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PROVISIONAL APPLICATION FOR PATENT COVER SHEET

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53(c).

INVENTOR(S)

Given Name (first and middle [if any])	Family Name or Surname	Residence (City and either State or Foreign Country)
William Ho	Chang	Vancouver, WA

☑ Additional inventors are being named on the 1 separately numbered sheets attached hereto

TITLE OF THE INVENTION (280 characters max)

System, Method, Apparatus And Raster Imaging Process For Universal Output

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ENCLOSED APPLICATION PARTS (check all that apply)

☑ Specification *Number of Pages* 44
☑ Drawing(s) *Number of Sheets* 8
☐ Application Data Sheet. See 37 CFR 1.76
☐ CD(s), Number
☑ Other (specify) Receipt postcard

METHOD OF PAYMENT OF FILING FEES FOR THIS PROVISIONAL APPLICATION FOR PATENT

☑ Applicant claims small entity status. See 37 CFR 1.27.
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☒ No.
☐ Yes, the name of the U.S. Government agency and the Government contract number are: _____

Respectfully submitted,

SIGNATURE William Chang

TYPED or PRINTED NAME William Chang

TELEPHONE (360) 253 - 9388

Date 1/14/01

REGISTRATION NO. *(if appropriate)*

Docket Number: FLX000P000 6

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INVENTOR(S)/APPLICANT(S)		
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Number 1 of 1

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System, Method, Apparatus And Raster Imaging Process For Universal Output

Inventor: William Ho Chang and Ying Liu

Field of invention

Present invention relates to pervasive output. More particularly, it relates to system, apparatus, process, and method where an information apparatus can pervasively output digital document to different output devices without the need for installing multiple dedicated device dependent printer drivers.

Moreover, present invention provides universal output capability and process as well as provides a new raster image process and method of output or printing so that an information apparatus can pervasively output digital document to an output devices even if the Information apparatus may have relatively smaller processing power, display screen size and memory space.

Background

An Information apparatus refers to both stationary computers and mobile computing devices (pervasive devices). Examples of information apparatus include, without limitation, desktops, laptops, networked computers, palmtops (hand-held computer), personal digital assistants (PDAs), Internet enabled cellular phones, smart phones, pagers, digital capturing devices (e.g. digital cameras and video cameras), Internet or information appliances, e-books and digital or web pads among others. An output device may include fax machines, printers, copiers, image and/or video display devices (e.g. TV, monitors and projectors), and audio output devices. For simplicity and convenience, hereafter, we may refer to an output device as a printer and output process as printing. However, it should be understood that the term printer and printing used in the discussion of present invention may refer to a specific example intended to simplify the description or may be one preferred embodiment among others. The definition of printer used here should be easily applied and or extended to the larger scope and definition of output devices. In no way this should be construed as restricting the scope and practice of present invention.

In conventional output process, an output device (e.g. printer) is connected to information apparatus via wired connection such as through a cable line. A wireless connection may also be possible by using, for example, radio communication or infrared communication. Regardless of

wired or wireless connection, a user must first install in his/her information apparatus a device driver corresponding to a particular printer model and make. Using a dedicated or specific device-dependent driver, the user's information apparatus may process output content or digital document into a printer's input space. Printer's input space corresponds to the type of input that a printer understands (herein and after referred to as print data). For example, printer's input space or print data may include printer specific input format (e.g. image, graphics, file, data format), encoding, page description language (PDL), markup language, instructions, protocols or data that can be understood or used by a particular printer make and model. The print data format, protocol or language may be proprietary to a particular printer maker or published or combination. Printer's input space or print data is, in general, device dependent. Different printer model may specify its own input, designed or adopted for optimal operation by the printer manufacturer according to a specification. Consequently, different printers usually require their own specific printer drivers producing specific print data for accurate printing. A device driver (printer driver in this example) may process, control, manage, communicate, and output print data to a printer among other functions. A printer or device driver may be invoked or used by different application software. Sometimes, instead of using a printer or device driver, the device-driving feature may be included in an application software or as part of an application software.

Installation of a printer driver or application may be accomplished by, for example, installing manually using CD or floppy disk supplied by the printer manufacturer. Or alternatively, a user may be able to download that particular driver or application from a network. For a home or office user, this installation process may take anywhere from several minutes to several hours depending on the type of driver and user's sophistication level with computing devices and networks. Even with plug and play driver installation, it still requires the user to execute multiple-step process for each printer. Nevertheless, this installation and configuration process is adding undoubtedly a degree of complexity and work to end-users who may otherwise spend their time doing other productive or enjoyable work. Moreover, many unsophisticated users may be discouraged from adding new peripherals (e.g. printers, scanners) to their home computer or network only to avoid the hassle of installation and configuration. Therefore, there is a need to provide a method where a user can more conveniently or easily output digital content to an output device without the inconvenience of finding and installing multiple printer drivers in order to support multiple output devices.

Fueled by the ever-increasing bandwidth, processing power, wireless Internet, and availability of

mobile software applications for pervasive devices, millions (if not soon billions) of users will be creating, downloading, and transmitting content and information using their pervasive computing devices or a mobile information apparatus. With computing paradigm shifting from static to mobile, users need a method to output mobile content anywhere with their information apparatus.

To illustrate, a mobile worker at an airport, receiving Email in his hand-held computer (information apparatus) may want to walk up to a nearby printer or fax machine to have his e-mail printed. In addition, the mobile worker may also want to print a copy of his to do list, appointment book, business card, and his flight schedule from his mobile devices. As another example, a user reading a news article using his/her Internet-enabled pager or mobile phone may want to print out the complete article instead of reading it from the limited small screen on his pager or mobile device. Yet in another example, a user with a digital camera, after taking a picture, may want to easily print the picture out to a nearby printer. Still another example, a user may want to simply walk up to a printer with a mobile device and conveniently prints his/her PowerPoint, Word document, PDF, HTML, JPEG etc. stored in his/her mobile device or downloaded from a network (e.g. Internet, corporate network). It is further desirable if a user can output directly and conveniently content and information from their pervasive information apparatus, without depending for example on synchronizing with a static PC for output. Nor should output process and application be limited to only more powerful computing devices such as desktops and laptops.

Conventional printing method may pose significantly higher challenge and difficulty for mobile device users than for home and office users. The requirement for pre-installation of device-dependent driver is in conflict with the concept of pervasive computing and output. As mentioned in the above examples, a mobile user may want to print his e-mail, PowerPoint, web page, or other document at airport, in airplane, gas station, convenient store, kiosk, hotel, conference room, office, and at home. It is highly unlikely that the user finds at each of these locations printer of the same make and model. It is usually not a viable option to pre-install multiple (hundreds if not thousands) printer drivers in the user's information apparatus with limited memory space and processing power. Alternatively, a user may have to install and configure a printer driver each time at each of these locations before printing to every new printer encountered. The user may not want to be bothered with looking for a driver or downloading and installing it just to print out one page of email at the airport. This is certainly an

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