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Harrison

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(54) **DATA TRANSFER USING HAND-HELD DEVICE**

(75) Inventor: **Phil Harrison**, London (GB)

(73) Assignee: **Sony Computer Entertainment America LLC**, Foster City, CA (US)

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(52) **U.S. Cl.** **345/204**; 345/169; 345/212; 345/214

(58) **Field of Classification Search** 345/169, 345/173–179, 204–215
See application file for complete search history.

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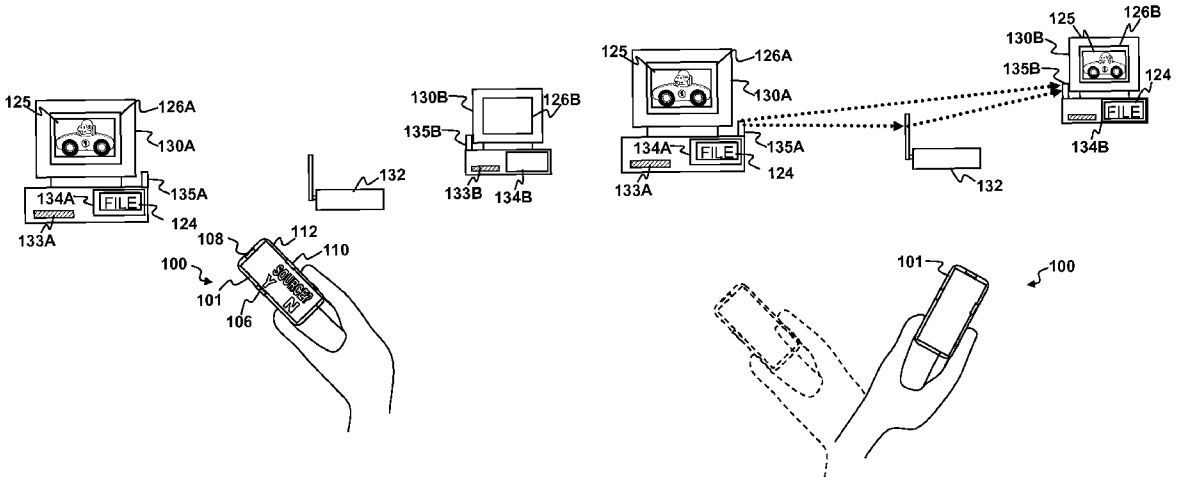
Primary Examiner — Vijay Shankar
(74) *Attorney, Agent, or Firm* — Joshua D. Isenberg; JDI Patent

(57) **ABSTRACT**

A hand-held electronic device and data transfer method are disclosed. The device may comprise a case, a processor and a memory. A case motion sensor and a remote device detector may be coupled to the processor. A communication interface may be coupled to the memory and processor. The processor may be programmed with instructions that, when executed cause the device to recognize a remote device, recognize a gesture from resulting from motion of the case, and transfer data from the hand-held device to the remote device or vice versa in response to recognition of the gesture. Alternatively, the instructions may cause the device to identify data to be transferred from a source to a destination, identify the source and/or destination, recognize a gesture resulting from motion of the case, and transfer the data from the source to the destination in response to recognition of the gesture.

32 Claims, 5 Drawing Sheets



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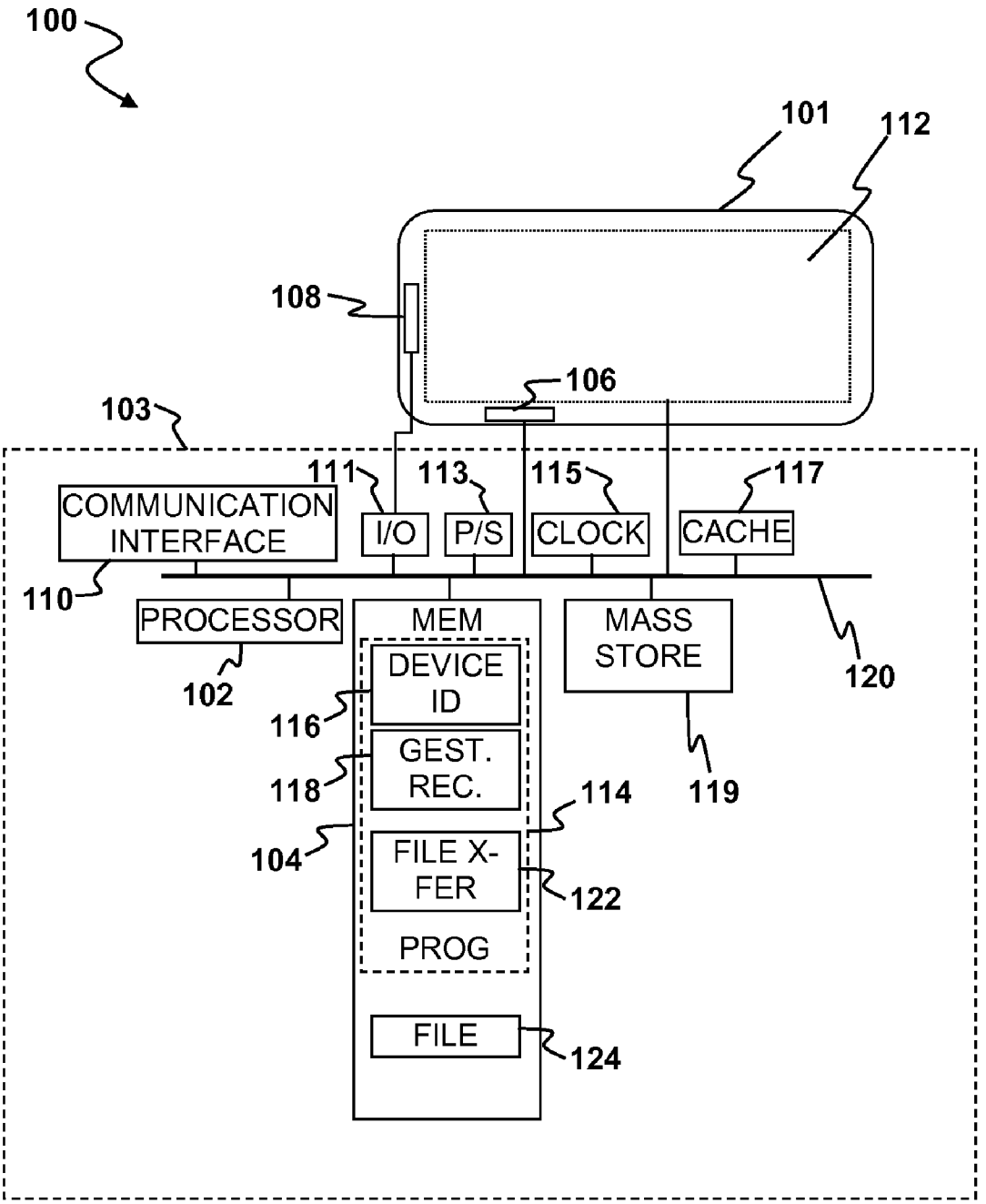
100
101
112
108
106
103
111
113
115
117
COMMUNICATION INTERFACE
I/O
P/S
CLOCK
CACHE
110
PROCESSOR
MEM
MASS STORE
120
102
DEVICE ID
116
GEST. REC.
118
114
119
104
FILE X-FER
122
PROG
FILE
124

FIG. 1A

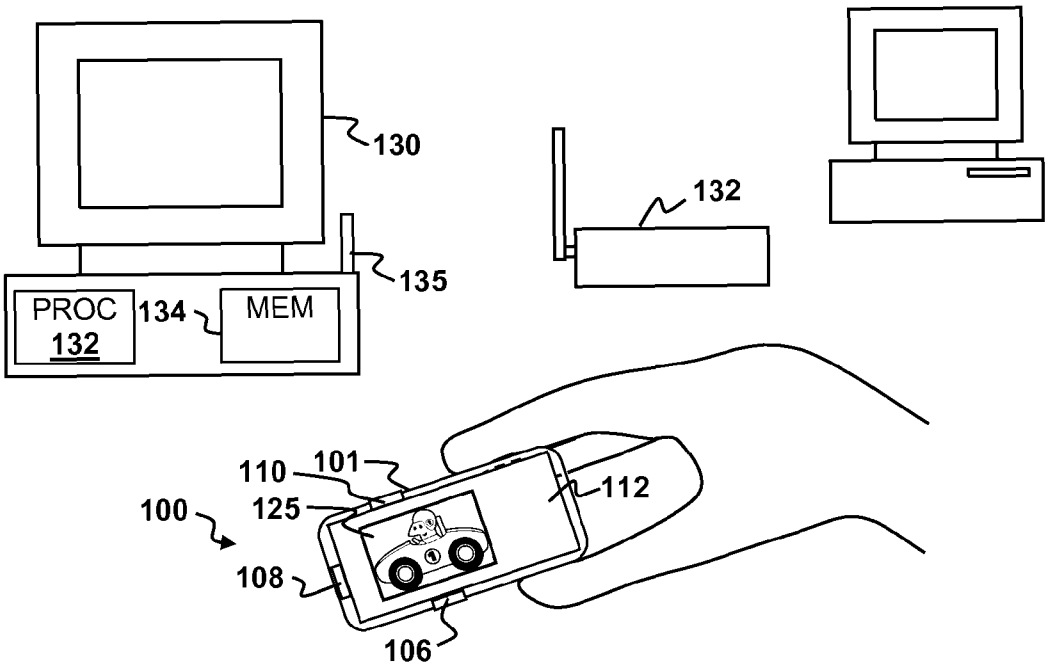
130
132
135
PROC
132
134
MEM
110
101
112
100
125
108
106

FIG. 1B

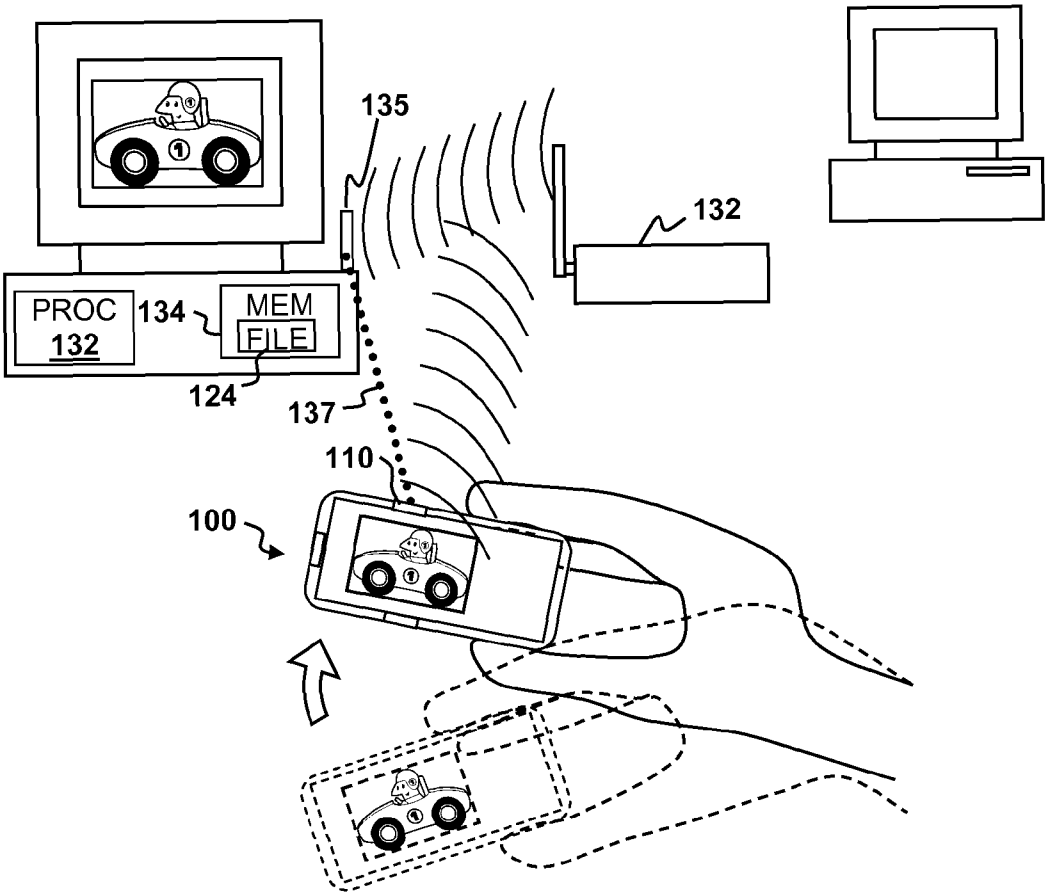
135
132
PROC
132
134
MEM
FILE
124
137
110
100

FIG. 1C

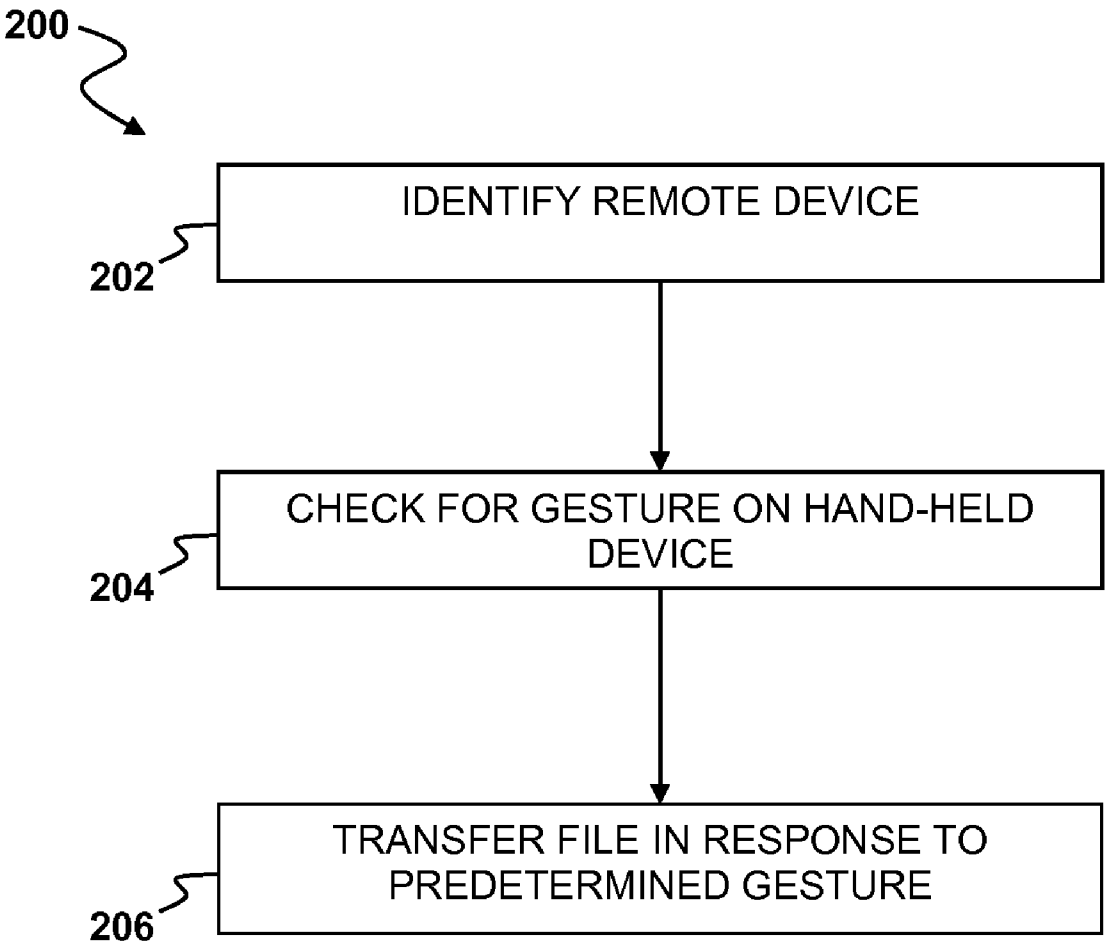
200
IDENTIFY REMOTE DEVICE
202
CHECK FOR GESTURE ON HAND-HELD DEVICE
204
TRANSFER FILE IN RESPONSE TO PREDETERMINED GESTURE
206

FIG. 2

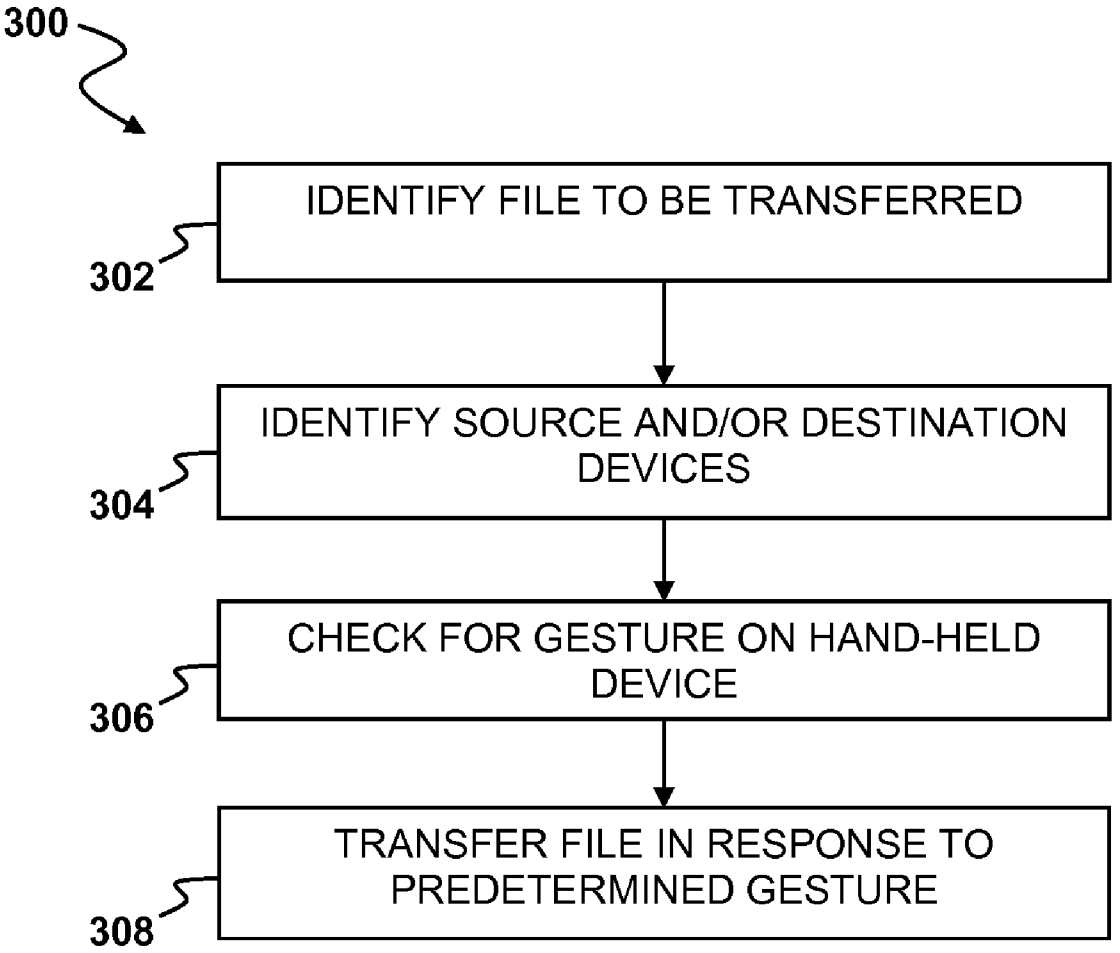
300
IDENTIFY FILE TO BE TRANSFERRED
302
IDENTIFY SOURCE AND/OR DESTINATION DEVICES
304
CHECK FOR GESTURE ON HAND-HELD DEVICE
306
TRANSFER FILE IN RESPONSE TO PREDETERMINED GESTURE
308

FIG. 3

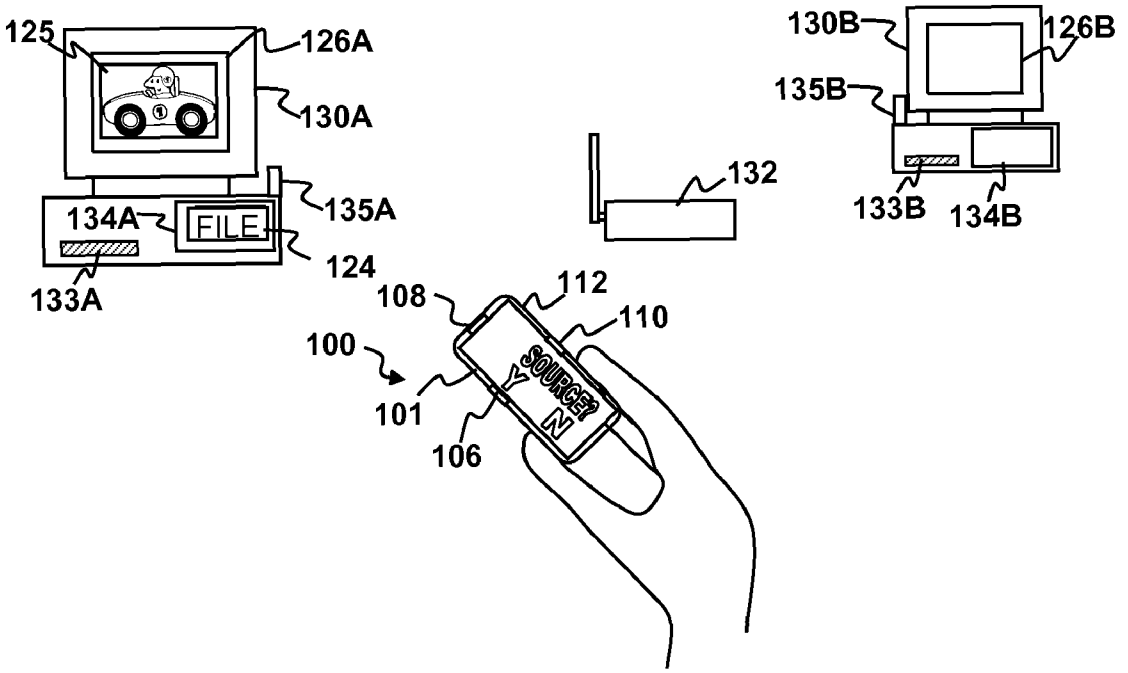
125
126A
130A
135A
134A
FILE
124
133A
132
130B
126B
135B
133B
134B
108
112
110
100
101
106
SOURCE
Y
N

FIG. 4A

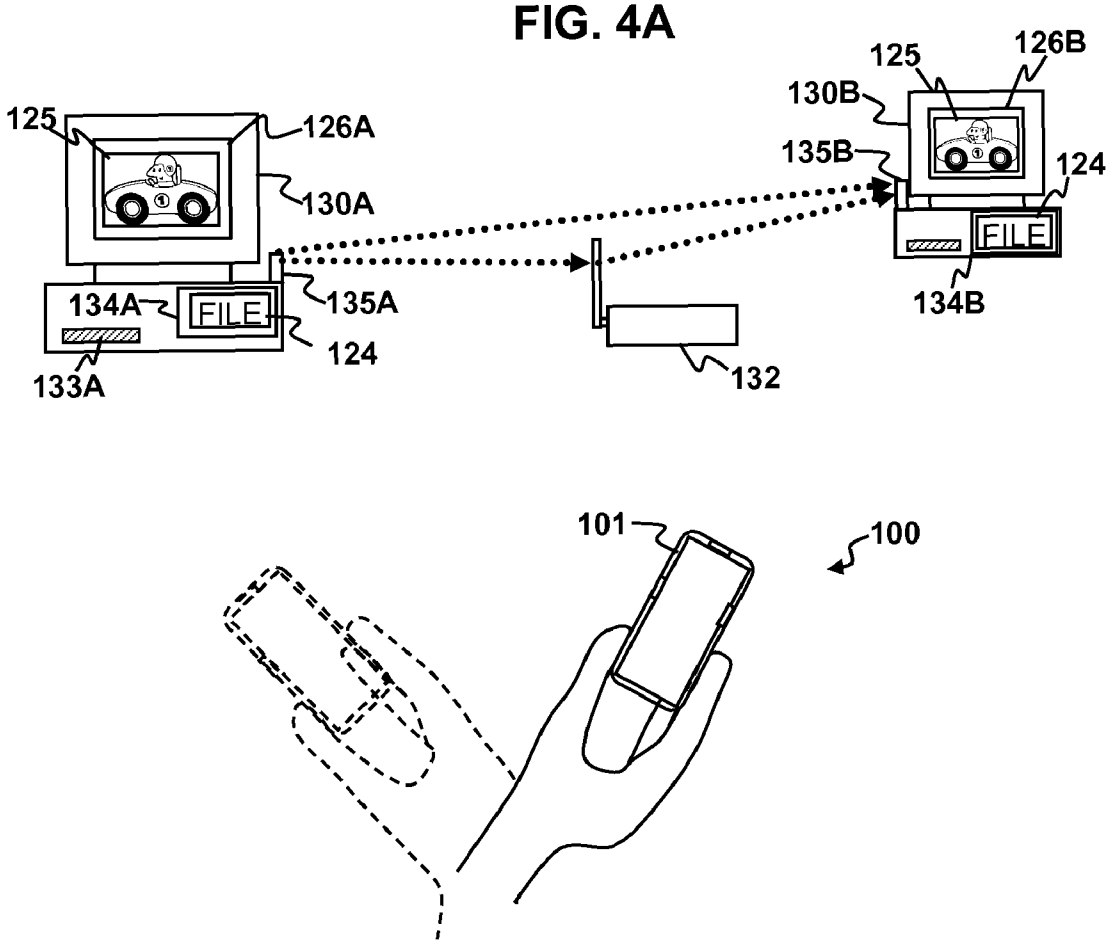
125
126A
130A
135A
134A
FILE
124
133A
132
125
126B
130B
135B
124
FILE
134B
101
100

FIG. 4B

DATA TRANSFER USING HAND-HELD DEVICE

FIELD OF THE INVENTION

Embodiments of the present invention are related to hand-held devices and more particularly to data transfer with hand-held devices.

BACKGROUND OF THE INVENTION

Electronic devices are increasingly becoming connected to each other over networks, such as the Internet. The use of hand-held electronic devices with network capability has also become quite widespread. Cell phones, personal digital assistants (PDAs), portable email devices, and hand-held game devices are but a few of many examples of hand-held electronic devices that can generate, store and transfer data wirelessly over a network. Although connectivity of these devices has increased, the process of transferring files from one device to another tends to remain somewhat awkward.

For example, for devices connected over a local area network (LAN), a user can look up a destination for a file using a browser or menu on one of the networked devices. The file can then be transferred using a "drag" and "drop" operation with a "mouse" or a series of keyboard commands, or commands selected from a menu. The file-transfer instruction sequence does not depend on how physically close the source and destination devices are with respect to each other. This can make a transfer of a file, say, from a portable email device to a nearby laptop computer, needlessly complicated.

It would be desirable, therefore, to make file transfer between nearby devices less complicated and more intuitive.

It is within this context that embodiments of the present invention arise.

BRIEF DESCRIPTION OF THE DRAWINGS

The teachings of the present invention can be readily understood by considering the following detailed description in conjunction with the accompanying drawings, in which:

FIG. **1**A is a block diagram of a hand-held device according to an embodiment of the present invention.

FIGS. **1**B-**1**C are schematic diagrams illustrating file transfer with a hand-held electronic device according to an embodiment of the present invention.

FIG. **2** is a flow diagram illustrating a method of file transfer with a hand-held device according to an embodiment of the present invention.

FIG. **3** is a flow diagram illustrating a method of file transfer with a hand-held device according to an embodiment of the present invention.

FIGS. **4**A-**4**B are schematic diagrams illustrating file transfer with a hand-held electronic device according to an embodiment of the present invention.

DESCRIPTION OF THE SPECIFIC EMBODIMENTS

Although the following detailed description contains many specific details for the purposes of illustration, anyone of ordinary skill in the art will appreciate that many variations and alterations to the following details are within the scope of the invention. Accordingly, the exemplary embodiments of the invention described below are set forth without any loss of generality to, and without imposing limitations upon, the claimed invention.

According to an embodiment of the invention, a shown in FIG. **1**A, a hand-held electronic device **100** includes a case **101**. The device may include a controller **103**, the components of which may be located within the case **101**. The controller **103** may include a processor **102** and a memory **104**. In some embodiments, the device **100** may include multiple processors **102** if parallel processing is to be implemented. By way of example, the device **100** may be configured for use as a game device, a phone, a portable media player, an email device, web browser device and the like. The hand-held device **100** may further include a memory **104** (e.g., RAM, DRAM, ROM, and the like). The device **100** further includes a case motion sensor **106** coupled to the processor **102** and a remote device detector **108** coupled to the processor **102**. A communication interface **110** may be coupled to the processor **102** and memory **104**.

The device **100** may include a display screen **112** disposed on a major surface of the case **101** and operably coupled to the processor **102**. Furthermore, it is noted that in certain embodiments of the invention the device **100** may include two display screens located on opposite faces of the case **101**. By way of example, the display screen **112** may be a flat panel screen, e.g., a liquid crystal display (LCD) array. In some embodiments, the display **112** may be a touch screen, which may be based on any suitable touch screen technology, such as resistive, surface-acoustic wave (SAW) capacitive, infrared, strain gauge, optical imaging, dispersive signal technology, acoustic pulse recognition, frustrated total internal reflection or graphics tablet based on magneto-strictive technology to locate the tip of a stylus. By way of example a resistive touch screen panel may be composed of several layers including two thin metallic electrically conductive and resistive layers separated by thin space. When some object touches this kind of touch panel, the layers are connected at certain point. The panel then electrically acts similar to two voltage dividers with connected outputs. This causes a change in the electrical current which is registered as a touch event which may be sent to the processor **102** for processing.

The memory **104** may store program instructions **114** for execution on the processor **102**. The program instructions **114** may be configured to respond to inputs from one or more input sources on the device (e.g., the case motion sensor **106** or device detector **108**) or conventional inputs such as buttons, a joystick, and the like. In addition, the program instructions **114** may receive input from the display screen **112**, e.g., in the case where the display screen **112** is a touch screen.

The hand-held device **100** may also include well-known support functions, such as input/output (I/O) elements **111**, power supplies (P/S) **113**, a clock (CLK) **115** and cache **117**. The device **100** may optionally include a mass storage device **119** such as a disk drive, CD-ROM drive, flash drive, or the like to store programs and/or data. The processor **102**, digital memory **104**, case motion sensor **106**, remote device detector **108** and other components of the device **100** may exchange signals (e.g., code instructions and data) with each other via a system bus **120** as shown in FIG. **1**A.

The program instructions **114** may include a subset of device recognition instructions **116** that when executed cause the device **100** to recognize a remote device **130** from a signal generated by the remote device detector **108**. In addition, the instructions **114** may include another subset of gesture recognition instructions **118** that, when executed, cause the device **100** to recognize a gesture from a signal generated by the case motion sensor **106** as a result of motion of the case **101**. Furthermore, the instructions **114** may include a subset of file transfer instructions **122** that, when executed transfer a file in response to recognition of the gesture.

The case motion sensor **106** may be based on any suitable signal for tracking the position and/or orientation of the case. Examples of suitable devices for case motion tracking include inertial sensors such as accelerometers and tilt sensors, acoustic sensors such as a combination of a sound source and microphone array, optical sensors such as a video camera. It is noted that case motion sensor may be mounted to the case, but it need not be. For example, the case motion sensor may include a remote video camera and a light source mounted to the case. In the case of acoustic-based motion tracking, a sound source may be mounted to the case and a microphone array may be remotely located or vice versa. Motion of the case **101** may be tracked in any suitable fashion, by way of example, and without loss of generality, if the case motion sensor is a 6-axis accelerometer, motion of the case may be tracked by obtaining signals corresponding to translational acceleration along orthogonal x, y and z axes and rotation about each of these axes. Acceleration signals may be integrated once to determine change in velocity and a second time to determine displacement.

The remote device detector **108** is generally configured to facilitate detection of one or more remote devices **130** that are in the vicinity of the hand-held device **100**. The remote device **130** may be any suitable electronic device, e.g., a personal computer, laptop, game console, television, digital picture frame, and the like. The remote device detector **108** may facilitate selection of a particular remote device as a source or destination for file transfer. Remote device detection may be based on any suitable technology. By way of example, and without loss of generality, the remote device detector **108** may be configured to identify a remote device **130** that is within a line of sight of the hand-held device and within reasonably close proximity, e.g., within the same room using a unique identifier associated with the remote device **130**. There are a number of possible schemes for implementing such a function. By way of example, each remote device may be fitted with a unique radiofrequency identification (RFID) tag and the remote device detector **108** may include an RFID tag reader. Alternatively, the remote device may be fitted with a unique bar code and the device detector **108** may include a bar code reader. In other embodiments, the remote device detector **108** may include a video camera configured to recognize either the remote device or a marker placed on the remote device. In still other embodiments, the remote device and remote device detector **108** may be configured to communicate via a wireless communication link, e.g., an optical, infrared, or radiofrequency link.

The communication interface **110** may be configured to facilitate transfer of data, e.g., in the form of one or more files **124**. The files **124** may be stored in the memory **104** or may be stored on a remote device **130** shown in FIGS. **1B-1C**. In certain embodiments, the communication interface **110** may be used during transfer of files **124** from the memory **104** to the remote device **130** or vice versa. By way of example, the communication interface may facilitate communication between the device **100** and remote device **130** via a network. By way of example, the network may be a wireless network implemented, e.g., using the communication interface **110**, a wireless router **132** and a communication link **135** affiliated with the remote device **130**. Alternatively, the communication interface **110** and communication link **135** may facilitate direct communication with the remote device **130**, e.g., by a direct link **137**, e.g., an optical or infrared link, a radiofrequency link, such as Bluetooth®, or other wireless link. It is noted that in some embodiments, the communication interface **110** may implement or facilitate function of the remote device detector **108**. It is further noted that in some embodiments there may be overlap between the functions of the case motion sensor **106** and the remote device detector **108** and communication interface **110**. For example, an infrared-based transceiver may be used to track the motion of the case **101** and to provide a wireless link for communication. Similarly, a video camera may serve to track motion of the case and to identify remote devices.

File transfer in accordance with an embodiment of the present invention may be understood with reference to FIG. **1**A, FIG. **1**B, FIG. **1**C and FIG. **2**. FIGS. **1B-1C** show a user holding the hand-held device **100** and transferring a data file to a nearby remote electronic device **130** by performing a gesture with the hand-held device **100**. By way of example, file information **124** may be stored in the memory **104** of the hand-held device **100**. The file information **124** may include an entire data file. Alternatively, the file information may include a file address of some remote location, e.g., a server associated with a website. The remote device **130** may include a unique identifier **130**, such as an RFID tag, bar code, etc. that allows the remote device detector **108** to generate a signal for detecting and identifying the remote device **130**. The remote device **130** may also include a processor **134** and memory **136**. Both the hand-held device **100** and electronic device **130** may be programmed with code instructions for communicating over a network such as a local area network.

The flow diagram in FIG. **2** depicts an example of a file transfer method **200** that may be implemented using the device **100**. Such a method may be implemented, in whole or in part through execution of the program instructions **114**. Specifically, as indicated at **202** a remote device **130** may be identified from a signal generated by the remote device detector **108**. The remote device **130** may be one of a plurality of remote devices in the vicinity of the hand-held device **100**. The device identification instructions **115** may be configured identify the remote device **130** from among a plurality of remote devices based on one or more remote device selection criteria. There are a number of different techniques for implementing device identification at **202**. These techniques generally involve generating a signal with the remote device detector **108** in response to some stimulus uniquely associated with the remote device **130**. Examples of such a stimulus may be based on bar code reading, image identification, RFID or direct wireless communication, as discussed above.

The device **100** may recognize a gesture from a signal generated by the case motion sensor as a result of motion of the case **101** as indicated at **204**. A file **124** may then be transferred from the memory **104** of the hand-held device **100** to the memory **134** of the remote device **130** or vice versa in response to recognition of the gesture as indicated at **206**. By way of example, once the file and destination have been identified the transfer of the file **124** may be triggered by making a flicking motion with the hand-held device **100**. In some embodiments, the gesture recognition instructions **116** may be configured to determine a direction of the flicking motion and select the remote device **130** from among a plurality of remote devices using a direction of the flicking motion. Thus, triggering of the file transfer and selection of the destination device may be combined into a single operation.

Gesture recognition at **204** may be implemented in any of a number of ways. For example, a gesture may be detected using sample motion data from the case motion sensor. An energy value and a baseline value may be computed. The baseline value may be updated if the energy value is below a calm energy threshold. The sample motion data may be adjusted based on the updated baseline value. A local variance may be calculated over a predetermined number of samples.

Sample motion data values may be recorded if the local variance exceeds a threshold. Sample motion data recording may stop if a local variance scalar value falls below a drop threshold. Input Gestures may be recognized by computing a total variance for sample values in an Input Gesture; calculating a figure of merit using sample values from the Input Gesture and one or more Catalog Gestures; and determining whether the Input Gesture matches a Catalog Gesture from the figure of merit. Further details of such gesture recognition are described, e.g., in commonly assigned U.S. Provisional Patent Application No. 61/020,669 to Thomas Miller IV, entitled GESTURE CATALOGING AND RECOGNITION, filed Jan. 11, 2008, which is incorporated herein by reference.

There are a number of different ways of implementing the file transfer indicated at **206**. For example, suppose the file **124** is to be transferred from the hand-held device memory **104** to the remote device memory **134**. Once the remote device **130** has been identified at **202** the file transfer instructions **122** may use a default memory location in the remote device memory **134** as a destination for the file. The file **124** may be transferred, e.g., copied or moved, using conventional file transfer routine involving the communication interface **110**. For example, the communication interface **110** may be a network interface, such as a wireless Ethernet card. The remote device **130** may be configured with a similar wireless network interface **138**. Both the hand-held device **110** and remote device **130** may exchange files via a wireless router **132**. Once the file and destination have been identified the transfer of the file **124** via the router **132** may be triggered by making a flicking motion with the hand-held device **100**. Alternatively, the file may be transferred by direct link between the hand-held device **100** and remote device **130** in the absence of a network. Such file transfer may be accomplished, e.g., by wireless link, such as an optical, infrared or radiofrequency (e.g., BlueTooth®) link.

According to an alternative embodiment of the invention, files may be identified for transfer and source and destination devices may be identified and then the file may be transferred with the hand-held device by gesturing with the case from the hand-held device. In such embodiments, the hand-held device **100** may be the source device or the destination device or neither the source nor destination. For example, the file may be transferred from the hand-held device (acting as the source) to a remote destination device, e.g., as shown in FIGS. **1**B-**1**C. Alternatively, the file may be transferred from a remote source device to the hand-held device (acting as the destination). This latter case is essentially the reverse of the situation shown in FIGS. **1**B-**1**C. In yet another example, the file may be transferred from one remote device to another remote device using the hand-held device to select the source and destination devices and trigger the transfer. An example of such an embodiment may be implemented as illustrated in FIG. **3** and FIGS. **4**A-**4**B.

The flow diagram in FIG. **3** depicts an example of a file transfer method **300** that may be implemented using the device **100**. Such a method may be implemented, in whole or in part through execution of the program instructions **114**. Specifically, at **302** a file to be transferred from a source to a destination is identified. There are a number of different ways of selecting the file to be transferred. For example, the default selection may be a file associated with an image that is displayed on a screen associated with the source device. Alternatively, multiple files may be represented by images or icons displayed on the display screen. A particular file may be selected, e.g., by touching it, in the case of a touch screen.

The source and/or destination for the file may be identified using a signal generated by the remote device detector **108**, as indicated at **304**. The source and/or destination may be identified as indicated above. It is noted that the order of the operations indicated at **302** and **304** may be different from that indicated in FIG. **3**. For example, if the file to be transferred is the file **125** stored in the memory **104** of the hand-held device **100**, selecting the file and selecting the device may be thought of as occurring more or less simultaneously. Alternatively, if the file to be transferred is located on the remote device **130**, it may be desirable to identify the remote device before selecting the file to be transferred.

Once the source, destination and file have been identified, the device **100** may recognize a gesture from a signal generated by the case motion sensor as a result of motion of the case **101** as indicated at **306**. Gesture recognition may take place as described above. The file may then be transferred from the source to the destination in response to recognition of the gesture as indicated at **308**. File transfer may take place as described above.

FIGS. **4**A-**4**B pictorially illustrate an example of file transfer according to the method of FIG. **3**. In this example, a file **124** stored in a memory **134**A associated with a first remote device **130**A is transferred to the memory **134**B of a second remote device **130**B using the hand-held device **100**. In this example, the hand-held device **100** and the remote devices **130**A, **130**B can communicate with each other via a wireless router **132**. The first remote device **130**A may be selected as the source by pointing the hand-held device **100** at the first remote device **130**A in such a way that the device detector can recognize a marker **133**A on the first remote device and generate a signal in response to recognition of the marker **133**A. By way of example, the marker **133**A may be a bar code, RFID tag, or other marker described above. A user may confirm selection of the first remote device **130**A by providing input to the remote device **100** in response to a query displayed on the screen **112** as seen in FIG. **4**A. The second remote device **130**B may be selected as the destination for the file **124** in a similar fashion, e.g., using a marker **133**B on the second remote device **130**B. Alternatively, the source and destination devices may be selected using a menu displayed on the screen **112** of the hand-held device **100**.

Selection of the file **124** may take place by default as a result of selection of the first device **130**A as the source. In particular, the device identification instructions **115** may be configured to automatically select the file **124** that is associated with an image **125** displayed on a screen **126**A of the first remote device **130**A. Alternatively, the file **124** may be selected from a menu displayed on the screen **112**.

As shown in FIG. **4**B, the file is transferred from the first remote device **130**A in response to a flicking motion made with the case **101**. The flicking motion may be recognized as a trigger to copy or move the file **124** from the first device **130**A to the second device **130**B. In the example shown in FIG. **4**B, the file **124** is transferred from the first remote device **130**A to the second remote device **130**B via the router **132** and communication links **135**A, **135**B affiliated respectively with the first and second remote devices **130**A, **130**B. Alternatively, the file transfer may take place directly between the first and second remote devices **130**A, **130**B via the communication links **135**A, **135**B in the absence of a network. After the file **124** has been transferred, the image **125** may be displayed on a display **126**B that is affiliated with the second remote device **130**B. This may provide a visual cue that the file has been successfully transferred.

Embodiments of the present invention provide for quick and natural transfer of files among various electronic devices. Such file transfer may be implemented in an intuitive and entertaining fashion.

While the above is a complete description of the preferred embodiment of the present invention, it is possible to use various alternatives, modifications and equivalents. Therefore, the scope of the present invention should be determined not with reference to the above description but should, instead, be determined with reference to the appended claims, along with their full scope of equivalents. Any feature described herein, whether preferred or not, may be combined with any other feature described herein, whether preferred or not. In the claims that follow, the indefinite article "A" or "An" refers to a quantity of one or more of the item following the article, except where expressly stated otherwise. The appended claims are not to be interpreted as including means-plus-function limitations, unless such a limitation is explicitly recited in a given claim using the phrase "means for."

What is claimed is:

1. A hand-held electronic device, comprising:

a case;

a processor; a memory;

a case motion sensor coupled to the processor;

a remote device detector coupled to the processor; and

a communication interface coupled to the memory and processor, wherein the communication interface is configured to facilitate transfer of data between the hand-held electronic device and a remote device, wherein the processor is programmed with instructions that, when executed cause the hand-held device to recognize a remote device from a signal generated by the remote device detector, recognize a gesture from a signal generated by the case motion sensor as a result of motion of the case; and transfer data with the communication interface from the hand-held device to the remote device or vice versa in response to recognition of the gesture.

2. The device of claim **1**, further comprising a display screen disposed on a major surface of the case, wherein the display screen is coupled to the processor.

3. The device of claim **2** wherein the display screen is a touch screen.

4. The device of claim **2** wherein the instructions are configured to transfer data corresponding to an image displayed on the display screen.

5. The device of claim **1** wherein the hand-held device is configured to be used as game device, phone, portable media player, email device, web browser device or navigation device.

6. The device of claim **1**, wherein the instructions are configured to select the remote device from among a plurality of remote devices proximate the hand-held device based on one or more remote device selection criteria.

7. The device of claim **1**, wherein the instructions are configured to select the remote device from among a plurality of remote devices using an analysis of the motion of the case.

8. The device of claim **1** wherein the gesture includes a flicking motion made by flicking the case.

9. The device of claim **8**, wherein the instructions are configured to determine a direction of the flicking motion and select the remote device from among a plurality of remote devices using a direction of the flicking motion.

10. The device of claim **1** wherein the communication interface is configured to communicate with the remote device via a network.

11. The device of claim **1** wherein the communication interface is configured to communicate directly with the remote device, even in the absence of a network.

12. A method for data transfer with a hand-held device having a processor; a memory, a case motion sensor coupled to the processor, a remote device detector coupled to the processor, and a communication interface coupled to the memory and processor, the method comprising:

a) recognizing a remote device from a signal generated by the remote device detector,

b) recognizing a gesture from a signal generated by the case motion sensor as a result of motion of the case; and

c) transferring data with the communication interface from hand-held device to the remote device or vice versa in response to recognition of the gesture.

13. The method of claim **12** wherein c) includes transferring data corresponding to an image displayed on a display screen associated with the hand-held device.

14. The method of claim **12** wherein a) includes selecting the remote device from among a plurality of remote devices proximate the hand-held device based on one or more remote device selection criteria.

15. The method of claim **12** wherein a) includes analyzing the motion of the case and selecting the remote device based on a resulting analysis of the motion of the case.

16. The method of claim **12** wherein the gesture includes a flicking motion made by flicking the case.

17. The method of claim **12** wherein c) includes transferring the data from the memory to the remote device or vice versa via a network.

18. The method of claim **17** wherein the network includes a wireless network.

19. The method of claim **12** wherein c) includes transferring the data directly from the memory to the remote device or vice versa, even in the absence of a network.

20. The method of claim **12**, further comprising selecting a file containing the data.

21. A method for data transfer with a hand-held device having a processor; a memory, a case motion sensor coupled to the processor, a remote device detector coupled to the processor, and a communication interface coupled to the memory and processor, the method comprising:

a) identifying data to be transferred from a source to a destination;

b) identifying the source and/or destination for the data using a signal generated by the remote device detector,

c) recognizing a gesture using a signal generated by the case motion sensor as a result of motion of the case; and

d) causing transfer of the data from the source to the destination in response to recognition of the gesture.

22. The method of claim **21** wherein a) includes selecting data associated with an image displayed on a screen associated with the source.

23. The method of claim **21** wherein b) includes selecting a remote device from among a plurality of remote devices proximate the hand-held device based on one or more remote device selection criteria.

24. The method of claim **23** wherein b) includes analyzing a motion of the case and selecting the remote device based on a resulting analysis of the motion of the case.

25. The method of claim **21** wherein b) includes selecting a remote device as the source using the signal generated by the remote device detector.

26. The method of claim **25** wherein b) further includes selecting the hand-held device as the destination.

27. The method of claim **21** wherein b) includes selecting a remote device as the destination using the signal generated by the remote device detector.

28. The method of claim **27** wherein b) further includes selecting the hand-held device as the source.

29. The method of claim **21** wherein b) includes

i) selecting a first remote device as the source using a first signal generated by the remote device detector and

ii) selecting a second remote device as the destination using a second signal generated by the remote device detector.

30. The method of claim **29** wherein the gesture includes a flicking motion made by flicking the case in a direction directed from the first remote device toward the second remote device.

31. The method of claim **21**, further comprising, after d), displaying an image associated with the data on a display screen affiliated with the destination.

32. A hand-held electronic device, comprising:

a case;

a processor; a memory;

a case motion sensor coupled to the processor;

a remote device detector coupled to the processor; and

a communication interface coupled to the memory and processor, wherein the communication interface is configured to facilitate transfer of data stored in the memory between the memory and one or more remote devices,

wherein the processor is programmed with instructions that, when executed cause the device to identify data to be transferred from a source to a destination, identify the source and/or destination for the data using a signal generated by the remote device detector, recognize a gesture using a signal generated by the case motion sensor as a result of motion of the case, and cause transfer of the data from the source to the destination in response to recognition of the gesture.

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