



(22) Date de dépôt/Filing Date: 2012/04/04

(41) Mise à la disp. pub./Open to Public Insp.: 2012/10/11

(45) Date de délivrance/Issue Date: 2023/11/07

(62) Demande originale/Original Application: 2 832 492

(30) Priorité/Priority: 2011/04/06 (US61/472,611)

(51) Cl.Int./Int.Cl. *G06Q 50/10* (2012.01),
G06Q 30/08 (2012.01)

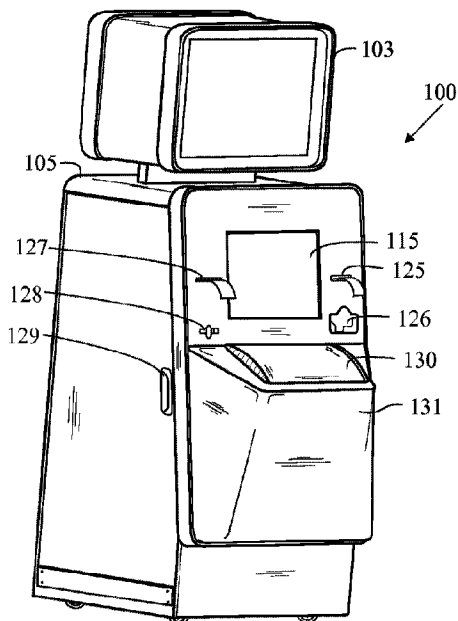
(72) Inventeurs/Inventors:
BOWLES, MARK, US;
TULLIE, THOMAS L., US;
BEANE, JOHN ANDREW, US;
PLOETNER, JEFFREY, US;
MILLER, JOHN, US;
VESCO, NEIL, US

(73) Propriétaire/Owner:
ECOATM, LLC, US

(74) Agent: NORTON ROSE FULBRIGHT CANADA
LLP/S.E.N.C.R.L., S.R.L.

(54) Titre : PROCEDE ET KIOSQUE POUR LE RECYCLAGE DE DISPOSITIFS ELECTRONIQUES

(54) Title: METHOD AND KIOSK FOR RECYCLING ELECTRONIC DEVICES



(57) Abrégé/Abstract:

A recycling kiosk (100) for recycling and financial remuneration for submission of an electronic device (150) such as a mobile phone is disclosed herein. The recycling kiosk (100) includes electrical connectors (505) and an inspection area (106) with an upper chamber (520), a lower chamber (530), a transparent plate (545) and at least one camera (610) in order to perform a visual analysis and an electrical analysis of the electronic device (150) for determination of a value of the electronic device (150). The recycling kiosk (100) also includes a processor (160) and a display (115) for user interaction.

ABSTRACT

A recycling kiosk (100) for recycling and financial remuneration for submission of an electronic device (150) such as a mobile phone is disclosed herein. The recycling kiosk (100) includes electrical connectors (505) and an inspection area (106) with an upper chamber (520), a lower chamber (530), a transparent plate (545) and at least one camera (610) in order to perform a visual analysis and an electrical analysis of the electronic device (150) for determination of a value of the electronic device (150). The recycling kiosk (100) also includes a processor (160) and a display (115) for user interaction.

Title

Method And Kiosk For Recycling Electronic Devices

(Docket Number ECO-006PCT)

Technical Field

[0001] The present invention generally relates to recycling of consumer electronic devices.

Background Art

[0002] There has been a large increase in the number of electronic devices used by the typical consumer. These devices include cell phones, PDA's, mp3 players, tablet computers, GPS devices, cameras, beepers, remote controls, cordless phones, calculators, etc. The rapid pace at which new technology and models of electronic devices are introduced creates a situation where many consumers upgrade or replace one or more recyclable device on a frequent basis. Often, the consumer does not dispose of the prior electronic device, but rather just stops using it and begins using the new device. This may happen over several generations of such devices.

[0003] There is a need for handling of such items in an ecologically friendly manner, both via recycling or by proper disposal procedures. It has not been convenient for owners of electronic devices to either recycle such devices or to properly dispose of such devices. There is currently little incentive for a device owner to "do the right thing" with a used device. When the owner just stops using a device and simply puts it in storage: the opportunity for recycling or re-use by another party is lost. If the owner just throws the device away in normal trash containers, the proper recycling or safe disposing of the device is thwarted.

[0004] The prior art has failed to recognize the problems associated with recycling electronic devices in a manner that is enticing to a consumer yet financially rewarding to the recycler.

Summary of the Invention

[0005] The present invention enables one to securely recycle, donate, trade-in, and/or sell electronic devices in a publicly accessible location.

5 [0006] One aspect of the present invention a method for analysis of a mobile communication device and financial remuneration to a user for submission of the mobile communication device. The method comprises identifying a mobile communication device, soliciting bids for a used model of the mobile communication device and receiving bids for the used model of the mobile communication device from a plurality of bidders. The method further
10 comprises setting a purchase price to pay for the used model of the mobile communication device based on the plurality of bids received from the plurality of bidders and identifying a used model of the mobile communication device at a recycling kiosk for the mobile communication device. The method further comprises verifying the integrity of the used model of the mobile
15 communication device at the recycling kiosk and offering the purchase price for the used model of the mobile communication device at the kiosk. Additionally, the method comprises purchasing the used model of the mobile communication device. Preferably, the method further comprises automatically binning the mobile communication device after purchasing the
20 used model of the mobile communication device. The method may further comprise instructing the user to erase the data of the used model of the mobile communication device prior to positioning the mobile communication device in the recycling kiosk.

[0007] The kiosk of the method comprises a housing, the housing comprising
25 a user interface on an exterior surface of the housing for the user to input information, an upper dome and a lower dome, wherein the upper dome and the lower dome comprise a plurality of mirrors. The kiosk further comprises an upper chamber camera, a lower chamber camera and a transparent surface. The kiosk further comprises a processor within the housing and in
30 communication with the at least one camera, the processor configured to

identify the brand and model number of the mobile communication device based on at least one of the information from the user and the images from the at least one camera, the processor configured to determine a purchase price for the used model of the mobile communication device.

5 [0008] Another aspect of the present invention is a method for analysis of an electronic device and financial remuneration to a user for submission of the electronic device. The method comprises positioning an electronic device in an inspection area of a kiosk, the inspection area having a camera. The method further comprises imaging a screen shot of an about page of the electronic
10 device, and inspecting the screen shot of the about page of the electronic device obtained by at least one camera disposed in the inspection area to determine if the electronic device has any defects. The method further comprises determining a value for electronic device. Lastly the method comprises determining a value for the electronic device.

15 [0009] The kiosk of the method comprises a housing, a user interface on an exterior surface of the housing for the user to input information, an upper dome and a lower dome, wherein the upper dome and the lower dome comprise a plurality of mirrors. The kiosk further comprises an upper chamber camera, a lower chamber camera and a transparent surface. The kiosk also
20 comprises a processor within the housing and in communication with the at least one camera, the processor configured to identify the brand and model number of the electronic device based on at least one of the information from the user and the images from the at least one camera, the processor configured to determine a financial remuneration value for the electronic device.
25 Preferably, the method further comprises comparing information derived from the barcode sticker to information derived from the about page.

[00010] An additional aspect of the present invention is a method for analysis of an electronic device and financial remuneration to a user for submission of the electronic device. The method comprises positioning an electronic device
30 in an inspection area of a kiosk wherein the inspection area has a camera. The

method further includes imaging the electronic device. The image of the electronic device obtained by at least one camera disposed in the inspection area is inspected to determine if the electronic device has any defects. Lastly, the method includes determining a value for electronic device.

5 [00011] Yet another aspect of the present invention is a dome shaped apparatus, the dome shaped apparatus comprising an upper dome, a lower dome and the upper and lower dome comprising a plurality of walls, wherein the plurality of walls are composed of mirrors. The dome shaped apparatus further comprises a transparent surface and at least one camera, the camera capable of obtaining
10 a 360 degree view of an electronic device placed within the dome shaped apparatus. The upper dome preferably comprises an upper chamber camera. The lower dome preferably comprises a lower chamber camera. Preferably, a combination of the each of the upper dome and lower dome cameras and the plurality of mirrors allow for an image of the device placed on the transparent
15 surface. Preferably, the combination of the each of the upper dome and lower dome cameras and the plurality of mirrors allow for a 360 degree of the electronic device placed on the transparent surface.

[00012] In another aspect of the present invention, the invention comprises a method for analysis of an electronic device and financial remuneration to a
20 user for submission of the electronic device. The method comprises positioning an electronic device in an inspection area of a recycling kiosk 100, wherein the inspection area has a plurality of mirrors. The method further comprises placing the electronic device in an illuminated mode wherein a LCD screen of the electronic device is illuminated to visually enhance the
25 appearance of any defects in the LCD screen and inspecting an image of the LCD screen of the electronic device obtained by at least one camera disposed in the inspection area to determine if the LCD screen of the electronic device has any defects. The method further comprises defining an analyzed electronic device. Lastly, the method comprises determining a value for the analyzed
30 electronic device.

[00013] In one embodiment of the present invention, the method further comprises performing an electrical analysis of the electronic device. In an alternative embodiment of the present invention, the method further comprises powering up the electronic the device. In yet another embodiment of the present invention the method further comprises measuring the luminescence from the LCD screen of the electronic device.

[00014] In one embodiment of the present invention, the method further comprises automatically binning the electronic device after a visual inspection and electrical inspection. Further, the method comprises completing the visual inspection and electrical inspection within an illumination period. The illumination period comprises the time from when the LCD of the phone is initially illuminated to the time the display screen transitions into an energy conserving mode, evidenced by the screen blacking out.

[00015] In yet another embodiment, the method comprises positioning an electronic device in an inspection area of a recycling kiosk 100, powering up the electronic device and inputting a term on the electronic device. The inputted term comprises a plurality of characters and the term is displayed on the LCD screen of the electronic device. The method further comprises inspecting an image of the LCD screen of the electronic device obtained by at least one camera disposed in the inspection area utilizing an optical character recognition program of the recycling kiosk to determine if the LCD screen of the electronic device has any defects. The term is preferably a telephone number, a word or number.

[00016] Another aspect of the invention is a dome shaped apparatus comprising a plurality of walls, wherein the plurality of walls composed of mirrors and at least one camera, wherein the camera is capable of obtaining a multiple views of an electronic device placed within the dome shaped apparatus. The invention optionally comprises an electrical connector dispensing device. The electrical connecting dispensing device comprises a cartridge containing a plurality of cables, wherein each of the plurality of cables have an

interchangeable connector and wherein each of the cables is automatically retracted after an electrical analysis of an electronic device.

Brief Description of the Drawings

- 5 [00017] FIG. 1 is a perspective view of a recycling kiosk.
- [00018] FIG. 1A is a front view of the recycling kiosk of FIG. 1.
- [00019] FIG. 1B is an isolated view of a front of the recycling kiosk of FIG. 1.
- [00020] FIG. 1C is an isolated view of a front of the recycling kiosk of FIG. 1.
- [00021] FIG. 2 is an isolated view of an electrical connector wheel.
- 10 [00022] FIG. 2A is an isolated view of an electrical connector is a staging area.
- [00023] FIG. 2B is an isolated view of an electrical connector in a detached position.
- [00024] FIG. 2C is an isolated view of an electrical connector being detached.
- [00025] FIG. 2D is an isolated view of an electrical connector being retracted.
- 15 [00026] FIG. 3 is a perspective view of internal components of a kiosk.
- [00027] FIG. 3A is a perspective view of internal components of a kiosk.
- [00028] FIG. 3B is a perspective view of internal components of a kiosk.
- [00029] FIG. 3C is a perspective view of internal components of a kiosk.
- [00030] FIG. 4 is an isolated view of a phone an inspection plate of a kiosk.
- 20 [00031] FIG. 4A is an isolated view of a phone being transferred in the kiosk.
- [00032] FIG. 4B is an isolated view of a phone being transferred in the kiosk.
- [00033] FIG. 4C is an isolated view of a phone being binned in the kiosk.
- [00034] FIG. 5 is a block diagram of components of a recycling kiosk.
- [00035] FIG. 6 is a block diagram of components of a recycling kiosk.
- 25 [00036] FIG. 7 is an isolated view of an inspection area of a kiosk.
- [00037] FIG. 8 is an isolated view of a camera in a dome of a kiosk.
- [00038] FIG. 9 is an isolated view of a phone in an inspection area of a kiosk.
- [00039] FIG. 10 is a front view of a phone.
- [00040] FIG. 11 is a front view of a phone connected to an electrical connector.
- 30 [00041] FIG. 12 is a flow chart for recycling an electronic device.

[00042] FIG. 13 is a flow chart for a pre-acquisition auction method.

Best Mode(s) For Carrying Out The Invention

5 [00043] As shown in FIGS. 1, 1A, 1B and 1C, a kiosk for recycling electronic devices and providing financial remuneration is generally designated 100. The electronic device may be a Smart Phone, mobile phone, tablet, iPod, MP3 Player, e-reader, etc. The kiosk 100 has a housing 105 in a pseudo-rectangular cube shape. A header 103 allows for marketing and videos. An access door
10 130 in a front body area 131 provides access to an inspection area 106 for electronic devices. The front of the housing 105 has a display screen 115 for providing information to a user, and acts as a user interface in a touchscreen embodiment. The exterior of the housing 105 also preferably has a label printer 125, a voucher dispenser 126, a receipt printer 127, and a cash or card
15 dispenser 128. The exterior housing may also have a thumbprint reader.

[00044] The kiosk 100 allows for automatic visual analysis of an electronic device to identify the electronic device and to determine electronic device is damaged in order to ascertain a value for recycling the electronic device. Further, the kiosk 100 also allows for electrical analysis of the electronic
20 device.

[00045] As shown in FIGS. 2, 2A, 2B, 2C and 2D, the kiosk 100 comprises a carousel 500 containing a plurality of electrical connectors 505a-505y. Each of the electrical connectors 505 has a unique connection plug for removable connection to an electronic device. Each of the electrical connectors 505a-
25 505y has a cartridge removeably secured in the carousel 500. Thus, new electrical connectors 505 can be substituted for older electrical connectors 505. Further, the kiosk 100 is designed to allow for automatic removal of the electrical connector 505 using detachment mechanism 511. In FIG. 2A, the electrical connector 505 is in a staging area, where it would be connected to a
30 port of an electrical device (as shown FIG. 11). Next, as shown in FIGS. 2B

and 2C, hinged arms 512 of the detachment mechanism 511 engage a moveable member of the electrical connector 505 to force the outward movement of the moveable member and the disconnection of the electrical connector 505 from a port of an electronic device (as shown in FIG. 11). As shown in FIG. 2D, the electrical connector 505 is retracted by a cable from the detachment mechanism 511.

[00046] As shown in FIGS. 3, 3A, 3B and 3C, the internal mechanism 101 of the kiosk 100 includes an upper chamber 520, a lower chamber 530, a binning plate 540, a transparent plate 545, a door 550, a bin 555 and the carousel 500. Preferably, the carousel 500 is able to hold approximately 25 electrical connectors 505, wherein the electrical connectors 505 are interchangeable to easily adapt to the variations in USB and other like connections. As shown in FIG. 3B, a mobile phone 150 is placed on the transparent plate 545 and transferred to an inspection area 106 within upper chamber 520 and lower chamber 530. Both the upper chamber and the lower chamber preferably have a bell-like shape. As shown in FIG. 3C, the mobile phone is moved between the upper chamber 520 and the lower chamber 530 for visual analysis. The transparent plate, preferably composed of glass or a transparent plastic material, allows for imaging components within the upper chamber 520 and lower chamber 530 to obtain multiple view images of the mobile phone 150. Preferably, a 3-D profile of the mobile phone is generated in order to provide visual analysis for identification and condition of the mobile phone. Once the visual analysis is complete, the transparent plate 545 moves out from between the upper chamber 520 and lower chamber 530.

[00047] FIGS. 4, 4A, 4B, and 4C, show the automatic transport and binning of an electronic device 150 within the internal mechanism 101 of the kiosk 100. As shown in FIG. 4, the door 550 is lowered to reside above the transparent plate 545, which is then moved inward with the mobile phone 150 thereon. As shown in FIG. 4A, as the transparent plate 545 is moved inward, the mobile phone is blocked by the door 550 and engages binning plate 540 as the mobile

phone begins to fall into an opening created by the inward movement of the transparent plate 545. As shown in FIG. 4B, once the mobile phone is on the binning plate 540, the binning plate 540 is slowly lowered on one side to open into the bin 555. As shown in FIG. 4C, the mobile phone 150 slowly falls
5 through an opening 556 into the bin 555 to secure the mobile phone 150 and for collection at a later time. The entire process performed at a rate of speed to prevent damage to the electronic device being recycled.

[00048] The kiosk 100 is of a typical size and shape of a vending machine, such as a soda machine, coin changing machine, can recycling machine, or
10 other vending machines. The housing 105 of the kiosk 100 protects the internal mechanism 101 and secures electronic devices submitted for recycling. The housing 105 is preferably constructed of a metal material, such as steel or aluminum, to prevent authorized access to the kiosk 100.

[00049] The inspection area 106 is preferably designed to permit a detailed
15 visual inspection of an electronic device such as a mobile phone, tablet computer, e-reader, MP3 players, PDA. The walls of the inspection area are preferably white and/or mirrored to provide imaging of the electronic device.

[00050] The couplings from the kiosk 100 and to a remote computer are preferably a single coupling to a communications network such as the internet
20 via wired LAN, wireless LAN, cellular or any other proprietary communications system. The Kiosk 100 preferably includes a processor 160 for processing the information obtained from the mobile phone and for controlling the components of the kiosk 100. Preferably, the processor 160 is a standard personal computer ("PC") or other type of embedded computer
25 running any operating system such as Linux or MAC OS. The processor 160 is most preferably a small form factor PC with integrated hard disk drive ("HDD"), central processing unit ("CPU") and universal serial bus ("USB") ports to communicate with the other components of the kiosk 100. One most preferred CPU is a DELL PC OPTIPLEX 780. Alternatively, the processing
30 means is a microprocessor with a standalone motherboard which interfaces to

a discrete HDD, power supply and the other components of the kiosk 100. The kiosk 100 preferably includes a memory 161 or other storage device, such as a disk drive, that stores the executable applications, test software, databases and other software required to operate the recycling kiosk 100.

5 [00051] The external communication component for the kiosk 100 preferably includes a wired Ethernet to provide connection to the internet, or alternatively the external communication component includes a wireless modem such as GSM, CDMA, 3G and 4G technologies for data communications.

10 [00052] As shown in FIGS. 7-9, the visual inspection of an electronic device such as a mobile phone 150 in the inspection area 106 is preferably performed by at least one camera 610 within the upper chamber 520. The lower chamber 530 also preferably has at least one camera or other imaging component such as a scanner. Alternatively, the visual inspection is performed by multiple cameras. A preferred camera 610 is a 1 megapixel machine vision camera. If
15 a single camera 610 is utilized in the inspection area 106, the camera 610 preferably is movable to increase a field of view of the inspection area 106 to inspect the electronic device 150 such as a mobile phone placed on the transparent plate 545. The camera 161 is preferably movable. Preferably the camera 610 is positioned to image a LCD screen 153 of the electronic device
20 150 to determine if the LCD screen 153 is damaged. The interior surfaces of the upper chamber 520 and lower chamber 530 preferably include mirrors 615 in order to optimize viewing of an electronic device positioned within the inspection area 106. As shown in FIG. 9, a reflection 150' of a mobile phone 150 is illustrated. The camera 610 is also preferably movable to image a data
25 port of the electronic device to determine the type of electrical connector 505 for the electronic device in order to perform an electrical analysis of the electronic device. Alternatively, the entire interior surfaces of the upper chamber 520 and the lower chamber 530 are mirrored for optimization of imaging of the electronic device. The camera(s) alternatively are CCD or
30 CMOS.

[00053] Also, time is of the essence when inspecting the electronic device. The analysis is completed within an illumination period of the electronic device, wherein the illumination device comprises the time from when the display screen of the electronic device is illuminated to the time the display screen
5 converts to an energy conserving mode, evidences by the screen blacking out. During the inspection, the brightness of the illumination is also measured. The lighting preferably comprises LED based lighting with beam splitters, or alternatively UV lighting.

[00054] The transparent plate optionally operates as a weight scale to obtain a
10 mass of the electronic device for use in determining a remuneration value. For example, if the mass of the electronic device 150 is less than set forth in a vendor specification for the electronic device, then one or more components of the electronic device may be missing, such as the battery for the electronic device 150.

[00055] Preferably, visual inspection and recognition software is utilized by the kiosk 100 to analyze an electronic device. In one preferred method, a
15 recognition algorithm is applied to a specific make and model of a electronic device. The visual inspection and recognition software determines the borders of a electronic device 150 under inspection to determine the external
20 dimensions of the electronic device 150. The external dimensions are utilized to determine a subset of possible mobile phones from a master database of mobile phones stored in the memory 161 of the kiosk 100 or available online to the kiosk 100 using external communications. The visual inspection and
25 recognition software then preferably uses a set of secondary and tertiary features to further distinguish the electronic device 150. These secondary and tertiary features can include placement and size of the display screen, placements and size of the keyboard, unique buttons, placement of ports, and other distinguishing features. Once an exact make and model of the electronic device is determined, the visual inspection and recognition software subtracts
30 an image of the electronic device 150 from an image of a perfect electronic

device for the same make and model. The result of the subtraction is preferably a quantifiable number of pixels that are calibrated into categories of broken or missing parts, cracked screen, and low, medium or high wear.

[00056] Alternatively, the visual inspection is performed using neural network pattern recognition techniques to identify the mobile phone 150, then filter algorithms are utilized to determine defects such as cracked screens. Further, those skilled in the pertinent art will recognize that other visual inspection techniques may be employed without departing from the scope and spirit of the present invention.

[00057] The electrical analysis of an electronic device 150 is preferably performed using an electrical connector 505 connected to a data port of a electronic device 150 as discussed above in reference to FIGS. 2, 2A, 2B, 2C and 2D. Once the make and model of the electronic device 150 is determined, either by visual inspection or user input using a user interface such as touch screen display 115, the correct electrical connector 505 is dispensed by the carousel 500 for connection to the data port of the electronic device 150. The connection of the electrical connector 505 to the electronic device 150 is preferably performed automatically by the kiosk 100. Alternatively, the proper choice of electrical connector 505 is rotated into position on the carousel 500 and illuminated or in some other way presented to the consumer for manual connection of the electrical connector 505 to the data port of the electronic device 150. Electrical analysis software is preferably utilized by the kiosk 100 to interact with the electronic device 150. The electrical analysis preferably determines if the mobile phone is capable of activation, maintaining a charge, performing correctly, powering a display screen of the electronic device 150, providing make, model, serial number and other pertinent information about the electronic device 150, and other relevant information.

[00058] The touch screen display 115 preferably includes a keypad, user selection buttons, soft keys, and other similar components. The touch screen

display 118 is used to enable quick and easy access to various features and functions of the recycling kiosk 100. The recycling kiosk 100 preferably dispenses various forms of payment, including cash, credit cards, debit cards, chip cards, gift cards from the kiosk's host location or other gift cards, and other magnetic striped cards or electronic payment methods. The kiosk 100 also uses the barcode reader to read the barcode identification on the inside of the battery pack. A UV detector is used for reading "invisible" barcodes in use by certain vendors such as Apple and others. The bar code reader, camera, and/or UV detector of the kiosk 100 is another technique used to identify the product model, IMEI #, and/or FCC ID. Alternatively, the kiosk 100 communicates with the electronic device 150 using wireless communications to test and if necessary erase data from the electronic device 150.

[00059] FIG. 6 is a block diagram of the main components of the kiosk 100. A processor 160 is preferably in communication with the other components of the kiosk 100. The memory 161 preferably contains a database of information on multiple mobile phones including images, physical characteristics, prices and other similar information. The external communications 167 preferably communicates through a wireless connection or Ethernet with a network to receive and transmit information to a remote site. The power supply 170 is preferably received through a plug-in connection to a wall outlet. The mechanical components 165 include the electrical connector carousel 500, the transparent plate 545, the binning plate 540, the door 550, and other similar components. The camera 610 or cameras, electrical connectors, and a user interface interact with the processor 160 as discussed above. FIG. 5 illustrates an internal back of a recycling kiosk 100. As shown a processor 160 is preferably a personal computer having a battery backup 170a, a wireless connection 167 for external communications, an electrical connection 140, a receipt dispenser 104 and a display screen 115.

[00060] The processor 160 identifies the electronic device 150 submitted for recycling using information from the visual inspection and user interface. The

processor 160 also determines the proper electrical connector 505 for connection to the data port of the electronic device 150 using information obtained during the visual inspection or from the user interface. The processor 160 also directs and receives information from the electrical analysis of the electronic device 150 performed using the electrical connector 505 connected to the data port of the electronic device 150. The processor also preferably determines a financial remuneration for the submitted electronic device 150 based on the visual inspection, optionally the electrical analysis and data stored in the memory 161 of the kiosk or information provided externally through the external communication component 167.

[00061] A flow chart for a preferred recycling method is shown in FIG. 12. At step 301 a customer elects to sell or recycle an electronic device. The customer checks to see if the electronic device is supported for sale/refurbishing from a list on the screen of the kiosk. The customer activates the on-screen menu system and either enters the phone model directly or goes through a series of menus to determine if the electronic device is eligible for sale or only for recycling. At decision block 302 it is determined if the electronic device is only available for recycling. If yes, (i.e. it is not on the list of electronic device available for reselling) the customer can insert the electronic device into receptacle at step 303 and the electronic device falls into bin 112 for recycling.

[00062] If the electronic device is supported for refurbishment/resale the customer is then encouraged to engage the testing/rating operation of the system. At step 304, the system has determined the correct connector to couple to the electronic device. Connectivity options and are not limited to cable, standard or proprietary connectors, hard docks, reading removable or external physical memory or other wireless methods like WiFi, Bluetooth, RFID, NFC, and the like. At step 305 the electronic device is connected and inserted into inspection area 106. If this has been done correctly, the customer is given some indication (e.g. a green light) and the system proceeds to step 306. At step 306 the electronic device is tested for operation using diagnostics and

operating via, for example, the OMSI interface. The diagnostics preferably includes electrical and physical testing including testing the electronic device's battery, screen, memory, button functionality and structural integrity.

[00063] Preferably, the electronic device is imaged and analysis software is used to identify scratches, cracks, wear patterns, dents, broken or missing pieces, inclusion of features such as lenses, buttons, connectors, badges, labeling and/or branding. Identification may be done by image comparison or other similar methods where the image taken of the electronic device is normalized and compared to a reference image. Other inspection methods may be used in conjunction with visual and/or electrical testing including weighing to determine specific weight and use that data to further refine verification of manufacturer and verification of exact device model. In another embodiment, the photographic image is used to identify the correct manufacturer and model number/product number. Visual identification could include any combination of the following: calculations based upon measurement, physical (e.g., mm, inches), pixel count or other. Identification based upon electronic device dimensions, location/size of buttons, LCD and other physical characteristics. One camera or multiple cameras may be used to determine height, width, depth as needed. Identification based on OCR (Optical Character Recognition) of identifiers such as Carrier (for phone and tablet computers), brand, model, serial number, other identifiers. Identification based upon barcodes. Consumer may be asked to orient CE on its front, back, side and then asked to change orientation as needed. Consumer may even be asked to remove CE cover(s), batteries and the like in order to gain access to identifiable items, such alphanumeric or barcode data. The kiosk 100 provides a way to use visual inspection with electrical inspection to identify a device, determine its value, and reduce possible fraud.

[00064] In one embodiment, the kiosk 100 communicates with the carrier associated with a mobile phone to collect any information that could be germane to the device, including, for example, validation or authentication,

registered ownership, account status, time in service, and the like. In some cases, when the customer's identification information does not match the registered owner information, the kiosk 100 automatically contacts the assumed owner in some manner (automated telephone call, email, text message, etc.) to alert the owner of the phone of the possible transaction.

5 [00065] Another feature of an embodiment of the kiosk 100 is to determine if there is personal information on the electronic device. This is determined by the presence of data in particular storage registers in the memory (e.g., quick-key stored numbers) or by looking at file types (jpegs, mp3's, etc.), or just
10 assuming all non-default storage locations must contain personal data. The customer is offered the chance to erase the data from the phone. One option allows the customer to request that the data be first downloaded and then sent to a location designated by the customer (e.g., email address, website, etc.). In another embodiment, there is a slot for the customer to enter a memory card
15 (e.g. USB drive, memory stick, etc.) whereupon the kiosk 100 uploads the data to the memory device. In still another embodiment, the kiosk 100 offers a web location from which the user retrieves the data at some later time if desired. In another embodiment, the user elects to have the data placed in another electronic device purchased by the customer at the kiosk 100 or in the location
20 of the kiosk 100 or some other store. The customer preferably selects a user name and password to access the system provided storage location.

[00066] Once the value is determined, the value is provided at step 307 to the kiosk. The kiosk 100 then offers the customer a price or other remuneration for the phone that is typically less than the resale value. In other embodiments,
25 the kiosk 100 offers the customer a price or remuneration that is at the current real-time market price. At step 308 it is determined if the user wishes to accept the offer. If not, the kiosk 100 proceeds to step 309 and opens the door and releases the electronic device back to the customer. If the user wishes to accept the offer, the kiosk 100 proceeds to step 310. At a point where the user
30 accepts a price, the kiosk 100 may then lock down the inspection area to

prevent further access to the electronic device by the user. The kiosk 100 then disconnects any cables that have been attached. At step 310, the user indicates acceptance of the decision by confirming on the keypad or touch-screen. At this point the kiosk 100 proceeds with deleting the personal data from the electronic device. In addition, once the transaction is confirmed, the kiosk 100 tags the electronic device with a transaction number that is associated with the diagnostic data and the transaction itself. This is preferably a printed adhesive label that is affixed physically to the phone and/or the loading of electronic data corresponding to the transaction number onto the phone itself for traceability purposes.

[00067] At step 311, the kiosk 100 completes any additional testing and diagnostics of the electronic device, disconnects the cable from the electronic device, and prints a receipt for the customer. Transfer of funds may be authorized via the kiosk 100 by crediting a customer credit card or account by dispensing cash, or by dispensing a voucher or coupon. At step 312 the kiosk 100 updates its inventory database and transmits the update via a communications network to a kiosk server.

[00068] One preferred method for a pre-acquisition auction is illustrated in the flow chart of FIG. 13. A method for analysis of an electronic device and financial remuneration to a user for submission of the electronic device is generally designated 1000. At block 1001, an electronic device is identified. At block 1002, bids are solicited for a used model of the electronic device in a predetermined condition. The bids are preferably solicited online through a website and the bidders are preferably pre-qualified. At block 1003, bids for the used model of the electronic device are received from a plurality of bidders. At block 1004, a purchase price to pay for the used model of the electronic device is set based on the plurality of bids received from the plurality of bidders. Typically, the purchase price is based on the winning bid. The shipping information for the winning bidder is preferably obtained at this time. At block 1005, a used model of the electronic device is identified at a

recycling kiosk for the electronic device. Preferably, a consumer desires to recycle the electronic device. At 1006, the integrity of the used model of the electronic device is verified at the recycling kiosk. Preferably, the condition of the electronic device is established at the kiosk, with the kiosk determining
5 any damage to the electronic device based on visual and electronic analysis of the electronic device. At block 1007, the electronic device is evaluated and graded. At block 1008, the purchase price for the used model of the electronic device is offered to a consumer at the kiosk. At block 1009, the electronic device is automatically binned after purchasing the used model of the
10 electronic device from the consumer at the kiosk. At block 1010, the electronic device is shipped to the winning bidder.

[00069] Preferably, the kiosk 100 of the method comprises a housing 105, the housing 105 comprising a user interface on an exterior surface of the housing for the user to input information, an upper dome and a lower dome, wherein
15 the upper dome and the lower dome comprise a plurality of mirrors. The kiosk 100 further comprises an upper chamber camera, a lower chamber camera and a transparent surface. The kiosk 100 further comprises a processor 160 within the housing and in communication with the at least one camera, the processor 160 configured to identify the brand and model number of the mobile
20 communication device based on at least one of the information from the user and the images from the at least one camera, the processor 160 configured to determine a purchase price for the used model of the mobile communication device.

[00070] An alternative method for a pre-acquisition auction begins with a
25 mobile communication device identified for acquisition. Bids are solicited for a used model of the mobile communication device. Bids for the used model of the mobile communication device are received from a plurality of bidders. A purchase price to pay for the used model of the mobile communication device is set based on the plurality of bids received from the plurality of bidders. A
30 used model of the mobile communication device is identified at a recycling

kiosk for the mobile communication device. The integrity of the used model of the mobile communication device is verified at the recycling kiosk. The purchase price for the used model of the mobile communication device is offered to a consumer at the kiosk. The mobile communication device is automatically binned after purchasing the used model of the mobile communication device from the consumer at the kiosk. The mobile communication device is shipped to the winning bidder.

[00071] Another alternative method for a pre-acquisition auction begins with establishing a plurality of pre-acquisition purchase prices. Each of the plurality of pre-acquisition purchase prices is established for a recycled electronic device in a predetermined condition. Each of the pre-acquisition purchase prices is established by a winning bid from a bidder of a plurality of bidders for a recycled electronic device. An electronic device is positioned in an inspection area of a kiosk. The inspection area has at least one camera. The electronic device or a portion thereof is imaged. The image of the electronic device obtained by the at least one camera disposed in the inspection area is inspected to determine if the electronic device has any defects. The electronic device is identified and a condition of the electronic device is determined. A matching pre-acquisition purchase price is selected from the plurality of pre-acquisition purchase prices for the electronic device. A consumer is offered the pre-acquisition purchase price for the electronic device.

What is claimed is:

1. A method for analyzing a mobile electronic device and providing financial remuneration to a user for submission of the mobile electronic device, the method comprising:
 - identifying a mobile electronic device;
 - soliciting bids for a used model of the mobile electronic device;
 - receiving bids for the used model of the mobile electronic device from a plurality of bidders;
 - setting a purchase price to pay for the used model of the mobile electronic device based on the bids received from the plurality of bidders;
 - identifying an example of the used model of the mobile electronic device at a recycling kiosk for the mobile electronic device;
 - verifying the integrity of the example of the used model of the mobile electronic device at the recycling kiosk;
 - offering the purchase price for the example of the used model of the mobile electronic device at the kiosk; and
 - purchasing the example of the used model of the mobile electronic device.

2. A method for analyzing an electronic device and providing financial remuneration to a user for submission of the electronic device, the method comprising:
 - establishing a plurality of pre-acquisition purchase prices, each of the plurality of pre-acquisition purchase prices established for a recycled electronic device in a predetermined condition, each of the pre-acquisition purchase prices established by a winning bid from a bidder of a plurality of bidders for the recycled electronic device;
 - receiving an electronic device in an inspection area of a kiosk, the inspection area having at least one camera;
 - imaging the electronic device;
 - analyzing the electronic device for identification of the electronic device and a condition of the electronic device;
 - selecting a matching pre-acquisition purchase price from the plurality of pre-acquisition purchase prices for the electronic device; and
 - offering the user the matching pre-acquisition purchase price for the electronic device.

3. A method for analyzing a mobile electronic device and providing financial remuneration to a user for submission of the mobile electronic device, the method comprising:
 - identifying a mobile electronic device and a predetermined condition of the mobile electronic device;
 - soliciting bids for a used model of the mobile electronic device in the predetermined condition;

receiving bids for the used model of the mobile electronic device from a plurality of bidders;
 setting a purchase price to pay for the used model of the mobile electronic device based on the bids received from the plurality of bidders;
 identifying an example of the used model of the mobile electronic device at a recycling kiosk for mobile electronic devices;
 verifying the integrity of the example of the used model of the mobile electronic device at the recycling kiosk;
 purchasing the example of the used model of the mobile electronic device; and
 delivering the example of the used model of the mobile electronic device to a winning bidder.

4. The method according to claim 2 wherein the kiosk comprises:
 - a housing;
 - a user interface on an exterior surface of the housing for the user to input information;
 - a plurality of electrical connectors, at least one electrical connector of the plurality of electrical connectors capable of connecting to the electronic device received within the inspection area; and
 - a processor within the housing and in communication with the at least one camera, each of the plurality of electrical connectors, and the user interface, the processor configured to identify the brand and model number of the electronic device based on at least one of the information from the user or at least one image of the electronic device obtained via the at least one camera, and the processor configured to perform an electrical analysis of the electronic device via the at least one electrical connector.
5. The method according to claim 2 wherein the inspection area further comprises: an upper chamber and a lower chamber, wherein the upper chamber comprises a plurality of mirrors and an upper chamber camera, and wherein the lower chamber comprises a lower chamber camera.
6. The method according to claim 1 or 3 wherein the recycling kiosk comprises:
 - a user interface for receiving information from the user;
 - at least one camera; and
 - a processor in communication with the at least one camera and the user interface, the processor configured to identify the example of the used model of the mobile electronic device at the recycling kiosk based on at least one of information received from the user or at least one image of the example of the used model of the mobile electronic device obtained via the at least one camera.
7. The method according to claim 1 or 3 wherein the recycling kiosk comprises:
 - at least one camera; and
 - a processor in communication with the at least one camera, the processor configured to verify the integrity of the example of the used model of the electronic device based at least in part on at least one

image of the example of the used model of the mobile electronic device obtained via the at least one camera.

8. The method according to claim 1 or 3 wherein the recycling kiosk comprises:
 - a wired and/or wireless connectivity device configured to operably connect to the example of the used model of the mobile electronic device at the recycling kiosk; and
 - a processor in communication with the wired and/or wireless connectivity device, the processor configured to verify the integrity of the example of the used model of the mobile electronic device via the wired and/or wireless connectivity device.
9. The method according to claim 2 wherein the kiosk comprises:
 - a user interface for receiving information from the user; and
 - a processor in communication with the at least one camera and the user interface, the processor configured to identify the electronic device based on at least one of the information from the user or at least one image of the electronic device obtained via the at least one camera.
10. The method according to claim 2 wherein the kiosk comprises:
 - a processor in communication with the at least one camera, the processor configured to analyze the condition of the electronic device based at least in part on at least one image of the electronic device obtained by the at least one camera.
11. The method according to claim 2 wherein the kiosk comprises:
 - a wired and/or wireless connectivity device configured to operably connect to the electronic device at the kiosk; and
 - a processor in communication with the wired and/or wireless connectivity device, the processor configured to analyze the condition of the electronic device via the wired and/or wireless connectivity device.
12. The method of any one of claims 1 to 11 wherein the bids are solicited online through a website.
13. The method of any one of claims 1 to 11 wherein the bidders are pre-qualified.
14. An apparatus for recycling electronic devices, the apparatus comprising:
 - a processor configured to offer a consumer a pre-acquisition purchase price for a recycled electronic device with the pre-acquisition purchase price established by a winning bid from a bidder of a plurality of bidders; and
 - an inspection area comprising—

an upper chamber and a lower chamber;
one or more mirrors; and
at least one camera, the camera capable of obtaining multiple views of an electronic device placed within the apparatus.

15. The apparatus of claim 14, further comprising a transparent surface between the upper and lower chambers, the transparent surface configured to support the electronic device within the inspection area.

16. The apparatus of claim 15 wherein the camera is configured to obtain multiple views of the electronic device when the electronic device is supported by the transparent surface.

17. A kiosk for processing a used electronic device, the kiosk comprising:
a housing;
a user interface operably coupled to the housing and configured to receive a first identifier associated with the electronic device;
an inspection area within the housing; and
a camera positioned within the housing and configured to obtain an image of the electronic device within the inspection area, wherein the image includes a second identifier associated with the electronic device.

18. The kiosk of claim 17 wherein the first identifier is associated with a make, a model, and/or a unique number of the electronic device.

19. The kiosk of claim 17 wherein the first identifier includes a machine-readable code.

20. The kiosk of claim 17 wherein the first identifier is a barcode.

21. The kiosk of claim 17 wherein the second identifier is associated with a make, a model, and/or a unique number associated with the electronic device.

22. The kiosk of claim 17 wherein the second identifier includes a machine-readable code.

23. The kiosk of claim 17 wherein the second identifier includes an IMEI number of the electronic device.

24. The kiosk of claim 17 wherein the camera is configured to obtain an image of a display screen of the electronic device while the display screen displays the second identifier.

25. The kiosk of claim 17, further comprising a door movable to control access to the inspection area.
26. The kiosk of claim 17, further comprising a plate within the inspection area, wherein the plate is configured to support the electronic device within the inspection area.
27. The kiosk of claim 26 wherein the plate is transparent, wherein the camera is a first camera positioned above the transparent plate, and wherein the kiosk further comprises a second camera positioned below the transparent plate.
28. The kiosk of claim 27 wherein the first camera is operable to obtain a first image of a first side of the electronic device and the second camera is operable to obtain a second image of a second side of the electronic device opposite the first side.
29. The kiosk of claim 27 wherein the inspection area includes white walls positioned at least partially adjacent to the transparent plate.
30. The kiosk of claim 17, further comprising a binning mechanism positioned within the housing and operable to move the electronic device away from the inspection area.
31. The kiosk of claim 30, further comprising a storage receptacle configured to receive the electronic device from the inspection area.
32. The kiosk of claim 31 wherein the binning mechanism is configured to move the electronic device from the inspection area toward the storage receptacle.
33. The kiosk of claim 30 wherein the binning mechanism includes:
a first member configured to move the electronic device in a first direction relative to the housing;
and
a second member configured to move the electronic device in a second direction relative to the housing, the second direction different than the first direction.
34. The kiosk of claim 33, further comprising an electronic device storage receptacle positioned within the housing and operably associated with the inspection area, wherein:
the first direction is toward the second member; and
the second direction is toward the electronic device storage receptacle.

35. A computer-implemented method for recycling an electronic device of a user at a kiosk, the method comprising:

receiving, via a user interface operably associated with the kiosk, a first identifier associated with the electronic device;

determining, based at least in part on the first identifier, an initial price for the electronic device;

prompting the user to position the electronic device in an inspection area of the kiosk while a screen of the electronic device is illuminated;

performing, via one or more cameras of the kiosk, a visual inspection of the electronic device, wherein performing the visual inspection includes—

receiving, via the one or more cameras, a second identifier associated with the electronic device, and

determining a condition of the electronic device;

determining a purchase price for the electronic device; and

offering, via the user interface, to purchase the electronic device from the user for the purchase price.

36. The method of claim 35 wherein receiving the second identifier includes:

prompting the user to cause the electronic device to display the second identifier on the screen of the electronic device; and

reading, via the one or more cameras, the second identifier from the screen.

37. The method of claim 36 wherein the second identifier is a unique number associated with the electronic device.

38. The method of claim 36 wherein reading the second identifier includes using OCR to read the second identifier from the screen of the electronic device.

39. The method of claim 35 wherein receiving the second identifier includes:

capturing, via the one or more cameras, an image of the screen of the electronic device; and

analyzing, via a processor, the image to determine the second identifier.

40. The method of claim 39, wherein analyzing the image includes analyzing the image using OCR.

41. The method of claim 35 wherein determining the purchase price includes receiving the purchase price from a remote server.

42. The method of claim 35 wherein performing the visual inspection includes performing the visual inspection while the screen of the electronic device is illuminated.
43. The method of claim 35, further comprising moving, via a binning mechanism of the kiosk, the electronic device relative to the inspection area.
44. The method of claim 43, wherein moving the electronic device includes moving the electronic device in a first direction relative to the inspection area, the method further comprising moving, via the binning mechanism, the electronic device in a second direction relative to the inspection area.
45. The method of claim 44 wherein the second direction is different from the first direction.
46. The method of claim 35 wherein the purchase price is based at least in part on the condition of the electronic device.
47. The method of claim 35 wherein receiving the first identifier includes receiving a make, a model, and/or a predefined condition of the electronic device.
48. A method for recycling an electronic device at a kiosk, the method comprising:
obtaining an initial price for the electronic device, wherein the initial price is based at least in part on the make, the model, and/or a predefined determination of the condition of the electronic device;
prompting a user of the kiosk to position the electronic device in an inspection area of the kiosk;
obtaining, via one or more cameras of the kiosk, an actual determination of the condition of the electronic device; and
if the actual determination of the condition matches the predefined determination of the condition, offering the initial price to the user.
49. The method of claim 48 wherein obtaining the initial price includes scanning, via a sensor operably associated with the kiosk, a machine-readable code provided by the user.
50. The method of claim 48 wherein verifying a condition of the electronic device includes reading, via the one or more cameras, an image from a screen of the electronic device.
51. The method of claim 50 wherein reading the image includes reading a unique number associated with the electronic device.

52. The method of claim 48 wherein verifying the condition of the electronic device includes determining, via the one or more cameras, whether the electronic device is damaged.

53. The method of claim 48 wherein verifying the condition of the electronic device includes determining a condition of a screen of the electronic device.

54. The method of claim 53 wherein determining a condition of the screen of the electronic device includes capturing, via the one or more cameras, an image of the screen of the electronic device.

55. A system for recycling a used electronic device, the system comprising:
a kiosk, wherein the kiosk includes—
a housing,
a display coupled to an exterior surface of the housing,
a user interface operably coupled to the housing and configured to receive a first identifier associated with the electronic device,
an inspection area within the housing,
a camera positioned within the housing and configured to obtain an image of the electronic device while a plate supports the electronic device within the inspection area, wherein the image includes a second identifier associated with the electronic device, and
one or more processors operably associated with the kiosk; and
one or more computer-readable memory storing instructions that, when executed by the one or more processors, cause the one or more processors to:
receive, via the user interface, the first identifier;
prompt, via the display, a user of the kiosk to position the electronic device on the plate;
receive, via the camera, the second identifier;
determine, based at least in part on the first identifier and the second identifier, a price for the electronic device; and
offer, via the display, the price to the user.

56. The system of claim 55, further comprising a binning mechanism positioned within the housing and operable to move the electronic device away from the inspection area.

57. The system of claim 56 wherein the binning mechanism includes:
a first member operable to move the electronic device in a first direction relative to the housing;
and
a second member operable to move the electronic device in a second direction relative to the housing, the second direction different from the first direction, and

wherein the one or more processors are further configured to—
move, via the first member, the electronic device in the first direction, and
move, via the second member, the electronic device in the second direction.

58. The system of claim 55, further comprising an electronic device storage receptacle configured to receive the electronic device.

59. The system of claim 58, further comprising a binning mechanism positioned within the housing and operable to move the electronic device toward the electronic device storage receptacle.

60. The system of claim 55, further comprising a plate within the inspection area, wherein the plate is configured to support the electronic device within the inspection area.

61. The system of claim 60 wherein plate is a transparent plate, wherein the camera is a first camera positioned above the transparent plate and operable to image a first side of the electronic device, wherein the kiosk further comprises a second camera positioned below the transparent plate and operable to image a second side of the electronic device, and wherein the one or more processors are further configured to:

capture, via the first camera, a first image of the first side of the electronic device, and
capture, via the second camera, a second image of the second side of the electronic device opposite the first side.

62. The system of claim 61 wherein the instructions, when executed by the one or more processors, cause the one or more processors to prompt, via the display, a user of the kiosk to position the electronic device on the plate.

1/15

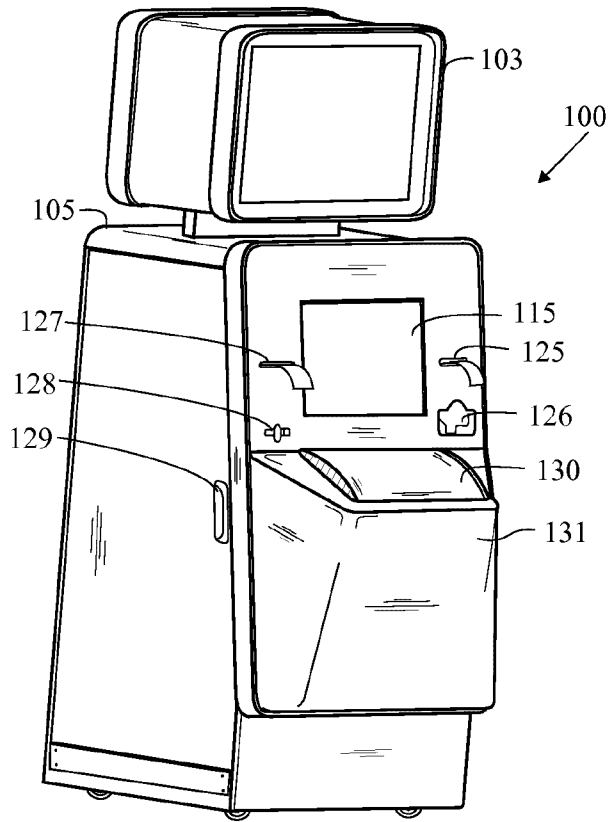


FIG. 1

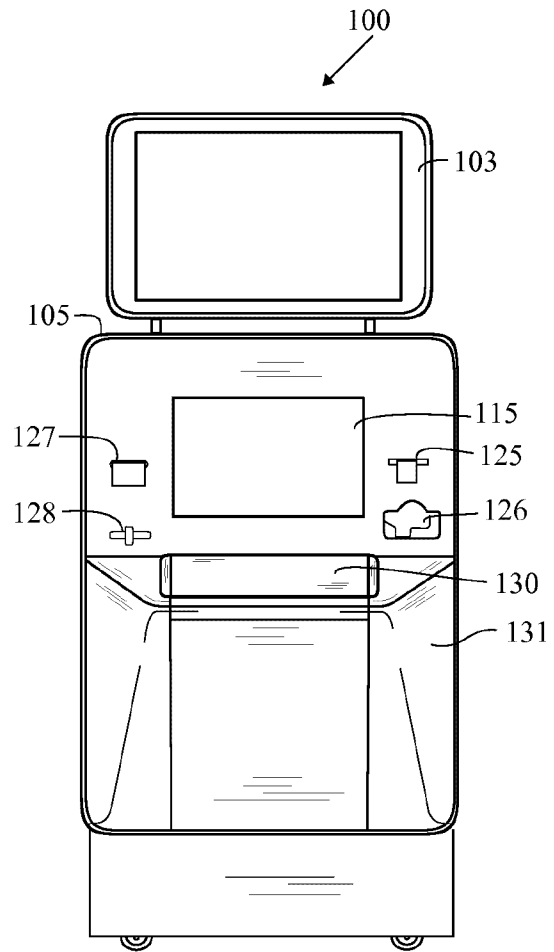


FIG. 1A

2/15

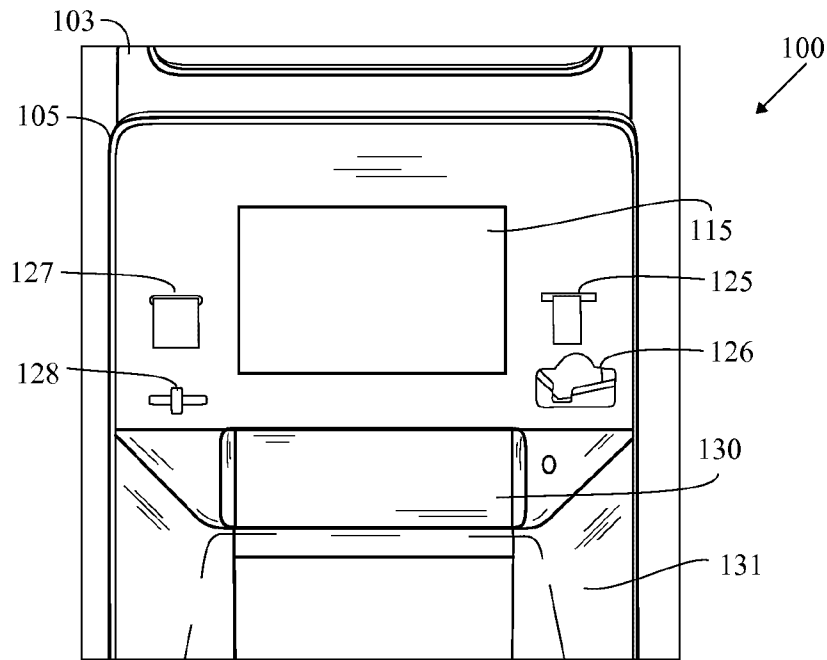


FIG. 1B

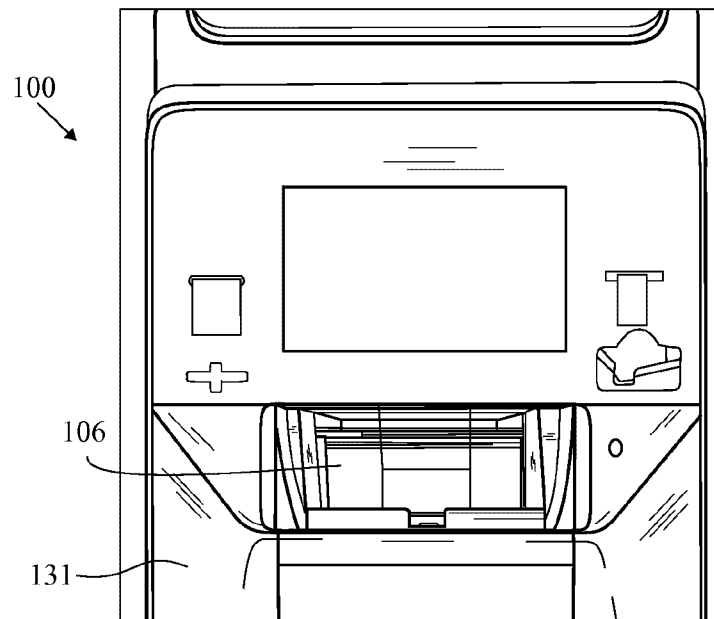


FIG. 1C

3/15

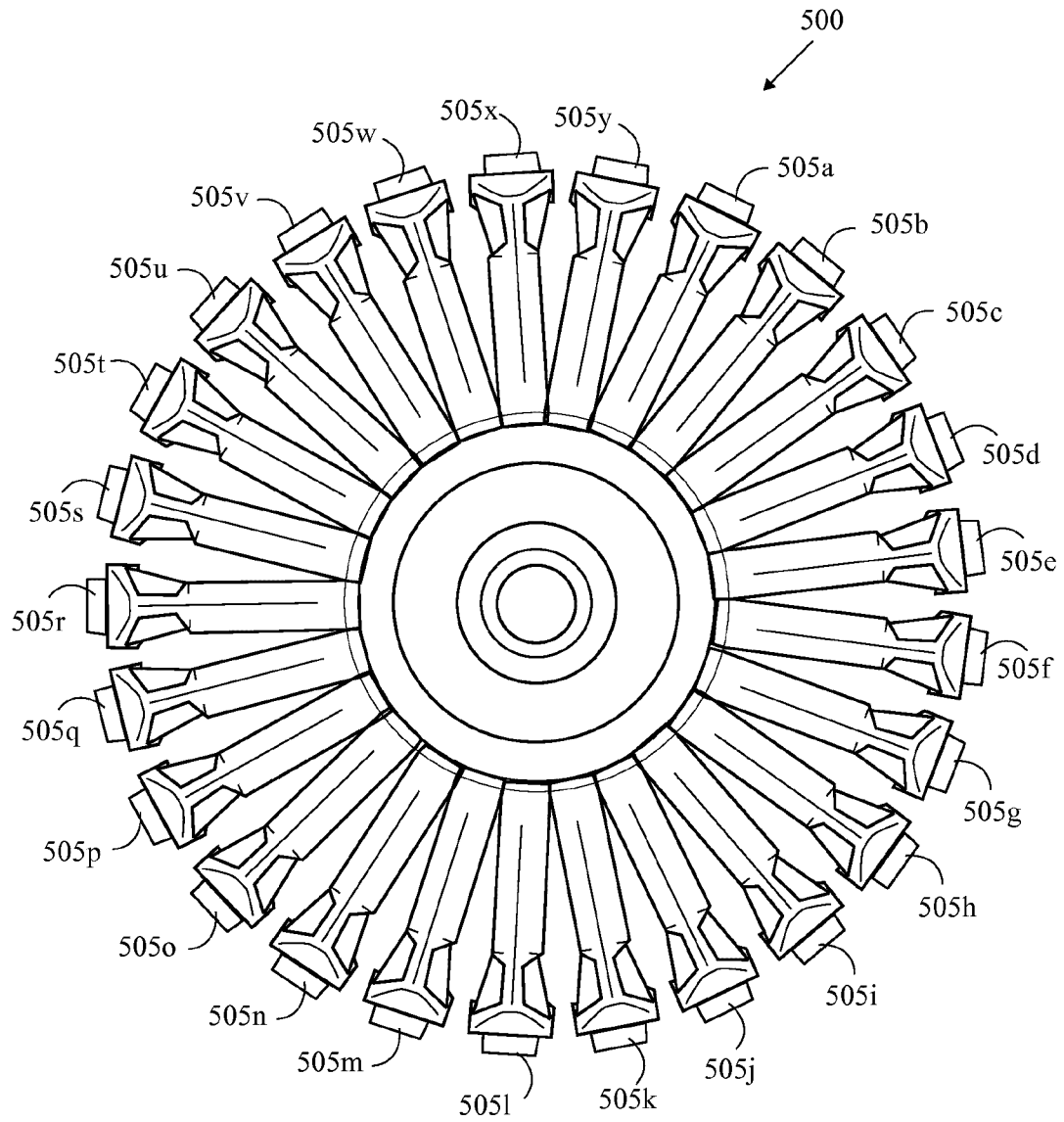


FIG. 2

4/15

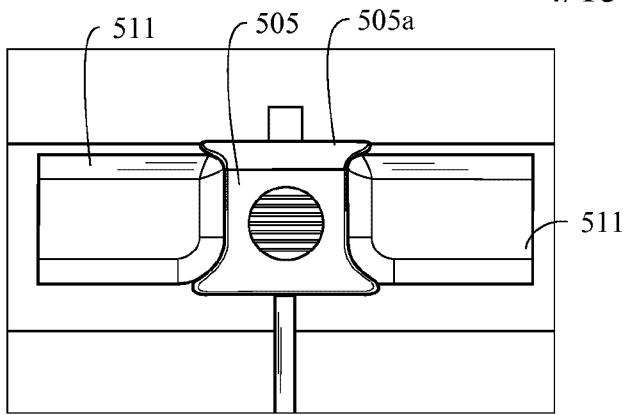


FIG. 2A

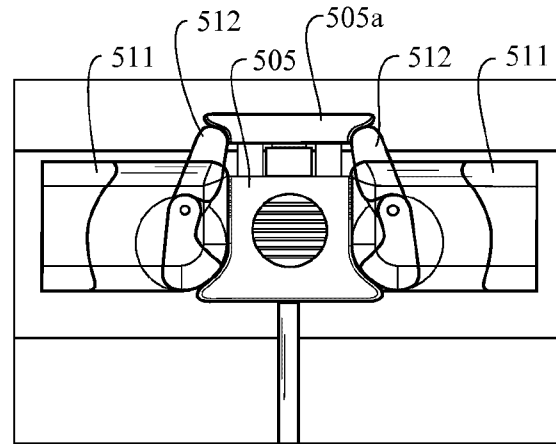


FIG. 2B

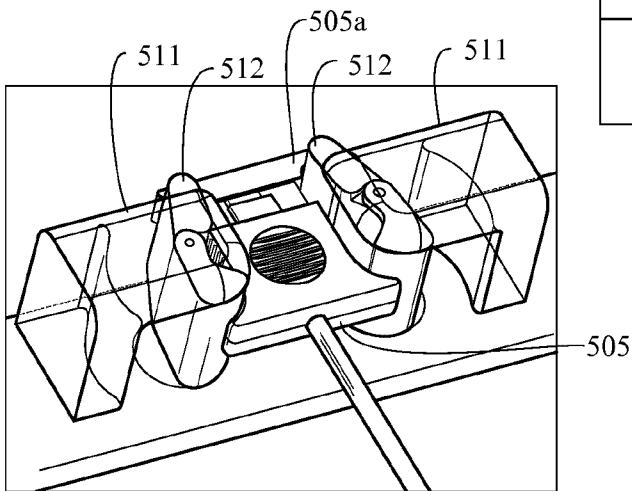


FIG. 2C

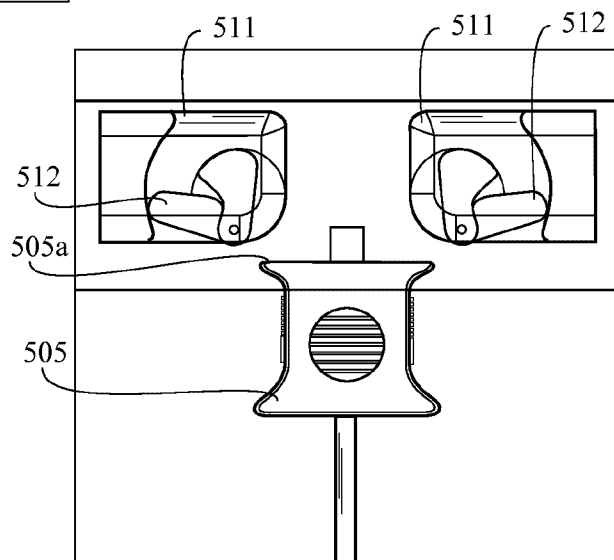


FIG. 2D

5/15

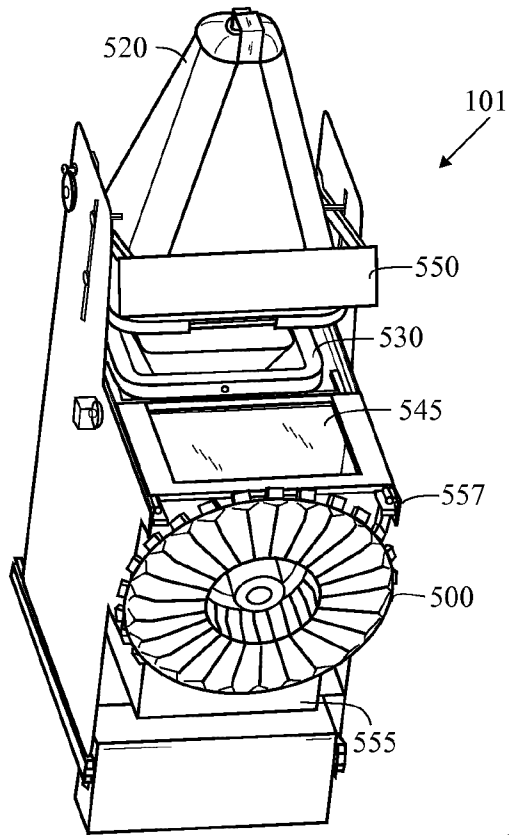


FIG. 3

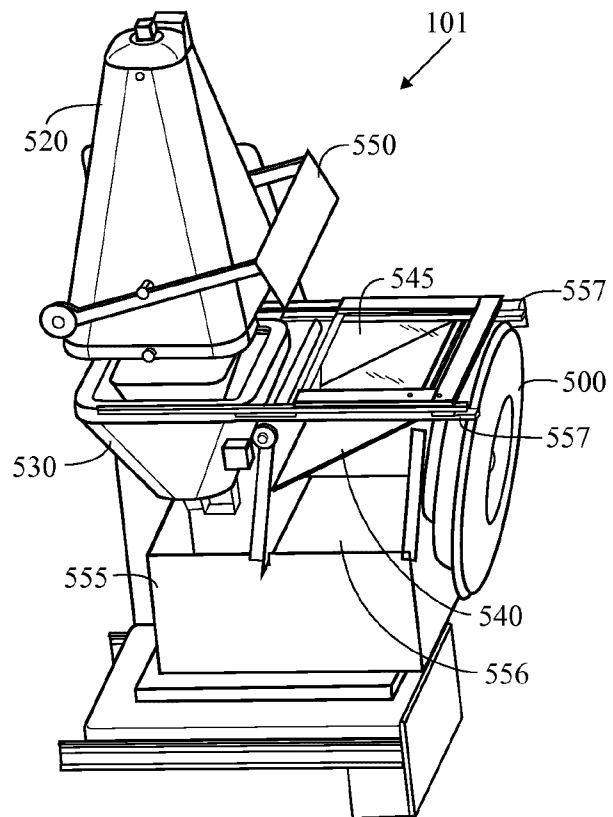


FIG. 3A

6/15

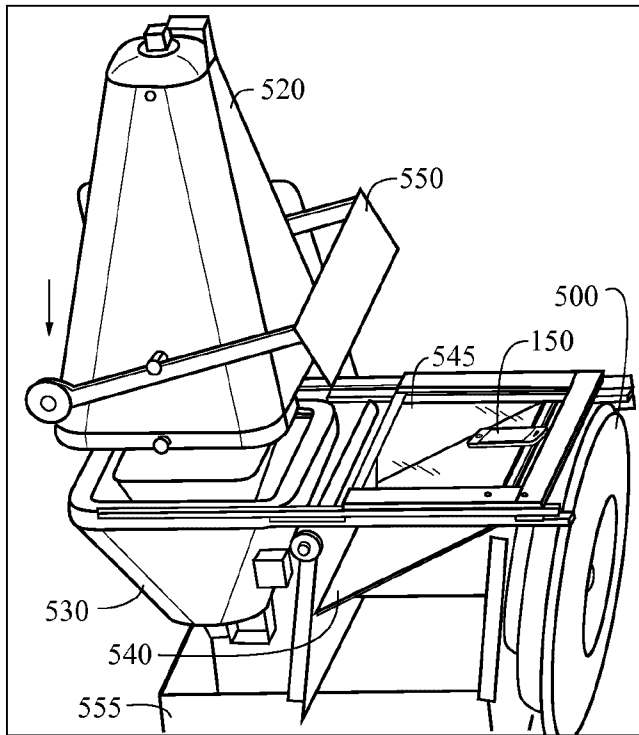


FIG. 3B

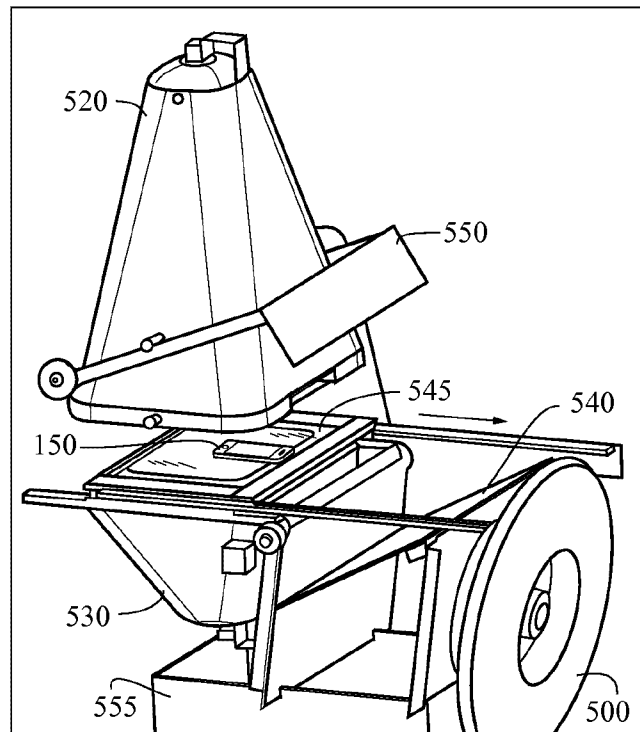


FIG. 3C

7/15

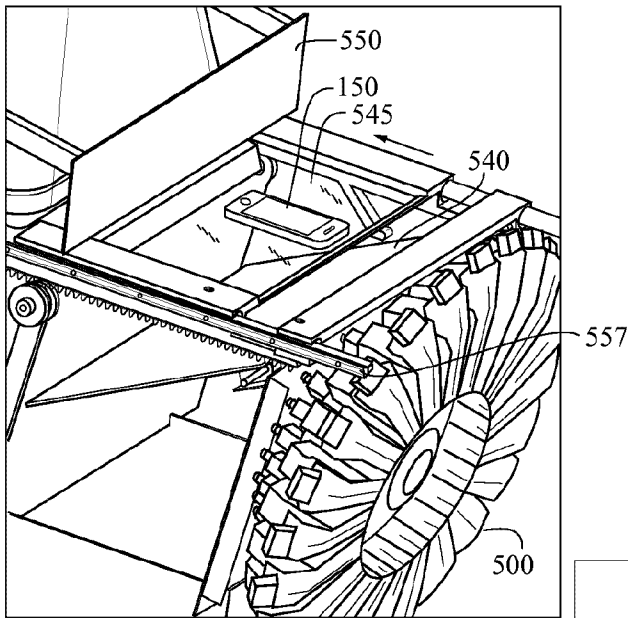


FIG. 4

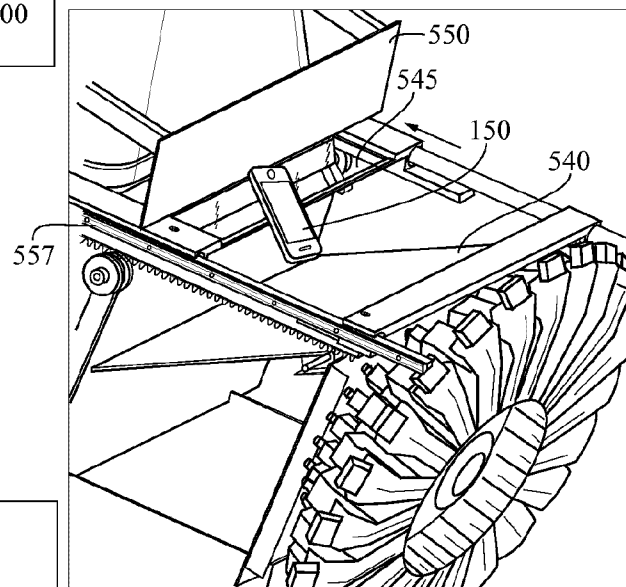


FIG. 4A

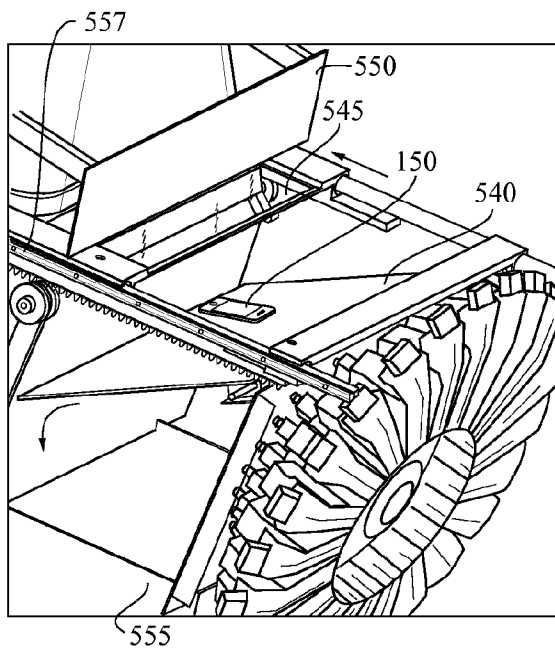


FIG. 4B

8/15

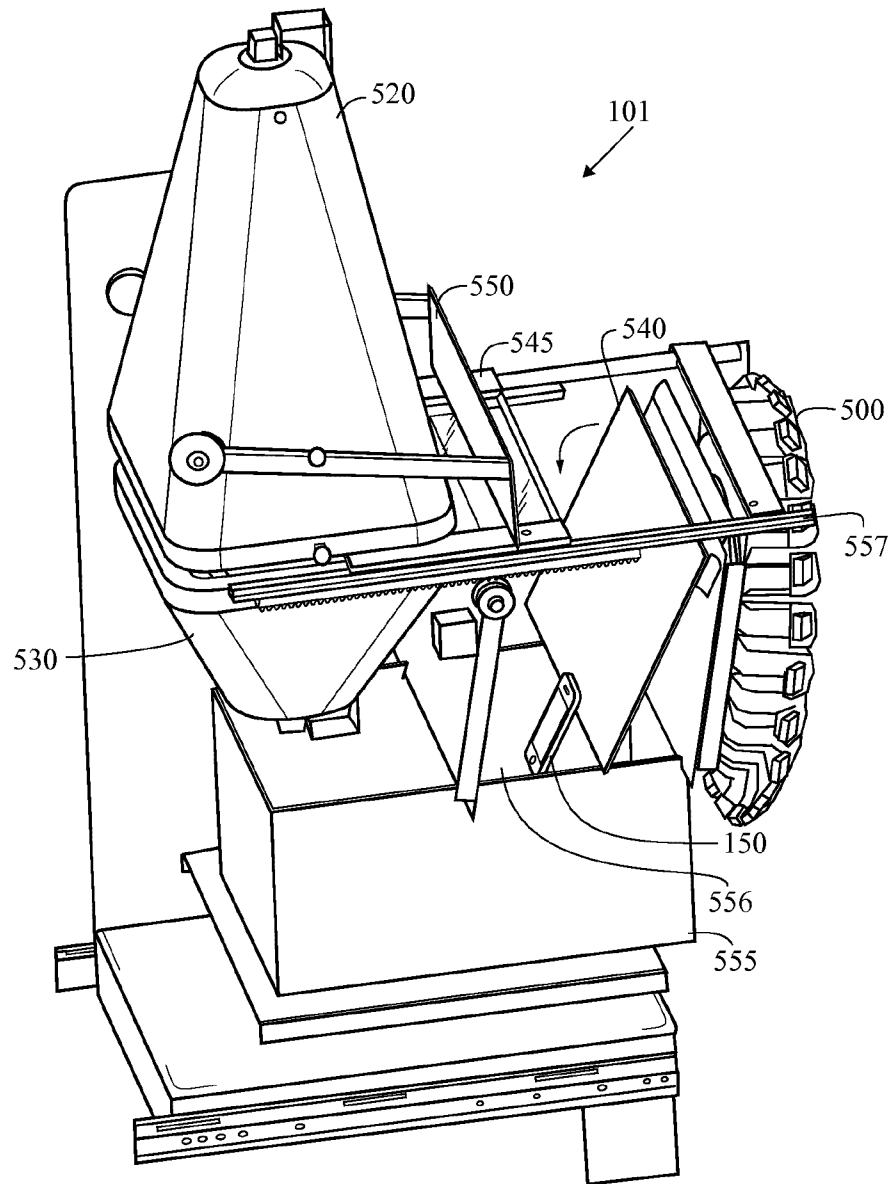


FIG. 4C

9/15

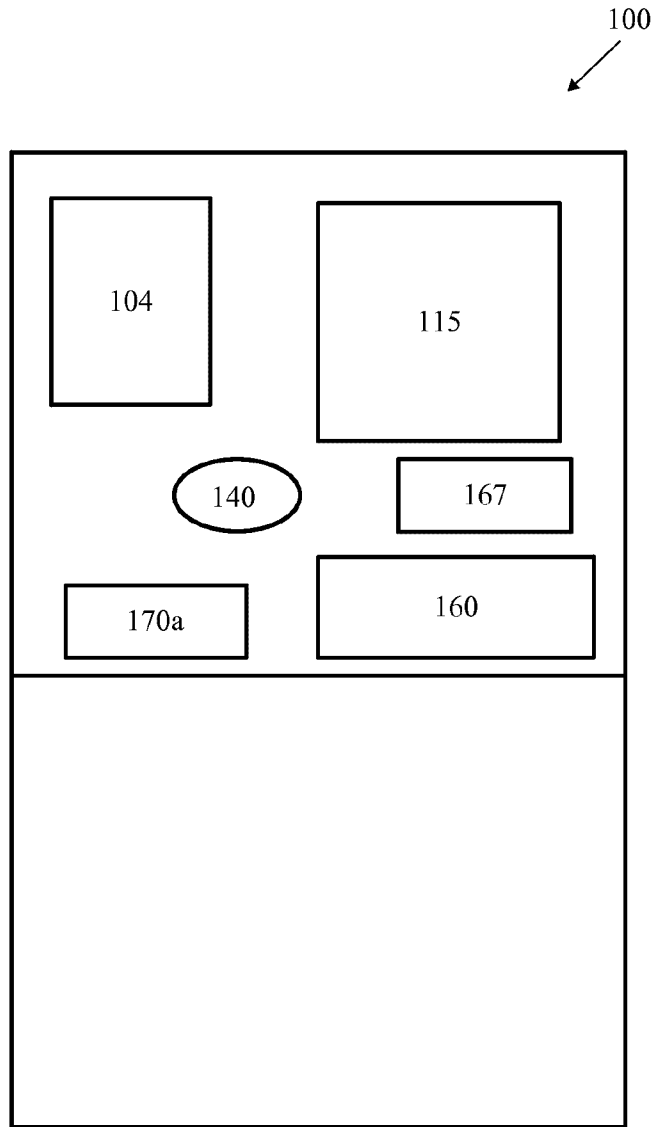


FIG. 5

10/15

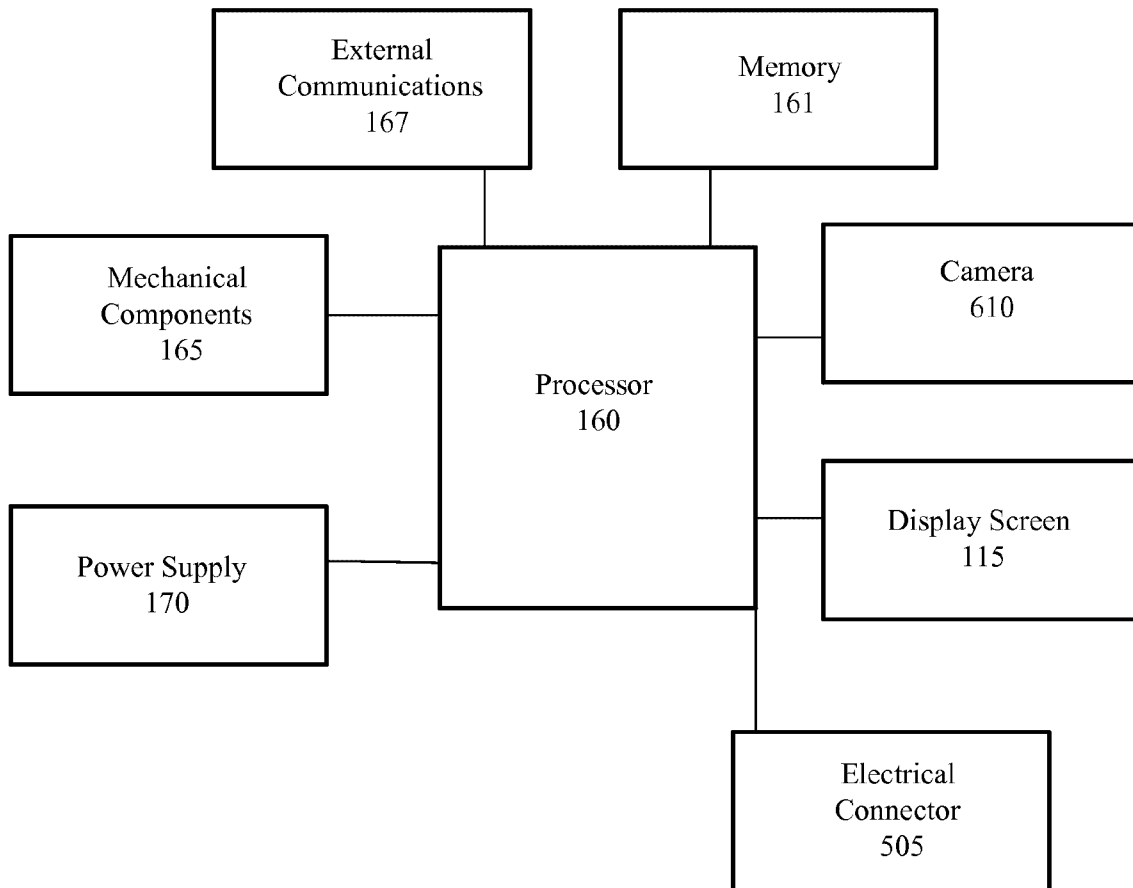


FIG. 6

11/15

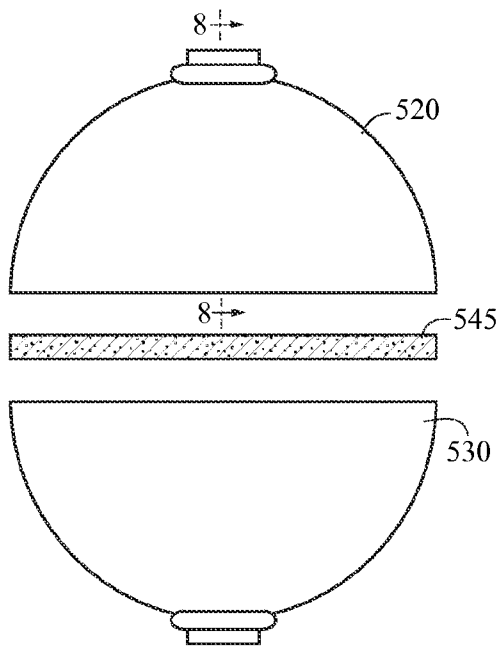


FIG. 7

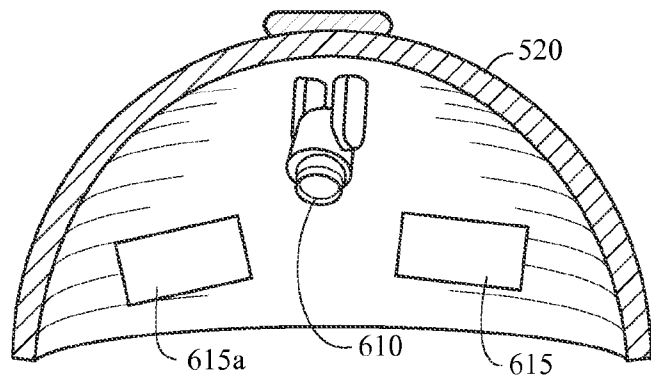


FIG. 8

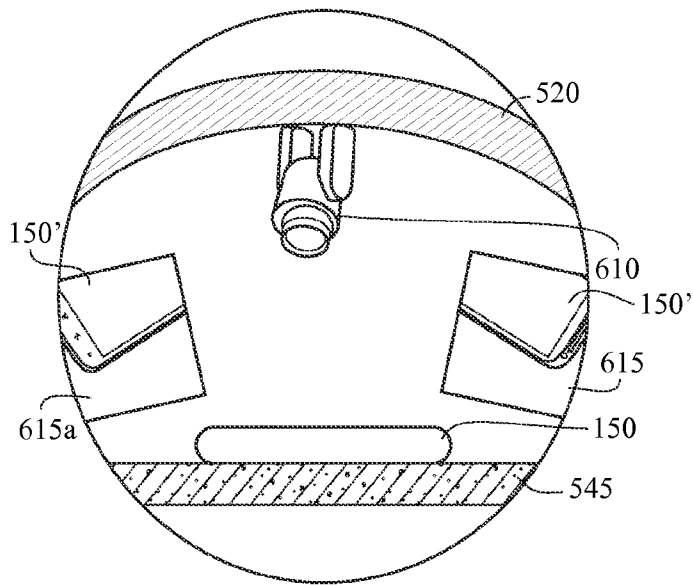


FIG. 9

12/15

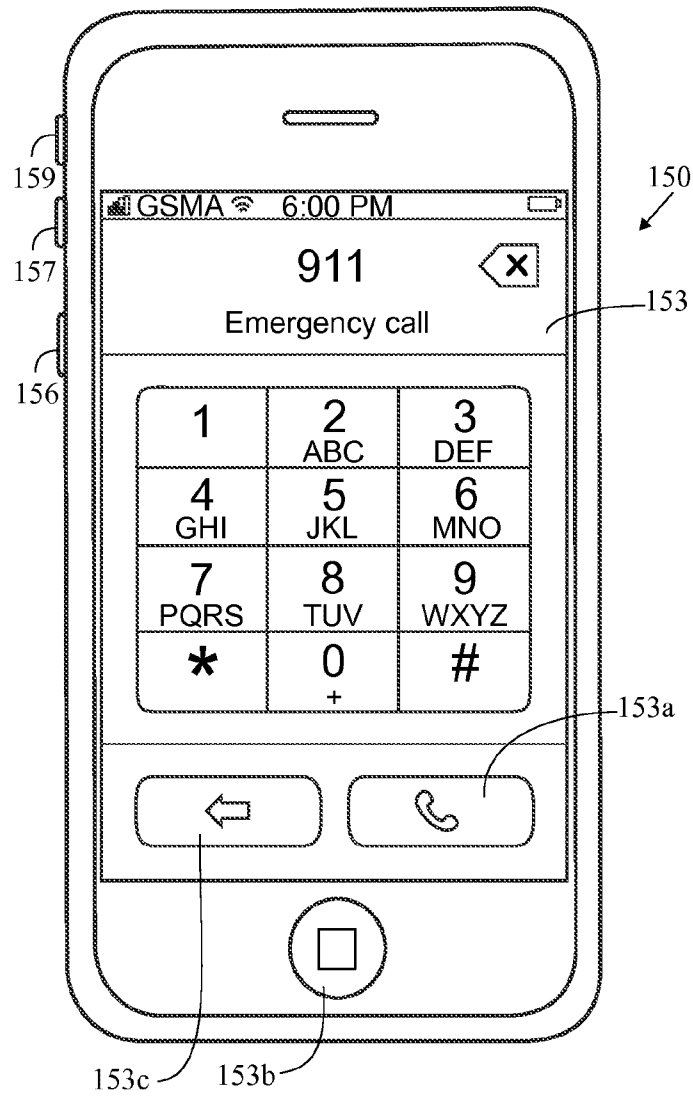


FIG. 10

13/15

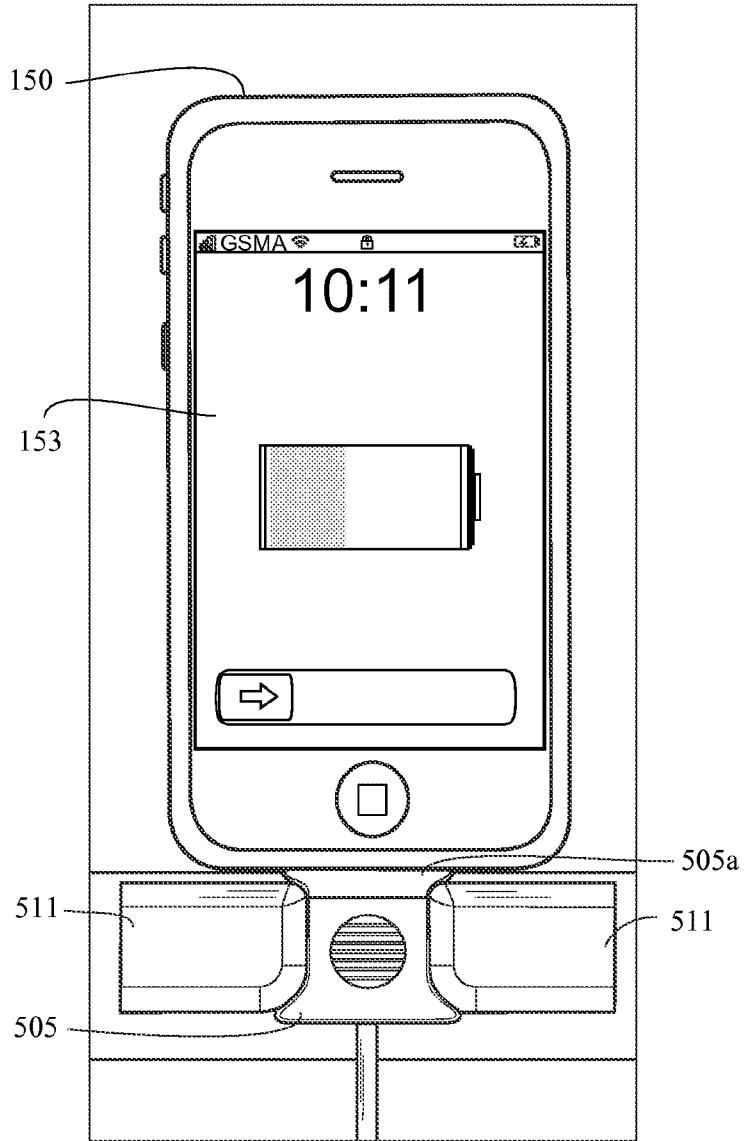


FIG. 11

14/15

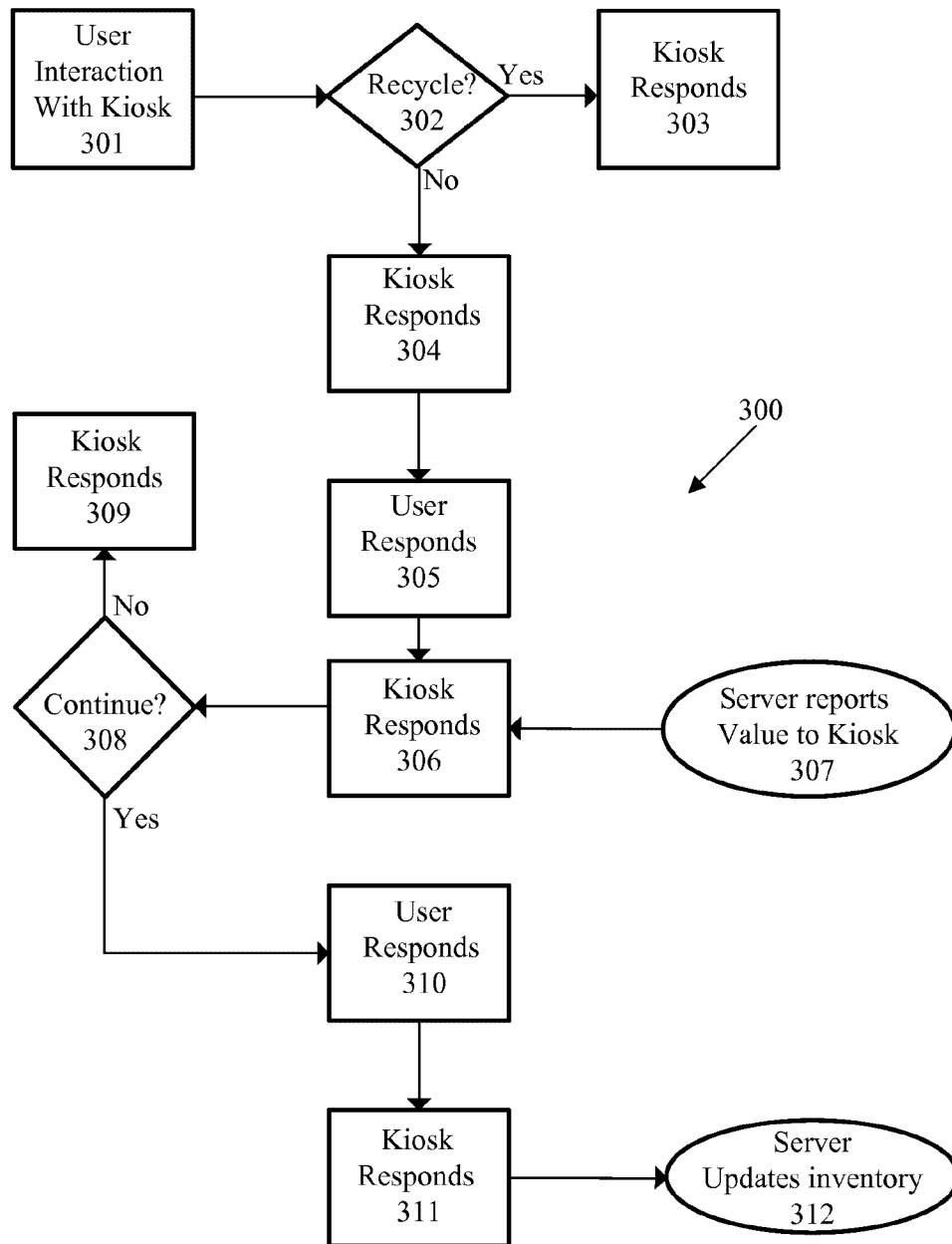


FIG. 12

15/15

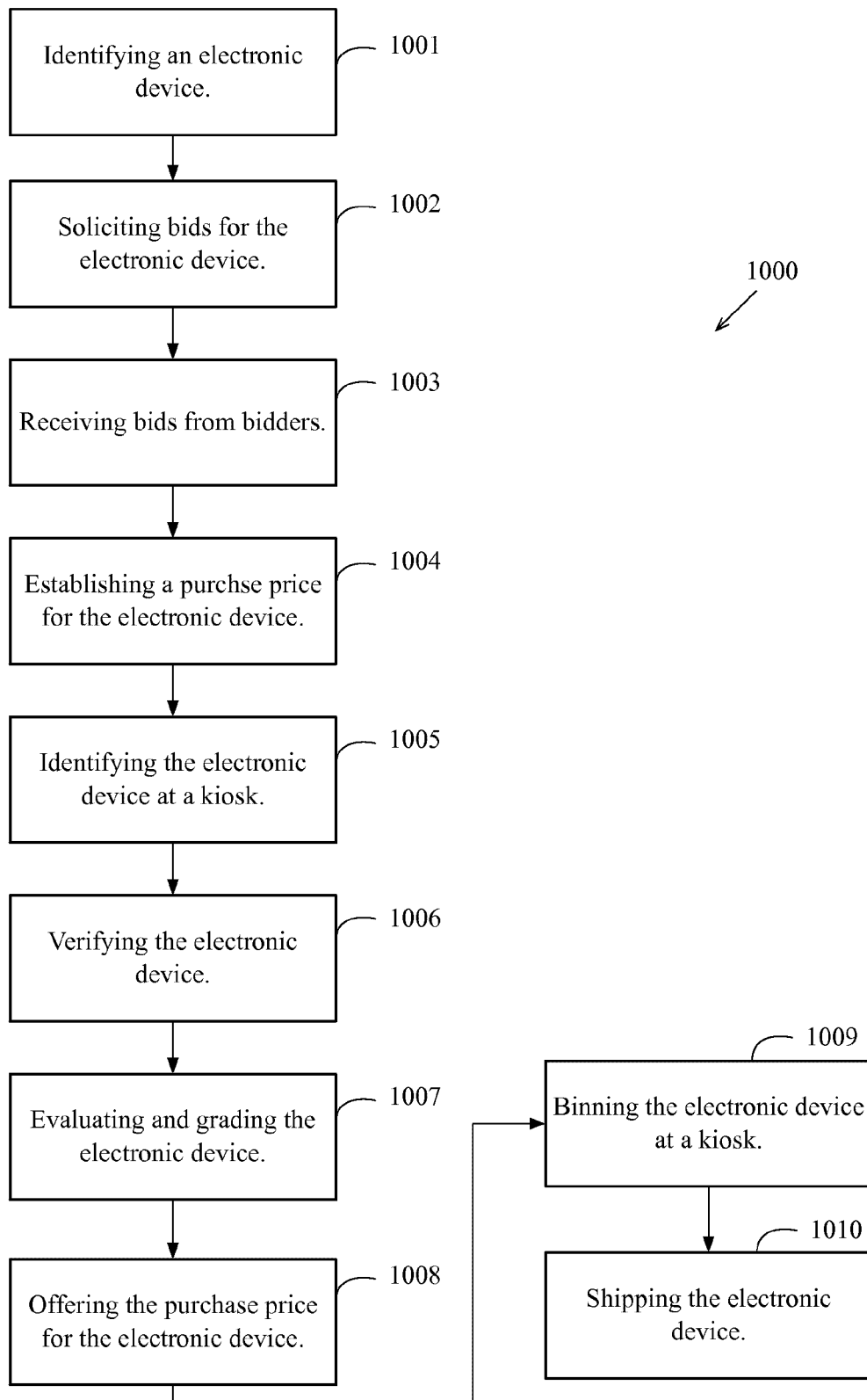


FIG. 13

