



- (51) International Patent Classification:
G06F 3/048 (2006.01) *G06F 13/14* (2006.01)
- (21) International Application Number:
PCT/US2015/056405
- (22) International Filing Date:
20 October 2015 (20.10.2015)
- (25) Filing Language: English
- (26) Publication Language: English
- (71) Applicant: **HEWLETT-PACKARD DEVELOPMENT COMPANY, L.P.** [US/US]; 11445 Compaq Center Drive West, Houston, Texas 77070 (US).
- (72) Inventors: **GINES, Richard Nathan**; 11311 Chinden Blvd, Boise, Idaho 83714 (US). **HUTCHINGS, Cameron**; 11311 Chinden Blvd, Boise, Idaho 83714 (US). **BATES, Brett**; 11311 Chinden Blvd, Boise, Idaho 83714 (US). **HANSEN, Steven M.**; 11311 Chinden Blvd, Boise, Idaho 83714 (US). **JENSEN, Jeremy Ray**; 11311 Chinden Blvd, Boise, Idaho 83714 (US).

- (74) Agents: **TONG, Kin-Wah** et al.; Hewlett-Packard Company, Intellectual Property Administration, 3404 E. Harmony Road, Mail Stop 35, Fort Collins, Colorado 80528 (US).
- (81) Designated States (*unless otherwise indicated, for every kind of national protection available*): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.
- (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, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK,

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(54) Title: FILE SYSTEM GRAPHICAL USER INTERFACE (GUI) TO INSTALL EXTERNAL DEVICES

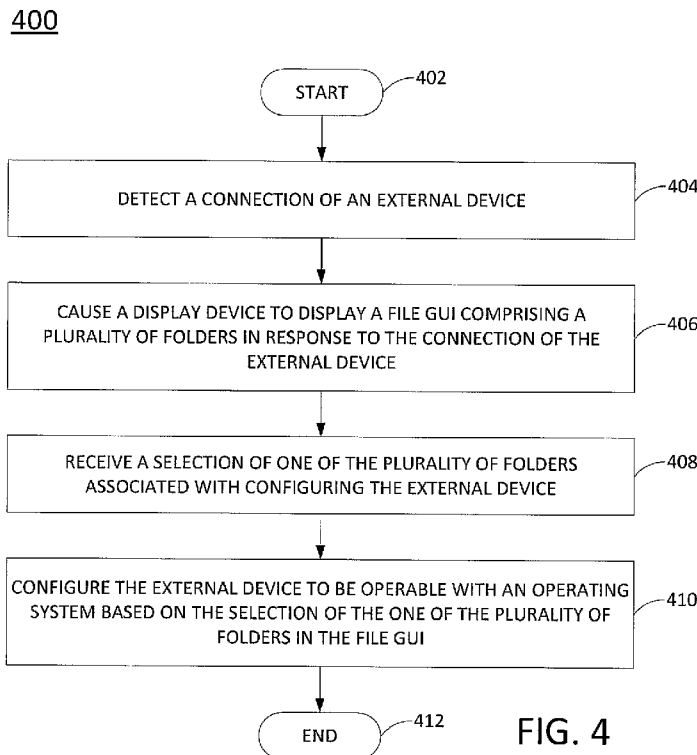


FIG. 4

(57) Abstract: In example implementations, an apparatus is provided. The apparatus includes an external device connection interface to detect a connection of an external device. A file graphical user interface (GUI) having plurality of folders is generated via a GUI in response to the connection of the external device. The GUI also receives inputs and display outputs. An installer configures the external device to be operable with an operating system of the apparatus based on a selection of one of the plurality of folders in the file GUI.

WO 2017/069737 A1

SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, — *as to applicant's entitlement to apply for and be granted*
GW, KM, ML, MR, NE, SN, TD, TG). *a patent (Rule 4.17(ii))*

Declarations under Rule 4.17:

— *as to the identity of the inventor (Rule 4.17(i))*

Published:

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

FILE SYSTEM GRAPHICAL USER INTERFACE (GUI) TO INSTALL EXTERNAL DEVICES

BACKGROUND

[0001] Computers are manufactured with a variety of different operating systems. The design of computers has allowed many devices to be connected externally, rather than requiring the consumer to add devices internally at the time a computer is purchased.

[0002] The external devices are added to the computer by installing a driver onto the computer so that the operating system of the computer knows how to communicate with the external device. Different operating systems have different interfaces and protocols for installing external devices. As a result, external devices are created or programmed to be compatible with a variety of different operating systems and versions of operations systems, as well as being backwards compatible.

BRIEF DESCRIPTION OF THE DRAWINGS

[0003] FIG. 1 is a block diagram of an example apparatus of the present disclosure;

[0004] FIGs. 2A-2B is a block diagram of example graphical user interfaces (GUIs) of the present disclosure;

[0005] FIG. 3 is a block diagram of another example apparatus of the present disclosure; and

[0006] FIG. 4 is a flow diagram of an example method for installing an external device using a file system GUI.

DETAILED DESCRIPTION

[0007] The present disclosure discloses a method for installing and configuring an external device using a file system GUI. As discussed above, computers are manufactured with a variety of different operating systems. Some operating systems do not allow for installation of drivers to install and configure external devices.

[0008] Examples of the present disclosure leverage the ability of most computers and operating systems to read file systems for external devices without installing a device driver. Each external device typically has a pre-existing GUI for browsing the file system. In one implementation, the file system GUI may be used to install and configure external devices onto a computer that cannot install drivers used to install the external devices. For example, when an external device is connected to a computer that is modified with the functions of the present disclosure, a file system GUI is displayed on a display device. A series of folders within the file system GUI may be selected and information entered into a folder (e.g., changing a folder name or entering text in a text file) may cause the information to be used to configure and install the external device.

[0009] FIG. 1 illustrates an example apparatus 100 of the present disclosure. The apparatus 100 may include a graphical user interface (GUI) 102, an operating system (OS) 104, an installer 106 and an external device connection interface 108. The external device connection interface 108 may be in communication with the OS 104 and the installer 106. The OS 104 may also be in communication with the GUI 102 and the installer 106.

[0010] In one example, the GUI 102 may be part of a display device that is part of the apparatus 100 (e.g., an all-in-one computer, a tablet device, a lap top computer, and the like). In another example, the GUI 102 may be part of a display device that is separate from the apparatus 100.

[0011] In one example, the GUI 102 may receive inputs and display outputs. As discussed in further detail below, the inputs that the GUI 102 may receive may include a selection of a folder or a series of folders, information associated with changing a name of a folder or a text file, and the like. The outputs that the

GUI 102 may include a new series of folders based on a selection of a folder, changes to a name of a folder, and the like.

[0012] In one example, OS 104 may include instructions that are executed by a processor (not shown) of the apparatus 100. The OS 104 may include instructions regarding how the apparatus 100 operates, how an external device 110 can be connected, and so forth.

[0013] In one example, the OS 104 may prevent the installation of drivers onto the apparatus 100. Drivers may include specific instructions regarding how an external device is to communicate and function with a specific operating system. A different driver may be created for various different types of operating systems. However, as noted above, some operating systems may not allow the installation of drivers.

[0014] The installer 106 may install an external device 110 when a connection between an external device connection interface 108 and the external device 110 is detected. For example, the installer 106 may configure the external device 110 to be operable with the OS 104 based on a selection of a folder or series of folders displayed by the GUI 102.

[0015] As will be discussed in further detail below, the folders displayed in the GUI 102 may be named with an action. For example, one of the folders in the GUI 102 may be named "network connections" and a series of sub folders within the "network connections" folder may be selected. When a parameter or information is needed to configure the external device 110, the parameter or information may be entered as the name of the folder. When entered, the installer 106 may cause the external device 110 to be configured with the parameter or information that was entered. In addition, the name of the folder may be automatically deleted or changed for security, as discussed in further detail below.

[0016] In one implementation, the external device connection interface 108 may be any type of connection interface. In one example, the external device connection interface 108 may be a universal serial bus (USB) interface (e.g., a type-C USB interface, a mini-USB interface, USB interface 2.0, USB interface 3.0, standard-A, standard-B, and the like), a FireWire connection interface, an

Ethernet connection interface, a musical instrument digital interface (MIDI), a Serial AT Attachment (SATA) connection interface, a thunderbolt connection interface, and the like.

[0017] In one implementation, the external device 110 may be any type of device. For example, the external device 110 may be a peripheral device that is typically plug and play via drivers that are installed onto the apparatus 100. Examples of external devices 110 may include a Wireless Fidelity (WiFi) adapter, a Bluetooth adapter, an external hard drive (e.g., a flash drive, thumb drive, a hard disk drive, and the like), an external media drive (e.g., a CD-ROM drive, a Blue-Ray drive, and the like), a USB wireless mouse, a USB wireless keyboard, and the like.

[0018] In one example, when the external device 110 is connected to the apparatus 100 via the external device connection interface 108, the installer 106 may detect the connection. As noted, the OS 104 may not allow for installation of drivers to install and configure the external device 110. However, the external device 110 may be configured to display a file GUI containing a plurality of folders. The OS 104 may believe that the external device 110 is a storage device and cause the GUI 102 to display a file GUI that includes a plurality of folders in response to the connection of the external device 110 being detected.

[0019] In one implementation, each one of the plurality of folders may include information or data that would usually be included in a device driver. As a result, a user may select a folder or a series of folders. The selection of a folder or a series of folders may be transformed into a command or configuration change of the external device 110. For example, the installer 106 may take information associated with the selection of a folder or a series of folders and configure the external device 110 with the information. As a result, the external device 110 may be installed on the apparatus 100.

[0020] FIGs 2A-2B illustrate a series of example file GUIs 202-212 that illustrate the selection of a folder and how the selection can be used to configure the external device 110. In FIG. 2A, a file GUI 202 may be displayed when a connection of the external device 110 is detected. The file GUI 202 may include an identification 220 of a type of external device 110 that is connected

(e.g., a USB WiFi), a file directory tree 222, a name column 224 that contains a name of the files, a size column 226, a type column 228 and a date modified column 230.

[0021] Notably, each file is a folder as indicated by the type column 228. In addition, the folders may include information that would otherwise be part of a driver file. For example, the file GUI 202 may include a folder named “network connections.”

[0022] In file GUI 204, the “network connections” folder may have been selected. The selection of the “network connections” folder is illustrated in the file directory tree 222. The “network connections” folder may include additional folders that list a series of detected WiFi connections.

[0023] In file GUI 206, the “ABC WiFi” folder may have been selected. The selection of the “ABC WiFi” folder is illustrated in the file directory tree 222. The “ABC WiFi” folder may include an additional folder named “connect.”

[0024] In file GUI 208, the “connect” folder may have been selected. The selection of the “connect” folder is illustrated in the file directory tree 222. The “connect” folder may include an additional folder named “password.”

[0025] In file GUI 210, the folder may be selected to change a name of the folder to “123ABC.” In one example, the name change “123ABC” may be a password of the “ABC WiFi” connection. As a result, when the name change to “123ABC” is entered on the “password” folder, the name change may be converted into a command by the installer 106 to configure the external device 110. For example, when the external device 110 is a USB WiFi adapter, the information contained in the name change of the “password” folder may be used to configure the USB WiFi adapter.

[0026] In another implementation, when the “password” folder is selected, the folder may be opened to display a text file. The text file may be modified to include the password “123ABC” associated with the “ABC WiFi” connection. The installer 106 may receive the information entered in the text file and use the information to configure and install the USB WiFi adapter.

[0027] In file GUI 212, once the external device 110 is configured, the name of the folders in the file GUIs 202-212 may be automatically changed. For

example, the folder "ABC WiFi" in the file GUI 204 may be changed to "connected – ABC WiFi" as shown in the file GUI 212. Notably, the name of the folder was not changed by a user. Rather, the name of the folder was automatically changed by the file GUI 102.

[0028] In addition, the change may include a deletion of a folder. For example, after the password is entered to change the name of the "password" folder, the "password" folder may be deleted. As a result, the password may not be stolen. In one example, when a user re-enters the "connect" folder (e.g., the file GUI 206), the "password" folder may be re-displayed (e.g., the file GUI 208) and require a user to re-enter the password by changing the name of the "password" folder (e.g., the file GUI 210).

[0029] In one implementation, the name of the folders in the file GUIs 202-212 may be dynamically changed by the GUI 102. For example, if the connection to the external device 110 is lost, the name of the "connected – ABC WiFi" folder in the file GUI 212, may be changed to "disconnected – ABC WiFi." Subsequently, if the connection is restored, the folder "disconnected – ABC WiFi" may be changed again to "connected – ABC WiFi."

[0030] It should be noted that the names of the folders are provided only as examples associated with a USB WiFi adapter. For example, for different types of external devices 110, the names of the folders may be associated with functions or configuration parameters associated with the type of external device 110 that is connected.

[0031] FIG. 3 illustrates another example apparatus 300 of the preset disclosure. The apparatus 300 may include a processor 302 and a non-transitory computer readable storage medium 304. The non-transitory computer readable storage medium 304 may include instructions 306, 308 and 310 that when executed by the processor 302, cause the processor 302 to perform the functions described above.

[0032] In one example, the instructions 306 may include instructions to detect a connection of an external device. The instructions 308 may include instructions to cause a display device to display a file GUI comprising a plurality of folders in response to the connection of the external device. The instructions

310 may include instructions to configure the external device to be operable with an operating system of the apparatus based on a selection of one of the plurality of folders in the file GUI.

[0033] FIG. 4 illustrates a flow diagram of an example method 400 for installing an external device using a file system GUI. The method 400 may be performed by the apparatus 100 or the apparatus 300.

[0034] At block 402, the method 400 begins. At block 404, the method 400 detects a connection of an external device. For example, when an external device is connected to an external device connection interface, the connection may be detected.

[0035] The connection may be made via any type of external device connection interface. For example, the external device connection interface may be a universal serial bus (USB) interface (e.g. a type-C USB interface, a mini-USB interface, USB interface 2.0, USB interface 3.0, standard-A, standard-B, and the like), a FireWire connection interface, an Ethernet connection interface, a musical instrument digital interface (MIDI), a SATA connection interface, a thunderbolt connection interface, and the like.

[0036] The external device may be any type of device. For example, the external device may be a peripheral device that is typically plug and play via drivers that are installed onto a computer. Examples of external devices may include a WiFi adapter, a Bluetooth adapter, an external hard drive (e.g., a flash drive, thumb drive, a hard disk drive, and the like), an external media drive (e.g., a CD-ROM drive, a Blue-Ray drive, and the like), a USB wireless mouse, a USB wireless keyboard, and the like.

[0037] At block 406, the method 400 causes a display device to display a file GUI comprising a plurality of folders in response to the connection of the external device. As discussed above, the present disclosure may leverage the ability of most computers and operating systems to read file systems for external devices without installing a device driver. The configuration parameter or command and information that would otherwise be in a driver may be presented as a folder of the plurality of folders.

[0038] At block 408, the method 400 receives a selection of one of the

plurality of folders associated with configuring the external device. For example, as described above in FIGs. 2A to 2B, a folder or a series of folders may be selected to configure and install the external device. For example, if the external device was a USB WiFi adapter, a “network connections” folder may be selected, followed by a selection of a folder having a name of a WiFi connection that the USB WiFi adapter will connect to, followed by a selection of a “connect” folder and followed by a selection of a “password” folder.

[0039] The password may be entered by changing the name of the “password” folder to include the password of the selected WiFi connection. In another example, the password may be entered into a text file that is contained in the “password” folder.

[0040] At block 410, the method 400 configures the external device to be operable with an operating system based on the selection of the one of the plurality of folders in the file GUI. For example, the information that was entered for the selected folder or series of folders may be used to configure and install the external device.

[0041] Referring back to the USB WiFi adapter example, when the password is entered, the selection of the folder and entering the change of the folders name from “password” to the actual password (e.g., “ABC123” in FIG. 2B above) is translated into a command to modify the external device. In other words, changing the name of the folder causes a command to select the appropriate WiFi connection and enter the password so the USB WiFi adapter can be configured to connect to the selected WiFi connection. In addition, any information necessary to install the USB WiFi adapter on the computer may be provided by selection of an appropriate folder in the file GUI and entering the appropriate parameters, values or data.

[0042] In one implementation, after the external device is configured, the name of at least one folder of the plurality of folders in the file GUI may be changed. The name of at least one folder may be changed to show a status of the external device. Referring back to the USB WiFi adapter example, the name of the WiFi connection that was selected may be changed to “connected.” Notably, the name of the folder is changed by the apparatus 100 or 300 and not

by the user.

[0043] In one example, changing the name of at least one folder may include deleting a folder. For example, after the name of the “password” folder is changed to enter the actual password used to configure the USB WiFi adapter, the “password” folder may be deleted. As a result, automatic deletion of a folder may provide security to prevent another user from stealing the password after the password has been entered.

[0044] In other examples, the name of at least one folder may be changed dynamically. For example, when the connection to the selected WiFi connection is lost, the name of the “connected” folder may be changed to “disconnected.” When the connection is restored, the name of the “disconnected” folder may be changed back to “connected,” and so forth.

[0045] As a result, the method 400 provides a single interface that works on a variety of different platforms without requiring any type of installation (e.g., installation drivers, configuration drivers, and the like). Thus, costs in developing and testing installation software for external devices across a variety of different operating systems, providing technical support, and the like, may be reduced. At block 412, the method 400 ends.

[0046] It will be appreciated that variants of the above-disclosed and other features and functions, or alternatives thereof, may be combined into many other different systems or applications. Various presently unforeseen or unanticipated alternatives, modifications, variations, or improvements therein may be subsequently made by those skilled in the art which are also intended to be encompassed by the following claims.

CLAIMS

1. An apparatus, comprising:
 - an external device connection interface to detect a connection of an external device;
 - a graphical user interface (GUI) to generate a file GUI comprising a plurality of folders in response to the connection of the external device, receive inputs and display outputs; and
 - an installer, wherein the installer configures the external device to be operable with an operating system of the apparatus based on a selection of one of the plurality of folders in the file GUI.
2. The apparatus of claim 1, wherein the external device connection interface comprises a universal serial bus (USB) interface.
3. The apparatus of claim 1, wherein the external device is configured by the installer based on information that is received by the GUI from a name change of the one of the plurality of folders that is selected.
4. The apparatus of claim 1, wherein the external device is configured by the installer based on information that is received by the GUI from text entered into a text file stored in the one of the plurality of folders that is selected.
5. The apparatus of claim 1, wherein the GUI changes at least one folder of the plurality of folders after the external device is configured.
6. The apparatus of claim 5, wherein the at least one folder that is changed by the GUI comprises adding a new folder by the GUI, wherein a name of the new folder is a status of the external device.
7. A method, comprising:

detecting, by a processor, a connection of an external device;
causing, by the processor, a display device to display a file graphical user interface (GUI) comprising a plurality of folders in response to the connection of the external device;
receiving, by the processor, a selection of one of the plurality of folders associated with configuring the external device; and
configuring, by the processor, the external device to be operable with an operating system based on the selection of the one of the plurality of folders in the file GUI.

8. The method of claim 7, wherein the selection of one of the plurality of folders is translated into a command to modify the external device.
9. The method of claim 7, wherein the configuring further comprises:
changing, by the processor, a name of the one of the plurality of folders that is selected, wherein the name comprises information used to configure the external device; and
configuring, by the processor, the external device using the information.
10. The method of claim 7, wherein the configuring further comprises:
receiving, by the processor, text entered into a text file stored in the one of the plurality of folders that is selected; and
configuring, by the processor, the external device using the text.
11. The method of claim 7, further comprising:
changing, by the processor, at least one folder of the plurality of folders in the file GUI to show a status of the external device.
12. A non-transitory computer-readable storage medium encoded with instructions executable by a processor, the computer-readable storage medium comprising:
instructions to detect a connection of an external device;

instructions to cause a display device to display a file graphical user interface (GUI) comprising a plurality of folders in response to the connection to the external device; and

instructions to configure the external device to be operable with an operating system of an apparatus based on a selection of one of the plurality of folders in the file GUI.

13. The non-transitory computer-readable storage medium of claim 12, wherein the instructions to configure the external device, further comprises:

instructions to receive information used to configure the external device from a name change of the one of the plurality of folders that is selected.

14. The non-transitory computer-readable storage medium of claim 12, wherein the instructions to configure the external device, further comprises:

instructions to receive information used to configure the external device from text entered into a text file stored in the one of the plurality of folders that is selected.

15. The non-transitory computer-readable storage medium of claim 12, wherein the instructions to configure the external device, further comprises:

instructions to change at least one folder of the plurality of folders in the file GUI to show a status of the external device.

1/5

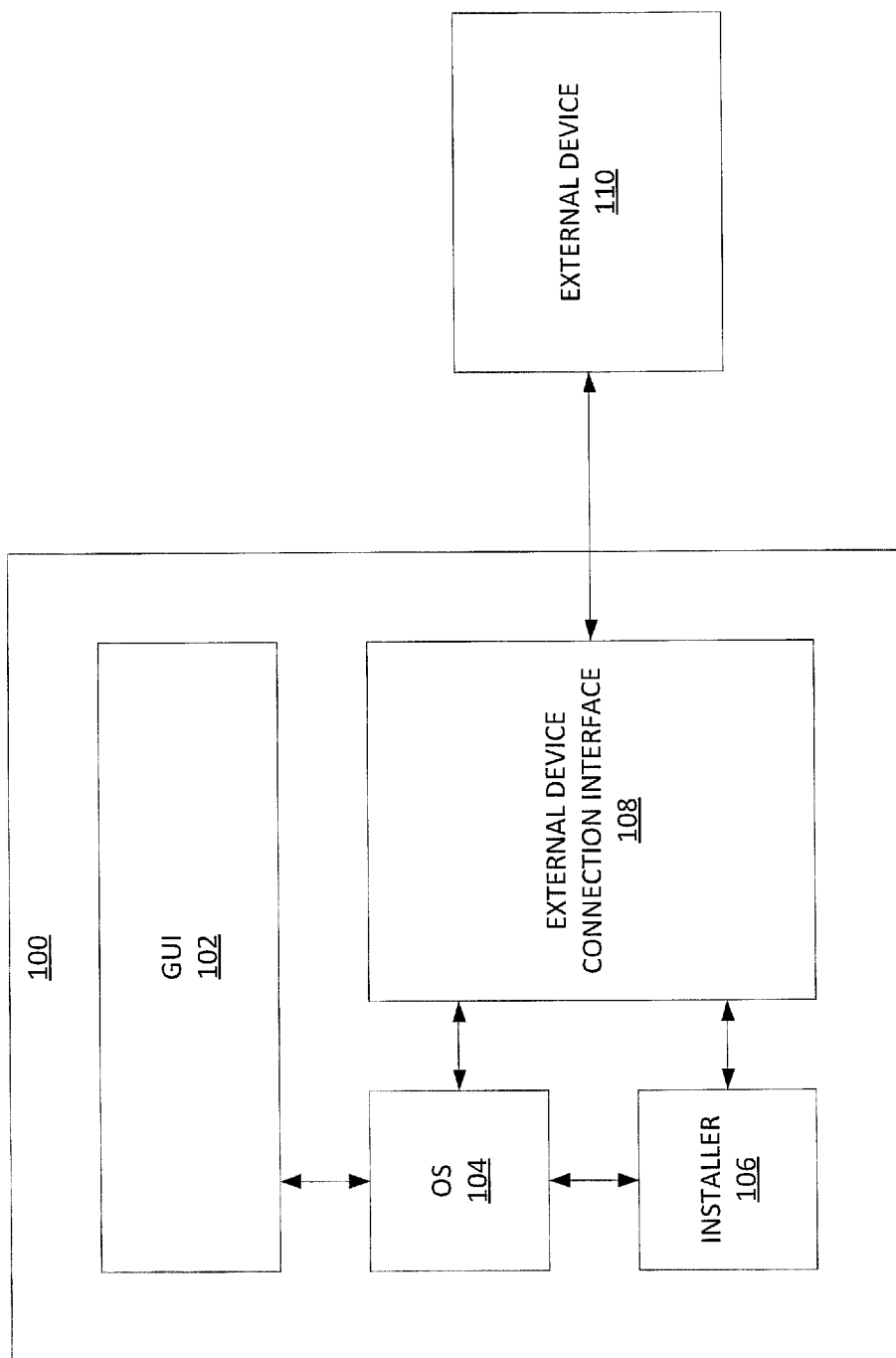


FIG. 1

2/5

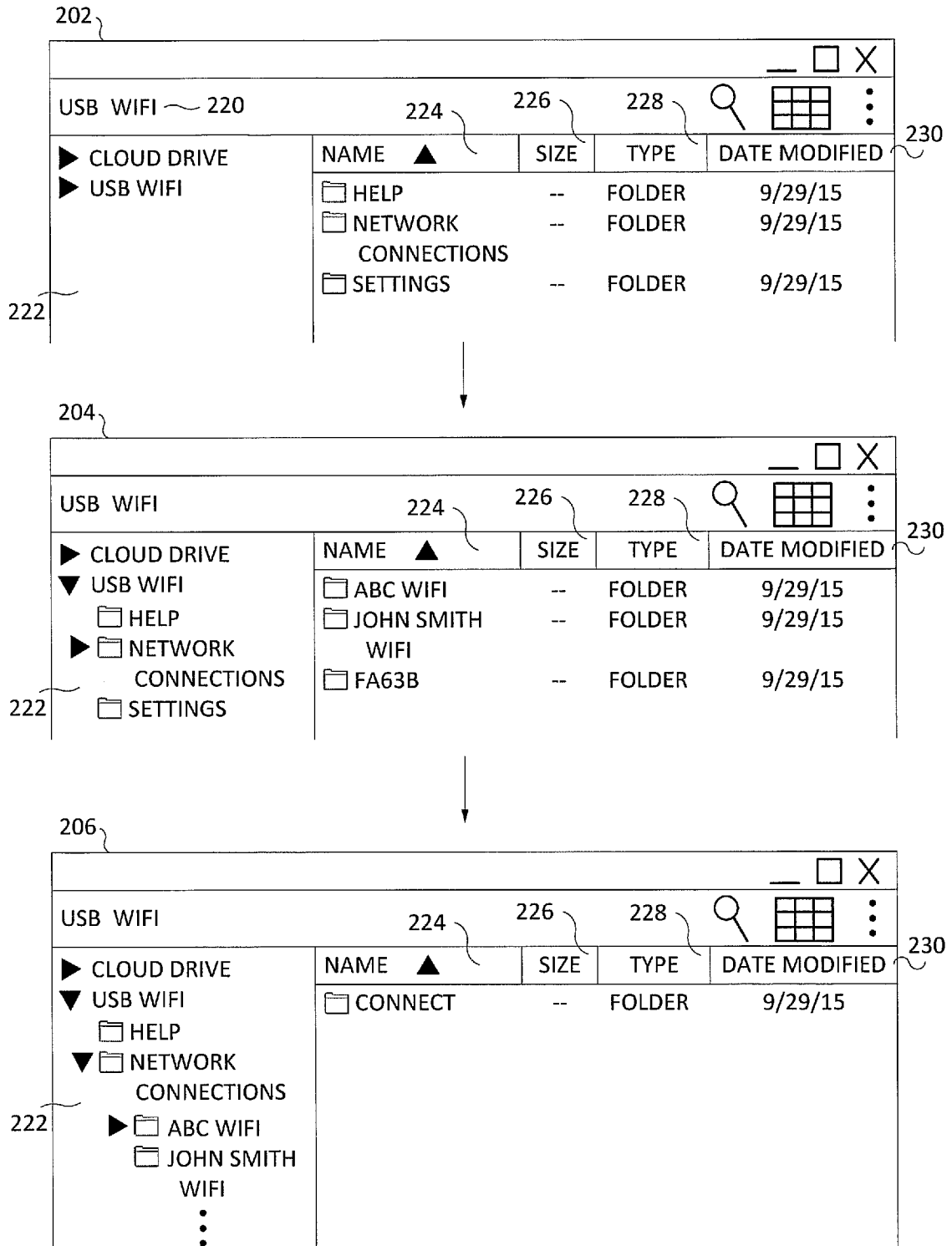
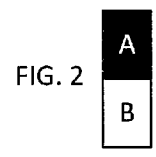


FIG. 2A



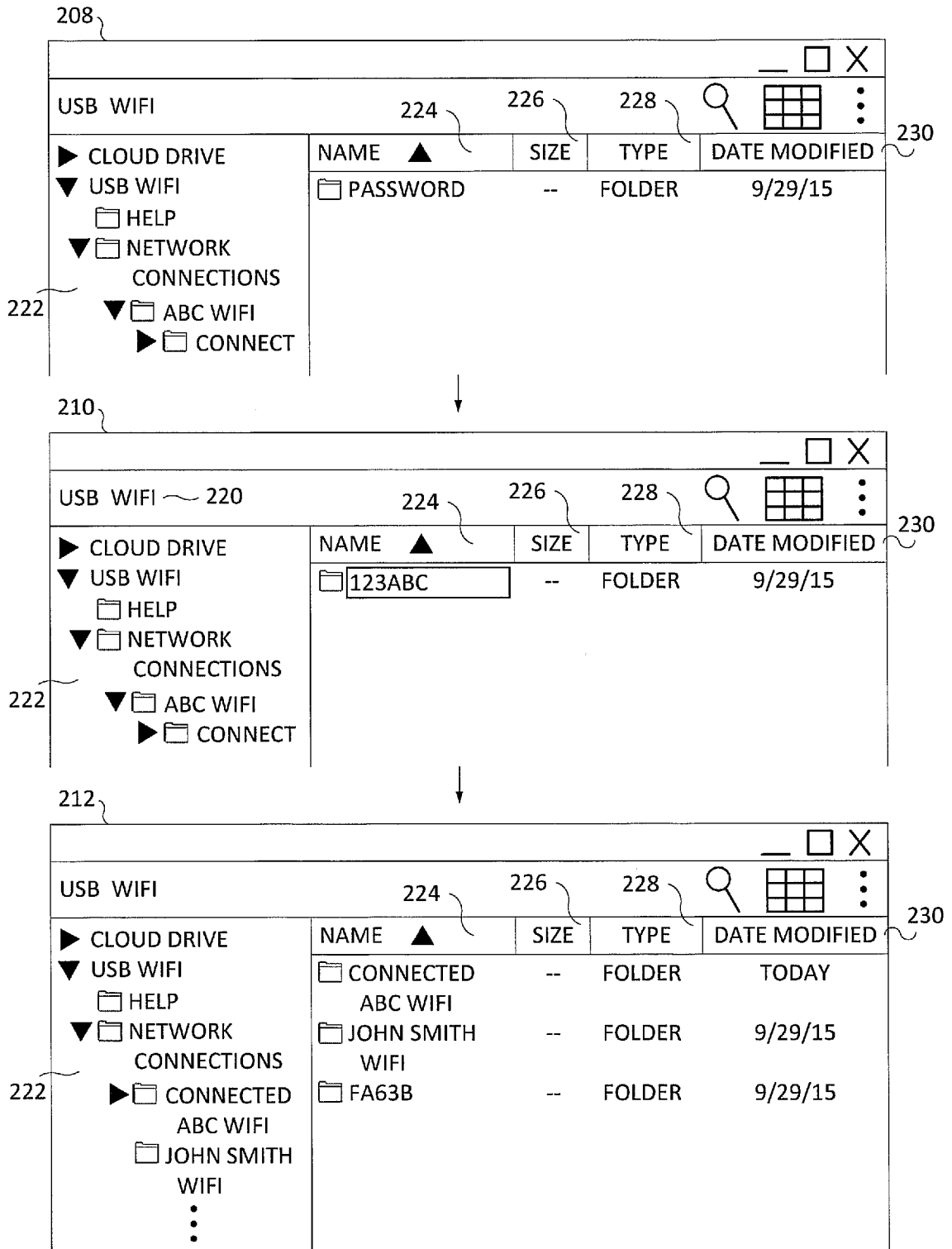
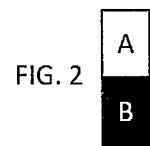


FIG. 2B



4/5

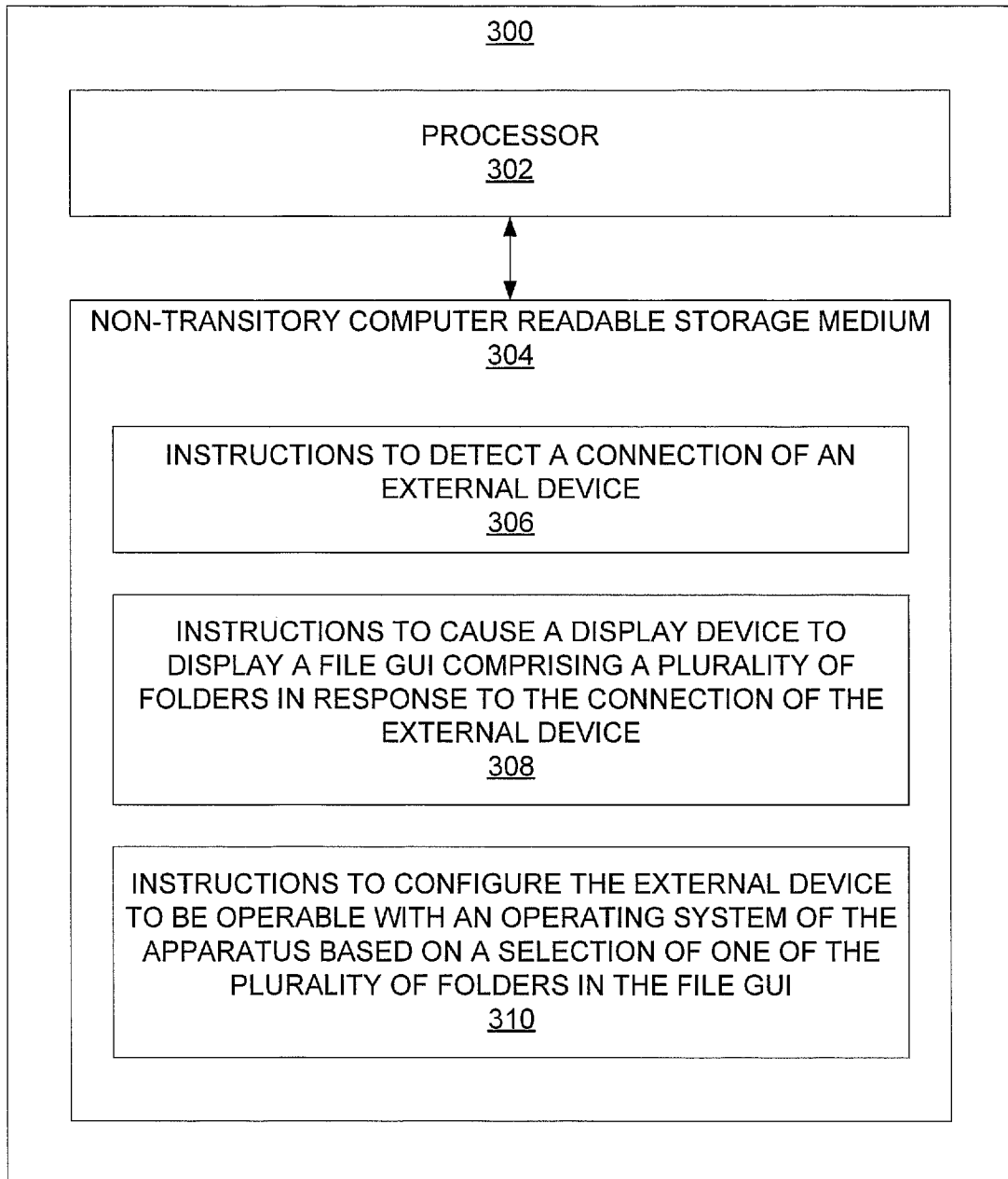


FIG. 3

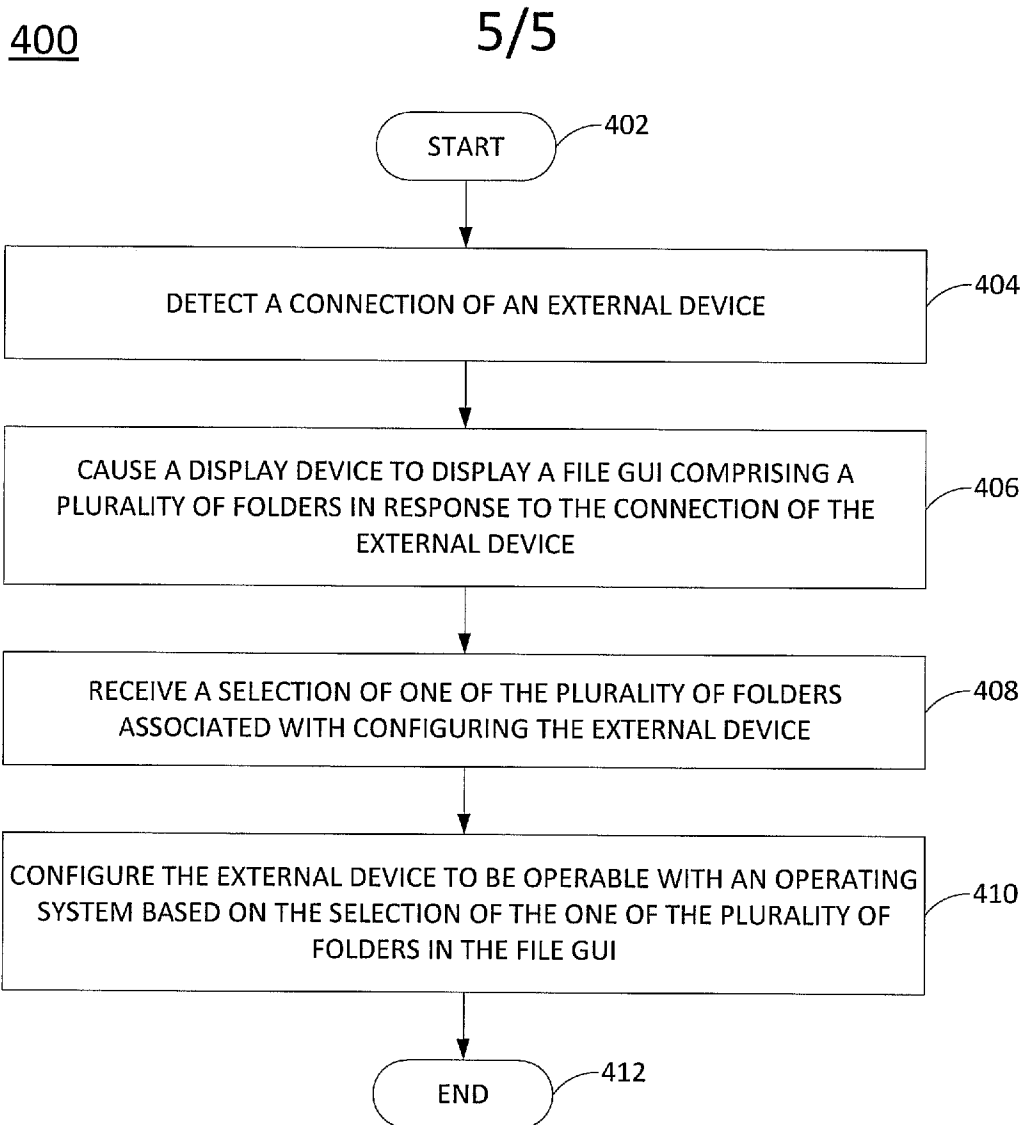


FIG. 4

A. CLASSIFICATION OF SUBJECT MATTER**G06F 3/048(2006.01)i, G06F 13/14(2006.01)i**

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHEDMinimum documentation searched (classification system followed by classification symbols)
G06F 3/048; G06F 3/06; G06F 17/30; G06F 3/0488; G06F 13/12; G06F 13/14Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Korean utility models and applications for utility models
Japanese utility models and applications for utility modelsElectronic data base consulted during the international search (name of data base and, where practicable, search terms used)
eKOMPASS(KIPO internal) & Keywords: external device, connection, folder, GUI, selection, interface**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2015-0067007 A1 (KABUSHIKI KAISHA TOSHIBA) 05 March 2015 See paragraphs [0014], [0018], [0022], [0025], [0031], [0056]; claims 1-2; and figures 2, 4-6.	1-15
A	US 2014-0282236 A1 (HON HAI PRECISION INDUSTRY CO., LTD.) 18 September 2014 See paragraphs [0025]-[0026]; and figure 5.	1-15
A	US 2010-0325585 A1 (KENSAKU ISHIZUKA) 23 December 2010 See paragraphs [0064]-[0065]; and figure 6.	1-15
A	US 2014-0156885 A1 (XIN LIAN) 05 June 2014 See paragraph [0054]; and figure 2.	1-15
A	US 2004-0199909 A1 (DAVID D. GOODMAN) 07 October 2004 See paragraph [0030]; and figure 2.	1-15

 Further documents are listed in the continuation of Box C. See patent family annex.

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Date of the actual completion of the international search

19 July 2016 (19.07.2016)

Date of mailing of the international search report

20 July 2016 (20.07.2016)

Name and mailing address of the ISA/KR

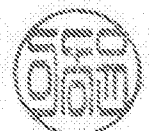
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Korean Intellectual Property Office
189 Cheongsa-ro, Seo-gu, Daejeon, 35208, Republic of Korea

Facsimile No. +82-42-481-8578

Authorized officer

LEE, Dong Yun

Telephone No. +82-42-481-8734



INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2015/056405

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