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[Continued on next page]

(54) Title: INK SUBSCRIPTION MANAGEMENT

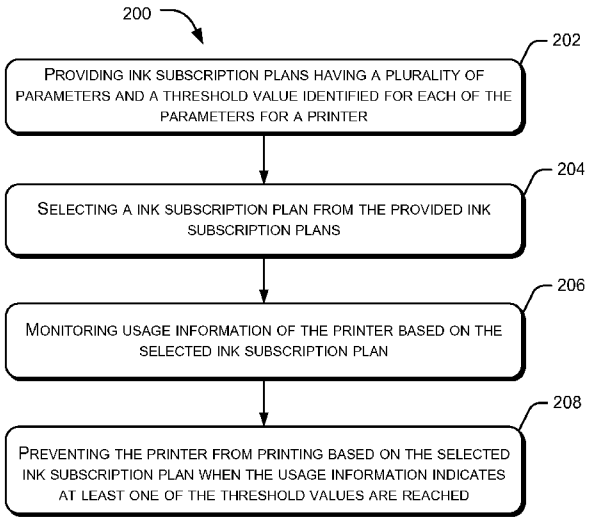

Figure 2

(57) Abstract: Systems and methods for managing ink subscription for a printer (108) over a cloud printing network (104) are described. The printer (108) is monitored for usage information based on an ink subscription plan selected by a user. The ink subscription plan includes a plurality of threshold values associated with usage of the printer (108). The printer (108) is prevented from executing print jobs assigned to the printer (108) when the usage information indicates that at least one of the threshold values is reached.

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INK SUBSCRIPTION MANAGEMENT

BACKGROUND

[0001] In a typical shared printer environment, such as an enterprise environment, institutions implementing a central printing network like libraries, universities, and hospitals, and so on, a plurality of computing devices are connected to at least one printer over a network. Print jobs can be assigned to the printer by a user using any of the computing devices connected to the network. Nowadays, to increase mobility, reduce costs, and simplify IT administration, cloud printing solutions are being implemented in the shared printer environments for centralized print management. In such a case, the printer receives an assigned print job from the computing devices through the cloud printing solution.

Brief Description of Figures

[0002] The detailed description is provided with reference to the accompanying figures. In the figures, the left-most digit(s) of a reference number identifies the figure in which the reference number first appears. The same numbers are used throughout the figures to reference like features and components.

[0003] Figure 1a illustrates an example cloud printing network for managing ink subscription, in accordance with principles of the present subject matter.

[0004] Figure 1b illustrates an example data flow for managing ink subscription, in accordance with principles of the present subject matter.

[0005] Figures 2 and 3 illustrate example methods for managing ink subscription over a cloud printing network in accordance with principles of the present subject matter.

Detailed Description

[0006] Systems and methods for managing ink subscription over a cloud printing network are described herein. In the cloud printing network, a plurality of

computing devices is connected to a printer through a cloud printing solution. Print jobs are assigned to the printer from the computing devices through the cloud printing solution. Cloud printing solution reduces overall IT costs, simplifies IT administration, and can provide secure printing. Thus, cloud printing solutions have now become a popular tool for monitoring of printers and tracking employee-printing behavior.

[0007] On receiving a print job, the printer may typically check the level of ink in a cartridge installed in the printer. If the level of ink is low, a message indicating the low level of ink in the cartridge is displayed on a front panel of the printer. Such a message may also be flashed on a screen of the computing device that had assigned the print job, and on a screen of a computing device monitoring the printer. In such a scenario, a user, such as a printer owner, who is assigned the responsibility of taking care of consumables used for the printer, has to manually place an order for a new cartridge to a vendor. This process can be time-consuming. Also, the user may ignore the message or delay taking action due to which the new cartridge may not be available in time. In case the printer runs out of ink, no further printing would be possible until the old cartridge is replaced.

[0008] Automated consumables reordering solutions which place purchase order for ink cartridges, can be used. Such solutions monitor the consumables' levels, such as the ink level in a cartridge, for a threshold level. Further, such solutions at least partially fill an order form for submitting, by the user to the vendor. Alternatively, the order form can be automatically submitted to the vendor and the user is charged by the vendor according to marked price of the cartridges. Further, the user can be provided discount in charges based on user's frequency of ordering, user centric incentive based plans and other agreed upon discounts. Other mechanism may also monitor and provide alerts to users indicating the amount of ink that may be used for a print job before completing the print job. The user may accordingly change the printing options to minimize printing costs. Subsequently, the user can be then charged according to the amount of ink used for printing.

[0009] However, such automated solutions for ordering consumables typically require installation of specific software or device drivers either on the printer or on the computing device monitoring the printer. Further, these automated solutions monitor overall cartridge usage and cannot cater to user preferences in the shared printer environment, and therefore, cannot be used effectively for managing printing costs.

[0010] Systems and methods described herein help to manage printing costs based on ink subscription management in a cloud printing solution, which can flexibly cater to user preferences in a shared printer environment. In an enterprise environment, for example, the user can be a person or a team of personnel responsible for, amongst other things, monitoring printers and taking care of consumables used for printers and other office machines. Further, the ink subscription management also allows monitoring of print jobs, providing notifications, and reducing administration costs, thereby assisting in managing printing costs of the shared printer environment. It may be understood that a printer in the shared printer environment is communicatively coupled with a plurality of computing devices over the cloud printing network.

[0011] In one implementation, a vendor offering a cloud printing solution can host an ink subscription system and at least one database server that communicate with each other over a cloud printing network. The vendor can provide a list of ink subscription plans through the ink subscription system. It will be appreciated that the vendor offering the cloud printing solution may or may not provide office machines, such as printer, copy machines, fax, and so on, and their respective consumables.

[0012] A user can access the ink subscription system and select an ink subscription plan for a printer. The ink subscription system tracks usage information of the printer, such as ink consumption, pages printed based on the selected ink subscription plan and print jobs assigned to the printer. The ink subscription system prevents the printer from executing print jobs if a limit to print has been reached based on the selected ink subscription plan.

[0013] Further, the ink subscription system, based on the selected ink subscription plan, can execute a supply chain workflow associated with a vendor upon a current cartridge in the printer has reached a threshold value of ink level. Based on the execution of the supply chain workflow, a new cartridge can be ordered for delivery to an address of the user. Additionally, the ink subscription system provides notification on the usage information of the printer on a selected mode of communication, such as email, short message service (SMS) or printer front panel. In another example, the ink subscription system allows the user to select a different plan, such as cartridge-based usage plan and page-based usage plan, based on user preferences in the shared printer environment and charges the user on a pro-rata basis of previously selected ink subscription plans.

[0014] The manner in which the systems and the methods for ink subscription management over the cloud printing network are implemented shall be explained in details with respect to Figures 1 and 2. While aspects of described system and method for ink subscription management can be implemented in any number of different computing systems, environments, and/or configurations, the embodiments are described in the context of the following example system(s).

[0015] It should be noted that the description and figures merely illustrate the principles of the present subject matter. It will thus be appreciated that various arrangements that embody the principles of the present subject matter, although not explicitly described or shown herein, can be devised from the description and are included within its scope. Moreover, all statements herein reciting principles, aspects, and embodiments of the present subject matter, as well as specific examples thereof, are intended to encompass equivalents thereof.

[0016] Figure 1a schematically illustrates an example cloud printing network for managing ink subscription. In an exemplary shared printer environment 100 with access to a cloud printing solution for implementing an ink subscription system 102, according to an implementation of the present subject matter. The shared printer environment 100 can be an enterprise environment, institutions implementing a central printer network like library, universities, and hospitals, and

so on. In an implementation, the ink subscription system 102 may include, but is not limited to, a server, a workstation, a computer, and the like, and may be hosted remotely by a vendor for managing ink subscription. The ink subscription system 102 can be used to host an application for an user to select an ink subscription plan.

[0017] For the purpose of providing cloud printing solution in the shared printer environment 100, the ink subscription system 102 is communicatively coupled over a cloud printing network 104 with a plurality of computing devices 106-1, 106-2, ... , 106-N and a printer 108 in the shared printer environment 100. The computing devices 106-1, 106-2, ..., 106-N, can be collectively referred to as computing device 106, and individually referred to as a computing device 106 hereinafter.

[0018] The computing devices 106 can include, but are not restricted to, desktop computers, laptops, smart phones, personal digital assistants (PDAs), tablets, and the like. The computing devices 106 are communicatively coupled to the ink subscription system 102 over the cloud printing network 104 through one or more communication links, for example, via dial-up modem connections, cable links, and digital subscriber lines (DSL), wireless or satellite links, or any other suitable form of communication through the cloud printing network 104. Further, the ink subscription system 102 is communicatively coupled to database server(s) 110 for storing data.

[0019] In an implementation, the ink subscription system 102 includes processor(s) 112. The processor(s) 112 may be implemented as one or more microprocessors, microcomputers, microcontrollers, digital signal processors, central processing units, state machines, logic circuitries, and/or any devices that manipulate signals based on operational instructions. Among other capabilities, the processor(s) 112 can fetch and execute computer-readable instructions stored in the memory.

[0020] The ink subscription system 102 also includes interface(s) 114. The interface(s) 114 may be implemented as a variety of software and hardware interfaces that allow the ink subscription system 102 to interact with the database server(s) 110. Further, the interface(s) 114 may enable the ink subscription system 102 to communicate with other computing devices, such as computing device 106, printer 108, and other network entities on the cloud printing network 104. The interface(s) 114 may facilitate multiple communications within a wide variety of networks and protocol types, including wired networks and wireless networks, for example, WLAN, cellular, and satellite-based network.

[0021] The ink subscription system 102 also includes memory 116. The memory 116 may include any computer-readable medium known in the art including, for example, volatile memory, for example, RAM, and/or non-volatile memory, for example, EPROM, flash memory, and the like. Further, the ink subscription system 102 includes module(s) 118 and data 120. The module(s) 118 include routines, programs, objects, components, data structures, and the like, which perform particular tasks or implement particular abstract data types. The data 120 serves, amongst other things, as a repository for storing data that may be fetched, processed, received, or generated by the module(s) 118. Although the data 120 is shown internal to the ink subscription system 102, the data 120 can reside in an external repository (not shown in the figure), which may be coupled to the ink subscription system 102. In such a case, the ink subscription system 102 can communicate with the external repository through the interface(s) 114 to obtain information from the data 120.

[0022] In an implementation, the module(s) 118 include a plan module 122, a subscription module 124, a tracking module 126, a messaging module 128, a charging module 130, and other module(s) 132. The other module(s) 132 may include programs or coded instructions that supplement applications and functions, for example, programs in the operating system of the ink subscription system 102, and the data 120 comprise data corresponding to other module(s) 120.

[0023] In an implementation, a user accesses the ink subscription system 102 for selecting an ink subscription plan based on user preferences in the shared printer environment 100 from a list of ink subscription plans. The ink subscription plan includes a plurality of parameters, such as type of the plan, support, validity, charges of the plan, number of pages that can be printed, number of cartridges that can be purchased, and so on. It would be understood that the ink subscription plans may differ for different consumer groups. For example, a page-based plan can be designed for allowing the printer to print only specific number of pages in a month for a user who prints sparingly. Furthermore, such ink subscription plans may be applied to either a single printer or for multiple printers within the shared printer environment 100. In one implementation, the list of ink subscription plans can be stored in an ink plan database provided in the database server(s) 110.

[0024] The list of ink subscription plans available in the ink subscription database are provided to the user through the plan module 122. The user can select an ink subscription plan from the list of ink subscription plans through the subscription module 124. It would be understood that functions of the plan module 122 and the subscription module 124 can be provided by a single module. The tracking module 126 tracks usage of the printer 108 based on the selected ink subscription plan. For example, the user has selected an ink subscription page type plan, wherein the plan allows the user to get a maximum of 2 cartridges and print 150 pages per month. The tracking module 126 enables the user to get a supply of 2 cartridges in the given month based on the selected ink subscription plan upon a current cartridge in the printer 108 has reached a threshold value of ink level.

[0025] After the selection of the ink subscription plan, print jobs can be assigned to the printer 108 through the computing device 106 over the cloud printing network 104. The print jobs are first transmitted to the ink subscription system 102 and then to the printer 108. In some arrangements, the printer 108 can poll the ink subscription system 102 to find any pending print jobs. The tracking module 126 interacts with the database server(s) 110 to receive information about

the selected ink subscription plan and tracks the print jobs assigned to the printer 108 through the computing device 106 based on the selected ink subscription plan.

[0026] Based on the selected ink subscription plan, the tracking module 126 monitors usage information of the printer 108, such as number of pages to be printed based on the assigned print jobs, ink level in cartridges, and so on during a given time when the selected ink subscription plan is valid. The tracking module 126 prevents the printer 108 from further printing or executing print jobs by sending appropriate messages if the usage information has reached a threshold value. For example, the user selects an ink subscription page type plan, wherein the plan allows the user to get a maximum of 2 cartridges and print 150 pages per month. The tracking module 126 monitors the assigned print jobs and sends an appropriate message to the printer 108 when number of pages to be printed has reached the 150 limit as indicated in the selected ink subscription plan. Thus, the printer 108 is now prevented from further printing or executing print jobs. The tracking module 126 enables the printer 108 to resume printing upon renewal of the selected ink subscription plan or upon purchasing a new ink subscription plan by the user.

[0027] Figure 1b schematically illustrates an example data flow for services provided ink subscription system 102. As described earlier, the user can select the ink subscription plan provided by the plan module 122 through the subscription module 124. The tracking module 126 monitor then monitors the usage information of the printer 108 based on the selected ink subscription plan and prevents the printer 108 from printing further based on the usage information. Further, the user can receive periodic notifications about the usage information of the printer 108. The tracking module 126 based on the selected ink subscription plan and the usage information can trigger the messaging module 128 for sending appropriate notifications to the user through a mode of communication, such as email, short messaging service (SMS), or on a front panel of the printer. The user, while selecting the ink subscription plan, can select the mode of communication and a periodicity of generating a plurality of notifications through the subscription module

124. For example, the user selects an ink subscription page type plan, wherein the plan allows the user to get a maximum of 2 cartridges and print 150 pages per month. Further, the user may wish to receive such notification via email every week. The tracking module 126 monitors the assigned print jobs, tracks the usage information, and sends an appropriate message to the messaging module 128 for sending the usage information to the user through the email. The notification includes current usage information and selected ink subscription plan for the given time when the selected ink subscription plan is valid. Thereby, enabling the user to monitor usage information and subscribe to a different ink subscription plan based on the usage information.

[0028] Furthermore, the ink subscription system 102 can order a supply of cartridges for the user based on the selected ink subscription plan and the usage information of the printer 108. The tracking module 126 monitors ink level in current cartridge in the printer 108 based on the usage information. The tacking module 126 can execute a supply chain workflow associated with the vendor based on the selected ink subscription plan and the usage information. An order form is then generated and communicated to the vendor for purchasing new cartridge when the ink level in current cartridge has reached a threshold value. Upon completion of the order form, a new cartridge can be delivered to an address specified by the user. The user, while selecting the ink subscription plan, can indicate receiving cartridges and provide details, such as address for delivering the cartridges through the subscription module 124. For example, the user selects an ink subscription page type plan, wherein the plan allows the user to get a maximum of 2 cartridges and print 150 pages per month. The tracking module 126 monitors the assigned print jobs and sends an appropriate message to the supply chain workflow when ink level in the cartridge in the printer 108 has reached a threshold value. The supply chain workflow upon receiving the message from the tracking module 126, arranges for sending a new cartridge to the address provided by the user.

[0029] Furthermore, the ink subscription system 102 can charge a user on a pro-rata basis. For example, the ink subscription system 102 can charge the user

on a pro-rata basis based on previously selected ink subscription plans by the user. The information about the selected ink subscription plan is provided to a charging module 130 for providing fine grained charges to the user. For example, if the user has used an USD 8 ink subscription cartridge type plan for 15 days and a USD 6 ink subscription page type plan for 15 days, then the user is now charged USD 7 for a new ink subscription plan on a pro-rata basis of the previously used ink subscription plans by the ink subscription system 102. Also, the charging module 130 can auto-debit the charges as per the selected ink subscription plan based on a subscription type indicated for the selected ink subscription plan. The user, while selecting the ink subscription plan, can opt for automatically renewing the subscription plan. In such a case, the user selects an ink subscription page type plan, wherein the plan allows the user to get a maximum of 2 cartridges and print 150 pages per month for USD 10 for a given month. The tracking module 126 monitors the usage information of the printer 108 for the given month and sends an appropriate message to the charging module 130 indicating the expiry of validity period. The charging module 130 would then auto-debit USD 10 as per the previously selected subscription plan.

[0030] Methods 200 and 300 are described in Figure 2 and Figure 3, respectively, for ink subscription management in the cloud printing solution. The methods 200 and 300 are explained in context of the aforementioned cloud printing network 104 including the ink subscription system 102, the computing device 106, and the printer 108 for the ease of explanation. The order in which the methods 200 and 300 are described is not intended to be construed as a limitation, and any number of the described method blocks can be combined in any order to implement the methods 200 and 300 or an alternative method. Additionally, individual blocks may be deleted from the method 200 without departing from the spirit and scope of the subject matter described herein. Furthermore, the methods 200 and 300 can be implemented in any suitable hardware, software, firmware, or combination thereof.

[0031] It would be understood that the methods 200 and 300 can be performed by programmed computing devices, for example, based on instructions retrieved from non-transitory computer readable media. The computer readable media can include machine-executable or computer-executable instructions to perform whole or a part of the described method. The computer readable media may be, for example, digital memories, magnetic storage media, such as a magnetic disks and magnetic tapes, hard drives, or optically readable data storage media.

[0032] Referring to Figure 2, in an implementation, at block 202, ink subscription plans can be provided to a user, for example, by the ink subscription system 102. The ink subscription plans can include a plurality of parameters, such as type of the plan, support, validity, charges of the plan, number of pages that can be printed, number of cartridges that can be purchased, and so on. The ink subscription plans identify a threshold value for each of the plurality of parameters.

[0033] At block 204, an ink subscription plan selected by the user for a printer, such as the printer 108, is received by the ink subscription system 102. In an implementation, after the selection of the ink subscription plan, print jobs are assigned to the printer 108 by at least one of the computing devices 106.

[0034] At block 206, the usage information of the printer is monitored based on the selected ink subscription plan and the assigned print jobs. For example, the ink subscription system 102 may monitor the usage information to determine whether at least one of the threshold values is reached.

[0035] At block 208, the printer 108 is prevented from further printing or executing assigned print jobs, for example, by the ink subscription system 102, when the usage information indicates that at least one of the threshold values as indicated by the ink subscription plan are reached.

[0036] Referring to Figure 3, in an implementation, at block 302, further parameters, such as mode of communication, periodicity of generating a plurality of notifications, subscription type can be selected by the user along with the selection of the ink subscription plan.

[0037] At block 304, notifications of the usage information of the printer 108 are provided on the selected mode of communication based on the selected periodicity of generating the plurality of notifications. The notifications can also include information about the selected ink subscription plan and can be provided, for example, by the ink subscription system 102.

[0038] At block 306, a supply chain workflow can be executed based on selected ink subscription plan for sending a cartridge to the user. The ink level in current cartridge in the printer 108 is monitored based on the usage information. An order form is generated and communicated to the vendor for purchasing new cartridge when the ink level in the current cartridge has reached a threshold value. For example, the ink subscription system 102 can execute the supply chain workflow when ink level in current cartridge in the printer 108 has reached a threshold value and the user in the selected ink subscription plan has indicated the receiving of cartridge. The order form is generated and communicated to the vendor, and new cartridges are dispatched to an address specified by the user.

[0039] At block 308, charges are levied to the user on a pro-rata basis for the selected ink subscription plan based on previously selected ink subscription plans. For example, the ink subscription system 102 can charge the user USD 7 for a new ink subscription plan when the user has previously selected and used an USD 8 ink subscription cartridge type plan for 15 days and a USD 6 ink subscription page type plan for 15 days.

[0040] Thus, the ink subscription management can also allow the user to print without worrying about ink consumption and allow the user to select and control a periodic expenditure on ink. Further, the user can get notifications regarding usage information and about the ink consumption on a selected mode of communication, such as email, short message service (SMS) or printer front panel. Moreover, the user can also move across different plans based on user preferences.

[0041] Although implementations for the ink subscription system over the cloud printing network have been described in language specific to structural

features and/or methods, it is to be understood that the appended claims are not necessarily limited to the specific features or methods described. Rather, the specific features and methods are disclosed as example implementations for managing ink subscription plans.

We claim:

1. An ink subscription system (102) for managing ink subscription for a printer (108) over a cloud printing network (104), the ink subscription system (102) comprising:

a processor (112); and

a tracking module (126) coupled to the processor (112) to:

monitor usage information of the printer (108) based on an ink subscription plan selected by a user, wherein the ink subscription plan includes a plurality of threshold values associated with usage of the printer (108); and

prevent execution of print jobs assigned to the printer (108) when the usage information indicates that at least one threshold value, from amongst the plurality of the threshold values, is reached.

2. The ink subscription system (102) as claimed in claim 1 further comprising a subscription module (124) coupled to the processor (112) to receive the selection of the ink subscription plan, a selection of a mode of communication, and a selection of periodicity for generating a plurality of notifications.

3. The ink subscription system (102) as claimed in claim 2, wherein the ink subscription system (102) further comprises a messaging module (128) coupled to the processor (112) to provide a notification related to the usage information of the printer (108) over the selected mode of communication, the notification being provided based on one of the ink subscription plan and the selected periodicity.

4. The ink subscription system (102) as claimed in claim 1, wherein the ink subscription system (102) further comprises a charging module (130) coupled to the processor (112) to levy charges on a pro-rata basis of previously selected ink subscription plans.

5. The ink subscription system (102) as claimed in claim 1, wherein the tracking module (126) further executes a supply chain workflow based on the usage information and the ink subscription plan when an ink level in current cartridge of the printer (108) has reached a threshold value.

6. A method for managing ink subscription of a printer (108) over a cloud printing network (104), the method comprising:

receiving an ink subscription plan selected by a user for the printer (108), wherein the ink subscription plan includes a plurality of threshold values associated with usage of the printer (108);

determining whether at least one of the threshold values is reached based on a usage information of the printer (108), the usage information being indicative of print jobs executed by the printer (108); and

preventing execution of print jobs assigned to the printer (108) on determining at least one of the threshold values being reached.

7. The method as claimed in claim 6 further comprising:

receiving a selection indicative of one of mode of communication and periodicity of generating a plurality of notifications; and

providing a notification of the usage information of the printer (108) over the selected mode of communication, based on the selected ink subscription plan and the selected periodicity of generating the plurality of notifications.

8. The method as claimed in claim 6 further comprising:

monitoring an ink level of current cartridge in the printer (108) based on the usage information of the printer (108); and

executing a supply chain workflow based on the ink subscription plan when the ink level of the current cartridge has reached a threshold value.

9. The method as claimed in claim 8, wherein the executing the supply chain workflow further comprising:

generating and communicating an order form to a vendor for purchasing new cartridge to the user; and

dispatching new cartridge to an address specified by the user based on the order form

10. The method as claimed in claim 6 further comprising levying charges on a pro-rata basis of previously selected ink subscription plans.

11. A non-transitory computer readable medium comprising instructions executable by a processor to:

receive an ink subscription plan for a printer (108), wherein the ink subscription plan includes a plurality of threshold values associated with usage of the printer (108);

monitor a usage information of the printer (108) based on the ink subscription plan, wherein the usage information being indicative of print jobs executed by the printer (108); and

prevent execution of print jobs assigned to the printer (108) based on the ink subscription plan when the usage information indicates that at least one of the threshold values, from amongst the plurality of threshold values, is reached.

12. The non-transitory computer readable medium as claimed in claim 11 further comprising instructions executable by the processor to:

receive a selection of one of mode of communication and a periodicity for generating a plurality of notifications; and

provide a notification of the usage information of the printer (108) over the selected mode of communication, based on the ink subscription plan and the selected periodicity for generating the plurality of notifications.

13. The non-transitory computer-readable medium as claimed in claim 11 further comprising instructions executable by the processor to:

monitor an ink level in current cartridge of the printer (108) based on usage information of the printer (108); and

execute a supply chain workflow based on the ink subscription plan when the ink level of the current cartridge has reached a threshold value.

14. The non-transitory computer-readable medium as claimed in claim 13 further comprising instructions executable by the processor to:

generating and communicating an order form to a vendor for purchasing new cartridge to the user; and

dispatching new cartridge to an address specified by the user based on the order form.

15. The non-transitory computer-readable medium as claimed in claim 11 further comprising instructions executable by the processor to levy charges on a pro-rata basis of previously selected ink subscription plans.

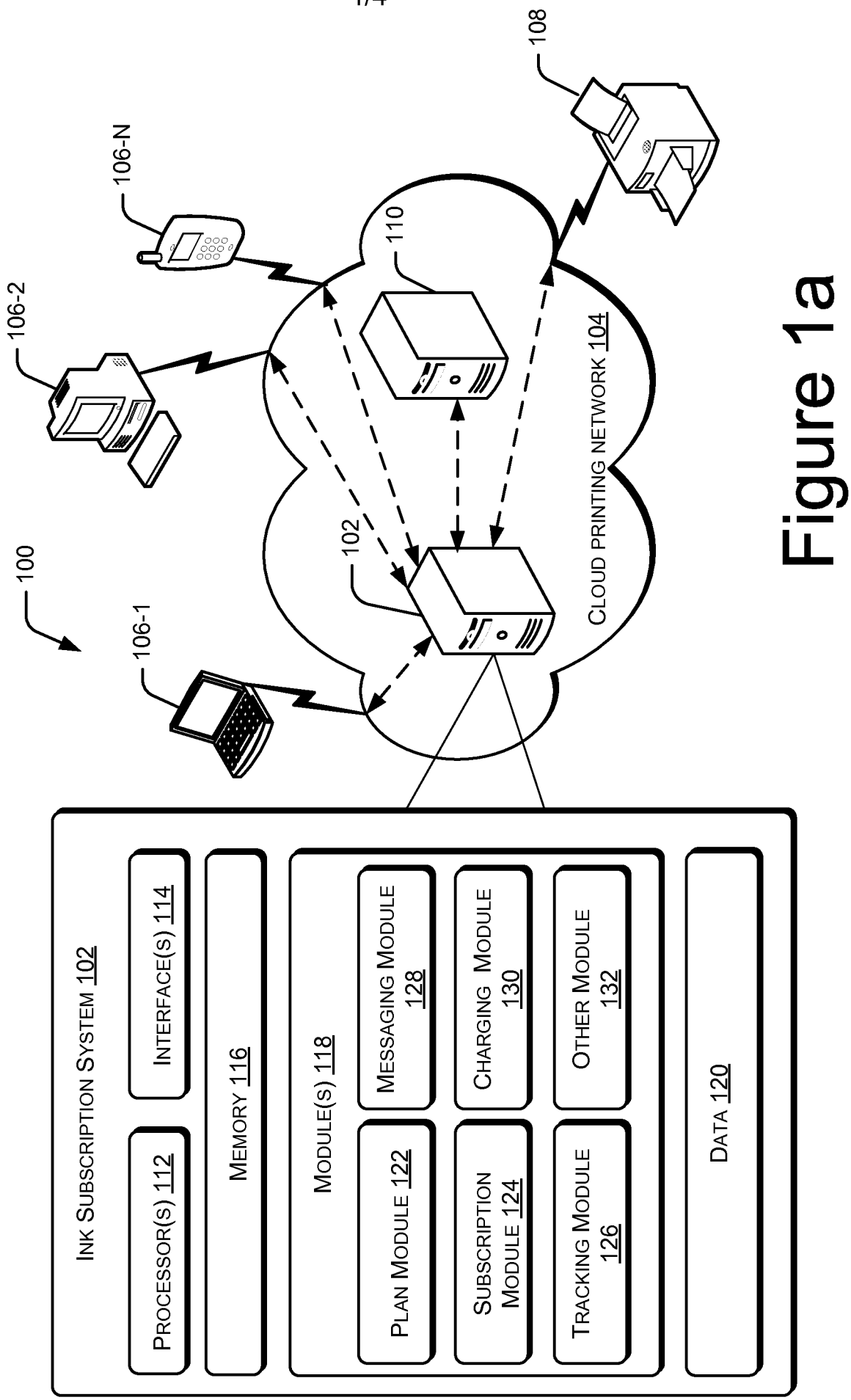
100
106-1
106-2
106-N
108
102
110
CLOUD PRINTING NETWORK 104
INK SUBSCRIPTION SYSTEM 102
PROCESSOR(S) 112
INTERFACE(S) 114
MEMORY 116
MODULE(S) 118
PLAN MODULE 122
MESSAGING MODULE 128
SUBSCRIPTION MODULE 124
CHARGING MODULE 130
TRACKING MODULE 126
OTHER MODULE 132
DATA 120

Figure 1a

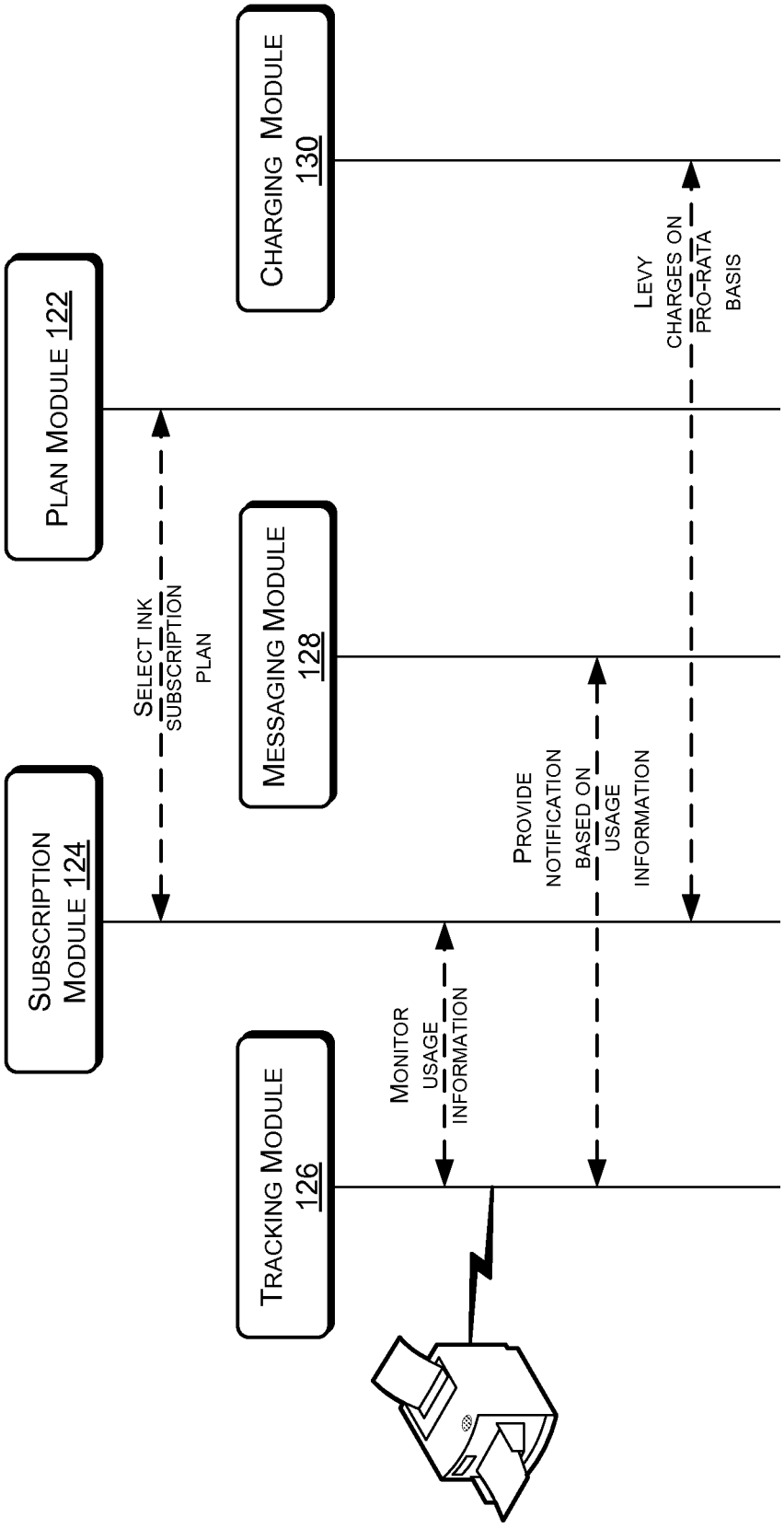
PLAN MODULE 122
CHARGING MODULE 130
SUBSCRIPTION MODULE 124
MESSAGING MODULE 128
TRACKING MODULE 126
SELECT INK SUBSCRIPTION PLAN
LEVY CHARGES ON PRO-RATA BASIS
PROVIDE NOTIFICATION BASED ON USAGE INFORMATION
MONITOR USAGE INFORMATION

Figure 1b

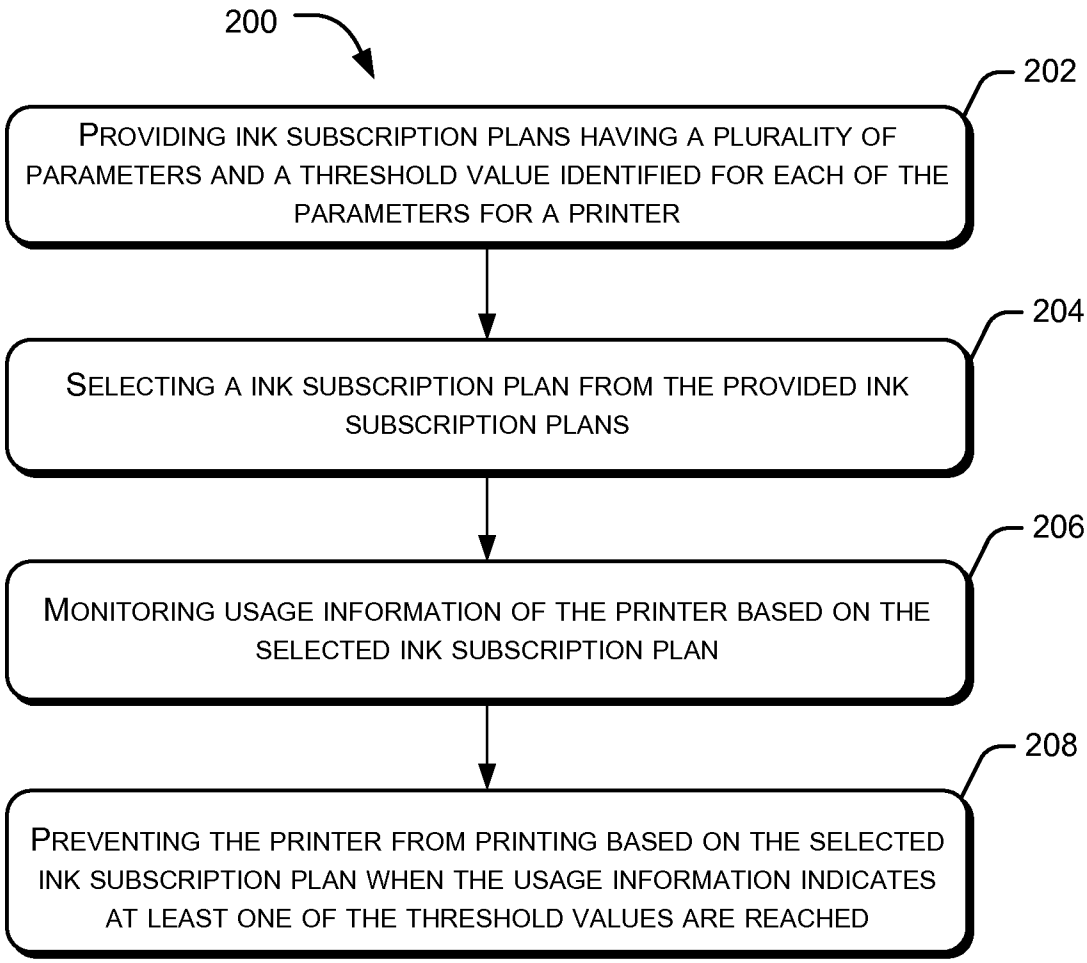
200
202
PROVIDING INK SUBSCRIPTION PLANS HAVING A PLURALITY OF PARAMETERS AND A THRESHOLD VALUE IDENTIFIED FOR EACH OF THE PARAMETERS FOR A PRINTER
204
SELECTING A INK SUBSCRIPTION PLAN FROM THE PROVIDED INK SUBSCRIPTION PLANS
206
MONITORING USAGE INFORMATION OF THE PRINTER BASED ON THE SELECTED INK SUBSCRIPTION PLAN
208
PREVENTING THE PRINTER FROM PRINTING BASED ON THE SELECTED INK SUBSCRIPTION PLAN WHEN THE USAGE INFORMATION INDICATES AT LEAST ONE OF THE THRESHOLD VALUES ARE REACHED

Figure 2

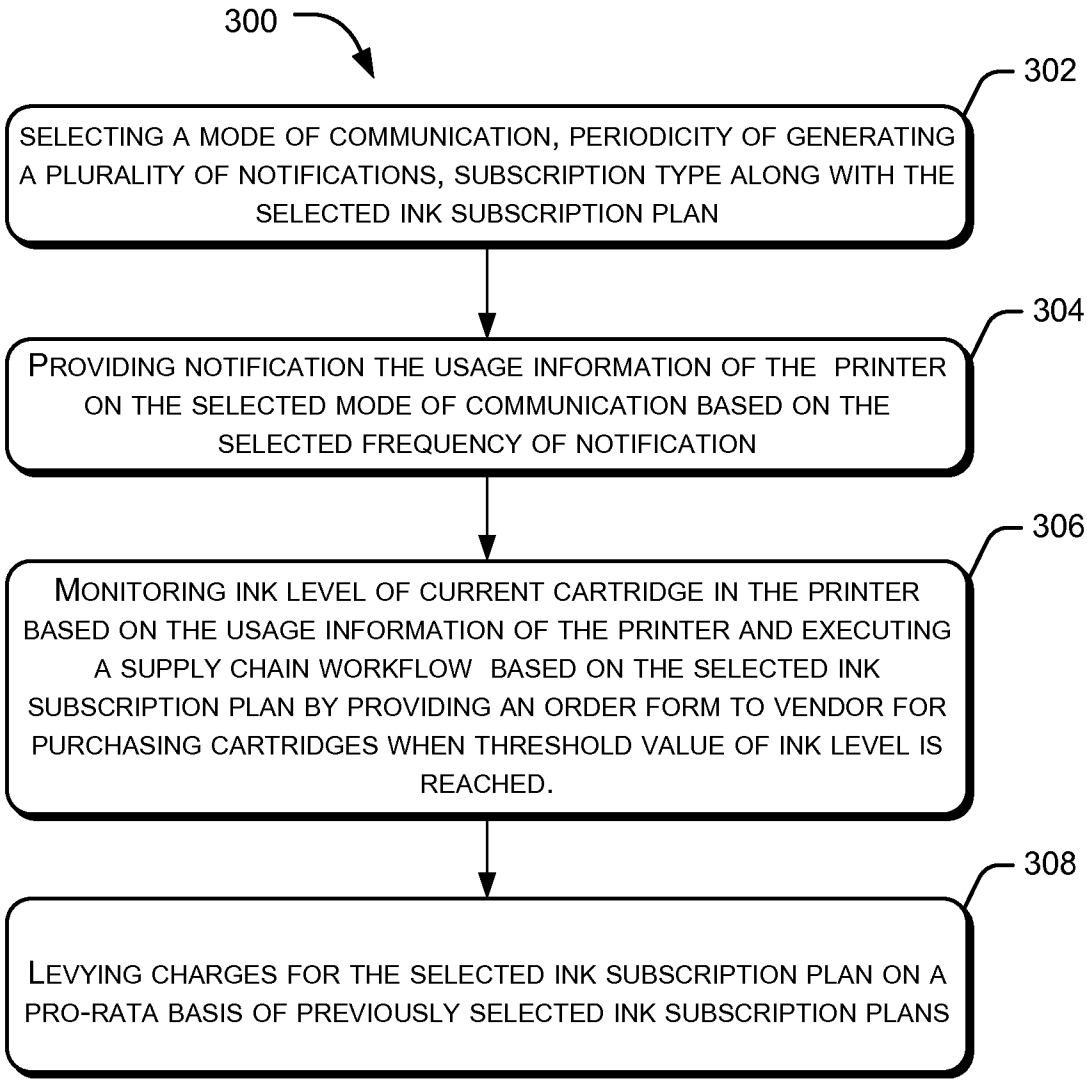
300
302
SELECTING A MODE OF COMMUNICATION, PERIODICITY OF GENERATING A PLURALITY OF NOTIFICATIONS, SUBSCRIPTION TYPE ALONG WITH THE SELECTED INK SUBSCRIPTION PLAN
304
PROVIDING NOTIFICATION THE USAGE INFORMATION OF THE PRINTER ON THE SELECTED MODE OF COMMUNICATION BASED ON THE SELECTED FREQUENCY OF NOTIFICATION
306
MONITORING INK LEVEL OF CURRENT CARTRIDGE IN THE PRINTER BASED ON THE USAGE INFORMATION OF THE PRINTER AND EXECUTING A SUPPLY CHAIN WORKFLOW BASED ON THE SELECTED INK SUBSCRIPTION PLAN BY PROVIDING AN ORDER FORM TO VENDOR FOR PURCHASING CARTRIDGES WHEN THRESHOLD VALUE OF INK LEVEL IS REACHED.
308
LEVYING CHARGES FOR THE SELECTED INK SUBSCRIPTION PLAN ON A PRO-RATA BASIS OF PREVIOUSLY SELECTED INK SUBSCRIPTION PLANS

Figure 3

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2013/024065

A. CLASSIFICATION OF SUBJECT MATTER

G06F 3/12(2006.01)i, G06F 11/30(2006.01)i

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
G06F 3/12; G06F 15/16; G06F 17/00; G06F 17/60; H04N 1/32; B41J 2/195; G07G 1/12; G06F 11/30

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Korean utility models and applications for utility models
Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
eKOMPASS(KIPO internal) & Keywords: ink, subscription, printer, cartridge, threshold, order, cloud, network, and similar terms.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2007-0188530 A1 (HENRY N. GARRANA et al.) 16 August 2007 See paragraphs [0011]-[0012], [0015], [0025]-[0026], [0029]-[0034], and [0038]-[0039]; and figures 1-2.	1-15
Y	KR 10-2009-0119512 A (HYUN JIN AHN) 19 November 2009 See paragraphs [0010], [0023], and [0025]-[0027]; and figures 1-2.	1-15
A	US 2003-0010818 A1 (STUART ASAWAKA) 16 January 2003 See paragraphs [0032]-[0034] and [0044]-[0045]; and figures 1-3.	1-15
A	US 2008-0133374 A1 (TSUTOMU NOBUTANI) 05 June 2008 See paragraphs [0147]-[0149] and figures 1-4.	1-15
A	WO 2000-076204 A1 (HEWLETT-PACKARD COMPANY) 14 December 2000 See page 3, lines 9-30; page 8, lines 7-15; and figures 1 and 8.	1-15

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

☒ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents,such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
22 November 2013 (22.11.2013)	**22 November 2013 (22.11.2013)**

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