US 20110216367A1

(19) United States

(12) Patent Application Publication

(10) Pub. No.: US 2011/0216367 A1

(43) Pub. Date: Sep. 8, 2011

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(54) METHOD AND APPARATUS FOR PROVIDING BACKUP FONT SUPPORT FOR MISSING DEVICE GLYPHS

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(21) Appl. No.: **13/111,665**

(22) Filed: **May 19, 2011**

Related U.S. Application Data

(62) Division of application No. 09/190,555, filed on Nov. 12, 1998.

Publication Classification

(51) **Int. Cl.**

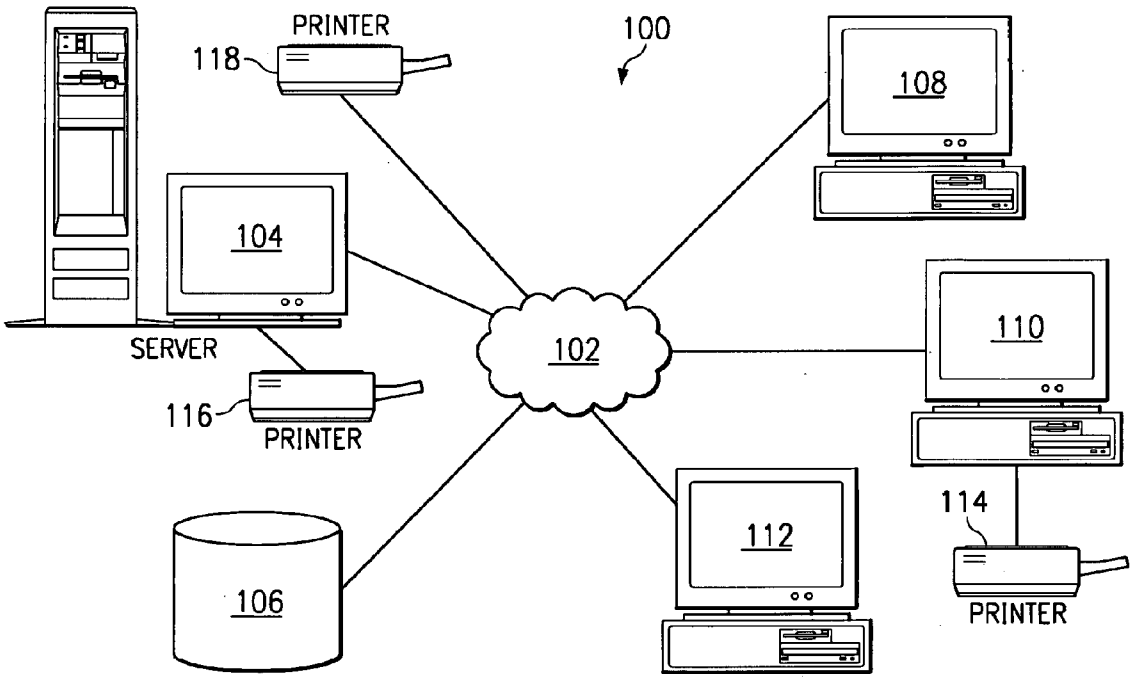
G06K 15/02 (2006.01)

G06T 11/00 (2006.01)

(52) **U.S. Cl.** **358/1.15**; 345/467

(57) **ABSTRACT**

The present invention provides a method and apparatus in a data processing system for printing characters. Data received includes glyphs for output on an output device, wherein the glyphs are to be output using a selected device font. Monitoring for unsupported glyphs in the selected device font is performed. In response to detecting a glyph unsupported by the selected device font, a back up system font is used to output the glyph to the output device.



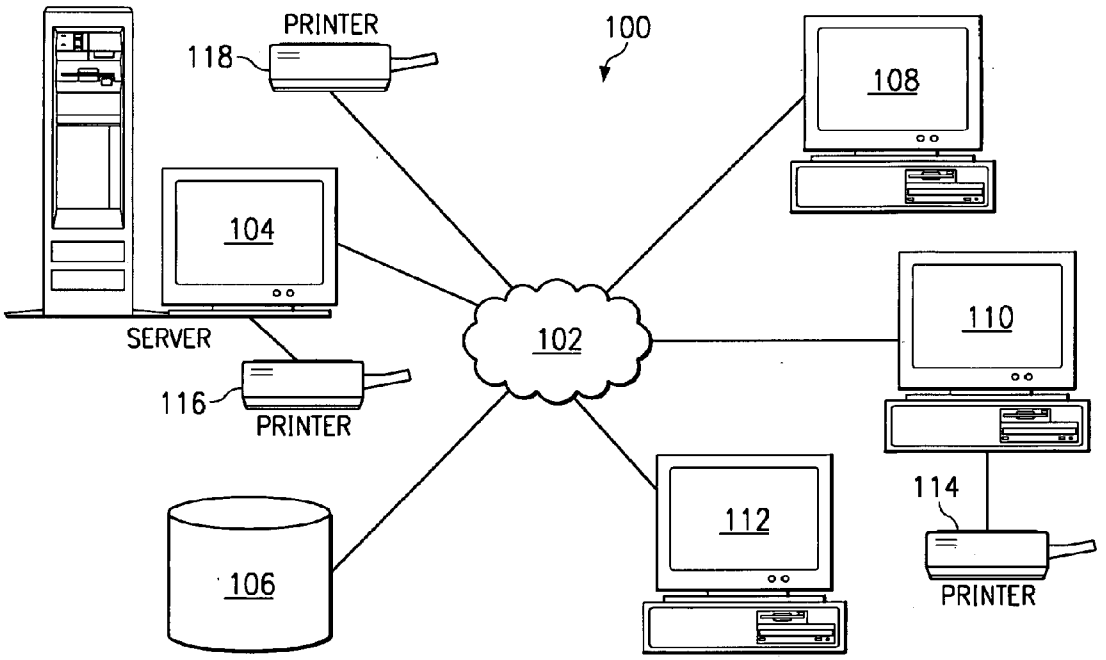

PRINTER
118
100
108
104
SERVER
102
110
116
PRINTER
114
112
106
PRINTER

FIG. 1

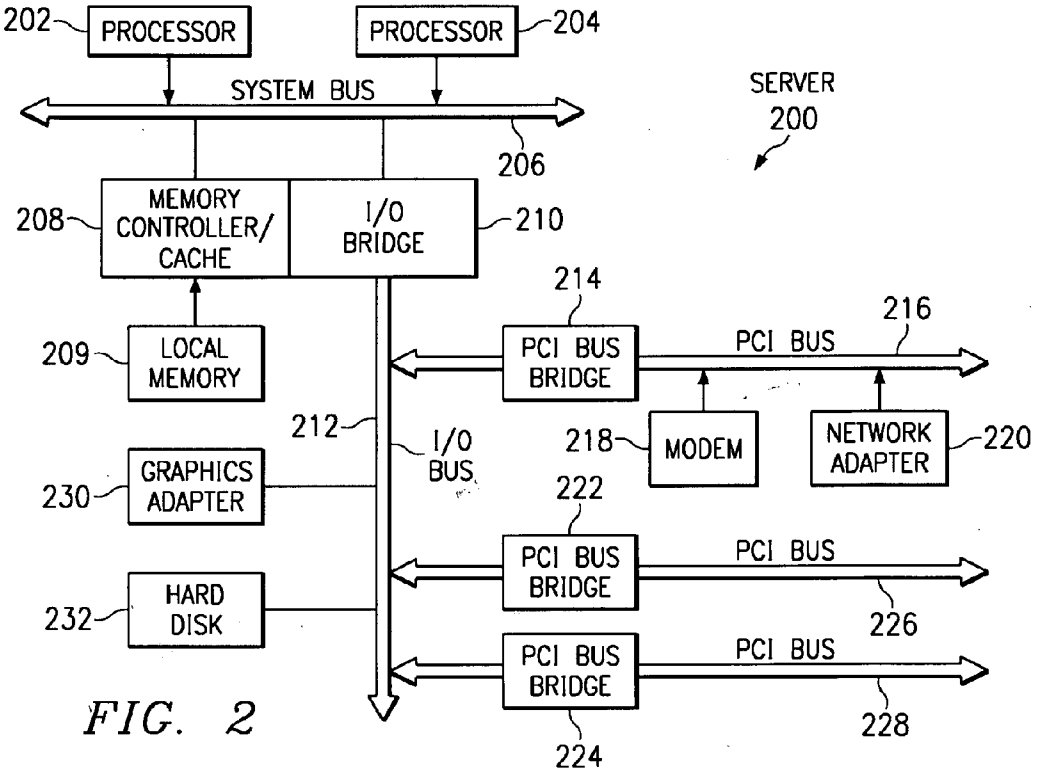

202
PROCESSOR
PROCESSOR
204
SYSTEM BUS
206
SERVER
200
208
MEMORY CONTROLLER/ CACHE
I/O BRIDGE
210
214
216
209
LOCAL MEMORY
PCI BUS BRIDGE
PCI BUS
212
I/O BUS
218
MODEM
NETWORK ADAPTER
220
230
GRAPHICS ADAPTER
222
PCI BUS BRIDGE
PCI BUS
232
HARD DISK
226
PCI BUS BRIDGE
PCI BUS
228
224

FIG. 2

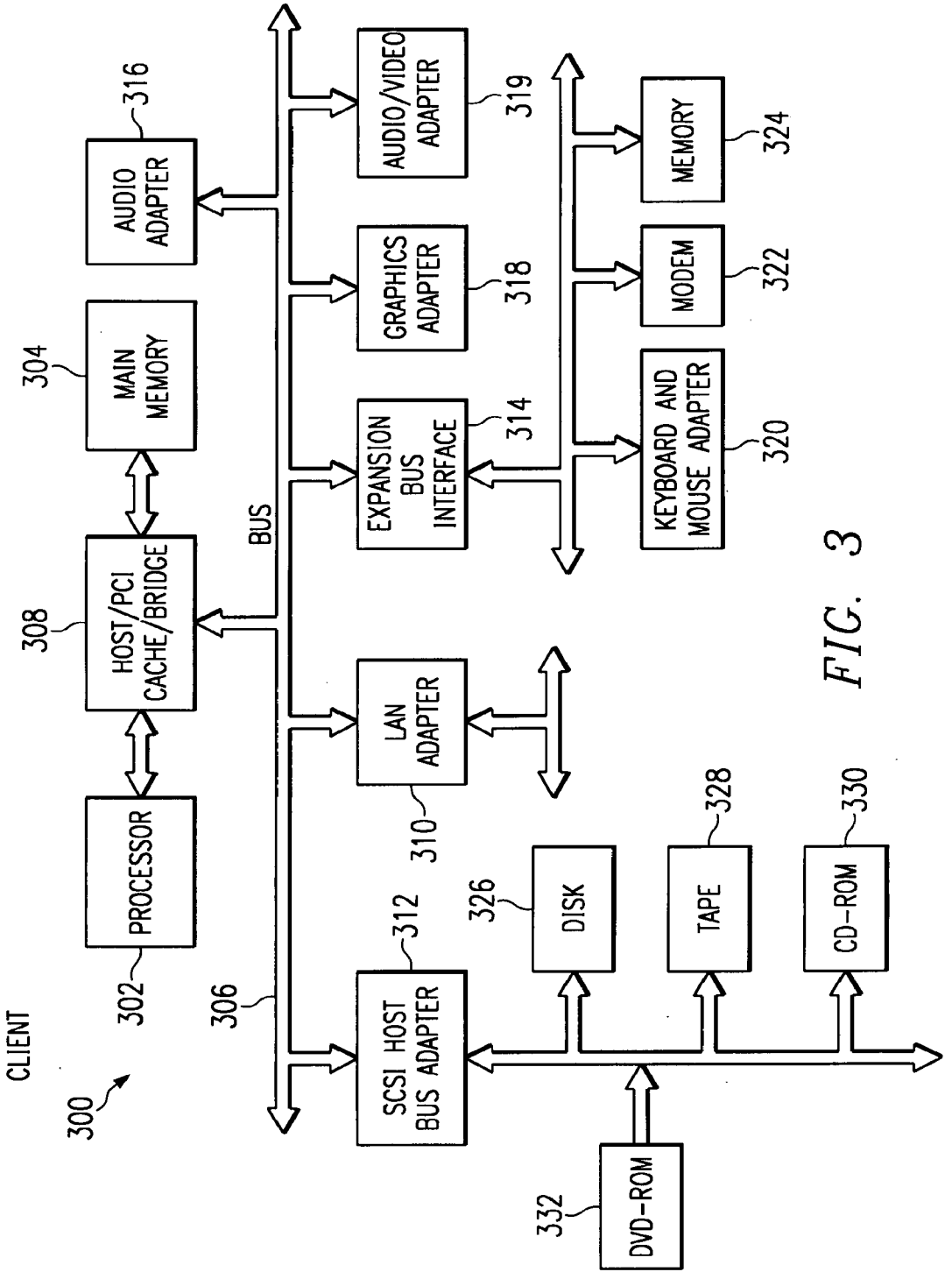

CLIENT
300
PROCESSOR
302
HOST/PCI CACHE/BRIDGE
308
MAIN MEMORY
304
AUDIO ADAPTER
316
BUS
306
SCSI HOST BUS ADAPTER
312
LAN ADAPTER
310
EXPANSION BUS INTERFACE
314
GRAPHICS ADAPTER
318
AUDIO/VIDEO ADAPTER
319
KEYBOARD AND MOUSE ADAPTER
320
MODEM
322
MEMORY
324
DISK
326
TAPE
328
CD-ROM
330
DVD-ROM
332

FIG. 3

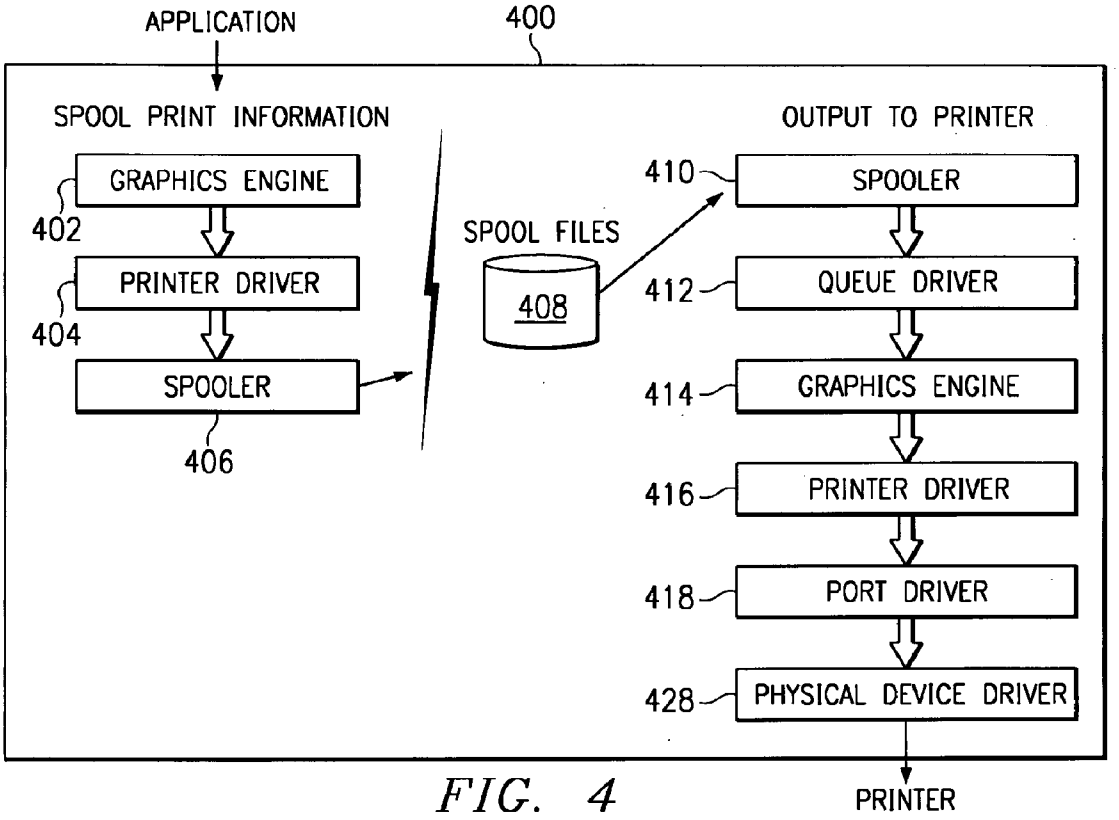

APPLICATION
400
SPOOL PRINT INFORMATION
OUTPUT TO PRINTER
GRAPHICS ENGINE
402
PRINTER DRIVER
404
SPOOLER
406
SPOOL FILES
408
410
SPOOLER
412
QUEUE DRIVER
414
GRAPHICS ENGINE
416
PRINTER DRIVER
418
PORT DRIVER
428
PHYSICAL DEVICE DRIVER
PRINTER

FIG. 4

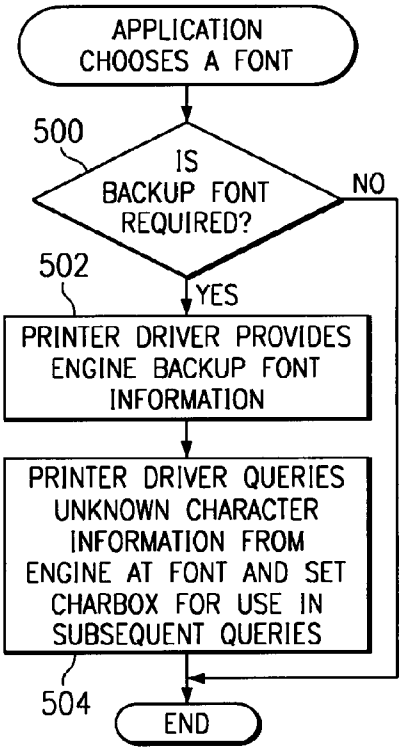

APPLICATION CHOOSES A FONT
500
IS BACKUP FONT REQUIRED?
NO
YES
502
PRINTER DRIVER PROVIDES ENGINE BACKUP FONT INFORMATION
PRINTER DRIVER QUERIES UNKNOWN CHARACTER INFORMATION FROM ENGINE AT FONT AND SET CHARBOX FOR USE IN SUBSEQUENT QUERIES
504
END

FIG. 5

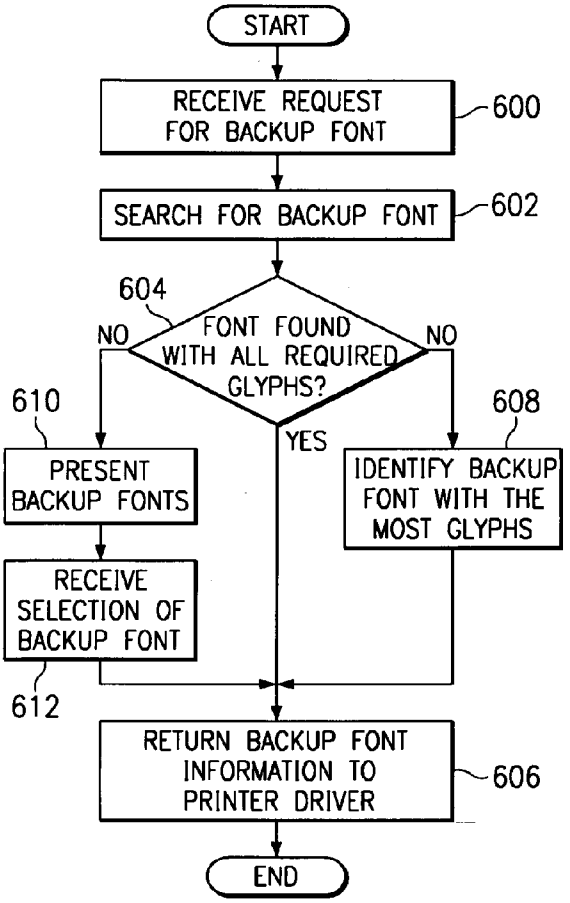

START
RECEIVE REQUEST FOR BACKUP FONT
600
SEARCH FOR BACKUP FONT
602
604
FONT FOUND WITH ALL REQUIRED GLYPHS?
NO
NO
YES
610
PRESENT BACKUP FONTS
RECEIVE SELECTION OF BACKUP FONT
612
608
IDENTIFY BACKUP FONT WITH THE MOST GLYPHS
RETURN BACKUP FONT INFORMATION TO PRINTER DRIVER
606
END

FIG. 6

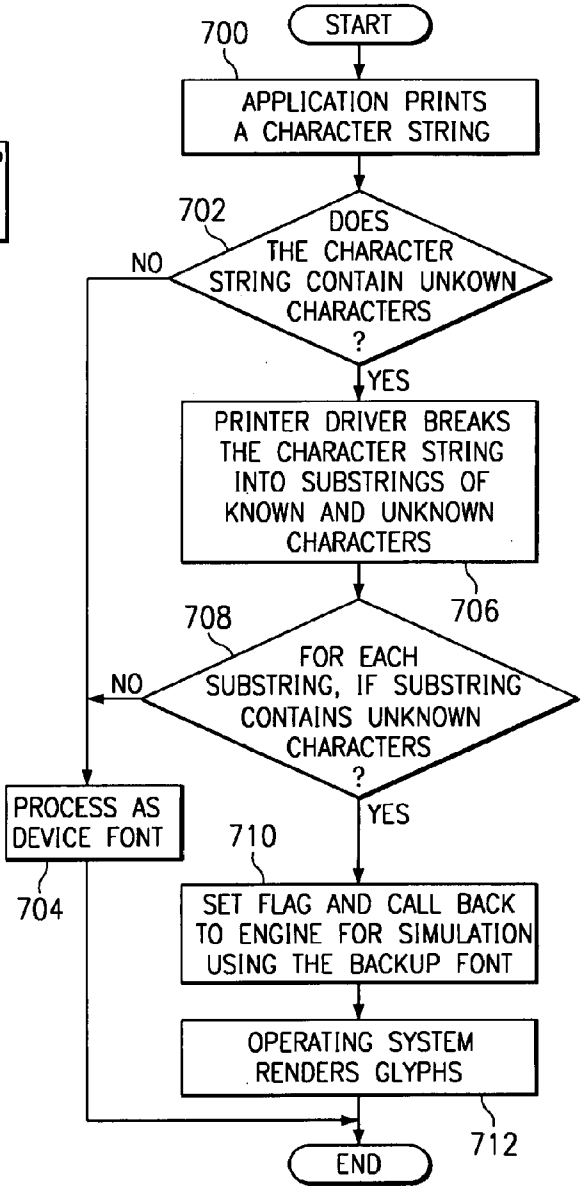

700
START
APPLICATION PRINTS A CHARACTER STRING
702
DOES THE CHARACTER STRING CONTAIN UNKOWN CHARACTERS ?
NO
YES
PRINTER DRIVER BREAKS THE CHARACTER STRING INTO SUBSTRINGS OF KNOWN AND UNKNOWN CHARACTERS
706
708
FOR EACH SUBSTRING, IF SUBSTRING CONTAINS UNKNOWN CHARACTERS ?
NO
YES
PROCESS AS DEVICE FONT
704
710
SET FLAG AND CALL BACK TO ENGINE FOR SIMULATION USING THE BACKUP FONT
OPERATING SYSTEM RENDERS GLYPHS
712
END

FIG. 7

METHOD AND APPARATUS FOR PROVIDING BACKUP FONT SUPPORT FOR MISSING DEVICE GLYPHS

BACKGROUND OF THE INVENTION

[0001] 1. Technical Field

[0002] The present invention relates to the field of information handling systems and in particular to an improved data processing system for presenting information to a user. Still more particularly, the present invention relates to a method and apparatus for providing backup font support for missing device font glyphs.

[0003] 2. Description of Related Art

[0004] During the creation of a print job, an application may use a variety of fonts and glyphs within the fonts to produce the desired text output on an output device, such as a printer or display device. A glyph is described as an image, usually an individual character within a font, or a graphic symbol whose appearance conveys information, such as, for example, the vertical and horizontal arrows on cursor keys that indicate the directions in which they control cursor movement. Typically, the application will select a code page, which defines the character encoding and the set of glyphs being used within the font. A code page is a standard character encoding that identifies a set of glyphs. The problem occurs when a font does not support all of the glyphs within a code page. In this instance, glyphs not present in the font are not printed. More specifically, when new glyphs are created such as the recent introduction of the Euro Currency character, many hardware devices that contain device fonts can not be readily updated to add the new glyph support. In the case of printing devices, this creates a situation where the new glyphs will simply be missing or incorrectly printed. One presently available method for printing missing glyphs involves turning off device fonts and using system fonts. A disadvantage with this method is that the amount of data downloaded to the printer increases by orders of magnitude, reducing efficiency in printing documents. Therefore, it would be advantageous to have an improved method and apparatus for outputting glyphs.

SUMMARY OF THE INVENTION

[0005] The present invention provides a method and apparatus in a data processing system for printing characters. Data received includes glyphs for output on an output device, wherein the glyphs are to be output using a selected device font. Monitoring for unsupported glyphs in the selected device font is performed. In response to detecting a glyph unsupported by the selected device font, a backup system font is used to output the glyph to the output device.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] The novel features believed characteristic of the invention are set forth in the appended claims. The invention itself, however, as well as a preferred mode of use, further objectives and advantages thereof, will best be understood by reference to the following detailed description of an illustrative embodiment when read in conjunction with the accompanying drawings, wherein:

[0007] FIG. **1** is a pictorial representation of a distributed data processing system in which the present invention may be implemented;

[0008] FIG. **2** is a block diagram of a data processing system which may be implemented as a server in accordance to the present invention;

[0009] FIG. **3** is a block diagram of a data processing system in which the present invention may be implemented;

[0010] FIG. **4** is a block diagram illustrating a typical print system in accordance with a preferred embodiment of the present invention;

[0011] FIG. **5** is a flowchart of a process of an application selecting a backup font in accordance with a preferred embodiment of the present invention;

[0012] FIG. **6** is a flowchart of a process for selecting a backup font in accordance with a preferred embodiment of the present invention; and

[0013] FIG. **7** is a flowchart of a process for the application printing a character string in accordance with a preferred embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0014] With reference now to the figures, and in particular with reference to FIG. **1**, a pictorial representation of a distributed data processing system in which the present invention may be implemented is depicted.

[0015] Distributed data processing system **100** is a network of computers in which the present invention may be implemented. Distributed data processing system **100** contains a network **102**, which is the medium used to provide communications links between various devices and computers connected together within distributed data processing system **100**. Network **102** may include permanent connections, such as wire or fiber optic cables, or temporary connections made through telephone connections.

[0016] In the depicted example, a server **104** is connected to network **102** along with storage unit **106**. In addition, clients **108**, **110**, and **112** also are connected to a network **102**. These clients **108**, **110**, and **112** may be, for example, personal computers or network computers. For purposes of this application, a network computer is any computer, coupled to a network, which receives a program or other application from another computer coupled to the network. In the depicted example, server **104** provides data, such as boot files, operating system images, and applications to clients **108-112**. Clients **108**, **110**, and **112** are clients to server **104**. Distributed data processing system **100** may include additional servers, clients, and other devices not shown. Distributed data processing system **100** also includes printers **114**, **116**, and **118**. A client, such as client **110** may print directly to printer **114**. Clients, such as client **108** and client **112** do not have directly attached printers. These clients may print to printer **116**, which is attached to server **104** or to printer **118**, which is a network printer that does not require connection to a computer for printing documents. Client **110** alternatively may print to printer **116** or printer **118** depending on the printer type and the document requirements.

[0017] In the depicted example, distributed data processing system **100** is the Internet with network **102** representing a worldwide collection of networks and gateways that use the TCP/IP suite of protocols to communicate with one another. At the heart of the Internet is a backbone of high-speed data communication lines between major nodes or host computers, consisting of thousands of commercial, government, educational, and other computer systems, that route data and messages. Of course, distributed data processing system **100**

also may be implemented as an umber of different types of networks, such as for example, an intranet or a local area network.

[0018] FIG. **1** is intended as an example, and not as an architectural limitation for the processes of the present invention.

[0019] Referring to FIG. **2**, a block diagram of a data processing system which may be implemented as a server, such as server **104** in FIG. **1**, is depicted in accordance to the present invention. Data processing system **200** may be a symmetric multiprocessor (SMP) system including a plurality of processors **202** and **204** connected to system bus **206**. Alternatively, a single processor system may be employed. Also connected to system bus **206** is memory controller/cache **208**, which provides an interface to local memory **209**. I/O bus bridge **210** is connected to system bus **206** and provides an interface to I/O bus **212**. Memory controller/cache **208** and I/O bus bridge **210** may be integrated as depicted.

[0020] Peripheral component interconnect (PCI) bus bridge **214** connected to I/O bus **212** provides an interface to PCI local bus **216**. A number of modems **218-220** may be connected to PCI bus **216**. Typical PCI bus implementations will support four PCI expansion slots or add-in connectors. Communications links to network computers **108-112** in FIG. **1** may be provided through modem **218** and network adapter **220** connected to PCI local bus **216** through add-in boards.

[0021] Additional PCI bus bridges **222** and **224** provide interfaces for additional PCI buses **226** and **228**, from which additional modems or network adapters may be supported. In this manner, server **200** allows connections to multiple network computers. A memory mapped graphics adapter **230** and hard disk **232** may also be connected to I/O bus **212** as depicted, either directly or indirectly.

[0022] Those of ordinary skill in the art will appreciate that the hardware depicted in FIG. **2** may vary. For example, other peripheral devices, such as optical disk drive and the like also may be used in addition or in place of the hardware depicted. The depicted example is not meant to imply architectural limitations with respect to the present invention.

[0023] The data processing system depicted in FIG. **2** may be, for example, an IBM RISC/System 6000 system, a product of International Business Machines Corporation in Armonk, N.Y., running the Advanced Interactive Executive (AIX) operating system.

[0024] With reference now to FIG. **3**, a block diagram of a data processing system in which the present invention may be implemented is illustrated. Data processing system **300** is an example of a client computer. Data processing system **300** employs a peripheral component interconnect (PCI) local bus architecture. Although the depicted example employs a PCI bus, other bus architectures such as Micro Channel and ISA may be used. Processor **302** and main memory **304** are connected to PCI local bus **306** through PCI bridge **308**. PCI bridge **308** also may include an integrated memory controller and cache memory for processor **302**. Additional connections to PCI local bus **306** may be made through direct component interconnection or through add-in boards. In the depicted example, local area network (LAN) adapter **310**, SCSI host bus adapter **312**, and expansion bus interface **314** are connected to PCI local bus **306** by direct component connection. In contrast, audio adapter **316**, graphics adapter **318**, and audio/video adapter (A/V) **319** are connected to PCI local bus **306** by add-in boards inserted into expansion slots. Expansion bus interface **314** provides a connection for a keyboard and mouse adapter **320**, modem **322**, and additional memory **324**. SCSI host bus adapter **312** provides a connection for hard disk drive **326**, tape drive **328**, CD-ROM drive **330**, and digital video disc read only memory drive (DVD-ROM) **332** in the depicted example. Typical PCI local bus implementations will support three or four PCI expansion slots or add-in connectors.

[0025] An operating system runs on processor **302** and is used to coordinate and provide control of various components within data processing system **300** in FIG. **3**. The operating system may be a commercially available operating system such as OS/2, which is available from International Business Machines Corporation. "OS/2" is a trademark of from International Business Machines Corporation. An object oriented programming system such as Java may run in conjunction with the operating system and provides calls to the operating system from Java programs or applications executing on data processing system **300**. Instructions for the operating system, the object-oriented operating system, and applications or programs are located on storage devices, such as hard disk drive **326** and may be loaded into main memory **304** for execution by processor **302**.

[0026] Those of ordinary skill in the art will appreciate that the hardware in FIG. **3** may vary depending on the implementation. For example, other peripheral devices, such as optical disk drives and the like may be used in addition to or in place of the hardware depicted in FIG. **3**. The depicted example is not meant to imply architectural limitations with respect to the present invention. For example, the processes of the present invention may be applied to multiprocessor data processing system.

[0027] The present invention provides a method, apparatus, and instructions for providing backup font support for missing glyphs. A mechanism is provided in which a device driver, such as, for example, a printer driver or video driver, informs a graphic sub-system to provide a backup font when the device driver is asked to output a character or glyph that is not located within the font supported by the device driver. In such an instance, the device driver calls back to the graphics drawing sub-system to draw the character or glyph. Furthermore, high performance characteristics of various fonts, such as printer fonts are available for the majority of the output while also providing support for characters that the device driver does not have the character definitions to draw. In this manner, device fonts are only turned off or not used when certain or selected glyphs unsupported by the device driver are encountered rather than drawing them completely using the graphic sub-system as presently performed.

[0028] Turning now to FIG. **4**, a block diagram illustrating a print system is depicted in accordance with a preferred embodiment of the present invention. Print system **400** performs the spooling and creation of a printer specific data stream on behalf of the application submitting the print request. In the depicted example, the printing process in print system **400** is divided into two phases, spooling or queuing of the print data and de-spooling or sending the data to the output device. The actual creation of the printer specific data stream may be performed during the spooling phase, or in some configurations when a metafile is used as a spool file the printer specific data stream connectivity, and server functionality, both phases of the print process may be done on a single system or the first phase may be done on a client, such as

client **110** in FIG. **1**, and the second phase may be done on a server, such as server **104** in FIG. **1**.

[0029] A graphics engine **402** is a component or is employed with a combination of components to produce similar functionality for print system **400**. Graphics engine **402** is responsible for mapping or converting the application interface calls or graphics API calls to the printer device interfaces. In the spooling phase, printer driver **404** is responsible for creating the printer specific data that is sent to the printer to produce the desired output. Printer driver **404** identifies unsupported characters and calls back to graphics engine **402** for simulation of characters or glyphs. For example, if a string of several characters is sent to printer driver **404** and the substring of several different characters is unsupported, printer driver **404** calls back to graphics engine **400** to simulate these characters at which time, graphics engine **402** associates another font with the device font. In many instances, this component provides configurable settings and returns information about the device. In some systems, this component is called a formatter since it formats the data appropriately for the printer. In other systems, this component is called a transform since it transforms the operating system calls or input stream to the data stream appropriate for the printer.

[0030] Next, spooler **406** is a component in print system **400** that stores and retrieves the print jobs as spool files **408**, using a queuing algorithm to coordinate access to the printer.

[0031] In the de-spooling phase, spooler **410** retrieves print jobs from spool files **408**. The data is later printed when queue driver **412** is available. Queue driver **412** is used to pre-format the spool data from spool files **408** before sending the data to the printer driver installed for the device. In most cases, this component, queue driver **412**, is handling the case where a metafile has been spooled to spool files **408** and the metafile must be played back to the underlying print components by calling operating system components that parse the metafile and convert the metafile back to graphics calls that can be passed to the graphics engine. In other instances where printer specific data has been spooled, queue driver **412** simply passes the raw data to the underlying components of the print system.

[0032] Graphics engine **414** is then employed from queue driver **412** for converting the specific raw data or graphics to printer driver **416**. Printer driver **416** is then responsible for creating the printer specific data to produce the desired output. Some printing systems separate the logic of how to communicate or send data to the printer device into a port driver **418**, which is responsible for handling the device driver interface to the printer. Physical device driver **420** is a component responsible for the hardware protocols, such as, for example, hardware interrupts, and supporting a set of input and output functions used to communicate with or transmit data to the printer.

[0033] When the spooling and de-spooling phases are performed on the same computer, graphics engine **402** is the same graphics engine as graphics engine **414**. Also, printer driver **404** and spooler **406** correspond to printer driver **416** and spooler **410**. These components are different when the de-spooling or the actual printing of a print job from spool files **408** is performed at a different computer than the one in which an application generates a print job.

[0034] Printer driver **416** includes device fonts, which are fonts owned and handled by the device or device driver associated with the device. System fonts are fonts that are owned and handled by the operating system. When printer driver **404** or **416** encounters a glyph that is missing, the device driver indicates to the operating system that a backup font is required. Device driver calls back to the operating system with the glyphs to be provided by the operating system. In the depicted example, the back up font is a system font provided by the operating system. The processes for selecting and automatically using a backup font to provide missing glyphs is described in more detail below. The printer driver that makes the callback is the printer driver that is converting meta data format to printer specific format.

[0035] Referring next to FIG. **5**, a flowchart of a process of an application selecting a backup font is depicted in accordance with a preferred embodiment of the present invention. In the depicted example, the backup font is a system font that is employed to supply missing glyphs encountered in a device font during the printing process.

[0036] This process is initiated when an application chooses a font. The process begins by the printer driver determining whether a backup font is requited based on the possible inability to print a glyph using the printer driver font (step **500**). In the depicted example, this font is a device font. If the entire range of glyphs is not supported by this font, the printer driver indicates to the operating system that a backup font is required. Next, the printer driver provides the system information about the backup font so that the operating system can select the appropriate backup font (step **502**). Information provided to the graphic sub-system in the operating system may include, for example, font name and font metrics, which are more precise characteristics of the font used for font selection. Other information provided to the operating system may include the desired range of glyphs that the backup font will be required to supply. The printer driver then queries unknown character information, such as, character widths, from the graphics engine and builds a set of information about the backup font by combining information from the device font and the backup font (step **504**) with the process terminating thereafter. For speed, the driver for the device or system component which may be responding to queries about the font or glyphs within the font may build a single set of information about the font by combining information from the device font and backup font. This set of information may be created, for example, for each particular job or for a particular application. With respect to creating a set of information for a particular application, the data structure containing the application may be persistent based on whether the application is active. With reference again to step **500**, if a backup font is not required, the process then terminates.

[0037] Turning next to FIG. **6**, a flowchart of a process used by the operating system for selecting a backup font is depicted in accordance with a preferred embodiment of the present invention. In the depicted example, the process in FIG. **6** is implemented by the operating system to select an appropriate system font. The process begins by receiving a request for selection of a backup font (step **600**). This request includes backup font information from the printer driver. This information will describe the font or characteristics of the font required to print glyphs not supported by the device font. The operating system then performs a search for the appropriate backup font (step **602**). An appropriate backup font may be one that has more characters available than the device font. A determination is then made as to whether a backup font that is able to support all of the glyphs unsupported by the device

font has been found (step **604**). If such a font has been found, the process then returns backup font information to the printer driver (step **606**) with the process terminating thereafter.

[0038] If a font containing all of the missing glyphs from the device font is not present, the backup font with the most glyphs is identified as the backup font for use by the printer driver (step **608**). Optionally, the path through **610** and **612** may be taken instead. In such a case, backup fonts are presented for selection (**610**). In this manner, a user may select the backup font that contains glyphs most important for printing. Thereafter, a selection of the backup font is received (step **612**) with the process then proceeding to step **606** as described above. Alternatively, in step **608** more than one backup font may be identified in which the multiple backup fonts support the entire range of glyphs missing from the device font.

[0039] Turning now to FIG. **7**, a flowchart of a process for the application printing a character string is depicted in accordance with a preferred embodiment of the present invention. The process begins by the application printing a character string to the printer driver (step **700**). A determination is made as to whether the character string contains glyphs that are unavailable in the device font (step **702**). If the character string does not contain any glyphs that can not be created by the device font, the character string is processed as a normal device font (step **704**) with the process terminating thereafter.

[0040] If the character string does contain glyphs that are unavailable in the device font, the character string is then broken into substrings consisting of known and unknown characters or glyphs (step **706**). Each substring is processed according to the contents of the substring. The boundaries of the substring are defined by the glyphs known and unknown to the printer driver. In other words, a substring will contain either all known glyphs or all unknown glyphs. Using these boundaries, the device driver can call back to the operating system only for the glyphs that are needed. A determination is made as to whether the substring contains unknown characters or glyphs (step **708**). If the substring does consist of known characters or glyphs, the substring is processed as a normal device font string as described above in step **704**. However, if the substring contains unknown characters or glyphs, the unknown characters or glyphs are processed using a backup font in which the printer driver sets a flag indicating to the operating system that the substring should be processed with the backup font (step **710**). The operating system then utilizes the backup font and backup font information to render the glyphs with the process terminating thereafter (step **712**). When the operating system is "rendering" the glyphs, a process of converting graphic drawings or font size and positioning calls to device specific data is employed. Alternatively, the printer driver may obtain the glyph information and use this information to print the glyphs thereafter.

[0041] Backup fonts are implemented in both the OS/2 Graphics Engine (GRE) and the individual printer drivers. The printer drivers are responsible for identifying the system font to be used for backup and for notifying the GRE when this backup font is to be used instead of the device font.

[0042] When the GRE calls the printer driver to realize, or instantiate, a device font, the printer driver's response includes a pointer to the facename of the system font to be used for backup purposes. The facename is the name of the system font. When text output and query calls are made to the GRE by the printer driver, the COM NODEVICE flag is used to indicate that all glyphs are to be taken from the backup font instead of the device font. Because all of the glyphs within a substring must be taken from one font or the other, the printer driver is responsible for converting all text strings into a collection of substrings composed entirely of either glyphs from the device font or glyphs from the backup font, not both.

[0043] Whenever the GRE receives a text call with the COM NODEVICE flag set, it verifies that a backup font has been defined for this device font. If the backup font exists, the GRE calls itself recursively to process the call using the backup font as the current font.

[0044] It is important to note that while the present invention has been described in the context of a fully functioning data processing system, those of ordinary skill in the art will appreciate that the processes of the present invention are capable of being distributed in a form of a computer readable medium of instructions and a variety of forms and that the present invention applies equally regardless of the particular type of signal bearing media actually used to carry out the distribution. Examples of computer readable media include recordable-type media such a floppy disc, a hard disk drive, a RAM, and CD-ROMs and transmission-type media such as digital and analog communications links.

[0045] The description of the present invention has been presented for purposes of illustration and description, but is not limited to be exhaustive or limited to the invention in the form disclosed. Many modifications and variations will be apparent to those of ordinary skill in the art. For example, although the depicted embodiment is directed towards a device driver that is in the form of a printer driver for printing various characters and glyphs to a printer, the present invention may be employed to provide support for missing glyphs for other types of output devices, such as a display device. In addition, although the depicted example illustrates processes of the present invention implemented in a device driver, the processes of the present invention may be implemented in other components called by the device driver. The embodiment was chosen and described in order to best explain the principles of the invention, the practical application, and to enable others of ordinary skill in the art to understand the invention for various embodiments with various modifications as are suited to the particular use contemplated.

1-4. (canceled)

5. A method in a data processing system for printing characters, the method comprising the data processing system implemented steps of:

receiving data including glyphs for output on an output device, wherein the glyphs are to be output using a selected font;

monitoring for glyphs unsupported by the selected font; and

responsive to detecting a glyph unsupported by the selected font, using a backup font to output the glyph to the output device, while remaining glyphs are output using the selected font.

6. The method of claim **5**, wherein the output device is a printer.

7. The method of claim **5**, wherein the output device is a display device.

8. The method of claim **5**, wherein the receiving, monitoring, and using steps are implemented in a printer driver.

9. The method of claim **5**, wherein the receiving, monitoring, and using steps are implemented in a video driver.

10. The method of claim **5**, wherein a set of information about the selected font and the backup font is created for use

in monitoring for glyphs unsupported by the selected font and for using a backup font to output the glyph to the output device.

11. A method in a computer system for presenting glyphs using an output device, the method comprising:

responsive to detecting a selection of font, determining whether the font is able to output all glyphs in a range of glyphs that may be used;

selecting a backup font based on the range of glyphs;

responsive to receiving a data stream for output on the output device, determining whether particular glyphs are present that are outside of the range of glyphs; and

responsive to a determination that the glyph is present, using the backup font to send the particular glyphs to the output device.

12. The method of claim **11**, wherein the using step includes:

breaking up the data stream into a first set of glyphs containing glyphs within the range of glyphs and into a second set of glyphs containing glyphs outside of the range of glyphs;

sending the first set of glyphs using the selected font; and

sending the second set of glyphs using the backup font.

13. The method of claim **11**, wherein the output device is a printer.

14. The method of claim **11**, wherein the output device is a video display device.

15. A printer system comprising:

a printer; and

a device driver, wherein the device driver includes:

receiving means for receiving data including glyphs for output to the printer, wherein the glyphs are to be output using a selected font;

monitoring means for monitoring for glyphs unsupported by the selected font; and

printing means, responsive to detecting a glyph unsupported by the selected font, printing glyph using a backup font to print a character at the printer.

16. The printer system of claim **15**, wherein the printing means comprises:

requesting means for requesting the glyph in the backup font; and

printing means for printing the glyph in the backup font.

17-19. (canceled)

20. A computer system for performing a method for printing characters, the method comprising the computer system implemented steps of:

receiving means for receiving data including glyphs for output on an output device, wherein the glyphs are to be output using a selected font;

monitoring means for monitoring for glyphs unsupported by the selected font; and

using means, responsive to detecting a glyph unsupported by the selected font, for using a backup font to output the glyph to the output device, while remaining glyphs are output using the selected font.

21. The computer system of claim **20**, wherein the output device is a printer.

22. The computer system of claim **20**, wherein the output device is a display device.

23. The computer system of claim **20**, wherein the receiving means, monitoring means, and using means are implemented in a printer driver.

24. The computer system of claim **20**, wherein the receiving means, monitoring means, and using means are implemented in a video driver.

25. The computer system of claim **20**, wherein the receiving means, monitoring means, and using means are implemented in a software component called by a device driver when glyphs are to be output on the output device by the device driver.

26. The computer system of claim **20**, wherein a set of information about the selected font and the backup font is created for use by the monitoring means.

27. The computer system of claim **26**, wherein the set of information is created for a print job.

28. The computer system of claim **26**, wherein the set of information is created for an application.

29. The computer system of claim **28**, wherein the set of information created for the application is present while the applications is active.

30. A computer system for performing a method for presenting glyphs using an output device, the method comprising:

determining means, responsive to detecting a selection of font, for determining whether the font is able to output all glyphs in a range of glyphs that may be used;

selecting means for selecting a backup font based on the range of glyphs;

determining means, responsive to receiving a data stream for output on the output device, for determining whether particular glyphs are present that are outside of the range of glyphs; and

using means, responsive to a determination that the glyph is present, for using the backup font to send the particular glyphs to the output device.

31. The computer system of claim **30**, wherein using means includes:

breaking means for breaking up the data stream into a first set of glyphs containing glyphs within the range of glyphs and into a second set of glyphs containing glyphs outside of the range of glyphs;

first sending means for sending the first set of glyphs using the selected font; and

second sending means for sending the second set of glyphs using the backup font.

32. The computer system of claim **30**, wherein the output device is a printer.

33. The computer system of claim **30**, wherein the output device is a video display device.

34. A method in a computer system for printing comprising:

receiving a string of glyphs for printing at a printer driver in a computer system, wherein the string of glyphs includes glyphs to be printed using a selected font;

determining whether glyphs within the string of glyphs are unsupported by the selected font;

responsive to a determination that a specific glyphs in the string of glyphs are unsupported absent by the selected font, dividing the string of glyphs into a plurality of substrings, each substring containing either only glyphs supported by the selected font or only glyphs unsupported by the selected font;

printing the substrings containing glyphs supported by the selected font using the selected font; and

printing the substrings containing glyphs unsupported by the selected font using a backup font containing a specific character.

35. (canceled)

36. A computer program product in a computer readable medium for printing characters, the computer program product comprising:

first instructions for receiving data including glyphs for output on an output device, wherein the glyphs are to be output using a selected font;

second instructions for monitoring for glyphs unsupported by the selected font; and

third instructions, responsive to detecting a glyph unsupported by the selected font, for using a backup font to output the glyph to the output device, while remaining glyphs are output using the selected font.

37. A computer program product in a computer readable media for presenting glyphs using an output device, the computer program product comprising:

first instructions, responsive to detecting a selection of font, for determining whether the font is able to output all glyphs in a range of glyphs that may be used;

second instructions for selecting a backup font based on the range of glyphs;

third instructions, responsive to receiving a data stream for output on the output device, for determining whether particular glyphs are present that are outside of the range of glyphs; and

fourth instructions, responsive to a determination that the glyph is present, for using the backup font to send the particular glyphs to the output device.

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