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964/DEL/2013 29 March 2013 (29.03.2013) IN(71) Applicant: **ALCATEL LUCENT** [FR/FR]; 148/152,
route de la Reine, F-92100 Boulogne-Billancourt (FR).(72) Inventor: **VARJI SIDDAPPA, Basavaraj**; Co / Alc-
atel-Lucent India Limited, Nagawara Village, Kasaba
Taluk, Outer Ring Road, Manyata Embassy Business Pk,
Bangalore 560045 (IN).(74) Agent: **THERIAS, Philippe**; Alcatel-Lucent International,
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(54) Title: SYSTEMS AND METHODS FOR CONTEXT BASED SCANNING

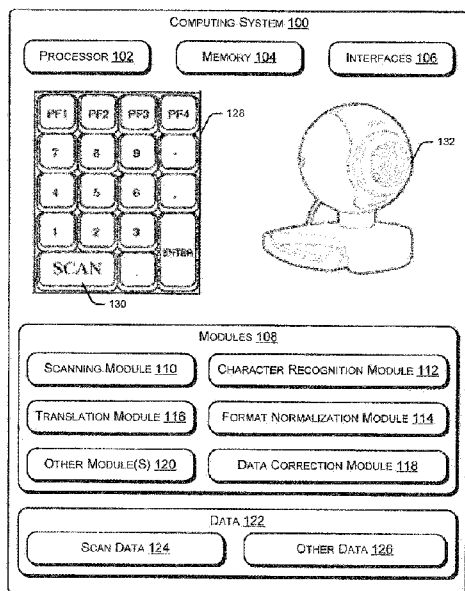


Figure 1

(57) Abstract: Systems and methods for context based scanning are de-
scribed. In one implementation, the method for context based scanning com-
prises initiating context based scanning from an application running on a
computing system (100) by pressing at least one of a dedicated scan button
(130) and a pre-configured combination of keys of the computing system
(100) and scanning a document on initiation of the context based scanning.
The method further comprises analyzing the scanned document, using optical
recognition techniques, to generate a digital document containing text and
pasting the text onto the application.

SYSTEMS AND METHODS FOR CONTEXT BASED SCANNING

FIELD OF INVENTION

[0001] The present subject matter relates to scanning and, particularly, but not exclusively, to methods and systems for context based scanning.

5

BACKGROUND

[0002] Computing devices, such as cellular phones, smart phones, personal digital assistants (PDAs), tablets, and laptops provide users with a variety of applications, services, and networking capabilities. Such computing devices have seemingly become a ubiquitous part of today's lifestyle and digital technology has found its way into different aspects of human life, professional as well as personal. Most computing systems include various accessories for providing additional functionalities, such as a scanner unit to capture an image.

[0003] The computing systems are often used for creating and transmitting content in various forms like electronic mails (e-mails), documents and messages. The commercially available computing devices usually include various mechanisms, such as keypads, on-screen keyboards, voice to text conversion modules and handwriting recognition modules to facilitate the user to enter data for generating the content.

SUMMARY

[0004] This summary is provided to introduce concepts related to context based scanning. This summary is not intended to identify essential features of the claimed subject matter nor is it intended for use in determining or limiting the scope of the claimed subject matter.

[0005] According to an embodiment, a method for context based scanning is described. The method includes initiating context based scanning from an application running on a computing system by pressing at least one of a dedicated scan button and a pre-configured combination of keys of the computing system and scanning a document on initiation of the context based scanning. The method further comprises analyzing the scanned document, using optical recognition techniques to generate a digital document containing text and pasting the text onto the application.

[0006] In another embodiment, a computing system for context based scanning is described. The computing system includes a processor. The computing system further

includes a processor, and an input unit, coupled to the processor, to initiate the context based scanning from an application running on the computing system. The computing system further includes a scanning module, coupled to the processor, to activate a scanner unit, communicatively coupled to the computing system, on initiation of the context based scanning and scans a document using the scanner unit. The computing system further includes a character recognition module, coupled to the processor, to analyze the scanned document using optical character recognition technique and generate a digital document containing text based on the analysis. The computing system also includes a format normalization module to paste the text onto the application.

[0007] In one embodiment a computer readable medium having embodied thereon computer readable instructions for context based scanning is described. The computer readable instructions when executed, cause a computing system to receive a user input to initiate context based scanning from an application running on a computing system. Thereafter, the executed computer readable instructions cause the computing system to scan a document on initiation of the context based scanning and analyze the scanned document, using optical recognition techniques, to generate a digital document containing text. The computing system then facilitates a user to paste the text onto the application.

BRIEF DESCRIPTION OF DRAWINGS

[0008] The detailed description is described 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:

[0009] Figure 1 schematically illustrates the components of a computing system for context based scanning, according to an example of the present subject matter.

[0010] Figure 2 illustrates a method for context based scanning, according to an example of the present subject matter.

DETAILED DESCRIPTION

[0011] The present subject matter relates to systems and methods for context based scanning. The methods and systems as described herein may be implemented as any computing system capable of capturing an image. Example of such computing

systems may include mobile phones, smart phones, tablets, laptops, personal computers and a desktop.

[0012] Generally, a user uses a computing system for generating content by inputting data or text using a keypad or an on-screen keyboard. This becomes time consuming and cumbersome if the volume of text is high. Certain computing systems facilitate the input of data using voice. However, such systems do not produce text which is true conversion of the voice due to various reasons, such as variations in the accent and pronunciation amongst the users. Similarly, variance in handwriting of the users causes handwriting recognition modules, a popular feature in many commercially available computing devices, to generate erroneous results.

[0013] In certain scenarios, the text which the user wants to input may be available as a hardcopy, either in handwritten or printed form. For example, while drafting an e-mail the user may wish to send his office address to the intended recipient. In one example, the user's office address may already be available as a printed document in form of the user's business cards. In such a scenario, the user may have to quit his e-mail application, launch another application to scan his business card, copy the scanned image to his computing system's clipboard, launch the e-mail application again and paste the scanned image from his computing system's clipboard. This process is usually cumbersome, time consuming, and causes inconvenience to the user.

[0014] The systems and methods, described herein, implement context based scanning. In one implementation, a computing system for context based scanning includes a button for initiating context based scanning. In one example, the button may be implemented as a key on a keypad or on an on-screen keyboard of the computing system. In another example, the button may be implemented as a special function button placed at a convenient location of the computing system, such as on any side of the computing system. In yet another example, the user may press a pre-configured combination of keys or buttons to initiate context based scanning.

[0015] In operation, the user may initiate context based scanning while working within any application, such as a word processor, an e-mail client, and a messaging client. For example, the user may initiate context based scanning for writing onto an application some text that may be already available in the form of a hardcopy. The initiation of context based scanning may activate a scanning module of the computing system. The scanning module may activate a scanner unit, such as a camera, integrated within the computing system or communicatively coupled to the computing system

using any port such as a universal serial bus (USB) port, a serial port, and a parallel port. Using the scanner unit, the user may scan the document, whose contents he intends to capture.

[0016] On successful scanning, a character recognition module of the computing system may convert the scanned document into a digital document containing text, using optical character recognition techniques. The computing system may further normalize any formatting in the text, by removing formatting symbols, such as line breaks, section breaks, column breaks, and page breaks. In one implementation, the computing system may format the scanned text based on the user input field from where the scanning is initiated. For example, in case the scanning is initiated from an address bar of a browser, the computing system may format the text in form of a uniform resource locator (URL). In another example, if the scanning is initiated from an Internet Protocol (IP) address field, the computing system may format the text in form of an IP address.

[0017] In one example, the computing system may operate in a language conversion mode. In the language conversion mode, a translation module of the computing system may convert the captured text to the default language of the application from which context based scanning has been launched or to the default language of the computing system.

[0018] In another example, the computing system may operate in a data correction mode. In the data correction mode, a data correction module of the computing system may highlight errors, such as spelling errors and grammatical errors, in the captured text. Based on user configuration, the data correction module may prompt the user to correct the highlighted errors or may automatically correct errors in the captured text.

[0019] The user may then paste the captured text onto the application from which context based scanning was launched. The user may further save the captured text in various file formats for future use.

[0020] Thus, the computing system for context based scanning as described above facilitates using of content, already available as hard copies, for inputting data in an application of the computing system, without having to exit or quit the application. The computing system for context based scanning thus makes it convenient for the user to use captured text from various sources for generating content.

[0021] The above systems and methods are further described in conjunction with the following figures. It should be noted that the description and figures merely illustrate

the principles of the present subject matter. It will thus be appreciated that those skilled in the art will be able to devise various arrangements that, although not explicitly described or shown herein, embody the principles of the present subject matter and are included within its spirit and scope. Furthermore, all examples recited herein are principally intended expressly for pedagogical purposes to aid the reader in understanding the principles of the present subject matter and the concepts contributed by the inventor(s) to furthering the art, and are to be construed as being without limitation to such specifically recited examples and conditions. Moreover, all statements herein reciting principles, aspects, and examples of the present subject matter, as well as specific examples thereof, are intended to encompass equivalents thereof.

[0022] The manner in which the systems and methods for context based scanning are implemented shall be explained in details with respect to Figures 1 and 2. While aspects of described systems and methods for context based scanning can be implemented in any number of different computing systems, environments, and/or configurations, the examples and implementations are described in the context of the following system(s).

[0023] Figure 1 schematically illustrates the components of a computing system 100 for context based scanning, according to an example of the present subject matter. In one implementation, the computing system 100 includes a processor 102, and a memory 104 connected to the processor 102. The processor 102 may include microprocessors, microcomputers, microcontrollers, digital signal processors, central processing units, state machines, logic circuitries and/or any other devices that manipulate signals and data based on computer-readable instructions. Among other capabilities, the processor 102 may fetch and execute computer-readable instructions stored in the memory 104.

[0024] Functions of the various elements shown in the figures, including any functional blocks labeled as “processor(s)”, may be provided through the use of dedicated hardware as well as hardware capable of executing computer-readable instructions.

[0025] The memory 104, communicatively coupled to the processor 102, can include any non-transitory computer-readable medium known in the art including, for example, volatile memory, such as static random access memory (SRAM) and dynamic random access memory (DRAM), and/or non-volatile memory, such as read only

memory (ROM), erasable programmable ROM, flash memories, hard disks, optical disks, and magnetic tapes.

5 [0026] Further the computing system 100 includes interfaces 106. The interfaces 106 may include a variety of commercially available interfaces, for example, interfaces for peripheral device(s), such as data input output devices, referred to as I/O devices, storage devices, network device. The I/O device(s) may include Universal Serial Bus (USB) ports, Ethernet ports, host bus adaptors, and their corresponding device drivers.

10 [0027] Further, the computing system 100 may include modules 108. The modules 108 may be coupled to the processor 102. The modules 108, amongst other things, include routines, programs, objects, components, and data structures, which perform particular tasks or implement particular abstract data types. The modules 108 may also be implemented as, signal processor(s), state machine(s), logic circuitries, and/or any other device or component that manipulate signals based on computer-readable instructions.

15 [0028] In said implementation, the modules 108 include a scanning module 110, a character recognition module 112, a format recognition module 114, a translation module 116, a data correction module 118 and other module(s) 120. The other module(s) 120 may include computer-readable instructions that supplement applications or functions performed by the computing system 100.

20 [0029] Further, the computing system 100 may also include data 122. In one implementation, the data 122 includes scan data 124 and other data 126. The other data 126 may include data generated and saved by the modules 108 for providing various functionalities of the computing system 100.

25 [0030] In one example, the computing system 100 may include an input unit 128 which may be inform of a keypad comprising a plurality of keys or an on-screen keyboard comprising a plurality of keys. In said example, the input unit 128 includes a dedicated scan button 130 to initiate context based scanning. In other examples, a pre-configured combination of keys may be used to initiate context based scanning.

30 [0031] In one implementation, the computing system 100 may include an integrated scanner unit 132, such as a camera, for scanning a document. In other implementations, the scanner unit 132 may be communicatively coupled to the computing system 100 using various available ports of the computing system 100.

[0032] In operation, a user may press the pre-configured key combination or the dedicated scan button 130 to initiate context based scanning while working on any application running on the computing system 100, such as an e-mail client, a word processor and a messaging client. On initiation of context based scanning, the scanning module 110 may activate the integrated scanner unit 132 to capture a snapshot of or scan a hardcopy, whose contents the user wants to use in the application. In one example, the scanning module 110 may set various scanner unit parameters, such as focal length, aperture depth, exposure time, film speed and usage of flash to optimally scan the hardcopy. In another example, the scanning module 110 may prompt the user to set values for the various scanner unit parameters for scanning the hardcopy. The scanning module 110 may further create and save the scanned document for future use. The scanning module 110 may save the scanned document, as the scan data 124, in various file formats, such as portable document format (pdf).

[0033] On successful scanning of the hardcopy and subsequent generation of the scanned document, the character recognition module 112 may use techniques, such as optical character recognition, to convert the scanned document into a digital document containing text. In one implementation, the character recognition module 112 may prompt the user to mark the areas of the scanned document which contains text and graphics. The character recognition module 112 may then only process the areas which contain text so as to reduce processing load on the computing system 100.

[0034] The format normalization module 114 may then analyze the digital document to remove various formatting symbols, such as line breaks, section breaks, column breaks and page breaks, to generate unformatted text. For example, the user may have scanned a news paper which usually comprises of multiple columns. The format normalization module 114 may analyze the digital document to demarcate whether a gap between two words in a row is caused due to a space symbol between the words or a column break between the two words. In another implementation, the format normalization module 114 may facilitate the user to either retain the original formatting of the contents of the digital document, as is on the hardcopy, or format the contents of the digital document in accordance with the formatting styles of the application, from which the context based scanning was initiated. In one implementation, the format normalization module 114 may format the scanned text based on a user input field of the application, from where the scanning is initiated. For example, in case the scanning is initiated from an address bar of a browser, the computing system may format the text in

form of a uniform resource locator (URL). Based on the selection of the user, the format normalization module 114 may format the document accordingly. Thus, the format normalization module 114 facilitates the user to capture text from documents having various formatting styles. The processed text may then be placed in a clipboard of the computing system 100. The user may then paste the contents of the clipboard onto the application from where the context based scanning was initiated.

[0035] In one example, the computing system 100 may be operated in a language conversion mode. In the language conversion mode, the translation module 116 may translate the captured text to a default language of the application from where the context based scanning was launched or to a default language of the computing system 100 or to any language specified by the user. For example, the user may initiate context based scanning while using an e-mail client whose default language is English. The user may then scan a newspaper in a different language, for example, a French newspaper. In language conversion mode, the translation module 116 may convert the captured text in French to English. In one example, the translation module 116 may retrieve data from databases located on the internet or from in-built databases of the computing system 100 to facilitate the translation of the captured text from one language to another.

[0036] In another example, the computing system 100 may be operated in a data correction mode. In the data correction mode, the data correction module 118 may analyze the captured text to detect errors, such as spelling mistakes and grammatical errors. In one example, the data correction module 118 may retrieve data from dictionaries available on the internet or in-built databases of the computing system 100 to facilitate error detection and error correction. In one implementation, the data correction module 118 may automatically correct any detected errors in the captured text. In another implementation, the data correction module 118 may highlight the detected errors and prompt the user to correct or ignore the same.

[0037] Thus, the computing system 100 for context based scanning facilitates using of content, already available in hardcopies, for inputting data in an application of the computing system, without having to exit or quit the application. The computing system for context based scanning thus makes it convenient for the user to use captured text from various sources for generating content by providing the user with additional features such as formatting, translation, and error correction.

[0038] Figure 2 illustrates a method 200 for context based scanning, according to an example of the present subject matter. The order in which the method 200 is 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 method 200, 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 method 200 may be implemented in any suitable hardware, machine readable instructions, firmware, or combination thereof.

[0039] In one example, the steps of the method 200 can be performed by programmed computers. Herein, some examples are also intended to cover program storage devices, for example, digital data storage media, which are machine or computer readable and encode machine-executable or computer-executable programs of instructions, where said instructions perform some or all of the steps of the described method 200. The program storage devices may be, for example, digital memories, magnetic storage media such as a magnetic disks and magnetic tapes, hard drives, or optically readable digital data storage media.

[0040] With reference to method 200 as depicted in Figure 2, as depicted in block 202, a user input is received to scan a document. In one implementation, the user may initiate context based scanning, while working on any application of the computing system 100, by pressing the pre-configured key combination or the dedicated scan button 130.

[0041] As illustrated in block 204, a scanner unit 132 of the computing system 100 is activated to scan the document. In one example, the scanning module 110 activates the integrated scanner unit 132 of the computing system 100. In one implementation, the scanning module 110 may automatically set various scanner unit parameters associated with the integrated scanner unit 132, whereas in another implementation, the scanning module 110 may prompt the user to set the values for the various scanner unit parameters.

[0042] As shown at block 206, the contents of the scanned document are analyzed using optical character recognition techniques. The contents of the scanned document are then extracted and a digital document containing text is generated. In one implementation, the character recognition module 112 may implement optical character recognition techniques to extract contents from the scanned document and generate the digital document containing text.

[0043] At block 208, the formatting of the digital document is normalized. In one implementation, the format normalization module 114 analyzes the digital document to remove various formatting symbols to generate unformatted text. In another example the format normalization module 114 may also facilitate the user either
5 retain the original formatting of the contents or format the contents of the digital document in accordance with the formatting styles of the application, from which the context based scanning was initiated. Based on the selection of the user, the format normalization module 114 may format the text of the digital document accordingly.

[0044] As depicted in block 210, it is determined whether the language
10 conversion mode is activated or on. If at block 210, it is determined that the language conversion mode is activated, then as depicted in block 212, the text of the digital document is converted into a language specified by the user. In one implementation, the translation module 116 may translate the text of the digital document to a default language of the application from where the context based scanning was launched or to a
15 default language of the computing system 100 or to any language specified by the user. If at block 210, it is determined that the language conversion mode is deactivated or off then no changes are made to the digital document.

[0045] As illustrated in block 214, it is determined whether the data correction mode is activated or on. If at block 214, it is determined that the data correction mode is
20 activated, as depicted in block 216, the text of the digital document is analyzed for error detection and error correction. In one implementation, the data correction module 118 may analyze the captured text to detect errors, such as spelling mistakes and grammatical mistakes. The data correction module 118 may then automatically correct any detected errors in the captured text or highlight the detected errors and prompt the
25 user to correct or ignore the same. If at block 214, it is determined that the language conversion mode is deactivated or off, then no changes are made to the digital document.

[0046] As shown in block 218, the contents of the digital document are then
30 pasted onto an application selected by the user. In one implementation, the format normalization module 114 may then place the text in a clipboard of the computing system 100. The user may then paste the contents of the clipboard onto the application from where the context based scanning was initiated.

[0047] Thus, the method 200 for context based scanning facilitates using of content, already available as hardcopies, for inputting data in an application of the

computing system, without having to exit or quit the application. The method 200 makes it convenient for the user to use captured text from various sources for generating content by providing the user with additional features such as formatting, translation and error correction.

- 5 [0048] Although implementations for context based scanning 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 examples of systems and methods for context based scanning over a network.

I/We claim:

1. A computing system (100) for performing context based scanning, the computing system (100) comprising:
 - 5 a processor (102);
 - an input unit (128), coupled to the processor (102), to initiate the context based scanning from an application running on the computing system (100);
 - a scanning module (110) coupled to the processor (102), to:
 - 10 activate a scanner unit (132), communicatively coupled to the computing system (100), on initiation of the context based scanning; and
 - scan a document using the scanner unit (132);
 - a character recognition module (112), coupled to the processor(102), to:
 - analyze the scanned document using optical character recognition technique; and
 - 15 generate, based on the analysis, a digital document containing text ; and
 - a format normalization module (114), coupled to the processor(102), to normalize the text in a format suitable for pasting the text onto the application.
- 20 2. The computing system (100) as claimed in claim 1, further comprising a dedicated scan button (130), to initiate context based scanning from the application running on the computing system (100).
3. The computing system (100) as claimed in claim 1, further comprising a
 - 25 translation module (116), coupled to the processor (102), to translate the text of the digital document to at least one of a default language of the application, a default language of the computing system (100), and a language specified by a user of the computing system (100).
- 30 4. The computing system (100) as claimed in claim 1, wherein the format normalization module (114) further removes formatting symbols from the text of the digital document to generate unformatted text.

5. The computing system (100) as claimed in claim 1, wherein the format normalization module (114) further processes the text of the digital document to format the text based on at least one of a formatting style of the application and a user input field from which the context based scanning is initiated.
- 5 6. The computing system (100) as claimed in claim 1, further comprising a data correction module (118), coupled to the processor (102), to analyze the text of the digital document for detection of errors present in the text.
- 10 7. The computing system (100) as claimed in claim 6, wherein the data correction module (118) further analyzes the text of the digital document to correct the detected errors.
8. A method to perform context based scanning, the method comprising:
15 initiating context based scanning from an application running on a computing system (100) by pressing at least one of a dedicated scan button (130) and a pre-configured combination of keys of the computing system (100);
 scanning a document on initiation of the context based scanning;
 analyzing the scanned document, using optical recognition techniques, to
20 generate a digital document containing text;
 normalizing the digital document; and
 pasting the normalized text onto the application.
9. The method as claimed in claim 8, further comprising translating the text of the
25 digital document to at least one of a default language of the application, a default language of the computing system (100) and a language specified by a user of the computing system (100).
10. The method as claimed in claim 9, further comprising removing formatting
30 symbols from the text of the digital document to generate unformatted text.
11. The method as claimed in claim 8, further comprising processing the text of the digital document to format the text based on at least one formatting style of the application.

12. The method as claimed in claim 8, the method further comprising:
analyzing the text of the digital document for detection of errors present
in the text; and
5 correcting the detected errors.
13. A non-transitory computer-readable medium having a set of computer readable
instructions that, when executed, cause a computing system to:
receive a user input to initiate context based scanning from an application
10 running on a computing system (100);
scan a document on initiation of the context based scanning;
analyze the scanned document, using optical recognition techniques, to
generate a digital document containing text; and
paste the text onto the application.

1 / 2

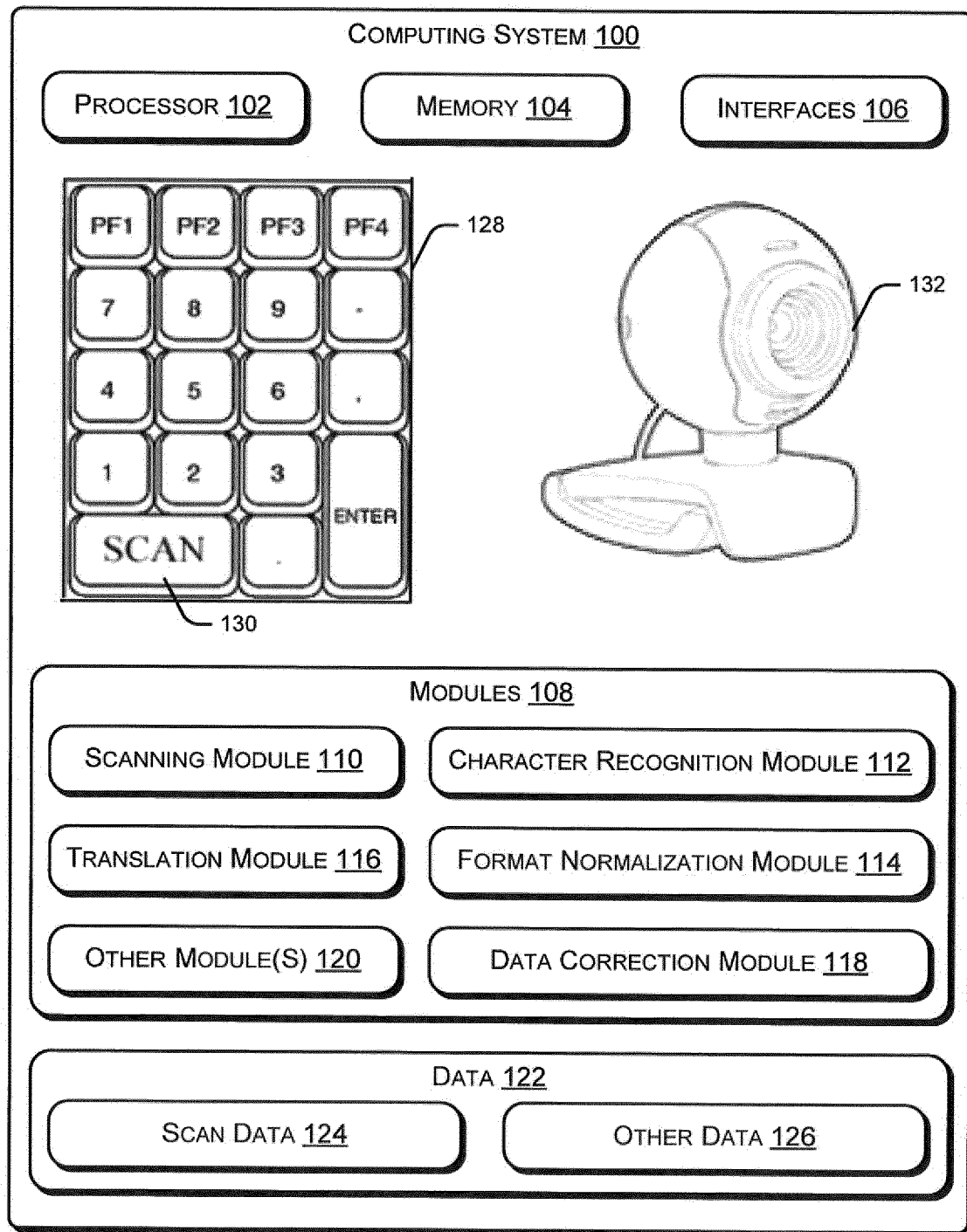


Figure 1

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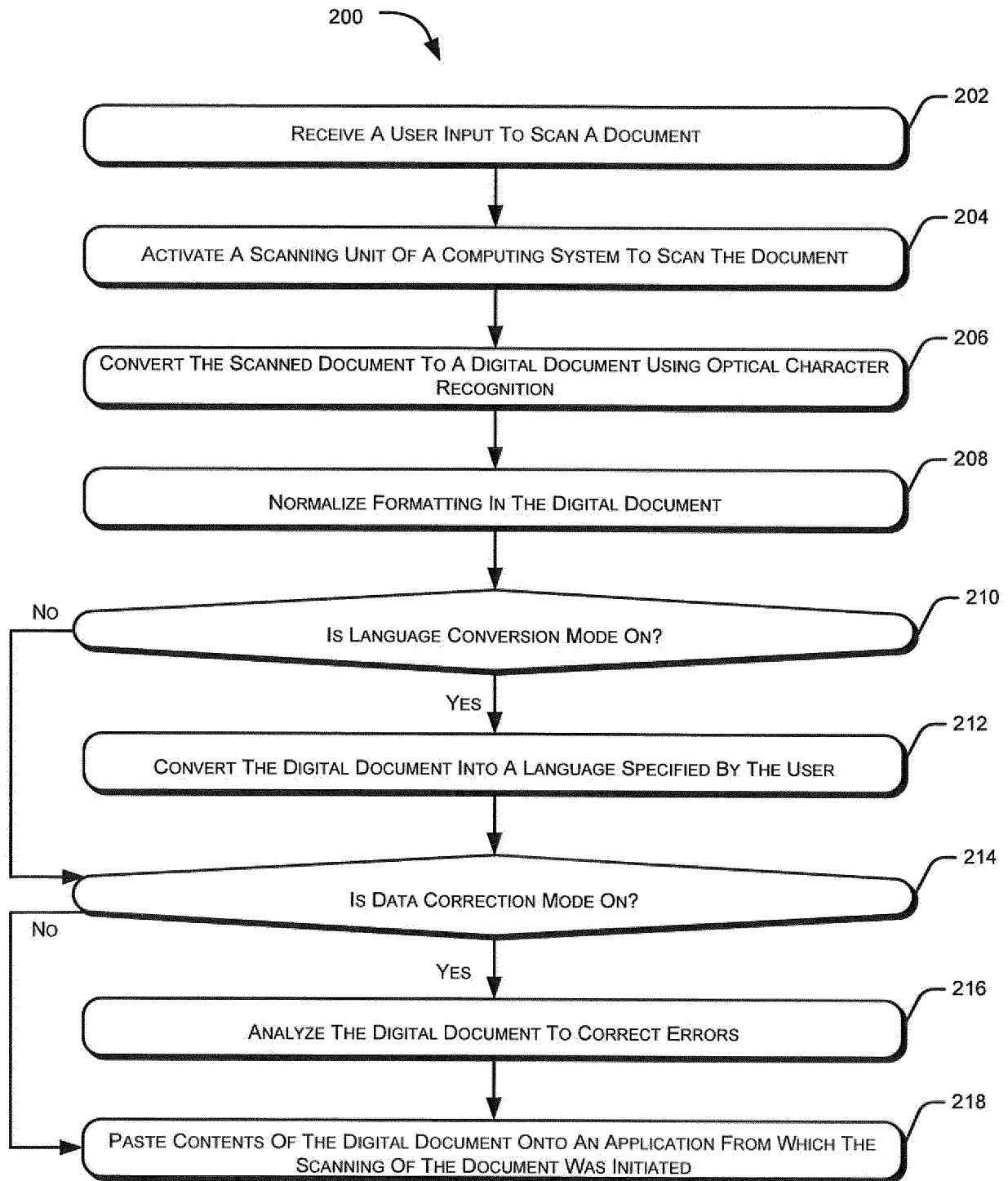


Figure 2

INTERNATIONAL SEARCH REPORT

International application No

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A. CLASSIFICATION OF SUBJECT MATTER

INV. H04N1/00

ADD.

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)

H04N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2005/205671 A1 (GELSOMINI TITO [US] ET AL) 22 September 2005 (2005-09-22) paragraphs [0010], [0011], [0043], [0051] - [0053] -----	1-13
X	WO 2006/011641 A1 (CANON KK [JP]; TONEGAWA NOBUYUKI [JP]) 2 February 2006 (2006-02-02) paragraphs [0012], [0051], [0052], [0057]; claims; figure 5 -----	1-13
X	US 2010/188419 A1 (RATNAKAR VIRESH [US] ET AL) 29 July 2010 (2010-07-29) paragraphs [0005], [0019] - [0027] ----- -/-	1-13



Further documents are listed in the continuation of Box C.



See patent family annex.

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Tel. (+31-70) 340-2040,
Fax: (+31-70) 340-3016

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Azaustre Maleno, V

INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2014/054267

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2012/075315 A1 (GOOGLE INC [US]; PETROU DAVID [US]; POPAT ASHOK C [US]; CASEY MATTHEW) 7 June 2012 (2012-06-07) paragraphs [0144], [0156] abstract -----	1-13
X	US 2012/050819 A1 (HONG JIANG [US]) 1 March 2012 (2012-03-01) claims; figure 2 -----	1-13
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