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(54) **SYSTEM AND METHOD FOR MULTIFUNCTION PERIPHERAL FLEET MANAGEMENT**

(71) Applicant: **Toshiba TEC Kabushiki Kaisha**, Shinagawa-ku (JP)

(72) Inventors: **Marianne Kodimer**, Huntington Beach, CA (US); **Grady Crossley**, Lake Forest, CA (US)

(73) Assignee: **TOSHIBA TEC KABUSHIKI KAISHA**, Tokyo (JP)

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(51) **Int. Cl.**
H04N 1/00 (2006.01)

(52) **U.S. Cl.**
CPC ***H04N 1/00432*** (2013.01); ***H04N 1/00244*** (2013.01); ***H04N 1/00344*** (2013.01); ***H04N 1/00427*** (2013.01); *H04N 2201/0094* (2013.01)

(58) **Field of Classification Search**
CPC G06F 18/2178; G06F 18/217; G06F 18/21; G06F 18/25; G06F 17/18; G06F 16/2477; G06F 2218/00; G06F 18/00; G06F 2211/005; G06F 21/62; G06F 16/288; G06F 16/27; G06F 21/12; G06F 21/14; G06F 21/53; G06F 21/6209; G06F 21/6218; G06F 2221/2113; G06F 8/53; G06F 16/51; G06F 16/583; G06F 16/5866; G06F 16/9554; G06F 16/9566; G06F 16/2379; G06F 16/9024; G06F 16/182; G06F 21/10; G06F 16/00; G06F 3/01; G06F 1/1626; G06F 16/2455; G06F 21/32; G06F 8/65; G06F 1/1684; G06F 16/2471; G06F 16/24; G06F 16/245; G06F 16/24537; G06F 16/24544; G06F 16/24552; G06F 16/2456; G06F 16/2462; G06F 16/278; G06F 21/31; G06F 1/1698; G06F 3/0231; G06F 16/23; G06F 16/258; G06F 3/1288; G06F 16/22; G06F 3/016; G06F 15/16; G06F 16/2255; G06F 21/34; G06F 21/41; G06F 21/6254; G06F 21/73; G06F 21/74; G06F 21/83; G06F 2221/2139; G06F 3/011; G06F 3/12;
(Continued)

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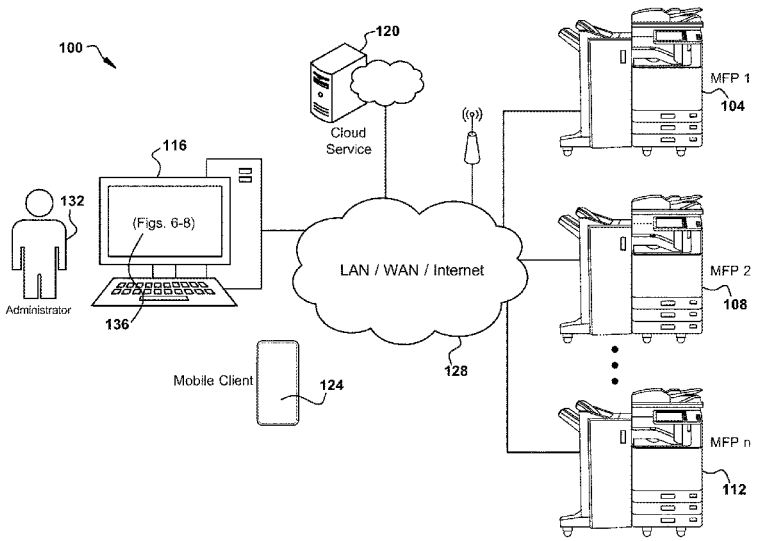
Primary Examiner — Negussie Worku
(74) *Attorney, Agent, or Firm* — UB Greensfelder LLP; John X. Garred

(57) **ABSTRACT**

A system and method for multifunction peripheral fleet device management includes a cloud-based management system interacting with an administrator terminal. Lists or desired device information are assembled and displayed as tabbed entries. An initial or active tab is displayed first, along with a tab that includes a descriptive term for the associated list, along with a numeric count of list items. A search box is provided to allow for filtering a list when a number of entries is excessive for an item-by-item review. Other tabs, associated with other, hidden lists, are not populated until the active tab list is complete. A placeholder indicator is displayed until such time as each inactive tab is completely populated. If an inactive tab is selected prior to being populated, it is moved to a position for being populated next.

20 Claims, 8 Drawing Sheets



(58) **Field of Classification Search**
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1/00307; H04N 23/63; H04N 23/64; H04N 1/00031; H04N 1/00039; H04N 1/00344; H04N 1/00973; H04N 21/42224; H04N 21/43072; H04N 21/436; H04N 21/4627; H04N 21/4788; H04N 21/835; H04N 1/00347; H04N 1/00938; H04N 1/4413; H04N 19/00; H04N 19/172; H04N 19/184; H04N 21/21; H04N 21/278; H04N 21/4332; H04N 21/43615; H04N 21/4363; H04N 21/44227; H04N 21/4622; H04N 21/47217; H04N 21/4722; H04N 21/485; H04N 21/60; H04N 21/6125
See application file for complete search history.

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2022/0337664	A1 *	10/2022	Takemura	H04L 41/0806
2023/0171319	A1 *	6/2023	Ota	H04L 63/0869 709/201

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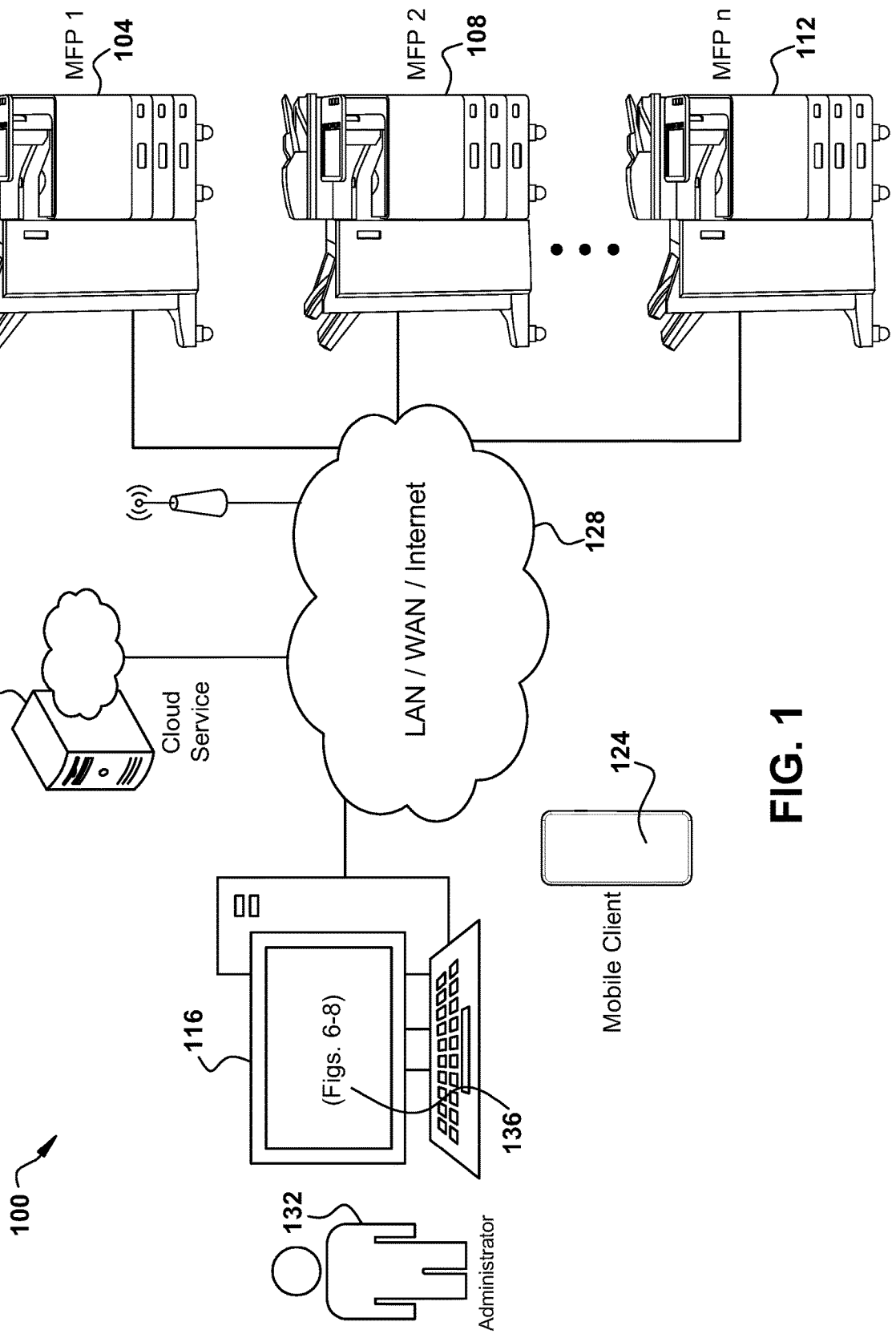
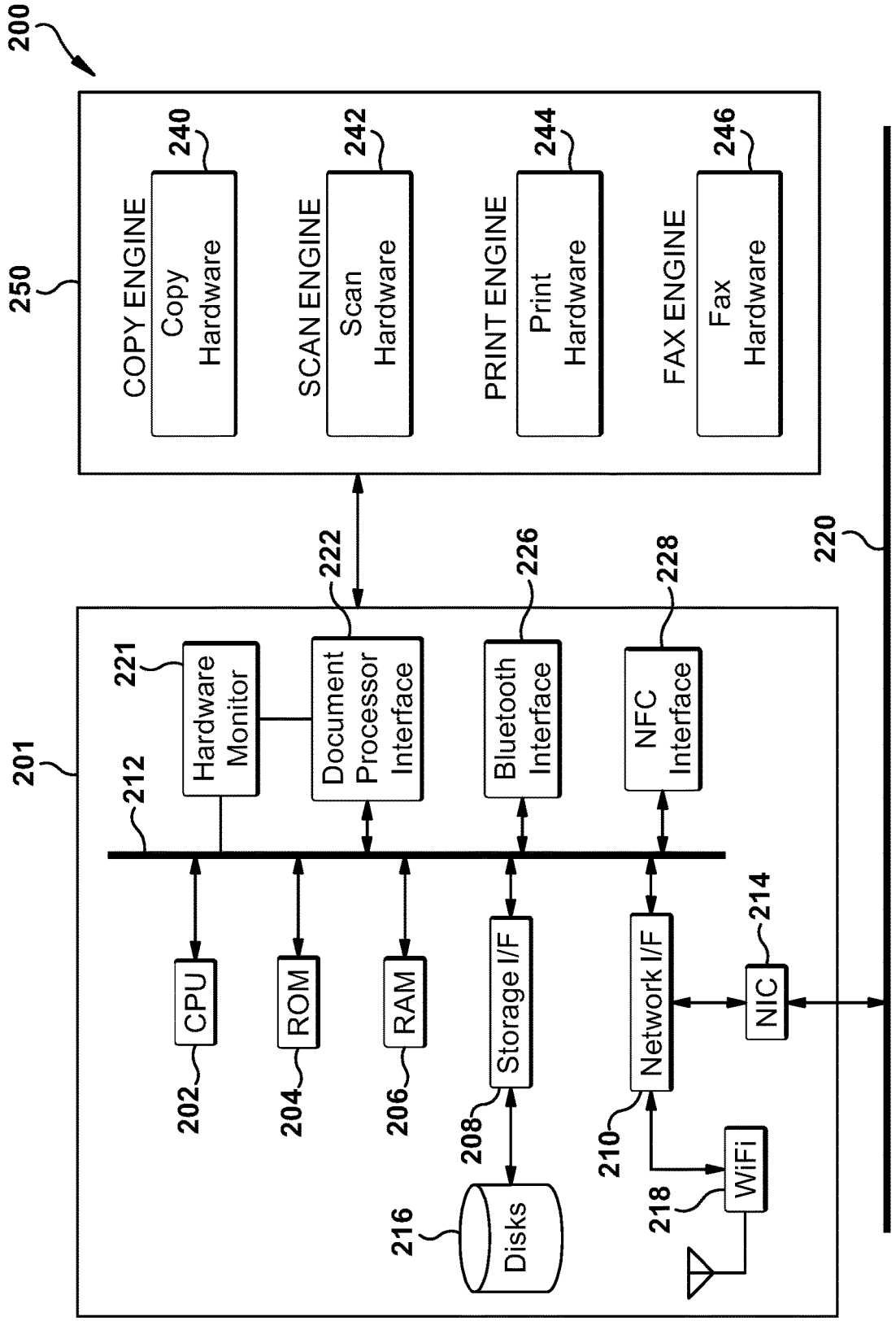

MFP 1
104
MFP 2
108
MFP n
112
LAN / WAN / Internet
128
120
Cloud Service
124
Mobile Client
116
(Figs. 6-8)
136
132
Administrator
100

FIG. 1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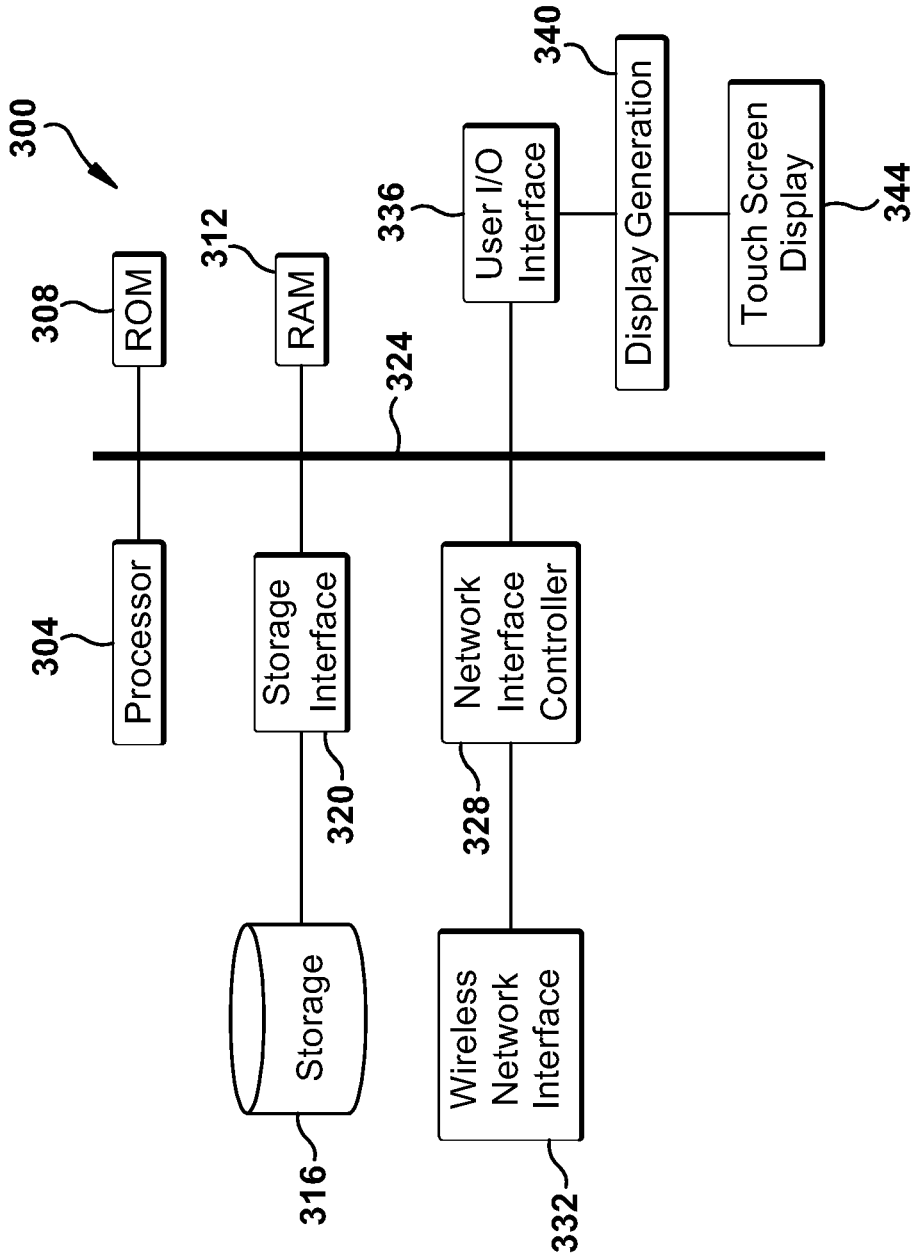
250
COPY ENGINE
Copy Hardware
240
SCAN ENGINE
Scan Hardware
242
PRINT ENGINE
Print Hardware
244
FAX ENGINE
Fax Hardware
246
222
226
228
220
201
221
Hardware Monitor
Document Processor Interface
Bluetooth Interface
NFC Interface
212
CPU
ROM
RAM
Storage I/F
Network I/F
NIC
214
202
204
206
208
210
WiFi
218
216
Disks

FIG. 2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308
ROM
312
RAM
336
User I/O Interface
340
Display Generation
Touch Screen Display
344
324
304
Processor
Storage Interface
320
Network Interface Controller
328
316
Storage
Wireless Network Interface
332

FIG. 3

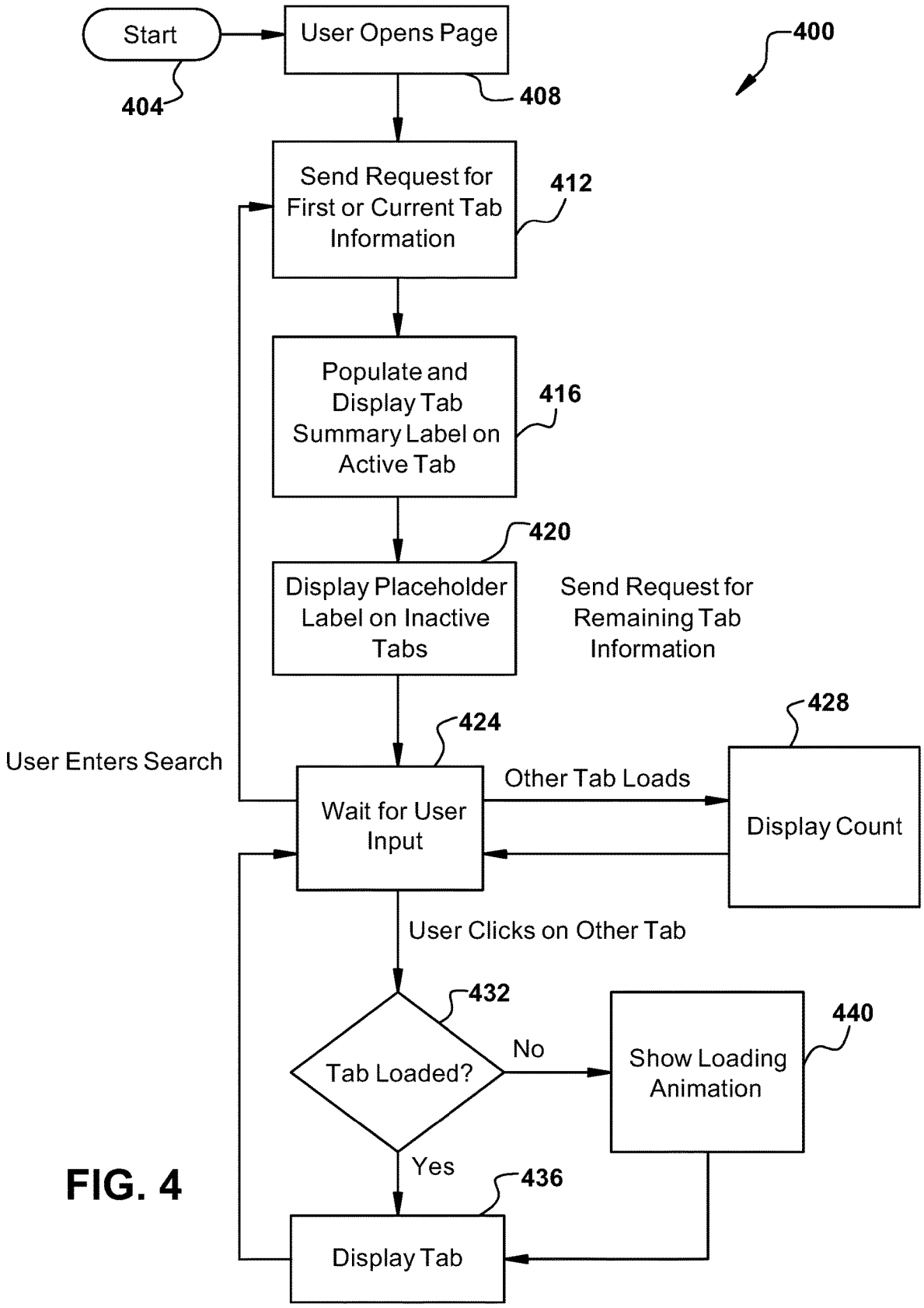

Start
User Opens Page
400
404
408
Send Request for First or Current Tab Information
412
Populate and Display Tab Summary Label on Active Tab
416
420
Display Placeholder Label on Inactive Tabs
Send Request for Remaining Tab Information
428
424
User Enters Search
Other Tab Loads
Wait for User Input
Display Count
User Clicks on Other Tab
432
Tab Loaded?
No
Show Loading Animation
440
Yes
436
Display Tab

FIG. 4

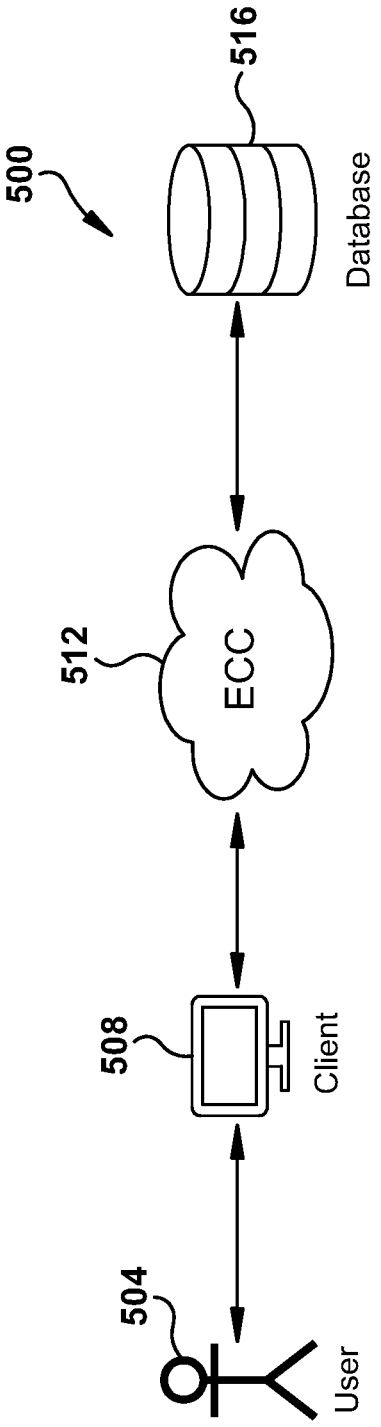
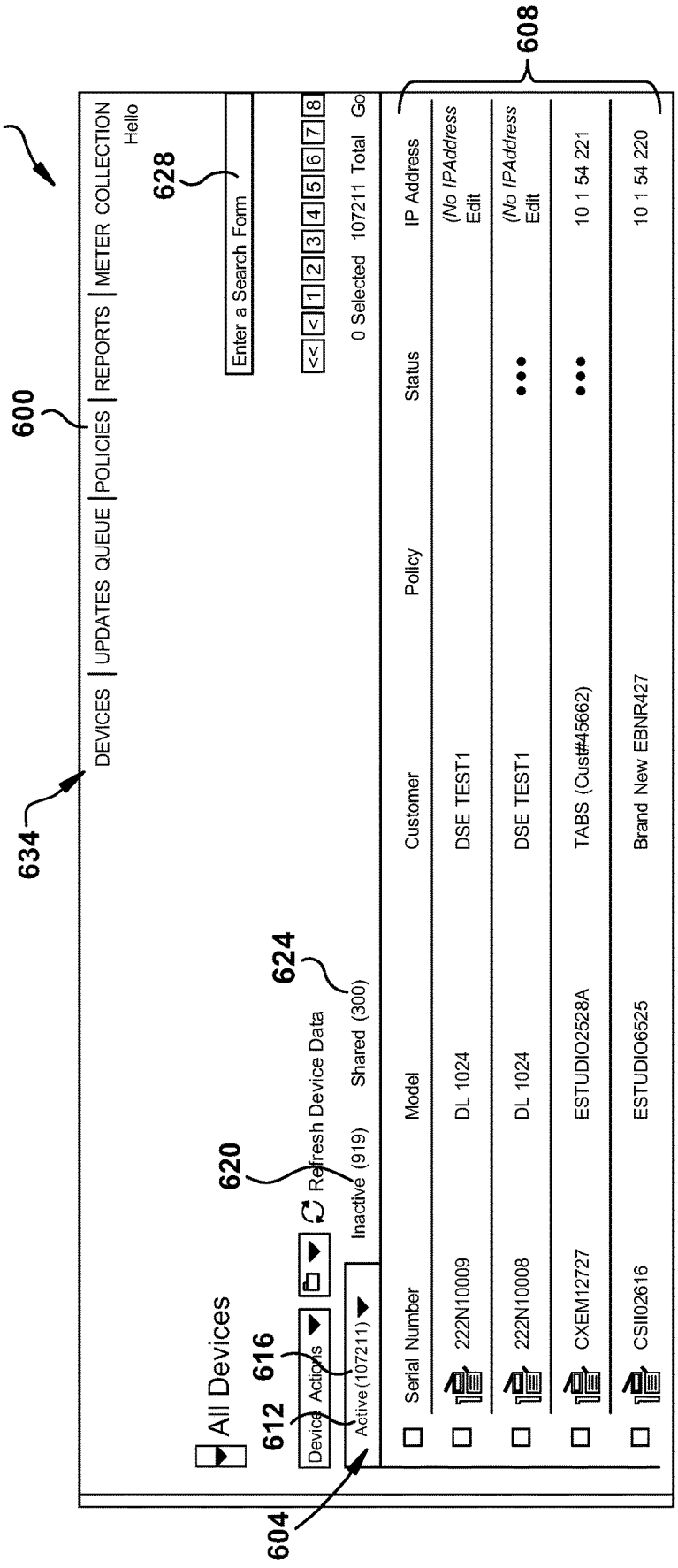


FIG. 5


632
600
634
608
628
624
620
616
612
604
DEVICES | UPDATES QUEUE | POLICIES | REPORTS | METER COLLECTION
Hello
Enter a Search Form
<< < 1 2 3 4 5 6 7 8
0 Selected 107211 Total Go
All Devices
Device Actions
Refresh Device Data
Active (107211)
Inactive (919)
Shared (300)
Serial Number
Model
Customer
Policy
Status
IP Address
222N10009
DL 1024
DSE TEST1
(No IPAddress Edit
222N10008
DL 1024
DSE TEST1
(No IPAddress Edit
CXEM12727
ESTUDIO2528A
TABS (Cust#45662)
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CSII02616
ESTUDIO6525
Brand New EBNR427
10 1 54 220

FIG. 6

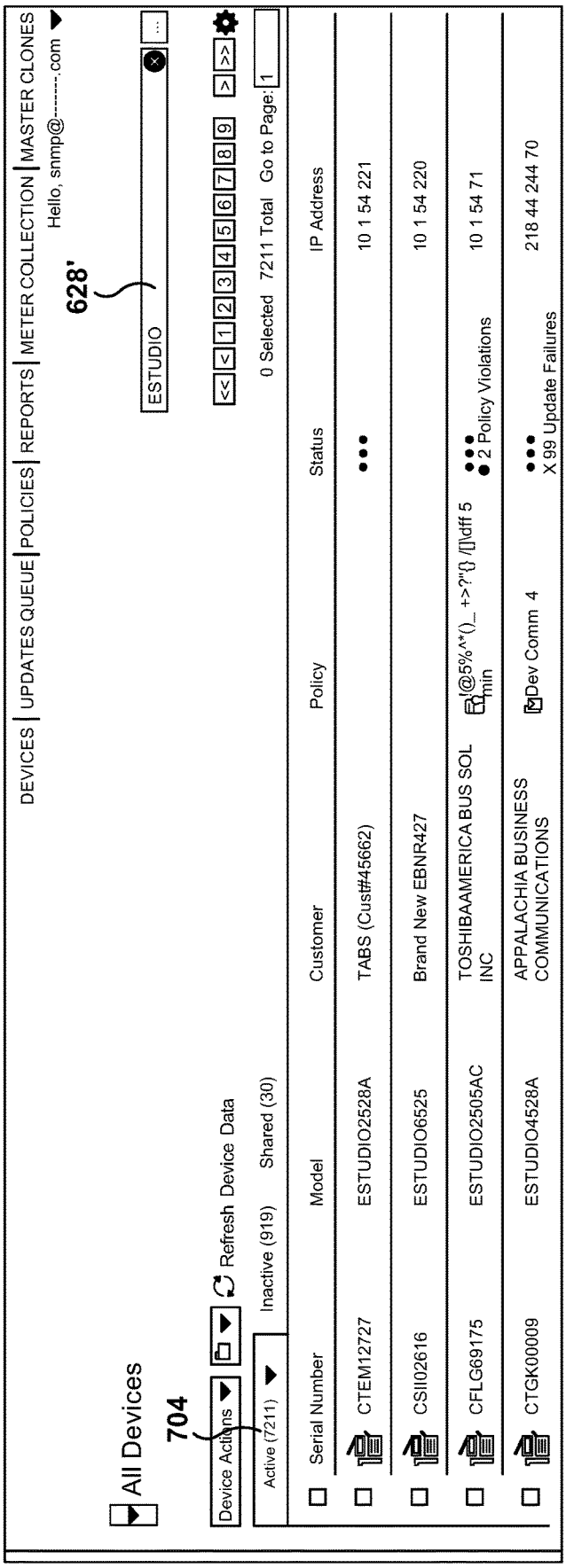
700
DEVICES | UPDATES QUEUE | POLICIES | REPORTS | METER COLLECTION | MASTER CLONES
Hello, snmp@------.com
628'
ESTUDIO
All Devices
704
Device Actions
Refresh Device Data
<< < 1 2 3 4 5 6 7 8 9 > >>
Active (7211)
Inactive (919)
Shared (30)
0 Selected 7211 Total Go to Page: 1
Serial Number
Model
Customer
Policy
Status
IP Address
CTEM12727
ESTUDIO2528A
TABS (Cust#45662)
10 1 54 221
CSII02616
ESTUDIO6525
Brand New EBNR427
10 1 54 220
CFLG69175
ESTUDIO2505AC
TOSHIBAAMERICA BUS SOL INC
{@5%^*()_ +>?"{} /[]\dff 5 min
2 Policy Violations
10 1 54 71
CTGK00009
ESTUDIO4528A
APPALACHIA BUSINESS COMMUNICATIONS
Dev Comm 4
X 99 Update Failures
218 44 244 70

FIG. 7

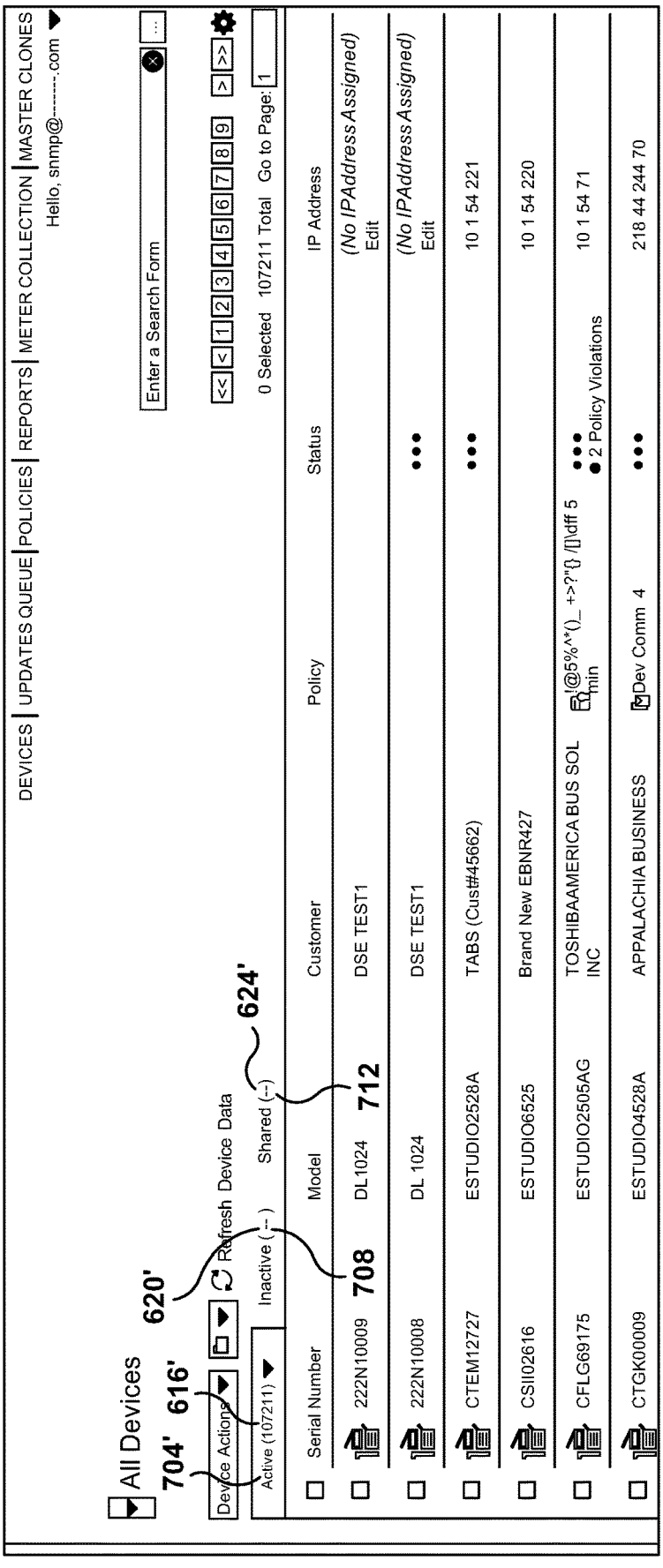
800
DEVICES | UPDATES QUEUE | POLICIES | REPORTS | METER COLLECTION | MASTER CLONES
Hello, snmp@--------.com
All Devices
704'
616'
620'
Device Actions
Refresh Device Data
Enter a Search Form
<< < 1 2 3 4 5 6 7 8 9 > >>
Active (107211)
Inactive (--)
708
Shared (--)
624'
0 Selected 107211 Total Go to Page: 1
712
Serial Number
Model
Customer
Policy
Status
IP Address
222N10009
DL1024
DSE TEST1
(No IPAddress Assigned)
Edit
222N10008
DL 1024
DSE TEST1
(No IPAddress Assigned)
Edit
CTEM12727
ESTUDIO2528A
TABS (Cus#45662)
10 1 54 221
CSII02616
ESTUDIO6525
Brand New EBNR427
10 1 54 220
CFLG69175
ESTUDIO2505AG
TOSHIBAAMERICA BUS SOL INC
!@5%^*()_ +>?"{} /[]\dff 5 min
2 Policy Violations
10 1 54 71
CTGK00009
ESTUDIO4528A
APPALACHIA BUSINESS
Dev Comm 4
218 44 244 70

FIG. 8

SYSTEM AND METHOD FOR MULTIFUNCTION PERIPHERAL FLEET MANAGEMENT

TECHNICAL FIELD OF THE INVENTION

This application relates generally to management of multifunction peripherals. The application relates more particularly to a fleet management system with increased usability and efficiency.

BACKGROUND OF THE INVENTION

Document processing devices include printers, copiers, scanners and e-mail gateways. More recently, devices employing two or more of these functions are found in office environments. These devices are referred to as multifunction peripherals (MFPs) or multifunction devices (MFDs). As used herein, MFPs are understood to comprise printers, alone or in combination with other of the afore-noted functions. It is further understood that any suitable document processing device can be used.

Monitoring of MFPs for device status or usage can be done over a network. Monitoring may be done remotely, such as via a wide area network (WAN) connection which may comprise the Internet. A suitable device monitoring system, such as Toshiba's eBridge Cloud Connect (ECC) application, provides a platform to which MFP devices can connect to and receive remote troubleshooting and maintenance. Using this technology, technicians no longer need to be on site to provide technical support. Rather, technicians and service providers can simply analyze service files sent from the devices and deliver patch fixes through the cloud platform. This provides the benefits of reducing cost on maintenance operations and improving customer experience with greater service responsiveness.

While ECC is used in example embodiments herein, it is to be appreciated that any suitable device administration device or portal may be used. Other examples include HP JetAdvantage and Xerox Managed Print Services.

BRIEF DESCRIPTION OF THE DRAWINGS

Various embodiments will become better understood with regard to the following description, appended claims and accompanying drawings wherein:

FIG. **1** is an example embodiment of a system for multifunction peripheral fleet management;

FIG. **2** is an example embodiment of a networked digital device, such as a multifunction peripheral;

FIG. **3** is an example embodiment of a digital device system;

FIG. **4** illustrates flowchart for an example embodiment of a fleet management system;

FIG. **5** is an example embodiment of a system diagram for a multifunction peripheral management system;

FIG. **6** is an example embodiment of an administrator user interface display;

FIG. **7** is another example embodiment of an administrator user interface display; and

FIG. **8** is another example embodiment of an administrator user interface display.

DETAILED DESCRIPTION OF THE INVENTION

The systems and methods disclosed herein are described in detail by way of examples and with reference to the figures. It will be appreciated that modifications to disclosed and described examples, arrangements, configurations, components, elements, apparatuses, devices methods, systems, etc. can suitably be made and may be desired for a specific application. In this disclosure, any identification of specific techniques, arrangements, etc. are either related to a specific example presented or are merely a general description of such a technique, arrangement, etc. Identifications of specific details or examples are not intended to be, and should not be, construed as mandatory or limiting unless specifically designated as such.

Remote MFP administration, such as via ECC as noted above, functions via a management terminal operated by an administrative user. MFP management may include areas such as:

- Remote Device Monitoring: This feature allows you to remotely track the status and performance of your MFP fleet. Metrics such as usage patterns, error codes, supplies levels, and maintenance requirements can be continuously monitored.
- Automated Supplies Replenishment: The system is designed to automatically keep track of the levels of toner and supplies in your connected devices. When these levels drop below a certain threshold, the system initiates an automated reordering process to ensure that supplies are always available.
- Proactive Maintenance: A system can alert you to upcoming maintenance needs or potential issues. This proactive approach enables you to schedule maintenance tasks before they develop into more significant problems.
- Usage Analysis and Reporting: The managed services provide tools for analyzing and reporting on how an MFP fleet is being utilized. This data-driven insight aids in making informed decisions regarding resource allocation and identifying opportunities for cost savings.
- Security and Access Control: Managed services include security features such as user authentication, secure print release, and document encryption. These measures help safeguard sensitive information.
- Device Configuration Management: Through a central dashboard, systems manage and update the configuration settings of an MFP fleet remotely. This ensures consistent settings across all devices.
- Firmware and Software Updates: Managed services enable one to centrally manage and deploy firmware and software updates to keep your MFP fleet current with the latest features and security patches.
- Remote Troubleshooting and Diagnostics: Administrators have the capability to diagnose and troubleshoot issues remotely, minimizing downtime and reducing the need for on-site visits.
- Cost Management and Control: The suite includes tools for tracking and managing printing costs accurately. This feature facilitates the allocation of expenses and implementation of cost-saving measures.
- Device Policy Control: Device policies refer to a sets of rules, settings, and configurations that govern the use and management of multi-function printers within an organization. Device policies are implemented to ensure that devices are used efficiently, securely, and in compliance with organizational policies.
- User Authentication and Access Tracking: The managed services offer user authentication mechanisms and activity tracking to ensure that only authorized users access MFP functions.

With such diverse functionality, it is to be appreciated that large amounts of data must be retrieved and displayed. Time is required to retrieve, organize and display such information. When an administrator has a certain task in mind, or a certain order of tasks, they may have to wait a considerable time before they can commence work since the required information is not yet assembled and displayed. Also, managing large fleets of MFPs for many customers can result in obtaining and displaying information that, while accurate relative to an information category, is only needed for a subset of devices. Defining such a subset may be discretionary to an administrator. By way of example, if there are relatively few devices in a selected list, the administrator may simply scroll through the list and addresses the devices as needed. However, a device list has hundreds, or thousands of entries making a complete list scroll impractical.

In cloud-based applications, tabs can be used to organize groups of listed device data on an administrator's workstation. Updating each device list across multiple tabs and the associated count label in a timely manner is difficult due to the backend processing required to update the associated user interface. Example embodiments here implement a user interface and associated backend processing that allows updated lists with associated count labels to be shown in a timely manner asynchronously. Current (in focus) tab list items and associated count label is processed and presented first. Further, a placeholder count label is presented while the system is processing, to communicate to the user that the system is busy. Presentation of the count of items is displayed as part of in tab category label. The device count is updated of the count in response to presentation of contained data including search/filter when provided, item deletion, item addition, and the like. Visual indication of "processing" state in tabs where count is not yet calculated.

FIG. **1** illustrates an example embodiment of a system for MFP fleet management **100**. One or more MFPs, such as MFPs **104**, **108** and **112** are in data communication with one another, along with administrator workstation **116**, cloud server **120**, and mobile client **124** via network cloud **128**. Network cloud **128** is suitably comprised of a local area network (LAN), a wide area network (WAN), which may comprise the Internet, or any suitable combination thereof. Network cloud **128** is comprised of any suitable wireless or wired data connection or combination thereof. Cloud server **120** suitably provides network management service such as via Toshiba's eBridge Cloud Connect (ECC) application which facilitates capture and transmission of device data from managed MFPs. Administrative user **132** interacts with administrator workstation **116** via a user interface that includes display **136**, the generation and content of which will be detailed below.

Turning now to FIG. **2**, illustrated is an example embodiment of a networked digital device comprised of document rendering system **200** suitably comprised within an MFP, such as with MFPs **104**, **108** and **112** of FIG. **1**. It will be appreciated that an MFP includes an intelligent controller **201** which is itself a computer system. Thus, an MFP can itself function as a server with the capabilities described herein. Included in intelligent controller **201** are one or more processors, such as that illustrated by processor (CPU) **202**. Each processor is suitably associated with non-volatile memory, such as read-only memory (ROM) **204**, and random access memory (RAM) **206**, via a data bus **212**.

Processor **202** is also in data communication with input/output interface **222**, suitably comprising a user touchscreen. While touchscreens are discussed in example embodiments herein, it is to be appreciated that any suitable user interface, such as keyboards, switches, displays, trackballs or mice may be used.

Processor **202** is also in data communication with a storage interface **208** for reading or writing to a storage **216**, suitably comprised of a hard disk, optical disk, solid-state disk, cloud-based storage, or any other suitable data storage as will be appreciated by one of ordinary skill in the art.

Processor **202** is also in data communication with a network interface **210** which provides an interface to a network interface controller (NIC) **214**, which in turn provides a data path to any suitable wired interface or physical network connection **220**, or to a wireless data connection via wireless network interface **218**. Example wireless data connections include cellular, Wi-Fi, Bluetooth, NFC, wireless universal serial bus (wireless USB), satellite, and the like. Example wired interfaces include Ethernet, USB, IEEE 1394 (FireWire), Lightning, telephone line, or the like.

Processor **202** can also be in data communication with any suitable user input/output (I/O) interface **226**, such as a Bluetooth interface, which provides data communication for interfacing with user peripherals, such as displays, keyboards, mice, track balls, touch screens, or the like. Processor **202** can also be in communication with hardware monitor **221**, such as a page counter, temperature sensor, toner or ink level sensor, paper level sensor, or the like.

Also in data communication with data bus **212** is a document processor interface **222** suitable for data communication with the document rendering system **250**, including MFP functional units. In the illustrated example, these units include a copy engine comprising copy hardware **240**, a scan engine comprise of scan hardware **242**, a print engine comprised of print hardware **244** and a fax engine comprised of fax hardware **246** which together comprise the document rendering system **250**. It will be understood that functional units are suitably comprised of intelligent units, including any suitable hardware or software platform.

Turning now to FIG. **3**, illustrated is an example embodiment of a digital data processing device **300** such as administrator workstation **116**, cloud server **120** or mobile client **124** of FIG. **1**. It is to be appreciated that some components listed may be unnecessary in certain configurations. Components of the digital data processing device **300** suitably include one or more processors, illustrated by processor **304**, memory, suitably comprised of read-only memory **308** and random access memory **312**, and bulk or other non-volatile storage **316**, suitably connected via a storage interface **320**. Such storage is suitably non-transitory and suitable for application and data storage. Data communication among components is accomplished via data bus **324**. A network interface controller **328** suitably provides a gateway for data communication with other devices, via any wireless or wired connection, such as via wireless network interface **332**. A user input/output interface **336** is suitably comprised of display generator **340** interfacing with touchscreen display **344**. As noted above, any suitable user input and display can be used.

FIG. **4** illustrates flowchart **400** for an example embodiment of a fleet management system. The process commences at block **404** and proceeds to block **408** where an administrator opens a page for viewing MFP device information. Example device information may include device serial numbers, model numbers, customer name, policy settings, device status, device network address, and the like. Next, the administrator sends a request to a cloud management server for information at block **412** which provides an initial display of items responsive to the request. This is suitably

tabbed as active and open. Next, at block **416**, the display is populated with list items along with a tab summary label that may include a category name. The tab summary label is also provided with a current count of items in the list.

Next, a request for remaining tab information is sent at block **420** for any additional categories or items of interest to the administrator. The process then proceeds to block **424** to await user input. When the administrator issues search criteria to filter the active list, the system applies the filter and returns to block **412** to generate the filtered list. While waiting for user input at block **424**, other background tabs are loaded with list counts appended to the tab label as they become available at block **428**. When a user clicks on another tab, the process proceeds to block **432** where a test is made to determine whether the items in the selected tab are fully loaded. If so, the process moves to block **436** where the selected tab, tab count and list items are displayed. The process then returns to block **424** to await further user input. If the tab is not yet fully loaded at block **432**, a place holder, such as an animation or message, is substituted for the currently unavailable list item count information at block **440**.

FIG. **5** illustrates an example embodiment of a system diagram **500** for an MFP management system such as that detailed herein. User **504** interacts with digital client **508** to access MFP service cloud **512**, such as by use of the noted ECC system noted above. MFP service cloud **512** secures device information for managed MFPs via database **516**. Such information may be pre-stored, such as customer information and device identification information. Other information may be secured by polling MFPs themselves or by MFP reports pushed to the database.

FIG. **6** illustrates an example embodiment of an administrator user interface display, such as display **136** of FIG. **1**. The example display shows three tabs. In focus tab **604** includes a label for an associated item list **608**, the label including text **612** showing that the associated list is for active devices. Numeric entry **616** indicates the number of entries in the list as being 107,211. As noted above, such a large number of entries makes it impractical to scroll through an entire list. Tabs **620** and **624** indicate their associated, hidden content label, along with their associated item list count. Tab **620** denotes that its associated, currently hidden, list is for 919 inactive devices. Tab **624** denotes that its associated, currently hidden, list is for 300 shared devices. Text box **628** allows for entry of search terms to build or filter a list as desired. Additional management functions **634** allow for administrative actions, such as device management, queue updates, policy control, report generation of device meter collection.

FIG. **7** shows administrative user interface display **700** wherein a search term "ESTUDIO" has been introduced into box **628'** and applied to item list **608**, resulting in an updated item list count **704** of 7,211 entries.

FIG. **8** shows administrative user interface display **800** where in focus tab **704'** has been supplied with list item count **616'** first as being the active tab. Numeric list entry counts for background tabs **620'** and **624'** are provided with placeholders **708** and **712**, respectively, indicating that their associated list content is not yet completely loaded. The placeholder is suitably any static image or moving animation indicative of an list build in progress.

While certain embodiments have been described, these embodiments have been presented by way of example only, and are not intended to limit the scope of the inventions. Indeed, the novel embodiments described herein may be embodied in a variety of other forms; furthermore, various omissions, substitutions and changes in the form of the embodiments described herein may be made without departing from the spirit of the inventions. The accompanying claims and their equivalents are intended to cover such forms or modifications as would fall within the spirit and scope of the inventions.

What is claimed is:

1. A system comprising:
- a processor;
- a network interface;
- a memory configured to receive device information corresponding to each of a plurality of multifunction peripherals, wherein the device information is organized in a plurality of categories; and
- a user interface including a user input and a display;
- wherein the processor is configured to:
  - receive a management session request from an associated user via the user interface,
  - showing a tabbed image on the display, each tabbed image associated with a different category,
  - determine an open tab among the tabbed images, wherein information relative to the open tab is displayable and information relative to remaining tabs is hidden,
  - retrieve device information associated with the open tab,
  - show a list of retrieved device information on the display,
  - show indicia corresponding to a number of entries in a list on the open tab,
  - retrieve device information associated with unopened tabs,
  - show placeholder indicia corresponding to a number of devices in each unopened tab while the device information associated with the unopened tabs is being retrieved, and
  - replace the placeholder indicia from each unopened tab with indicia corresponding to the number of entries in each unopened tab after its associated device information has been retrieved.

2. The system of claim **1** wherein the processor is further configured to:
- receive the user input comprising selection of a newly opened tab,
- retrieve any missing device information required for the newly opened tab,
- showing the list of retrieved device information for the newly opened tab, and
- show indicia on the newly opened tab corresponding to the number of devices listed in the newly opened tab.

3. The system of claim **2** wherein the processor is further configured to:
- receive a search term from a user via the user interface,
- filter a list currently shown on the display in accordance with a received search term, and,
- generate a revised list in accordance with the received search term,
- show the revised list on the display, and
- update a tab associated with the revised list to show the number of entries in the revised list.

4. The system of claim **3** wherein the processor is further configured to:
- receive a user selection for deletion of a list entry of a revised search shown on the display,
- delete the list entry selected for deletion, and
- update the tab associated with the revised list to show a current number of entries in a revised list after deletion.

5. The system of claim 4 wherein the processor is further configured to:

receive a new list entry from the user,

add the new list entry to the revised list, and

update the tab associated with the revised list to show a current number of entries after addition of the new list entry.

6. The system of claim 5 wherein device information includes one or more of device serial number, device model number, device customer, device policy, device status and device network address.

7. The system of claim 4 wherein the device information is obtained from a cloud device management service.

8. A method comprising:

receiving a management session request from an associated user via a user interface,

receiving, into a memory, device information corresponding to each of a plurality of multifunction peripherals, wherein the device information is organized in a plurality of categories

showing a tabbed image on a display, each tabbed image associated with a different category,

determining an open tab among the tabbed images, wherein information relative to the open tab is displayable and information relative to remaining tabs is hidden,

retrieving device information associated with the open tab,

showing a list of retrieved device information on the display,

show indicia corresponding to a number of entries in a list on the open tab,

retrieving device information associated with unopened tabs,

showing placeholder indicia corresponding to a number of devices in each unopened tab while the device information associated with the unopened tabs is being retrieved, and

replacing placeholder indicia from each unopened tab with indicia corresponding to the number of entries in each unopened tab after its associated device information has been retrieved.

9. The method of claim 8 further comprising:

receiving user input comprising selection of a newly opened tab,

retrieving any missing device information required for the newly opened tab,

showing the list of retrieved device information for the newly opened tab, and

showing indicia on the newly opened tab corresponding to the number of devices listed in the newly opened tab.

10. The method of claim 9 further comprising

receiving a search term from a user via the user interface,

filter a list currently shown on the display in accordance with a received search term, and,

generating a revised list in accordance with the received search term,

showing the revised list on the display, and

updating a tab associated with the revised list to show the number of entries in the revised list.

11. The method of claim 10 further comprising:

receiving a user selection for deletion of a list entry of a revised search shown on the display,

deleting the list entry selected for deletion, and

updating the tab associated with the revised list to show a current number of entries in a revised list after deletion.

12. The method of claim 11 further comprising:

receiving a new list entry from the user,

adding the new list entry to the revised list, and

updating the tab associated with the revised list to show a current number of entries after addition of the new list entry.

13. The method of claim 12 wherein device information includes one or more of device serial number, device model number, device customer, device policy, device status and device network address.

14. The method of claim 13 further comprising obtaining the device information from a cloud device management service.

15. A non-transitory computer readable storage medium storing a program for causing a networked computer to execute a control method, the control method comprising:

receiving, into a memory, device information corresponding to each of a plurality of multifunction peripherals, wherein the device information is organized in a plurality of categories

showing a tabbed image on a display, each tabbed image associated with a different category,

determining an open tab among the tabbed images, wherein information relative to the open tab is displayable and information relative to remaining tabs is hidden,

retrieving device information associated with the open tab,

showing a list of retrieved device information on the display,

show indicia corresponding to a number of entries in a list on the open tab,

retrieving device information associated with unopened tabs,

showing placeholder indicia corresponding to a number of devices in each unopened tab while the device information associated with the unopened tabs is being retrieved, and

replacing placeholder indicia from each unopened tab with indicia corresponding to the number of entries in each unopened tab after its associated device information has been retrieved.

16. The non-transitory computer readable storage medium of claim 15 wherein the control method further comprises:

retrieving any missing device information required for a newly opened tab,

showing the list of retrieved device information for the newly opened tab, and

showing indicia on the newly opened tab corresponding to the number of devices listed in the newly opened tab.

17. The non-transitory computer readable storage medium of claim 16 wherein the control method further comprises:

receiving a search term from a user via a user interface,

filter a list currently shown on the display in accordance with a received search term, and,

generating a revised list in accordance with the received search term,

showing the revised list on the display, and

updating a tab associated with the revised list to show the number of entries in the revised list.

18. The non-transitory computer readable storage medium of claim 17 wherein the control method further comprises:

receiving a user selection for deletion of a list entry of a revised search shown on the display,

deleting the list entry selected for deletion, and

updating the tab associated with the revised list to show a current number of entries in a revised list after deletion.

19. The non-transitory computer readable storage medium of claim **18** wherein the control method further comprises:

receiving a new list entry from the user,

adding the new list entry to the revised list, and

updating the tab associated with the revised list to show a current number of entries after addition of the new list entry.

20. The non-transitory computer readable storage medium of claim **19** wherein device information includes one or more of device serial number, device model number, device customer, device policy, device status and device network address.

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