing to process data received by said first and second reception processing by means of said first and second application programs,
wherein as said application program execution processing, when data received by said first reception processing includes specific data spec-

ifying processing by said second application program and when said specific data has regional properties, the current region where the second application program is executed is judged, and when the current region does not match a region to which processing specified by said specific data belongs, content specified by said specific data is converted based on data in a predetermined table, and the processing of said second application program is executed.

5. The reception method according to claim 4, wherein said first reception processing is processing to receive data via a wireless telephone line, said second reception processing is processing to receive broadcast content, and said application program execution processing is processing to convert a reception channel or reception frequency in said second reception processing, which is specified by data received in said first reception processing, into another reception channel or reception frequency.

6. The reception method according to claim 5, wherein the table for converting said reception channels or reception frequencies is formed based on electronic program guide information included in broadcast data received in said second reception processing.

FIG. 1

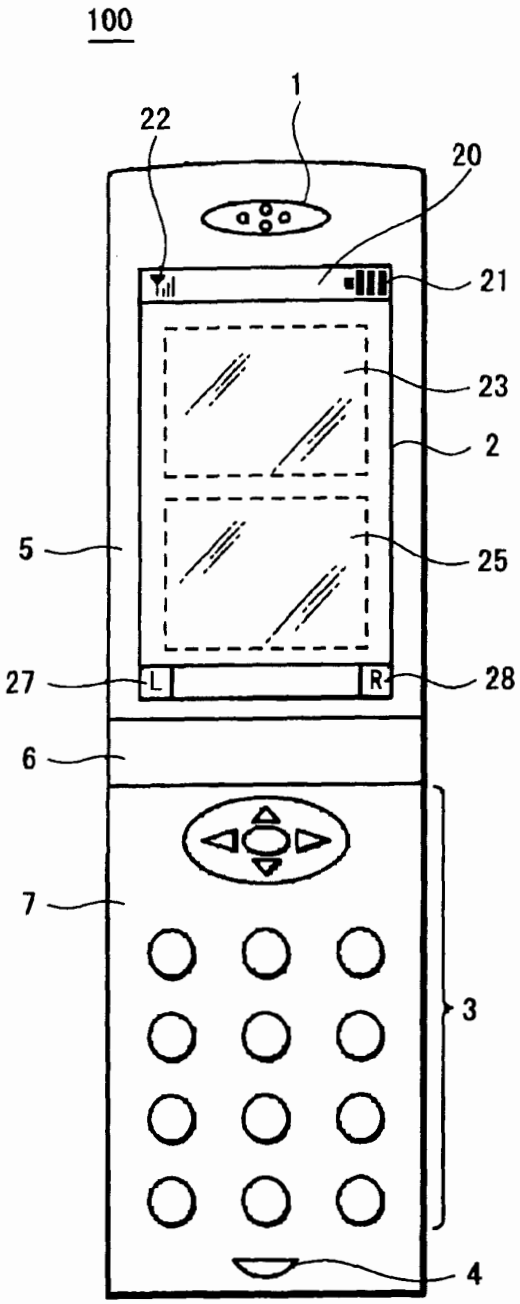


FIG. 2

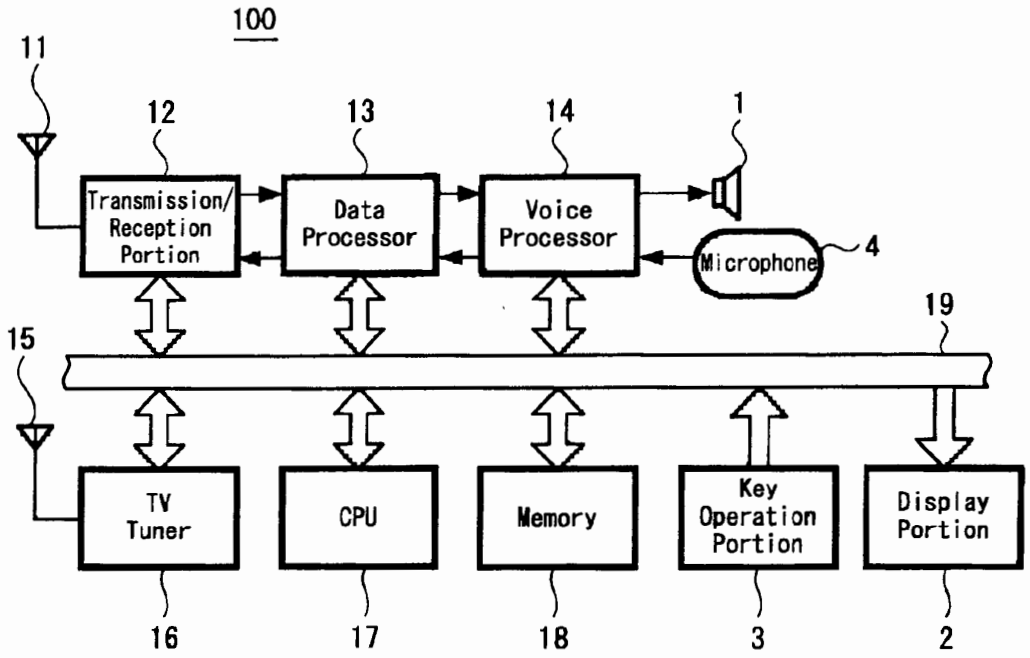

100
11
12
13
14
1
Transmission/
Reception
Portion
Data
Processor
Voice
Processor
Microphone
4
19
15
TV
Tuner
CPU
Memory
Key
Operation
Portion
Display
Portion
16
17
18
3
2

FIG. 3

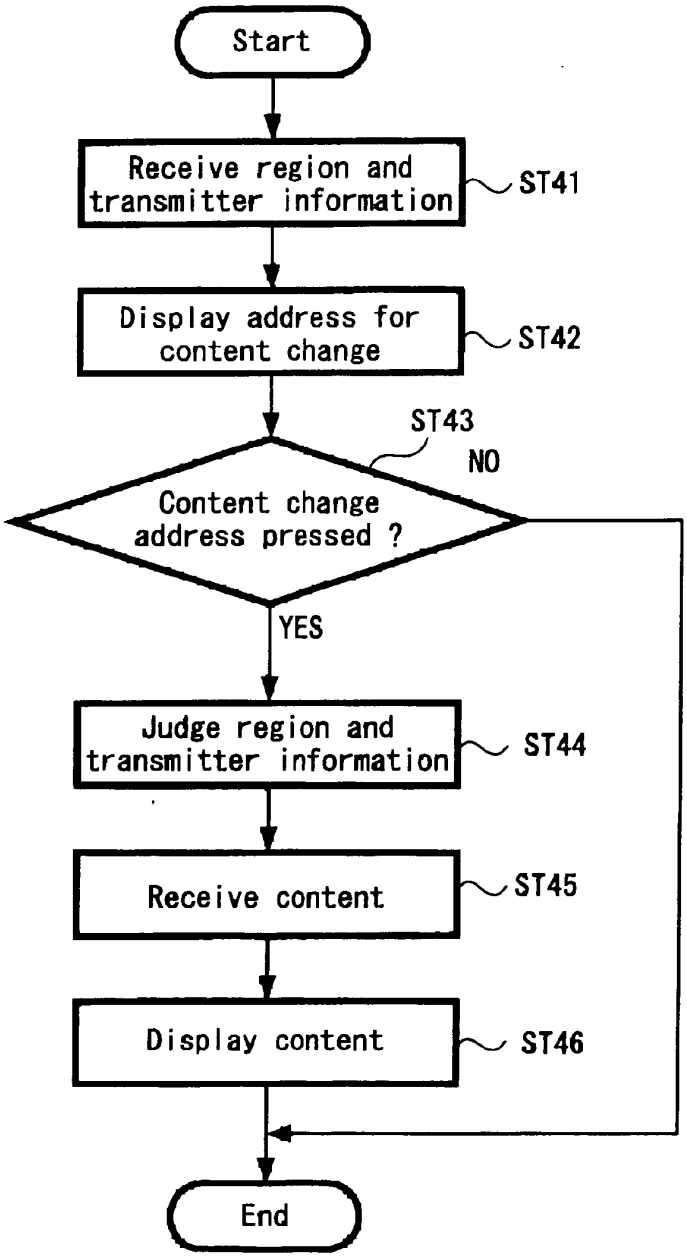

Start
Receive region and transmitter information
ST41
Display address for content change
ST42
ST43
NO
Content change address pressed ?
YES
Judge region and transmitter information
ST44
Receive content
ST45
Display content
ST46
End

FIG. 4

101

Station Name	Region	System	Channel
XXX TV	Sapporo	System A	3
YYY TV	Sapporo	System B	1
ZZZ TV	Sapporo	System C	4
⋮	⋮	⋮	⋮

FIG. 5

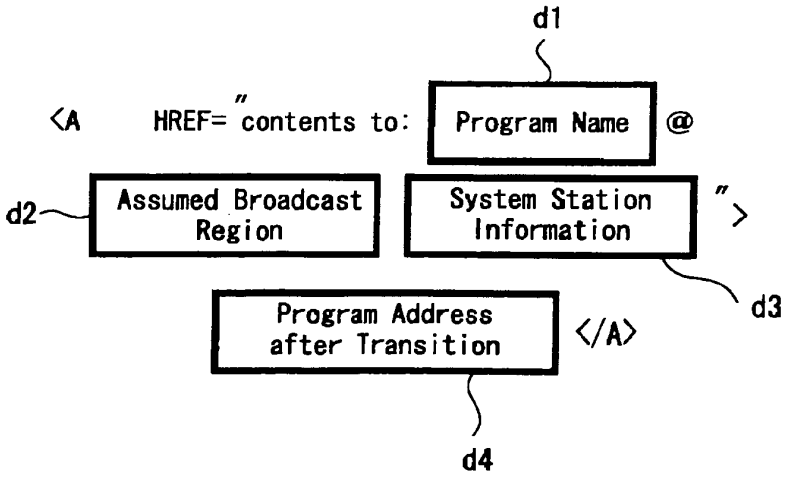


FIG. 6A

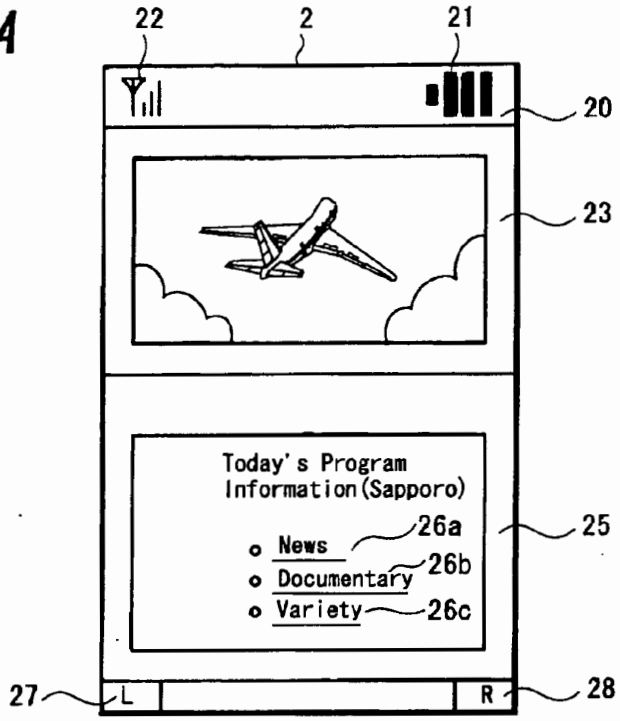
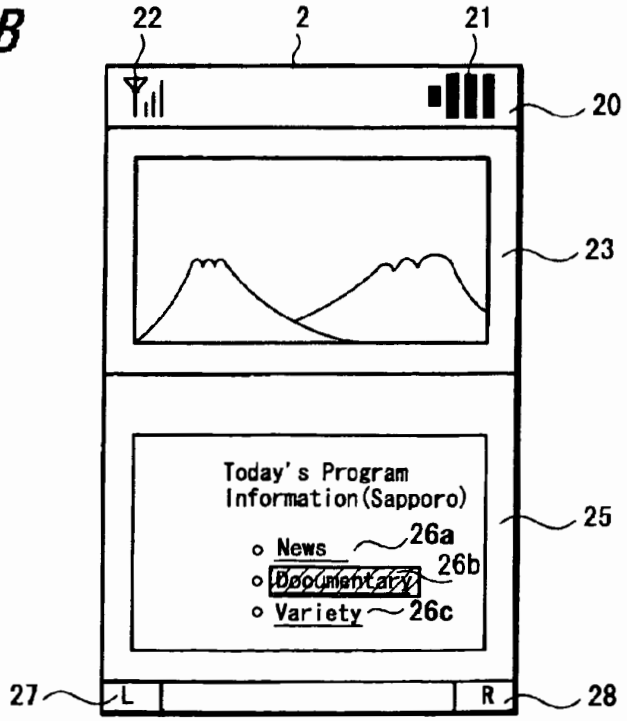

22
2
21
20
23
Today's Program
Information(Sapporo)
News
Documentary
Variety
26a
26b
26c
25
27
L
R
28

FIG. 6B


22
2
21
20
23
Today's Program
Information(Sapporo)
News
Documentary
Variety
26a
26b
26c
25
27
L
R
28

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 05 02 2439

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X	US 6 163 683 A (DUNN ET AL) 19 December 2000 (2000-12-19) * column 3, line 11 - line 60 * * column 4, line 31 - line 39 * * column 5, line 4 - line 13 * * column 5, line 62 - line 65 * * column 6, line 30 - line 58 * * column 7, line 18 - line 50 * * column 8, line 15 - line 29 * * column 8, line 52 - line 67 * * column 9, line 16 - line 59 * * column 10, line 6 - line 27 * * figures 1,2 *	1,2,4,5	TECHNICAL FIELDS SEARCHED (IPC) H04M H04N H04H
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	20 December 2005	Banerjea, R

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
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T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

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EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 05 02 2439

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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20-12-2005

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EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Application Number	13/247,708
				Filing Date	September 28, 2011
				First Named Inventor	Sanjiv Sirpal
(Use as many sheets as necessary)				Art Unit	2174
				Examiner Name	Steven Paul Sax
Sheet	1	of	2	Attorney Docket Number	6583-67

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Examiner Initials*	Cite No.[1]	Document Number Number-kind Code[2] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
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Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]; Number[4]; Kind Code[5] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]

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Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Application Number	13/247,708
				Filing Date	September 28, 2011
				First Named Inventor	Sanjiv Sirpal
(Use as many sheets as necessary)				Art Unit	2174
				Examiner Name	Steven Paul Sax
Sheet	2	of	2	Attorney Docket Number	6583-67

	25	EP 1648149	04/19/2006	SONY ERICSSON MOBILE COMMUNICATIONS JAPAN, INC.		

NON-PATENT LITERATURE DOCUMENTS		
Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
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	28	Official Action for U.S. Patent Application No. 13/247,369 mailed Jan. 07, 2015 (Attorney's Ref. No. 6583-66) 7 pages
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	33	Official Action for U.S. Patent Application No. 13/627,577, mailed Aug. 01, 2014 (Attorney's Ref. No. 6583-253) 18 pages
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	36	Official Action for U.S. Patent Application No. 13/629,211 mailed Jan. 16, 2015 (Attorney Ref. No. 6583-312), 16 pages.

Examiner Signature		Date Considered	

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re the Application of:	)	Group Art Unit: 2174
Sanjiv Sirpal	)	Confirmation No.: 8636
Serial No.: 13/247,708	)	Examiner: Steven Paul Sax
Filed: September 28, 2011	)	
Atty. File No.: 6583-67	)	**Interview Summary**
Entitled: "Full-Screen Annunciator"	)	***Electronically Submitted***

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Dear Commissioner:

Applicants would like to thank Examiner Sax for his time during Examiner initiated phone interviews conducted on March 16-17, 2015. Examiner Sax and Applicants' representative, Dean Reinhardt, discussed claim amendments to place the application in condition for allowance. During the Interview of March 17, 2015, Examiner Sax agreed that the amendments placed claim 1 in a condition for allowance. Examiner Sax also stated that if independent claims 6 and 10 were amended to include the same elements as claim 1, claims 6 and 10 would also be allowed. Applicants' representative agreed to send a list of amended claims to the Examiner.

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1560 Broadway, Suite 1200
Denver, Colorado 80202
(303) 863-9700

Date: March 18, 2015

Electronic Acknowledgement Receipt	
EFS ID:	21810666
Application Number:	13247708
International Application Number:	
Confirmation Number:	8636
Title of Invention:	FULL-SCREEN ANNUNCIATOR
First Named Inventor/Applicant Name:	Sanjiv Sirpal
Customer Number:	111285
Filer:	Dean Reinhardt/Ginger Bovenkamp
Filer Authorized By:	Dean Reinhardt
Attorney Docket Number:	6583-67
Receipt Date:	18-MAR-2015
Filing Date:	28-SEP-2011
Time Stamp:	16:35:55
Application Type:	Utility under 35 USC 111(a)

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Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Applicant summary of interview with examiner	Interview_Summary.pdf	81486 079b4e4127a08608477b9c5d9ab5428ba0efbe6d	no	1

Warnings:
Information:

Total Files Size (in bytes):	81486

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Electronic Acknowledgement Receipt	
EFS ID:	21812747
Application Number:	13247708
International Application Number:	
Confirmation Number:	8636
Title of Invention:	FULL-SCREEN ANNUNCIATOR
First Named Inventor/Applicant Name:	Sanjiv Sirpal
Customer Number:	111285
Filer:	Dean Reinhardt/Robert Roe-Pachirat
Filer Authorized By:	Dean Reinhardt
Attorney Docket Number:	6583-67
Receipt Date:	18-MAR-2015
Filing Date:	28-SEP-2011
Time Stamp:	18:04:40
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$180
RAM confirmation Number	4826
Deposit Account	191970
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		6583-67_IDS_04.pdf	210707 0c1ce07253bb0dddbca95c4e23bfd1bc74fbeffb	yes	5
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Transmittal Letter		1	3	
	Information Disclosure Statement (IDS) Form (SB08)		4	5	
Warnings:					
Information:					
2	Foreign Reference	EP1648149.pdf	726733 b30841fca66bcceec7031f7ba249761d5f3cfd61	no	15
Warnings:					
Information:					
3	Non Patent Literature	Windows_Media_Player_10_Mobile.pdf	916750 0ff84d90cbf26aab10edcfbde18dd01ad4abc9db	no	20
Warnings:					
Information:					
4	Non Patent Literature	6583-28_OA_11-13-2014.pdf	660573 c1a1243b6143e307246ba1f3b271494f643a6e84	no	17
Warnings:					
Information:					
5	Non Patent Literature	6583-66_OA_01-07-2015.pdf	464172 cd58fc363b29b22cedcedc43c27af85fd04fc4b7	no	7
Warnings:					
Information:					
6	Non Patent Literature	6583-70_OA_01-05-2015.pdf	466427 8275f3b1cf442583b9836009562b6174704542cf	no	7
Warnings:					
Information:					

7	Non Patent Literature	6583-110_OA_10-03-2014.pdf	1471598 3e38a08bc9531e0cfe6c73e70c2b2a3924afc516	no	42
Warnings:					
Information:					
8	Non Patent Literature	6583-120_NOA_10-24-2014.pdf	389713 295343270a0253f97463a1908c8ec0afd85a91be	no	7
Warnings:					
Information:					
9	Non Patent Literature	6583-122_OA_12-04-2014.pdf	902517 f2be3b4459076809b35a4e3a79d6fe2d892458dd	no	27
Warnings:					
Information:					
10	Non Patent Literature	6583-253_OA_08-01-2014.pdf	618203 0d50c0a9b5ea0bd96ecd3fe835822b8c0922fd9e	no	18
Warnings:					
Information:					
11	Non Patent Literature	6583-253_NOA_11-26-2014.pdf	1106055 7353b417a9849e977172cdf4791d09f2d66a250f	no	11
Warnings:					
Information:					
12	Non Patent Literature	6583-312_FOA_10-16-2014.pdf	1368266 91ef40ae28b3d69352f169f1024e9b7e13b0d7f6	no	14
Warnings:					
Information:					
13	Non Patent Literature	6583-312_OA_01-16-2015.pdf	1232156 2b147bdd054f18affbe6ab639d448444d354d4bb	no	16
Warnings:					
Information:					
14	Fee Worksheet (SB06)	fee-info.pdf	30347 0041649273e9d76894f750d434950acbc995c52f	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	10564217	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

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New International Application Filed with the USPTO as a Receiving Office
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re the Application of:	)	Group Art Unit: 2174
Sanjiv Sirpal	)	Confirmation No.: 8636
Serial No.: 13/247,708	)	Examiner: Steven Paul Sax
Filed: September 28, 2011	)	SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT
Atty. File No.: 6583-67	)	
Entitled: "Full-Screen Annunciator"	)	*Electronically Submitted*

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

The references cited on attached Form PTO/SB08 are being called to the attention of the Examiner.

☒ Copies of the cited non-patent and/or foreign references are enclosed herewith.

☐ Copies of the cited U.S. patents and/or patent applications are enclosed herewith.

☒ Copies of the cited U.S. patents/patent application publications are not enclosed in accordance with 37 C.F.R. § 1.98(a).

☐ Copies of the cited references are not enclosed, in accordance with 37 C.F.R. § 1.98(d), because the references were cited by or submitted to the U.S. Patent and Trademark Office in prior application Serial No. _____ filed _____, which is relied upon for an earlier filing date under 35 U.S.C. § 120.

☐ To the best of applicants' belief, the pertinence of the foreign-language references is believed to be summarized in the attached English abstracts and/or in the figures, although applicants do not necessarily vouch for the accuracy of the translation.

☐ Examiner's attention is drawn to the following related applications:

Serial No. _____ filed _____ (Attorney Ref. No. _____)

Serial No. _____ filed _____ (Attorney Ref. No. _____)

☐ Other:_____

Submission of the above information is not intended as an admission that any item is citable under the statutes or rules to support a rejection, that any item disclosed represents analogous art, or that those skilled in the art would refer to or recognize the pertinence of any reference without the benefit of hindsight, nor should an inference be drawn as to the pertinence

of the references based on the order in which they are presented. Submission of this statement should not be taken as an indication that a search has been conducted, or that no better art exists.

It is respectfully requested that the cited information be expressly considered during the prosecution of this application and the references made of record therein.

FEES

☐	**37 CFR 1.97(b)**: No fee is believed due in connection with this submission, because the information disclosure statement submitted herewith is satisfied by one of the following conditions ("X" indicates satisfaction): ☐ Within three months of the filing date of a national application other than a continued prosecution application under 37 CFR 1.53(d), or ☐ Within three months of the date of entry of the national stage as set forth in § 1.491 in an international application, or ☐ Before the mailing date of a first Office Action on the merits, or ☐ Before the mailing of a first Office action after the filing of a request for continued examination under 37 CFR 1.114. Although no fee is believed due, if any fee is deemed due in connection with this submission, please charge such fee to Deposit Account 19-1970.
☒	**37 CFR 1.97(c)**: The information disclosure statement transmitted herewith is being filed after all the above conditions (37 CFR 1.97(b)), but before the mailing date of any one of the following conditions: (1) a final action under 37 C.F.R. 1.113, or (2) a notice of allowance under 37 C.F.R. 1.311, or (3) an action that otherwise closes prosecution in the application. This Information Disclosure Statement is accompanied by: ☐ A Certification (below) as specified by 37 C.F.R. 1.97(e). Although no fee is believed due, if any fee is deemed due in connection with this submission, please charge such fee to Deposit Account 19-1970. OR ☒ Please charge Deposit Account 19-1970 in the amount of $90.00 for the fee set forth in 37 C.F.R. 1.17(p) for submission of an information disclosure statement. Please credit any overpayment or charge any underpayment to Deposit Account 19-1970.
☐	**37 CFR 1.97(d)**: This Information Disclosure Statement is being submitted after the period specified in 37 CFR 1.97(c). ☐ This information Disclosure Statement includes a Certification (below) as specified by 37 C.F.R. 1.97(e) AND ☐ Applicants hereby requests consideration of the reference(s) disclosed herein. Please charge Deposit Account 19-1970 in the amount of $90.00 under 37 C.F.R. 1.17(p). Please credit any overpayment or charge any underpayment to Deposit Account 19-1970. Election to pay the fee should not be taken as an indication that applicant(s) cannot execute a certification.

Certification (37 C.F.R. 1.97(e))
(Applicable only if checked)

☐ The undersigned certifies that:

☐ Each item of information contained in the Information Disclosure Statement submitted herewith was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this statement. 37 C.F.R. 1.97(e)(1).

☐ A copy of the communication from the foreign patent office is enclosed.

OR

☐ No item of information contained in the Information Disclosure Statement submitted herewith was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the undersigned after making reasonable inquiry, no item of information contained in the Information Disclosure Statement was known to any individual designated in 37 C.F.R. 1.56(c) more than three months prior to the filing of this statement. 37 C.F.R. 1.97(e)(2).

Respectfully submitted,

SHERIDAN ROSS P.C.

By: /Dean N. Reinhardt/
Dean N. Reinhardt
Registration No. 50225
1560 Broadway, Suite 1200
Denver, Colorado 80202-5141
(303) 863-9700

Date: March 18, 2015

Electronic Patent Application Fee Transmittal					
Application Number:	13247708				
Filing Date:	28-Sep-2011				
Title of Invention:	FULL-SCREEN ANNUNCIATOR				
First Named Inventor/Applicant Name:	Sanjiv Sirpal				
Filer:	Dean Reinhardt/Robert Roe-Pachirat				
Attorney Docket Number:	6583-67				
Filed as Large Entity					
Filing Fees for **Utility under 35 USC 111(a)**					
Description		**Fee Code**	**Quantity**	**Amount**	**Sub-Total in USD($)**
Basic Filing:					
Pages:					
Claims:					
Miscellaneous-Filing:					
Petition:					
Patent-Appeals-and-Interference:					
Post-Allowance-and-Post-Issuance:					
Extension-of-Time:					

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
		Total in USD ($)		**180**

Notice of References Cited	Application/Control No. 13/247,708	Applicant(s)/Patent Under Reexamination SIRPAL ET AL.	
	Examiner STEVEN SAX	Art Unit 2174	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-2007/0209019	09-2007	Kaval et al.	715/788
*	B	US-2010/0093399	04-2010	KIM et al.	455/566
*	C	US-2010/0138756	06-2010	Saund et al.	715/758
*	D	US-2010/0035658	02-2010	LEE, Myung Hee	455/566
*	E	US-6,313,828	11-2001	Chombo, Carlos Landetta	345/169
*	F	US-2014/0368601	12-2014	deCharms, Christopher	348/14.02
*	G	US-2013/0321340	12-2013	Seo et al.	345/174
*	H	US-2013/0072262	03-2013	Mhun et al.	455/566
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Application Number	13/247,708
				Filing Date	September 28, 2011
(Use as many sheets as necessary)				First Named Inventor	Sanjiv Sirpal
				Art Unit	2174
				Examiner Name	Steven Paul Sax
Sheet	1	of	2	Attorney Docket Number	6583-67

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-kind Code[2] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1	5889517	03/30/1999	Ueda et al.	
	2	7137074	11/14/2006	Newton et al.	
	3	7739604	06/15/2010	Lyons et al.	
	4	2002/0140746	10/03/2002	Gargi	
	5	2004/0095401	05/20/2004	Tomimori	
	6	2006/0085384	04/20/2006	Sato et al.	
	7	2006/0183505	08/17/2006	Willrich	
	8	2007/0036346	02/15/2007	Kwon	
	9	2007/0048717	03/01/2007	Hsieh	
	10	2008/0096593	04/24/2008	Park	
	11	2008/0119237	05/22/2008	Kim	
	12	2008/0204424	08/28/2008	Jin et al.	
	13	2008/0307350	12/11/2008	Sabatelli et al.	
	14	2009/0199128	08/06/2009	Matthews et al.	
	15	2009/0298418	12/03/2009	Michael et al.	
	16	2009/0307623	12/10/2009	Agarawala et al.	
	17	2010/0146428	06/10/2010	Ng et al.	
	18	2010/0169822	07/01/2010	Hollemans	
	19	2010/0182247	07/22/2010	Petschnigg et al.	
	20	2011/0107272	05/05/2011	Aguilar	
	21	2011/0167380	07/07/2011	Stallings et al.	
	22	2011/0187662	08/04/2011	Lee et al.	
	23	2011/0237303	09/29/2011	Matsuda	
	24	2012/0124515	05/17/2012	Li et al.	

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]; Number[4]; Kind Code[5] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]

Examiner Signature	/Steven Sax/	Date Considered	03/19/2015

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1] Applicant's unique citation designation number (optional). [2] See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6] Applicant is to place a check mark here if English language Translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /S.S./

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT *(Use as many sheets as necessary)*				Application Number	13/247,708
				Filing Date	September 28, 2011
				First Named Inventor	Sanjiv Sirpal
				Art Unit	2174
				Examiner Name	Steven Paul Sax
Sheet	2	of	2	Attorney Docket Number	6583-67

	25	EP 1648149	04/19/2006	SONY ERICSSON MOBILE COMMUNICATIONS JAPAN, INC.		

NON-PATENT LITERATURE DOCUMENTS		
Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
	26	"Windows Media Player 10 Mobile for Smartphone." Microsoft Corporation, 2004, 20 pages
	27	Official Action for U.S. Patent Application No. 13/247,982 mailed Nov. 13, 2014 (Attorney's Ref. No. 6583-28), 17 pages.
	28	Official Action for U.S. Patent Application No. 13/247,369 mailed Jan. 07, 2015 (Attorney's Ref. No. 6583-66) 7 pages
	29	Official Action for U.S. Patent Application No. 13/247,388 mailed Jan. 5, 2015 (Attorney's Ref. No. 6583-70) 7 pages
	30	Official Action for U.S. Patent Application No. 13/223,778, mailed Oct. 3, 2014 (Attorney's Ref. No. 6583-110) 42 pages
	31	Notice of Allowance for U.S. Patent Application No. 13/366,483, mailed Oct. 24, 2014 (Attorney's Ref. No. 6583-120), 7 pages
	32	Official Action for U.S. Patent Application No. 13/624,591, mailed Dec. 04, 2014 (Attorney's Ref. No. 6583-122), 27 pages
	33	Official Action for U.S. Patent Application No. 13/627,577, mailed Aug. 01, 2014 (Attorney's Ref. No. 6583-253) 18 pages
	34	Notice of Allowance for U.S. Patent Application No. 13/627,577, mailed Nov. 26, 2014 (Attorney's Ref. No. 6583-253) 11 pages
	35	Official Action for U.S. Patent Application No. 13/629,211 mailed Oct. 16, 2014 (Attorney Ref. No. 6583-312), 14 pages.
	36	Official Action for U.S. Patent Application No. 13/629,211 mailed Jan. 16, 2015 (Attorney Ref. No. 6583-312), 16 pages.

Examiner Signature	/Steven Sax/	Date Considered	03/19/2015

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. Applicant's unique citation designation number (optional). [2] See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6] Applicant is to place a check mark here if English language Translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /S.S./

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UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

BIB DATA SHEET

CONFIRMATION NO. 8636

SERIAL NUMBER	FILING or 371(c) DATE RULE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
13/247,708	09/28/2011	715	2174	6583-67

APPLICANTS

INVENTORS

Sanjiv Sirpal, Oakville, CANADA;
Paul E. Reeves, Oakville, CANADA;
Alexander de Paz, Burlington, CANADA;
Eduardo Diego Torres Milano, Oakville, CANADA;
Jared Ficklin, Austin, TX;
Denise Burton, Austin, TX;
Gregg Wygonik, Austin, TX;

**** CONTINUING DATA ***************************

This appln claims benefit of 61/539,884 09/27/2011
and claims benefit of 61/458,150 11/17/2010
and claims benefit of 61/389,000 10/01/2010
and claims benefit of 61/389,117 10/01/2010
and claims benefit of 61/389,087 10/01/2010

**** FOREIGN APPLICATIONS ***************************

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ****
10/13/2011

Foreign Priority claimed ☐ Yes ☑ No 35 USC 119(a-d) conditions met ☐ Yes ☑ No Verified and Acknowledged /STEVEN PAUL SAX/ Examiner's Signature	☐ Met after Allowance Initials	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
		CANADA	19	14	3

ADDRESS

Sheridan Ross P.C.
1560 Broadway
Suite 1200
Denver, CO 80202
UNITED STATES

TITLE

FULL-SCREEN ANNUNCIATOR

FILING FEE RECEIVED		
1380	FEES: Authority has been given in Paper No._____ to charge/credit DEPOSIT ACCOUNT No._____ for following:	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit

BIB (Rev. 05/07).

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13247708	SIRPAL ET AL.
	Examiner	**Art Unit**
	STEVEN SAX	2174

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☒ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	03/18/2015								
	1	=								
	2	=								
	3	=								
	4	=								
	5	=								
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	7	=								
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	14	=								
	15	=								
	16	=								
	17	=								
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	19	=								
	20	=								

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13247708	SIRPAL ET AL.
	Examiner	**Art Unit**
	STEVEN SAX	2174

CPC						
Symbol					**Type**	**Version**
G06F		1	/	1616	F	2013-01-01
G06F		3	/	048	I	2013-01-01
G06F		3	/	04812	I	2013-01-01
G06F		1	/	1641	I	2013-01-01
G06F		3	/	0481	I	2013-01-01
G06F		3	/	0483	I	2013-01-01
G06F		3	/	04883	I	2013-01-01
G06F		3	/	1423	A	2013-01-01
G06F		3	/	0488	I	2013-01-01
G06F		3	/	04886	I	2013-01-01
G06F		2200	/	1614	A	2013-01-01
G06F		1	/	1677	I	2013-01-01
G06F		3	/	017	I	2013-01-01
G06F		3	/	0484	I	2013-01-01
G06F		3	/	04842	I	2013-01-01
G06F		1	/	16	I	2013-01-01

CPC Combination Sets							
Symbol					**Type**	**Set**	**Ranking**	**Version**
			/					
			/					

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	20	
/STEVEN SAX/ Primary Examiner.Art Unit 2174	03/19/2015	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	7

U.S. Patent and Trademark Office — Part of Paper No. 20150318

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13247708	SIRPAL ET AL.
	Examiner	**Art Unit**
	STEVEN SAX	2174

US ORIGINAL CLASSIFICATION		INTERNATIONAL CLASSIFICATION										
CLASS	SUBCLASS	CLAIMED					NON-CLAIMED					
		G	0	6	F	3 / 0488 (2013.01.01)						
CROSS REFERENCE(S)												
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)											

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	20	
/STEVEN SAX/ Primary Examiner.Art Unit 2174	03/19/2015	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	7

U.S. Patent and Trademark Office

Part of Paper No. 20150318

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13247708	SIRPAL ET AL.
	Examiner	**Art Unit**
	STEVEN SAX	2174

☒ **Claims renumbered in the same order as presented by applicant** ☐ **CPA** ☐ **T.D.** ☐ **R.1.47**

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 20	
/STEVEN SAX/ Primary Examiner.Art Unit 2174 (Primary Examiner)	03/19/2015 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 7

U.S. Patent and Trademark Office — Part of Paper No. 20150318

Examiner-Initiated Interview Summary	Application No.	Applicant(s)	
	13/247,708	SIRPAL ET AL.	
	Examiner	Art Unit	
	STEVEN SAX	2174	

All participants (applicant, applicant's representative, PTO personnel):

(1) *Mr. Dean Reinhardt*. (3)_____.

(2) *Mr. Steve Sax*. (4)_____.

Date of Interview: *19 March 2015*.

Type: ☒ Telephonic ☐ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☐ No.
If Yes, brief description: _____.

Issues Discussed ☐101 ☐112 ☐102 ☒103 ☐Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: *all*.

Identification of prior art discussed: _____.

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

Agreement to Examiner's amendment.

Applicant recordation instructions: It is not necessary for applicant to provide a separate record of the substance of interview.

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☐ Attachment

/STEVEN SAX/ Primary Examiner, Art Unit 2174	

UNITED STATES PATENT AND TRADEMARK OFFICE

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NOTICE OF ALLOWANCE AND FEE(S) DUE

111285 7590 03/25/2015

Sheridan Ross P.C.
1560 Broadway
Suite 1200
Denver, CO 80202

EXAMINER
SAX, STEVEN PAUL

ART UNIT	PAPER NUMBER
2174	

DATE MAILED: 03/25/2015

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/247,708	09/28/2011	Sanjiv Sirpal	6583-67	8636

TITLE OF INVENTION: FULL-SCREEN ANNUNCIATOR

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	06/25/2015

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
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INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

111285 7590 03/25/2015
Sheridan Ross P.C.
1560 Broadway
Suite 1200
Denver, CO 80202

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/247,708	09/28/2011	Sanjiv Sirpal	6583-67	8636

TITLE OF INVENTION: FULL-SCREEN ANNUNCIATOR

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	06/25/2015

EXAMINER	ART UNIT	CLASS-SUBCLASS
SAX, STEVEN PAUL	2174	715-761000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
- ❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:
- ❑ Issue Fee
- ❑ Publication Fee (No small entity discount permitted)
- ❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
- ❑ A check is enclosed.
- ❑ Payment by credit card. Form PTO-2038 is attached.
- ❑ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
- ❑ Applicant certifying micro entity status. See 37 CFR 1.29 — NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
- ❑ Applicant asserting small entity status. See 37 CFR 1.27 — NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
- ❑ Applicant changing to regular undiscounted fee status. — NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

PTOL-85 Part B (10-13) Approved for use through 10/31/2013. OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/247,708	09/28/2011	Sanjiv Sirpal	6583-67	8636

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Sheridan Ross P.C.
1560 Broadway
Suite 1200
Denver, CO 80202

EXAMINER	
SAX, STEVEN PAUL	
ART UNIT	PAPER NUMBER
2174	

DATE MAILED: 03/25/2015

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 13/247,708	Applicant(s) SIRPAL ET AL.	
	Examiner STEVEN SAX	Art Unit 2174	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *Amendment 12/9/14 and Examiner's amendment contained herein*.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on_____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are *1-20*. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov .
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some *c) ☐ None of the:
   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date see attached
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
4. ☒ Interview Summary (PTO-413), Paper No./Mail Date *3/19/15* .
5. ☒ Examiner's Amendment/Comment
6. ☒ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/STEVEN SAX/
Primary Examiner, Art Unit 2174

Reasons for Allowance

1. The amendment filed 12/9/14 has been entered.

2. An examiner's amendment to the record appears below. This was made to clarify in the independent claims that the second display has a second application or desktop (i.e. not the same as that of the first display), and also that the modified information is displayed selectively across the annunciator window. Furthermore, claim 17 is amended to remedy a 112 concern. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Please amend the claims as follows:

1. (Currently Amended) A method of displaying information on a mobile multi-display device including a plurality of desktops and/or applications each having at least one window, and an annunciator window, the method comprising:

placing the multi-display device in an open state with a first display and a second display facing in a same direction;

receiving, by a processor, a first input that represents an instruction to reveal one of a first desktop or application on the first display of the multi-display device and selecting the first desktop or application to display on the first display;

receiving, by the processor, a second input that represents an instruction to reveal one of a second desktop or application on the second display of the multi-display device and selecting the second desktop or application to display on the second display;

displaying, by the processor, the selected first and second desktops or applications on the first and second displays;

displaying, by the processor, a pre-configured annunciator window having information therein showing at least one of a device status, a connectivity status, and a messaging status;

configuring, by the processor, the annunciator window to extend across a first portion of the first display and a second portion of the second display, wherein the first portion and the second portion do not degrade the display of information by the selected first and second desktops or applications; and

modifying, by the processor, the display of the annunciator window in response to a changed state of at least one of the device status, connectivity status, and messaging status, wherein the modified display of the annunciator window displays information selectively across the annunciator window.

2. (Previously Presented) The method of claim 1, wherein modifying the display of the annunciator window includes displaying the changed state including text corresponding to at least one of a calendar notification, a phone message, an email message, or a text message, and wherein the first display and the second display are on a common first screen of the multi-display device.

3. (Currently Amended) The method of claim 1, wherein modifying the display of the annunciator window further includes:

displaying the changed state across a portion of the annunciator window; and

masking at least one icon representing the device status, connectivity status, or messaging status, wherein the first display is on a first screen of the multi-display device, and wherein the second display is on a different second screen of the multi-display device.

4. (Previously Presented) The method of claim 1, wherein modifying the display of the annunciator window includes displaying information related to the changed state across substantially all of said annunciator window.

5. (Original) The method of claim 1, wherein said annunciator window is located across adjacent upper or lower edges of said first and second displays.

6. (Currently Amended) A non-transitory computer-readable medium having stored thereon instructions executable by a processor of a mobile multi-display device, the instructions causing the processor to execute a method, the instructions comprising:

instructions to receive a first input to reveal one of a first desktop or application on a first display of the multi-display device and to select the first desktop or application to display on the first display;

instructions to receive a second input to reveal one of a second desktop or application on a second display of the multi-display device and to select the second desktop or application to display on the second display, wherein the multi-display device is in an open state with the first display and the second display facing in a same direction;

instructions to display the selected first and second desktops or applications on the first and second displays;

instructions to display a pre-configured annunciator window having information therein showing at least one of a device status, a connectivity status, and a messaging status;

instructions to configure the annunciator window to extend across a first portion of the first display and a second portion of the second display, wherein the first portion and the second portion do not degrade the display of information by the selected first and second desktops or applications; and

instructions to modify the display of the annunciator window in response to a changed state of at least one of the device status, connectivity status, and messaging status, wherein the modified display of the annunciator window displays information selectively across the annunciator window.

7. (Currently Amended) The non-transitory computer-readable medium of claim 6, wherein the instructions to modify the display of the annunciator window further comprise

instructions to display the changed state including text corresponding to at least one of a calendar notification, a phone message, an email message, or a text message.

8. (Currently Amended) The non-transitory computer-readable medium of claim 6, wherein the instructions to modify the display of the annunciator window further comprise:

instructions to display the changed state across a portion of the annunciator window; and

instructions to mask at least one icon representing said device status, connectivity status, or messaging status, wherein the first display and the second display are on a common first screen of the multi-display device.

9. (Currently Amended) The non-transitory computer-readable medium of claim 6, wherein the instructions to configure the annunciator window further comprise instructions to display the annunciator window across adjacent upper or lower edges of the first and second displays, wherein the first display is on a first screen of the multi-display device, and wherein the second display is on a different second screen of the multi-display device.

10. (Currently Amended) A mobile multi-display user device, comprising:

a first display;

a second display;

a first user input gesture area;

a second user input gesture area, wherein the first and second user input gesture areas are configured to accept input from a user, and wherein the first and second user input gesture areas are not capable of performing a display function;

a processor; and

a computer-readable medium having instructions stored thereon that include:

instructions to receive a first input to reveal one of a first desktop or application on the first display of the multi-display device and to select the first desktop or application to display on the first display;

instructions to receive a second input to reveal one of a second desktop or application on the second display of the multi-display device and to select the second desktop or application to display on the second display, wherein the multi-display device is in an open state with the first display and the second display facing in a same direction;

instructions to display the selected first and second desktops or applications on the first and second displays;

instructions to display a pre-configured annunciator window having information therein showing at least one of a device status, a connectivity status, and a messaging status;

instructions to configure the annunciator window to extend across a first portion of the first display and a second portion of the second display, wherein the first portion and the second portion do not degrade the display of information by the selected first and second desktops or applications; and

instructions to modify the display of the annunciator window in response to one of a selected user gesture and a changed state of at least one of the device status, connectivity status, and messaging status, wherein the modified display of the annunciator window displays information selectively across the annunciator window.

11. (Currently Amended) The device of claim 10, wherein the instructions to modify the display of the annunciator window further comprise instructions to display a changed state of one of the device status, connectivity status, and messaging status including text corresponding to at least one of a calendar notification, a phone message, an email message, or a text message, and wherein the first display, the first user input gesture area, the second display, and the second user input gesture area are on a common first screen of the multi-display device.

12. (Currently Amended) The device of claim 10, wherein the instructions to modify the display of the annunciator window further comprise:

instructions to display a changed state of the multi-display device across a portion of the annunciator window; and

instructions to mask at least one icon representing the device status, connectivity status, or messaging status.

13. (Currently Amended) The device of claim 10, wherein the instructions to modify the display of the annunciator window further comprise instructions to display a changed state of the multi-display device across substantially all of the annunciator window.

14. (Currently Amended) The device of claim 10, wherein the instructions to modify the display of the annunciator window further comprise instructions to display the annunciator window across adjacent upper or lower edges of the first and second displays, wherein the first display and the first user input gesture area are on a first screen of the multi-display device, and wherein the second display and the second user input gesture area are on a different second screen of the multi-display device.

15. (Currently Amended) The device of claim 1, wherein the first and second displays are both in a portrait mode.

16. (Previously Presented) The device of claim 3, further comprising a hinge configured to connect the first screen with the second screen.

17. (Currently Amended) The non-transitory computer-readable medium of claim 6, wherein the instructions to modify the display of the annunciator window further comprise instructions to display information related to the changed state across substantially all of the annunciator window.

18. (Previously Presented) The device of claim 1, wherein the messaging status includes information about one or more of a phone call, an email message, a text message, and a calendar item.

19. (Previously Presented) The device of claim 1, wherein the information showing the device status and the connectivity status are in physical proximity.

20. (Currently Amended) The device of claim 1, wherein modifying the display of the annunciator window does not include changing a size of the annunciator window, and

wherein the annunciator window appears to be a unitary window displayed on each of the first portion of the first display and the second portion of the second display.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Dean Reinhardt on 12/19/15.

3. The following is an examiner's statement of reasons for allowance: The Examiner's amendment in combination with the amendment 12/9/15 together place the application into condition for allowance. The combined features bring out the mobile multi-display device with separate first and second displays, each displaying a different desktop or application; displaying the annunciator window which extends across a first portion of the first display and a second portion of the second display, wherein the first portion and the second portion do not degrade the display of information by the selected first and second desktops or applications; and modifying, by the processor, the display of the annunciator window in response to a changed state of at least one of the device status, connectivity status, and messaging status, wherein the modified display of the annunciator window displays information selectively across the annunciator window. There are multi-display devices in the prior art. See for example Purcell et al. However, Purcell et al is not a mobile device nor does it show the unified annunciator window which modifies its displayed information in response to the status changes as explained in the independent claims of the present invention. Seo et al comes close to the invention in showing a mobile multi-display device with a window that extends across portions of both displays. See for example Figure 9H. Nevertheless, Seo et al does not

show the unified annunciator window which modifies its displayed information in response to the status changes, as explained in the independent claims of the present invention. See Figure 8 of the present invention and note how the annunciator window is a unified window extending across portions of both displays, while not degrading the display of information by the selected first and second desktops or applications which are still displayed. The annunciator window is thus an addition to those desktops and/or applications, and it specifically modifies its display in response to a changed state of at least one of the device status, connectivity status, and messaging status, wherein the modified display of the annunciator window displays information selectively across the annunciator window. The features combined thus distinguish over Seo, even in combination with a standard annunciator window like that of Lee. The combined features of independent claims 1 (method), 6 (non-transitory medium), and 10 (apparatus) are not set forth over the prior art of record.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled “Comments on Statement of Reasons for Allowance.”

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to STEVEN SAX whose telephone number is (571)272-4072. The examiner can normally be reached on Monday thru Friday, 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dennis Chow can be reached on (571) 272-7767. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/STEVEN SAX/
Primary Examiner, Art Unit 2174

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13247708	SIRPAL ET AL.
	Examiner	Art Unit
	STEVEN SAX	2174

CPC- SEARCHED		
Symbol	Date	Examiner
G06F 3/04812, 3/0488	3/15	SS
G06F 3/04886	3/15	SS

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
715	761, 803-806, 790, 792	9/14	SS
715	769	9/14	SS

SEARCH NOTES		
Search Notes	Date	Examiner
East	9/14	SS
East update	3/15	SS
NPL: Google	3/15	SS
NPL: ACM	3/15	SS

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
G06F	3/04886, 3/04812 East Interference Search	3/15	SS

EAST Search History

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L15	0	((message or annunciator or status) with (window or bar) same (cover or covering or covered or extend or extending or extended or across or overlap or overlapped or overlapping) same (second or other or another or different) same window and (application or desktop) and (mobile or portable or handheld) same (((two or multi) same (display or screen)) or multidisplay or multiscreen)).clm.	US-PGPUB; USPAT; UPAD	OR	ON	2015/03/19 20:29

3/ 19/ 2015 8:29:17 PM
C:\ Users\ ssax\ Documents\ EAST\ Workspaces\ new.wsp

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	0	@ad<"20101101" and (annunciator or status) with (window or bar) with (cover or covering or covered or extend or extending or extended or across or overlap or overlapped or overlapping) with (each or both) with window and (((two or multi) near2 (display or screen)) or multidisplay or multiscreen)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/19 20:01
L2	0	@ad<"20101101" and (annunciator or status) with (window or bar) same (cover or covering or covered or extend or extending or extended or across or overlap or overlapped or overlapping) with (each or both) with window and (((two or multi) near2 (display or screen)) or multidisplay or multiscreen)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/19 20:02
L3	45	@ad<"20101101" and (annunciator or status) with (window or bar) with (each or both) with window and (((two or multi) near2 (display or screen)) or multidisplay or multiscreen)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/19 20:02
L4	4	@ad<"20101101" and (annunciator or status) with (window or bar) with (each or both) with window and (mobile or portable or handheld) with (((two or multi) near2 (display or screen)) or multidisplay or multiscreen)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/19 20:03

3/19/2015 8:05:11 PM
C:\Users\ssax\Documents\EAST\Workspaces\new.wsp

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L11	28	(message or communication or annunciator or status) with (window or bar) with (cover or covering or covered or extend or extending or extended or across or overlap or overlapped or overlapping) with (second or other or another or different) with window and (mobile or portable or handheld) with (((two or multi) with (display or screen)) or multidisplay or multiscreen)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/19 20:15

3/ 19/ 2015 8:29:33 PM
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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L5	9	@ad<"20101101" and (annunciator or status) with (window or bar) with (each or both) with window and (mobile or portable or handheld) with (((two or multi) with (display or screen)) or multidisplay or multiscreen)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/19 20:08
L6	5	5 not 4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/19 20:08
L7	35	@ad<"20101101" and (message or communication or annunciator or status) with (window or bar) with (each or both) with window and (mobile or portable or handheld) with (((two or multi) with (display or screen)) or multidisplay or multiscreen)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/19 20:09
L8	26	7 not 5	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/19 20:09

3/ 19/ 2015 8:13:11 PM
C:\ Users\ ssax\ Documents\ EAST\ Workspaces\ new.wsp

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT *(Use as many sheets as necessary)*				Application Number	13/247,708
				Filing Date	September 28, 2011
				First Named Inventor	Sanjiv Sirpal
				Art Unit	2174
				Examiner Name	Steven Paul Sax
Sheet	1	of	1	Attorney Docket Number	6583-67

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No.[1]	Document Number Number-kind Code[2] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1	5157763	10/20/1992	Peterset al.	
	2	2008/0111822	05/15/2008	Horowitz et al.	
	3	2008/0148152	06/19/2008	Blinnikka et al.	
	4	2008/0152297	06/26/2008	Ubillos	
	5	2011/0119611	05/19/2011	Ahn et al.	

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]; Number[4]; Kind Code[5] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]

NON-PATENT LITERATURE DOCUMENTS		
Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
	6	Notice of Allowance for U.S. Patent Application No. 13/247,982 mailed May 28, 2015 (Attorney's Ref. No. 6583-28), 8 pages.
	7	Official Action for U.S. Patent Application No. 13/223,778, mailed Apr. 24, 2015 (Attorney's Ref. No. 6583-110) 48 pages
	8	Notice of Allowance for U.S. Patent Application No. 13/366,483, mailed Apr. 3, 2015 (Attorney's Ref. No. 6583-120), 5 pages
	9	Official Action for U.S. Patent Application No. 13/624,591, mailed Jun. 19, 2015 (Attorney's Ref. No. 6583-122), 34 pages
	10	Official Action for U.S. Patent Application No. 13/629,211 mailed Jun. 18, 2015 (Attorney Ref. No. 6583-312), 18 pages.

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1] Applicant's unique citation designation number (optional). [2] See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6] Applicant is to place a check mark here if English language Translation is attached.

Electronic Acknowledgement Receipt

EFS ID:	22732325
Application Number:	13247708
International Application Number:	
Confirmation Number:	8636
Title of Invention:	FULL-SCREEN ANNUNCIATOR
First Named Inventor/Applicant Name:	Sanjiv Sirpal
Customer Number:	111285
Filer:	Douglas W. Swartz/Theresa Brown
Filer Authorized By:	Douglas W. Swartz
Attorney Docket Number:	6583-67
Receipt Date:	24-JUN-2015
Filing Date:	28-SEP-2011
Time Stamp:	18:15:52
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Post Allowance Communication - Incoming	Comments_on_Reasons_for_Allowance.pdf	228566 91182b79e4614dd76628d3294dbe530ea13dd777	no	5
Warnings:					
Information:					

Total Files Size (in bytes):	228566

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Electronic Acknowledgement Receipt	
EFS ID:	22732396
Application Number:	13247708
International Application Number:	
Confirmation Number:	8636
Title of Invention:	FULL-SCREEN ANNUNCIATOR
First Named Inventor/Applicant Name:	Sanjiv Sirpal
Customer Number:	111285
Filer:	Douglas W. Swartz/Theresa Brown
Filer Authorized By:	Douglas W. Swartz
Attorney Docket Number:	6583-67
Receipt Date:	24-JUN-2015
Filing Date:	28-SEP-2011
Time Stamp:	18:19:50
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$180
RAM confirmation Number	16452
Deposit Account	191970
Authorized User	SWARTZ, DOUGLAS W.
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)	

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Other Reference-Patent/App/Search documents	6583-28_NOA_05-28-2015.pdf	1040071 15f69b8f9b4205bfcf593205f84d762db9c7a755	no	8
Warnings:					
Information:					
2	Other Reference-Patent/App/Search documents	6583-110_FOA_04-24-2015.pdf	4504588 ef155191e7acc8b8da31188fc601f2b6e5a149e6	no	48
Warnings:					
Information:					
3	Other Reference-Patent/App/Search documents	6583-120_NOA_04-03-2015.pdf	805961 0054f7f09916c29e67835a024293eb3254f9e062	no	5
Warnings:					
Information:					
4	Other Reference-Patent/App/Search documents	6583-122_FOA_06-19-2015.pdf	1190881 8a5b8a6af96668e5d0ead05494123c54af1b55db	no	34
Warnings:					
Information:					
5	Other Reference-Patent/App/Search documents	6583-312_FOA_06-18-2015.pdf	660953 41bd11e890f1bf87289a96a6e6924359753a3e5a	no	18
Warnings:					
Information:					
6		IDS_05.pdf	182185 27413d9e7f8fe6ad8429fd30f51332245b5d32d1	yes	4

Multipart Description/PDF files in .zip description

Document Description	Start	End
Transmittal Letter	1	3
Information Disclosure Statement (IDS) Form (SB08)	4	4

Warnings:

Information:

7	Fee Worksheet (SB06)	fee-info.pdf	30678 ba75535d1838903927f51248199585cbc8fe6c0e	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	8415317	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re the Application of:	Group Art Unit: 2174
Sanjiv Sirpal	Confirmation No.: 8636
Serial No.: 13/247,708	Examiner: Steven Paul Sax
Filed: September 28, 2011	
Atty. File No.: 6583-67	
Entitled: "FULL-SCREEN ANNUNCIATOR"	***Submitted via EFS-Web***

Mail Stop Issue Fee
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

COMMENTS ON STATEMENT OF REASONS FOR ALLOWANCE

Dear Commissioner:

Applicant submits these Comments on Statement of Reasons for Allowance to address further the Notice of Allowability ("Notice") having a mailing date of March 25, 2015.

In the Notice, the Examiner's stated reasons for allowance were that:

> The Examiner's amendment in combination with the amendment 12/9/15 together place the application into condition for allowance. The combined features bring out the mobile multi-display device with separate first and second displays, each displaying a different desktop or application; displaying the annunciator window which extends across a first portion of the first display and a second portion of the second display, wherein the first portion and the second portion do not degrade the display of information by the selected first and second desktops or applications; and modifying, by the processor, the display of the annunciator window in response to a changed state of at least one of the device status, connectivity status, and messaging status, wherein the modified display of the annunciator window displays information selectively across the annunciator window. There are multi-display devices in the prior art. See for example Purcell et al. However, Purcell et al is not a mobile device nor does it show the unified annunciator window which modifies its displayed information in response to the status changes as explained in the

> independent claims of the present invention. Seo et al comes close to the invention in showing a mobile multi-display device with a window that extends across portions of both displays. See for example Figure 9H. Nevertheless, Seo et al does not show the unified annunciator window which modifies its displayed information in response to the status changes, as explained in the independent claims of the present invention. See Figure 8 of the present invention and note how the annunciator window is a unified window extending across portions of both displays, while not degrading the display of information by the selected first and second desktops or applications which are still displayed. The annunciator window is thus an addition to those desktops and/or applications, and it specifically modifies its display in response to a changed state of at least one of the device status, connectivity status, and messaging status, wherein the modified display of the annunciator window displays information selectively across the annunciator window. The features combined thus distinguish over Seo, even in combination with a standard annunciator window like that of Lee. The combined features of independent claims 1 (method), 6 (non-transitory medium), and 10 (apparatus) are not set forth over the prior art of record.

Based on the Notice, the patentability of all other independent and dependent claims is assumed to be based upon the elements as set forth in such claims and that such claims meet all criteria for patentability under §101, §102, §103 and §112.

As is clear from MPEP 1302.14,

> "The statement [of reasons for allowance] is not intended to necessarily state all the reasons for allowance or all the details why claims are allowed and should not be written to specifically or impliedly state that all the reasons for allowance are set forth."

While the above statement may be a stated reason for allowing some independent claims, Applicant submits that some independent claims may have a different reason for allowance and/or that some independent claims may have other reasons for allowance.

Specifically, the prior art fails to teach the following features of Claims 1, 6 and 10:

> 1. A method of displaying information on a mobile multi-display device including a plurality of desktops and/or applications each having at least one window, and an annunciator window, the method comprising:
>
> placing the multi-display device in an open state with a first display and a second display facing in a same direction;

receiving, by a processor, a first input that represents an instruction to reveal one of a first desktop or application on the first display of the multi-display device and selecting the first desktop or application to display on the first display;

receiving, by the processor, a second input that represents an instruction to reveal one of a second desktop or application on the second display of the multi-display device and selecting the second desktop or application to display on the second display;

displaying, by the processor, the selected first and second desktops or applications on the first and second displays;

displaying, by the processor, a pre-configured annunciator window having information therein showing at least one of a device status, a connectivity status, and a messaging status;

configuring, by the processor, the annunciator window to extend across a first portion of the first display and a second portion of the second display, wherein the first portion and the second portion do not degrade the display of information by the selected first and second desktops or applications; and

modifying, by the processor, the display of the annunciator window in response to a changed state of at least one of the device status, connectivity status, and messaging status, wherein the modified display of the annunciator window displays information selectively across the annunciator window.

6. A non-transitory computer-readable medium having stored thereon instructions executable by a processor of a mobile multi-display device, the instructions causing the processor to execute a method, the instructions comprising:

instructions to receive a first input to reveal one of a first desktop or application on a first display of the multi-display device and to select the first desktop or application to display on the first display;

instructions to receive a second input to reveal one of a second desktop or application on a second display of the multi-display device and to select the second desktop or application to display on the second display, wherein the multi-display device is in an open state with the first display and the second display facing in a same direction;

instructions to display the selected first and second desktops or applications on the first and second displays;

instructions to display a pre-configured annunciator window having information therein showing at least one of a device status, a connectivity status, and a messaging status;

instructions to configure the annunciator window to extend across a first portion of the first display and a second portion of the second display, wherein the first portion and the second portion do not degrade the display of information by the selected first and second desktops or applications; and

instructions to modify the display of the annunciator window in response to a changed state of at least one of the device status, connectivity status, and messaging status, wherein the modified display of the annunciator window displays information selectively across the annunciator window.

10. A mobile multi-display user device, comprising:

a first display;

a second display;

a first user input gesture area;

a second user input gesture area, wherein the first and second user input gesture areas are configured to accept input from a user, and wherein the first and second user input gesture areas are not capable of performing a display function;

a processor; and

a computer-readable medium having instructions stored thereon that include:

instructions to receive a first input to reveal one of a first desktop or application on the first display of the multi-display device and to select the first desktop or application to display on the first display;

instructions to receive a second input to reveal one of a second desktop or application on the second display of the multi-display device and to select the second desktop or application to display on the second display, wherein the multi-display device is in an open state with the first display and the second display facing in a same direction;

instructions to display the selected first and second desktops or applications on the first and second displays;

instructions to display a pre-configured annunciator window having information therein showing at least one of a device status, a connectivity status, and a messaging status;

instructions to configure the annunciator window to extend across a first portion of the first display and a second portion of the second display, wherein the first portion and the second portion do not degrade the display of information by the selected first and second desktops or applications; and

instructions to modify the display of the annunciator window in response to one of a selected user gesture and a changed state of at least one of the device status, connectivity status, and messaging status, wherein the modified display of the annunciator window displays information selectively across the annunciator window.

Although the Applicant believes that no fees are due for filing these Comments on Statement of Reasons for Allowance, please charge any fees deemed necessary to Deposit Account No. 19-1970.

Respectfully submitted,

SHERIDAN ROSS P.C.

DWS

By: /Douglas W. Swartz/
Douglas W. Swartz
Registration No. 37739
1560 Broadway, Suite 1200
Denver, Colorado 80202-5141
(303) 863-9700

Date: June 24, 2015

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re the Application of:	)	Group Art Unit: 2174
Sanjiv Sirpal	)	Confirmation No.: 8636
Serial No.: 13/247,708	)	Examiner: Steven Paul Sax
Filed: September 28, 2011	)	SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT
Atty. File No.: 6583-67	)	
Entitled: "Full-Screen Annunciator"	)	*Electronically Submitted*

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

The references cited on attached Form PTO/SB08 are being called to the attention of the Examiner.

☒ Copies of the cited non-patent and/or foreign references are enclosed herewith.

☐ Copies of the cited U.S. patents and/or patent applications are enclosed herewith.

☒ Copies of the cited U.S. patents/patent application publications are not enclosed in accordance with 37 C.F.R. § 1.98(a).

☐ Copies of the cited references are not enclosed, in accordance with 37 C.F.R. § 1.98(d), because the references were cited by or submitted to the U.S. Patent and Trademark Office in prior application Serial No. _____ filed _____, which is relied upon for an earlier filing date under 35 U.S.C. § 120.

☐ To the best of applicants' belief, the pertinence of the foreign-language references is believed to be summarized in the attached English abstracts and/or in the figures, although applicants do not necessarily vouch for the accuracy of the translation.

☐ Examiner's attention is drawn to the following related applications:

Serial No. _____ filed _____ (Attorney Ref. No. _____)

Serial No. _____ filed _____ (Attorney Ref. No. _____)

☐ Other:_____

Submission of the above information is not intended as an admission that any item is citable under the statutes or rules to support a rejection, that any item disclosed represents analogous art, or that those skilled in the art would refer to or recognize the pertinence of any reference without the benefit of hindsight, nor should an inference be drawn as to the pertinence

of the references based on the order in which they are presented. Submission of this statement should not be taken as an indication that a search has been conducted, or that no better art exists.

It is respectfully requested that the cited information be expressly considered during the prosecution of this application and the references made of record therein.

FEES

☐	**37 CFR 1.97(b)**: No fee is believed due in connection with this submission, because the information disclosure statement submitted herewith is satisfied by one of the following conditions ("X" indicates satisfaction): ☐ Within three months of the filing date of a national application other than a continued prosecution application under 37 CFR 1.53(d), or ☐ Within three months of the date of entry of the national stage as set forth in § 1.491 in an international application, or ☐ Before the mailing date of a first Office Action on the merits, or ☐ Before the mailing of a first Office action after the filing of a request for continued examination under 37 CFR 1.114. Although no fee is believed due, if any fee is deemed due in connection with this submission, please charge such fee to Deposit Account 19-1970.
☐	**37 CFR 1.97(c)**: The information disclosure statement transmitted herewith is being filed after all the above conditions (37 CFR 1.97(b)), but before the mailing date of any one of the following conditions: (1) a final action under 37 C.F.R. 1.113, or (2) a notice of allowance under 37 C.F.R. 1.311, or (3) an action that otherwise closes prosecution in the application. This Information Disclosure Statement is accompanied by: ☐ A Certification (below) as specified by 37 C.F.R. 1.97(e). Although no fee is believed due, if any fee is deemed due in connection with this submission, please charge such fee to Deposit Account 19-1970. OR ☐ Please charge Deposit Account 19-1970 in the amount of $180.00 for the fee set forth in 37 C.F.R. 1.17(p) for submission of an information disclosure statement. Please credit any overpayment or charge any underpayment to Deposit Account 19-1970.
☒	**37 CFR 1.97(d)**: This Information Disclosure Statement is being submitted after the period specified in 37 CFR 1.97(c). ☒ This information Disclosure Statement includes a Certification (below) as specified by 37 C.F.R. 1.97(e) AND ☒ Applicants hereby requests consideration of the reference(s) disclosed herein. Please charge Deposit Account 19-1970 in the amount of $180.00 under 37 C.F.R. 1.17(p). Please credit any overpayment or charge any underpayment to Deposit Account 19-1970. Election to pay the fee should not be taken as an indication that applicant(s) cannot execute a certification.

Certification (37 C.F.R. 1.97(e))
(Applicable only if checked)

☒ The undersigned certifies that:

☐ Each item of information contained in the Information Disclosure Statement submitted herewith was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this statement. 37 C.F.R. 1.97(e)(1).

☐ A copy of the communication from the foreign patent office is enclosed.

OR

☒ No item of information contained in the Information Disclosure Statement submitted herewith was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the undersigned after making reasonable inquiry, no item of information contained in the Information Disclosure Statement was known to any individual designated in 37 C.F.R. 1.56(c) more than three months prior to the filing of this statement. 37 C.F.R. 1.97(e)(2).

Respectfully submitted,

SHERIDAN ROSS P.C.

DWS

By: /Douglas W. Swartz/
Douglas W. Swartz
Registration No. 37739
1560 Broadway, Suite 1200
Denver, Colorado 80202-5141
(303) 863-9700

Date: June 24, 2015

Electronic Patent Application Fee Transmittal	
Application Number:	13247708
Filing Date:	28-Sep-2011
Title of Invention:	FULL-SCREEN ANNUNCIATOR
First Named Inventor/Applicant Name:	Sanjiv Sirpal
Filer:	Douglas W. Swartz/Theresa Brown
Attorney Docket Number:	6583-67
Filed as Large Entity	
Filing Fees for **Utility under 35 USC 111(a)**	

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
		Total in USD ($)		**180**

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT *(Use as many sheets as necessary)*				Application Number	13/247,708
				Filing Date	September 28, 2011
				First Named Inventor	Sanjiv Sirpal
				Art Unit	2174
				Examiner Name	Steven Paul Sax
Sheet	1	of	1	Attorney Docket Number	6583-67

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No.[1]	Document Number Number-kind Code[2] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1	5467102	11/14/1995	Kuno et al.	
	2	2006/0161847	07/20/2006	Holeceket al.	
	3	2011/0209102	08/25/2011	Hinckley et al.	
	4	2012/0084737	04/05/2012	Gimpl et al.	

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]; Number[4]; Kind Code[5] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]

NON-PATENT LITERATURE DOCUMENTS		
Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1] Applicant's unique citation designation number (optional). [2] See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6] Applicant is to place a check mark here if English language Translation is attached.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

111285 7590 03/25/2015
Sheridan Ross P.C.
1560 Broadway
Suite 1200
Denver, CO 80202

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/247,708	09/28/2011	Sanjiv Sirpal	6583-67	8636

TITLE OF INVENTION: FULL-SCREEN ANNUNCIATOR

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	06/25/2015

EXAMINER	ART UNIT	CLASS-SUBCLASS
SAX, STEVEN PAUL	2174	715-761000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Sheridan Ross P.C.
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: Z124

(B) RESIDENCE: (CITY and STATE OR COUNTRY): George Town, Cayman Islands

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:
- ☒ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☒ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number 19-1970 (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
- ☐ Applicant certifying micro entity status. See 37 CFR 1.29 — NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
- ☐ Applicant asserting small entity status. See 37 CFR 1.27 — NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
- ☐ Applicant changing to regular undiscounted fee status. — NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature /Douglas W. Swartz/ Date June 25, 2015
Typed or printed name Douglas W. Swartz Registration No. 37,739

PTOL-85 Part B (10-13) Approved for use through 10/31/2013. OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Electronic Acknowledgement Receipt	
EFS ID:	22735725
Application Number:	13247708
International Application Number:	
Confirmation Number:	8636
Title of Invention:	FULL-SCREEN ANNUNCIATOR
First Named Inventor/Applicant Name:	Sanjiv Sirpal
Customer Number:	111285
Filer:	Douglas W. Swartz/Theresa Brown
Filer Authorized By:	Douglas W. Swartz
Attorney Docket Number:	6583-67
Receipt Date:	25-JUN-2015
Filing Date:	28-SEP-2011
Time Stamp:	10:25:46
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		IDS_06.pdf	108492 ca41ac5779af8d575a8954c9d605a8036b3f4e38	yes	3

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Transmittal Letter	1	2
	Information Disclosure Statement (IDS) Form (SB08)	3	3
Warnings:			
Information:			
	Total Files Size (in bytes):	108492	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Electronic Acknowledgement Receipt	
EFS ID:	22740718
Application Number:	13247708
International Application Number:	
Confirmation Number:	8636
Title of Invention:	FULL-SCREEN ANNUNCIATOR
First Named Inventor/Applicant Name:	Sanjiv Sirpal
Customer Number:	111285
Filer:	Douglas W. Swartz/Amy Duarte
Filer Authorized By:	Douglas W. Swartz
Attorney Docket Number:	6583-67
Receipt Date:	25-JUN-2015
Filing Date:	28-SEP-2011
Time Stamp:	14:42:02
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$960
RAM confirmation Number	1049
Deposit Account	191970
Authorized User	SWARTZ, DOUGLAS W.
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	Issue-fee-transmittal_6583-67.pdf	93545 3d997731cb0afa52e458cdaaaec6383eea68a948	no	1
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30484 ca1bca33045b2776759c505d6bb5eac8c5a6c2e1	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	124029		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re the Application of:	)	Group Art Unit: 2174
Sanjiv Sirpal	)	Confirmation No.: 8636
Serial No.: 13/247,708	)	Examiner: Steven Paul Sax
Filed: September 28, 2011	)	SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT
Atty. File No.: 6583-67	)	
Entitled: "Full-Screen Annunciator"	)	*Electronically Submitted*

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

The references cited on attached Form PTO/SB08 are being called to the attention of the Examiner.

☐ Copies of the cited non-patent and/or foreign references are enclosed herewith.

☐ Copies of the cited U.S. patents and/or patent applications are enclosed herewith.

☒ Copies of the cited U.S. patents/patent application publications are not enclosed in accordance with 37 C.F.R. § 1.98(a).

☐ Copies of the cited references are not enclosed, in accordance with 37 C.F.R. § 1.98(d), because the references were cited by or submitted to the U.S. Patent and Trademark Office in prior application Serial No. _____ filed _____, which is relied upon for an earlier filing date under 35 U.S.C. § 120.

☐ To the best of applicants' belief, the pertinence of the foreign-language references is believed to be summarized in the attached English abstracts and/or in the figures, although applicants do not necessarily vouch for the accuracy of the translation.

☐ Examiner's attention is drawn to the following related applications:

Serial No. _____ filed _____ (Attorney Ref. No. _____)

Serial No. _____ filed _____ (Attorney Ref. No. _____)

☐ Other:_____

Submission of the above information is not intended as an admission that any item is citable under the statutes or rules to support a rejection, that any item disclosed represents analogous art, or that those skilled in the art would refer to or recognize the pertinence of any reference without the benefit of hindsight, nor should an inference be drawn as to the pertinence

of the references based on the order in which they are presented. Submission of this statement should not be taken as an indication that a search has been conducted, or that no better art exists.

It is respectfully requested that the cited information be expressly considered during the prosecution of this application and the references made of record therein.

Respectfully submitted,

SHERIDAN ROSS P.C.

By: /Douglas W. Swartz/ DWS
Douglas W. Swartz
Registration No. 37739
1560 Broadway, Suite 1200
Denver, Colorado 80202-5141
(303) 863-9700

Date: June 24, 2015

Electronic Patent Application Fee Transmittal

Application Number:	13247708
Filing Date:	28-Sep-2011
Title of Invention:	FULL-SCREEN ANNUNCIATOR
First Named Inventor/Applicant Name:	Sanjiv Sirpal
Filer:	Douglas W. Swartz/Amy Duarte
Attorney Docket Number:	6583-67

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Utility Appl Issue Fee	1501	1	960	960

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**960**

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/247,708	09/28/2011	Sanjiv Sirpal	6583-67	8636

7590 06/29/2015

Sheridan Ross P.C.
1560 Broadway
Suite 1200
Denver, CO 80202

EXAMINER	
SAX, STEVEN PAUL	

ART UNIT	PAPER NUMBER
2174	

NOTIFICATION DATE	DELIVERY MODE
06/29/2015	ELECTRONIC

NOTICE OF NON-COMPLIANT INFORMATION DISCLOSURE STATEMENT

An Information Disclosure Statement (IDS) filed 6-25-15 in the above-identified application fails to meet the requirements of 37 CFR 1.97(d) for the reason(s) specified below. Accordingly, the IDS will be placed in the file, but the information referred to therein has not been considered.

The IDS is not compliant with 37 CFR 1.97(d) because:

☑ The IDS lacks a statement as specified in 37 CFR 1.97(e).

☐ The IDS lacks the fee set forth in 37 CFR 1.17(p).

☐ The IDS was filed after the issue fee was paid. Applicant may wish to consider filing a petition to withdraw the application from issue under 37 CFR 1.313(c) to have the IDS considered. See MPEP 1308.

571-272-4200 or 1-888-786-0101
Application Assistance Unit
Office of Data Management

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/247,708	09/28/2011	Sanjiv Sirpal	6583-67	8636

111285 7590 07/08/2015

Sheridan Ross P.C.
1560 Broadway
Suite 1200
Denver, CO 80202

EXAMINER
SAX, STEVEN PAUL

ART UNIT	PAPER NUMBER
2174	

NOTIFICATION DATE	DELIVERY MODE
07/08/2015	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

flexpatents@sheridanross.com
edocket@sheridanross.com

UNITED STATES DEPARTMENT OF COMMERCE
U.S. Patent and Trademark Office
Address : COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450

APPLICATION NO./ CONTROL NO.	FILING DATE	FIRST NAMED INVENTOR / PATENT IN REEXAMINATION	ATTORNEY DOCKET NO.
13/247,708	28 September, 2011	SIRPAL ET AL.	6583-67

		EXAMINER	
Sheridan Ross P.C. 1560 Broadway Suite 1200 Denver, CO 80202		STEVEN SAX	
		ART UNIT	PAPER
		2174	20150701

DATE MAILED:

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner for Patents

Please see the attached Notice of Non-Compliant Information Disclosure Statement

/STEVEN SAX/
Primary Examiner, Art Unit 2174

PTO-90C (Rev.04-03)

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/247,708	09/28/2011	Sanjiv Sirpal	6583-67	8636

7590 06/29/2015

Sheridan Ross P.C.
1560 Broadway
Suite 1200
Denver, CO 80202

EXAMINER	
SAX, STEVEN PAUL	

ART UNIT	PAPER NUMBER
2174	

NOTIFICATION DATE	DELIVERY MODE
06/29/2015	ELECTRONIC

NOTICE OF NON-COMPLIANT INFORMATION DISCLOSURE STATEMENT

An Information Disclosure Statement (IDS) filed 6-25-15 in the above-identified application fails to meet the requirements of 37 CFR 1.97(d) for the reason(s) specified below. Accordingly, the IDS will be placed in the file, but the information referred to therein has not been considered.

The IDS is not compliant with 37 CFR 1.97(d) because:

☑ The IDS lacks a statement as specified in 37 CFR 1.97(e).

☐ The IDS lacks the fee set forth in 37 CFR 1.17(p).

☐ The IDS was filed after the issue fee was paid. Applicant may wish to consider filing a petition to withdraw the application from issue under 37 CFR 1.313(c) to have the IDS considered. See MPEP 1308.

571-272-4200 or 1-888-786-0101
Application Assistance Unit
Office of Data Management

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT *(Use as many sheets as necessary)*				Application Number	13/247,708
				Filing Date	September 28, 2011
				First Named Inventor	Sanjiv Sirpal
				Art Unit	2174
				Examiner Name	Steven Paul Sax
Sheet	1	of	1	Attorney Docket Number	6583-67

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No.[1]	Document Number Number-kind Code[2] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1	5157763	10/20/1992	Peterset al.	
	2	2008/0111822	05/15/2008	Horowitz et al.	
	3	2008/0148152	06/19/2008	Blinnikka et al.	
	4	2008/0152297	06/26/2008	Ubillos	
	5	2011/0119611	05/19/2011	Ahn et al.	

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]; Number[4]; Kind Code[5] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]

NON-PATENT LITERATURE DOCUMENTS		
Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
	6	Notice of Allowance for U.S. Patent Application No. 13/247,982 mailed May 28, 2015 (Attorney's Ref. No. 6583-28), 8 pages.
	7	Official Action for U.S. Patent Application No. 13/223,778, mailed Apr. 24, 2015 (Attorney's Ref. No. 6583-110) 48 pages
	8	Notice of Allowance for U.S. Patent Application No. 13/366,483, mailed Apr. 3, 2015 (Attorney's Ref. No. 6583-120), 5 pages
	9	Official Action for U.S. Patent Application No. 13/624,591, mailed Jun. 19, 2015 (Attorney's Ref. No. 6583-122), 34 pages
	10	Official Action for U.S. Patent Application No. 13/629,211 mailed Jun. 18, 2015 (Attorney Ref. No. 6583-312), 18 pages.

Examiner Signature	/STEVEN SAX/	Date Considered	08/18/2015

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1] Applicant's unique citation designation number (optional). [2] See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6] Applicant is to place a check mark here if English language Translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /SS/

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/247,708	09/28/2011	Sanjiv Sirpal	6583-67	8636

111285 7590 08/25/2015

Sheridan Ross P.C.
1560 Broadway
Suite 1200
Denver, CO 80202

EXAMINER	
SAX, STEVEN PAUL	

ART UNIT	PAPER NUMBER
2174	

NOTIFICATION DATE	DELIVERY MODE
08/25/2015	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

flexpatents@sheridanross.com
edocket@sheridanross.com

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Alexandria, Virginia 22313-1450

APPLICATION NO./ CONTROL NO.	FILING DATE	FIRST NAMED INVENTOR / PATENT IN REEXAMINATION	ATTORNEY DOCKET NO.
13/247,708		SIRPAL ET AL.	6583-67

		EXAMINER	
Sheridan Ross P.C. 1560 Broadway Suite 1200 Denver, CO 80202		STEVEN SAX	
		ART UNIT	PAPER
		2174	20150818A

DATE MAILED:

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner for Patents

Attached is signed Information Disclosure Statement filed 6/24/15

/STEVEN SAX/
Primary Examiner, Art Unit 2174

PTO-90C (Rev.04-03)

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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/247,708	09/22/2015	9141135	6583-67	8636

111285 7590 09/02/2015

Sheridan Ross P.C.
1560 Broadway
Suite 1200
Denver, CO 80202

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 901 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

Sanjiv Sirpal, Oakville, CANADA;
Paul E. Reeves, Oakville, CANADA;
Alexander de Paz, Burlington, CANADA;
Eduardo Diego Torres Milano, Oakville, CANADA;
Jared Ficklin, Austin, TX;
Denise Burton, Austin, TX;
Gregg Wygonik, Austin, TX;

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www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY.DOCKET NO./TITLE	REQUEST ID
13/247,708	09/28/2011	Sanjiv Sirpal	6583-67	76665

Acknowledgement of Loss of Entitlement to Entity Status Discount

The entity status change request below filed through Private PAIR on 12/03/2018 has been accepted.

CERTIFICATIONS:

Change of Entity Status:

X Applicant changing to regular undiscounted fee status.

NOTE: Checking this box will be taken to be notification of loss of entitlement to small or micro entity status, as applicable.

This portion must be completed by the signatory or signatories making the entity status change in accordance with 37 CFR 1.4(d)(4).

Signature:	/Thaine Lennox-Gentle/
Name:	Thaine Lennox-Gentle
Registration Number:	65260

AO 120 (Rev. 08/10)

TO:	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court Eastern District of Texas on the following

☐ Trademarks or ☑ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
2:21-cv-371	9/29/2021	Eastern District of Texas

PLAINTIFF	DEFENDANT
MULTIFOLD INTERNATIONAL INCORPORATED PTE. LTD.	SAMSUNG ELECTRONICS CO., LTD. and SAMSUNG ELECTRONICS AMERICA, INC.

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	8,836,842	9/16/2014	MULTIFOLD INTERNATIONAL INCORPORATED PTE. LTD.
2	8,881,053	11/4/2014	MULTIFOLD INTERNATIONAL INCORPORATED PTE. LTD.
3	9,134,756	9/15/2015	MULTIFOLD INTERNATIONAL INCORPORATED PTE. LTD.
4	9,310,834	4/12/2016	MULTIFOLD INTERNATIONAL INCORPORATED PTE. LTD.
5	8,854,834	10/7/2014	MULTIFOLD INTERNATIONAL INCORPORATED PTE. LTD.

see attached

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1		
2		
3		
4		
5		

In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE

Copy 1—Upon initiation of action, mail this copy to Director Copy 3—Upon termination of action, mail this copy to Director
Copy 2—Upon filing document adding patent(s), mail this copy to Director Copy 4—Case file copy

Continued

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
6	9,665,126	05/30/2017	MULTIFOLD INTERNATIONAL INCORPORATED PTE. LTD.
7	8,842,080	09/23/2014	MULTIFOLD INTERNATIONAL INCORPORATED PTE. LTD.
8	9,727,205	08/08/2017	MULTIFOLD INTERNATIONAL INCORPORATED PTE. LTD.
9	9,058,153	06/16/2015	MULTIFOLD INTERNATIONAL INCORPORATED PTE. LTD.
10	10,203,848	02/12/2019	MULTIFOLD INTERNATIONAL INCORPORATED PTE. LTD.
11	8,875,050	10/28/2014	MULTIFOLD INTERNATIONAL INCORPORATED PTE. LTD.
12	9,792,007	10/17/2017	MULTIFOLD INTERNATIONAL INCORPORATED PTE. LTD.
13	9,141,135	09/22/2015	MULTIFOLD INTERNATIONAL INCORPORATED PTE. LTD.
14	8,832,577	09/09/2014	MULTIFOLD INTERNATIONAL INCORPORATED PTE. LTD.
15	9,146,589	09/29/2015	MULTIFOLD INTERNATIONAL INCORPORATED PTE. LTD.
16	9,158,494	10/13/2015	MULTIFOLD INTERNATIONAL INCORPORATED PTE. LTD.
17	9,195,335	11/24/2015	MULTIFOLD INTERNATIONAL INCORPORATED PTE. LTD.

AO 120 (Rev. 08/10)

TO:	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court Eastern District of Texas on the following

☐ Trademarks or ☑ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
2:21-cv-371	9/29/2021	Eastern District of Texas

PLAINTIFF	DEFENDANT
MULTIFOLD INTERNATIONAL INCORPORATED PTE. LTD.	SAMSUNG ELECTRONICS CO., LTD. and SAMSUNG ELECTRONICS AMERICA, INC.

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
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2	8,881,053	11/4/2014	MULTIFOLD INTERNATIONAL INCORPORATED PTE. LTD.
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5	8,854,834	10/7/2014	MULTIFOLD INTERNATIONAL INCORPORATED PTE. LTD.

see attached

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1		
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3		
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In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT
ORDERED that all claims asserted by Multifold against Samsung and all claims asserted by Samsung against Multifold are DISMISSED WITH PREJUDICE.

CLERK	(BY) DEPUTY CLERK	DATE
David A. O'Toole	CH	6/2/22

Copy 1—Upon initiation of action, mail this copy to Director Copy 3—Upon termination of action, mail this copy to Director
Copy 2—Upon filing document adding patent(s), mail this copy to Director Copy 4—Case file copy

Continued

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
6	9,665,126	05/30/2017	MULTIFOLD INTERNATIONAL INCORPORATED PTE. LTD.
7	8,842,080	09/23/2014	MULTIFOLD INTERNATIONAL INCORPORATED PTE. LTD.
8	9,727,205	08/08/2017	MULTIFOLD INTERNATIONAL INCORPORATED PTE. LTD.
9	9,058,153	06/16/2015	MULTIFOLD INTERNATIONAL INCORPORATED PTE. LTD.
10	10,203,848	02/12/2019	MULTIFOLD INTERNATIONAL INCORPORATED PTE. LTD.
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16	9,158,494	10/13/2015	MULTIFOLD INTERNATIONAL INCORPORATED PTE. LTD.
17	9,195,335	11/24/2015	MULTIFOLD INTERNATIONAL INCORPORATED PTE. LTD.

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Patent Number	9,141,135
Issue Date	09/22/2015
Application Number	13/247,708
Filing Date	09/28/2011
First Named Inventor	Sanjiv Sirpal
Attorney Docket Number	6583-67

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☑ Attorney or agent of record. Registration Number 52471.

☐ Patent practitioner acting in a representative capacity whose correspondence address is the correspondence address of record. Notice has been given to the patentee or owner. Registration Number 52471.

Signature	/William J. Daley/
Typed or Printed Name	William J. Daley
Date: July 9, 2024	Telephone: 303-863-9700

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☑ *Total of 1 forms are submitted.

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ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
13/247,708	**07/09/2024 02:38:42 AM Z ET**	**6583-67**

Title of Invention

FULL-SCREEN ANNUNCIATOR

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	9141135
CONFIRMATION #	8636	FILED BY	Mandy Yu
PATENT CENTER #	66280524	FILING DATE	09/28/2011
CUSTOMER #	111285	FIRST NAMED INVENTOR	Sanjiv Sirpal
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Daniel Juffernbruch

Documents

TOTAL DOCUMENTS: 1

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
12_9141135 - CHANGE OF CORRESPONDENCE ADDRESS Patent.pdf	2	Change of Address	429 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
12_9141135 - CHANGE OF CORRESPONDENCE ADDRESS Patent.pdf	9A6CFA37EB5A0C42CE25DBB2FD4A8981FF10F8318F5603C7E0B1B7E7FB7548D48CFD8630513266681D15F6DE563D67E22A0055B94C24F5BB5D7F841DBCC48A637

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.