

LOGO WEAVING

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority to Chinese Patent Application No. 201810590235.9, filed on June 8, 2018 and entitled "LOGO WEAVING METHOD AND APPARATUS, ELECTRONIC DEVICE, STORAGE MEDIUM, AND WOVEN LOGO", which is incorporated herein by reference in its entirety.

TECHNICAL FIELD

[0002] This application relates to logo weaving.

BACKGROUND

[0003] Weaving a logo on items such as a textile is often referred to as logo weaving. Logo weaving is a process of weaving on a logo weaving machine by fixing warp yarns and using weft yarns to express information such as texts, graphics, letters, numerals, three-dimensional logos, and color combinations. In a production process of weaving a logo, generally a customer provides an image of the logo first, and then a worker draws the image of corresponding pixels manually on an electronic device such as a computer. After the image of the logo is drawn, the electronic device generates image data that is used to control the logo weaving machine to weave the corresponding logo. Depending on complexity of the image of the logo, a drawing worker generally can complete drawing 2 to 5 images of logos in a day. However, with the extensive use of logo weaving, some logos of different patterns need to be produced within a limited time. In meeting such needs, the customer provides several images of logos. However, nowadays, the practice of manually generating the image data that is used to control the logo weaving machine to weave the corresponding logo can hardly meet the needs of producing various woven logos within a limited time.

SUMMARY

[0004] To resolve the above problems, according to a first aspect, an embodiment of this application provides a logo weaving method. The method includes: obtaining image content description information of a to-be-woven logo; obtaining weave control information that is used for weaving the logo; generating weave data of the logo according to the weave control

information and the image content description information; and controlling weaving equipment to weave the logo according to the weave data.

[0005] According to a second aspect, an embodiment of this application provides a logo weaving apparatus. The apparatus includes: an image content description information obtaining module, a weave control information obtaining module, a weave data determining module, and a weaving module. The image content description information obtaining module is configured to obtain image content description information of a to-be-woven logo. The weave control information obtaining module is configured to obtain weave control information that is used for weaving the logo. The weave data determining module is configured to generate weave data of the logo according to the weave control information and the image content description information. The weaving module is configured to control weaving equipment to weave the logo according to the weave data.

[0006] According to a third aspect, an embodiment of this application further discloses a woven logo, which is woven by using the logo weaving method according to this embodiment of this application.

[0007] According to a fourth aspect, an embodiment of this application further discloses an electronic device. The electronic device includes a memory, a processor, and a computer program stored in the memory and executable on the processor. When executing the computer program, the processor implements the logo weaving method according to this embodiment of this application.

[0008] According to a fifth aspect, an embodiment of this application provides a computer-readable storage medium, on which a computer program is stored. When executed by a processor, the program performs the steps of the logo weaving method disclosed in this embodiment of this application.

[0009] In the logo weaving method and apparatus, electronic device, and storage medium disclosed in the embodiments of this application, the image content description information of the to-be-woven logo is obtained, and the weave control information that is used for weaving the logo is obtained; and then the weave data of the logo is generated according to the obtained weave control information and image content description information; and finally, the weaving equipment is controlled to weave the logo according to the weave data, thereby effectively improving efficiency of weaving logos.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] To describe the technical solutions in the embodiments of this application more clearly, the accompanying drawings required for describing the embodiments are briefly

described hereinafter. Apparently, the accompanying drawings in the following description show merely some embodiments of this application, and a person of ordinary skill in the art may obtain other accompanying drawings from these accompanying drawings without creative efforts.

- 5 [0011] FIG. 1 is a flowchart of a logo weaving method according to a first embodiment of this application;
- [0012] FIG. 2 is a flowchart of a logo weaving method according to a second embodiment of this application;
- 10 [0013] FIG. 3 is a schematic diagram of an application scenario of a logo weaving method according to a second embodiment of this application;
- [0014] FIG. 4 is a schematic diagram of another application scenario of a logo weaving method according to a second embodiment of this application;
- [0015] FIG. 5 is a schematic diagram of still another application scenario of a logo weaving method according to a second embodiment of this application;
- 15 [0016] FIG. 6 is a schematic structural diagram of a logo weaving apparatus according to a third embodiment of this application;
- [0017] FIG. 7 is another schematic structural diagram of a logo weaving apparatus according to a third embodiment of this application;
- [0018] FIG. 8 is a photo of a logo woven by using the logo weaving method according to an
- 20 embodiment of this application; and
- [0019] FIG. 9 is a schematic structural diagram of an electronic device according to a fourth embodiment of this application.

DETAILED DESCRIPTION OF THE EMBODIMENTS

- 25 [0020] The following clearly and completely describes the technical solutions in the embodiments of this application with reference to the accompanying drawings in the embodiments of this application. Apparently, the described embodiments are some embodiments of this application rather than all of the embodiments. All other embodiments obtained by a person of ordinary skill in the art based on the embodiments of this application without creative efforts shall fall within the protection scope of this application.

30 Embodiment 1

- [0021] This embodiment discloses a logo weaving method. As shown in FIG. 1, the method includes steps 110 to 140.
- [0022] Step 110: Obtain image content description information of a to-be-woven logo.
- [0023] The image content description information of the to-be-woven logo is information

that describes a pattern in the logo to be obtained by weaving. Generally, the image content description information is provided by a customer, and may be used to generate control data that is used to control weaving equipment to weave the logo. In some embodiments of this application, the image content description information may be: a template picture, an image
5 file, an image generation rule, a string, or any one or more thereof. The template picture is generally a paper design drawing. The image file is an image file that includes the pattern in the logo, and may be in a format such as JPG and PNG. The image generation rule may be text information that is used to describe a rule of generating the pattern in the logo. The string generally denotes the pattern in the logo.

10 **[0024]** Step 120: Obtain weave control information that is used for weaving the logo.

[0025] Before the logo is produced on a production line, the production line needs to be configured first, to configure the weave control information that is used for weaving the logo. The weave control information includes but is not limited to size information of the logo and thread type information that is used for weaving the logo. The weave control information may
15 be stored locally on the production line or stored in the cloud.

[0026] Step 130: Generate weave data of the logo according to the weave control information and the image content description information.

[0027] In specific implementation, after obtaining the image content description information of the logo, it is necessary to determine a production image that corresponds to the image
20 content description information and that is in a uniform file format, for example, an image in a BMP file format. In specific implementation, the specific solutions vary as regards how to extract pattern information from different types of content description information of images to generate production images corresponding to the content description information of images. For example, images in a uniform file format may be output by scanning paper design
25 drawings; an image generation program may be compiled according to the image generation rule and executed to generate production images in a uniform file format; or the production images in a uniform file format may be obtained by converting formats of image files.

[0028] When a logo needs to be produced on a production line, data parsing is performed on the production image first to obtain a color value and row-column location information of
30 each pixel in the production image. Then, according to size information of the logo configured on the production line and thread type information that is used for weaving the logo, the quantity of yarns required for weaving a logo region corresponding to each pixel is determined. Thereafter, weave data of the logo region corresponding to each pixel is determined according to the row-column location information of each pixel in the production
35 image, the color value of each pixel, the quantity of yarns required for weaving a logo region

corresponding to each pixel, and the thread type information. Finally, the weave data of the logo region corresponding to each pixel in the production image is arranged according to a preset rule to obtain the weave data of the logo.

[0029] The weave data is data that is used to control weaving equipment to perform weaving, and is generally expressed in the form of an array. For example, the weave data is used to record the weave data, such as the quantity of yarns and color value, of the logo region corresponding to each pixel in the image of the to-be-woven logo.

[0030] Step 140: Control weaving equipment to weave the logo according to the weave data.

[0031] After the weave data of the logo is determined, corresponding weave data is selected in the weave data of the logo in a preset weaving order, for example, in order from an upper left side to a lower right side of the logo, and is sent to the weaving equipment so that the weaving equipment is controlled to weave the corresponding logo.

[0032] In some embodiments of this application, the step of obtaining the weave control information that is used for weaving the logo may be performed first, and then the step of obtaining the image content description information of the logo is performed. The order of the two steps is not limited in this application.

[0033] In the logo weaving method disclosed in this embodiment of this application, the woven data can be automatically generated according to the image content description information of the to-be-woven logo, thereby effectively improving efficiency of weaving logos.

Embodiment 2

[0034] This embodiment discloses a logo weaving method. As shown in FIG. 2, the method includes steps 200 to 260.

[0035] Step 200: Obtain weave control information that is used for weaving a to-be-woven logo.

[0036] In some embodiments of this application, the weave control information includes: size information of the logo and thread type information that is used for weaving the logo. For a specific method for obtaining the weave control information that is used for weaving the logo, see Embodiment 1, and details are omitted in this embodiment.

[0037] Step 210: Obtain image content description information of the logo.

[0038] The image content description information of the logo is information that is used to describe the pattern of the logo to be obtained by weaving, and is generally provided by a customer, and may be used to generate control data that controls weaving equipment to weave to form the pattern of the logo. In some embodiments of this application, the image content description information may be: a template picture, an image file, an image generation rule, a

string, or any one or more thereof.

[0039] In some embodiments of the present application, when the image content description information of the logo is an image file, an image generation rule, a string, or the like, the image content description information may be obtained through a cloud database or a network platform. That is, a customer uploads the image content description information of the logo to a designated web server or cloud database, and then a manufacturer downloads the image content description information by logging in to the designated web server or cloud database.

[0040] Step 220: Determine a production image corresponding to the image content description information.

[0041] In some embodiments of this application, before generating the weave data of the logo, the method further includes: determining a production image corresponding to the image content description information.

[0042] After obtaining the image content description information of the logo, it is necessary to determine a production image that corresponds to the image content description information and that is in a uniform file format, for example, an image in a BMP file format. In specific implementation, the specific solutions vary as regards how to extract pattern information from different types of content description information of images to generate production images corresponding to the content description information of images. The step of determining a production image corresponding to the image content description information includes: scanning, if the image content description information is a template picture, the template picture by using a scanning device, to generate the production image corresponding to the image content description information; generating, if the image content description information is an image generation rule, at least one production image corresponding to the image content description information according to the image generation rule; and generating, if the image content description information is a string, at least one production image corresponding to the image content description information according to the string.

[0043] In some embodiments of the present application, when the image content description information is a template picture, an output image of the scanning device may be set to a streaming image that has the uniform file format. In this way, the template picture is scanned by the scanning device, and it is determined that the image output by the scanning device is the production image corresponding to the image content description information.

[0044] In other embodiments of this application, when the image content description information is an image file, if the format of the image file is not the specified uniform file format, the format of the image file may be converted to obtain an image that has the uniform

file format, and use the image as the production image corresponding to the image content description information. For example, assuming that the uniform file format of the production image is a BMP format, if the obtained image content description information is an image file 1.JPG, then the image file 1.JPG needs to be converted into a BMP format such as 1.BMP and then used as the production image corresponding to the image content description information. For conversion between different formats of the image files, reference may be made to any technology well known to those skilled in the art, and details are omitted in this embodiment.

[0045] In still another embodiment of this application, when the image content description information is a string, the string may be drawn on a canvas by using drawing software, and a string region corresponding to the string in the canvas is saved as a production image.

[0046] In still other embodiments of this application, when the image content description information is an image generation rule, production images that have a uniform file format may be generated in batches according to the image generation rule. In specific implementation, the image generation rule includes a code range of the logo and a code image generation rule. In this case, the generating at least one production image corresponding to the image content description information according to the image generation rule includes: determining all logo codes within the code range of the logo; and generating, for each logo code, a production image corresponding to the logo separately code according to the code image generation rule of the logo. The logo code may be a string, a barcode, or a quick response code.

[0047] For example, when the image generation rule used as the image content description information is to generate an image of a Roman font of each integer in a numerical range from 1,000 to 10,000, a total of 9,000 production images may be generated in batches, including a Roman font image of 1,000, a Roman font image of 1,001, until a Roman font image of 10,000. For a method for generating each Roman font image, refer to the method for generating a production image when the image content description information is a string, and details omitted here.

[0048] For another example, when the logo code in the image generation rule used as the image content description information is a barcode or a quick response code, the image generation rule may further include a code range and a coding standard. For example, it may be designated that 100 quick response (QR) codes will be generated, a start value of the codes is provided. Then, this application will determine each code value according to the start value of the codes and the specified number of codes, and further generate a QR code corresponding to each code value according to the coding standard. For a specific implementation of generating a barcode or quick response code according to the code value and the coding

standard, reference may be made to any technology well known to those skilled in the art, and details are omitted in this embodiment.

[0049] In other embodiments of this application, the image content description information is not limited to the forms exemplified in this embodiment, and may be in other forms; and the image generation rule and the code image generation rule are not limited to the range enumerated in this embodiment. This embodiment merely exemplifies types of typical content description information of images and code image generation rules to assist readers in understanding the technical solution of the present disclosure, and shall not be considered as a limitation on the present disclosure.

[0050] Step 230: Store the production image into a cloud database.

[0051] In some embodiments of this application, after the step of determining a production image corresponding to the image content description information, the method further includes: storing the production image into a cloud database. After the production image is determined, the production image may be stored in a cloud database so that the customer can perform a query or the manufacturer can perform distributed production.

[0052] Step 240: Generate weave data of the logo according to the weave control information and the production image corresponding to the image content description information.

[0053] Before the logo is woven, the production personnel sets the weave control information that is used for weaving the logo. In some embodiments of this application, the weave control information may include: size information of the logo and thread type information that is used for weaving the logo. For example, the dimensions of a to-be-woven logo are 21 cm × 21 cm, and the thread type used for weaving the logo is a yarn with a diameter of 0.1 mm. The customer may also input the image content description information of the logo. Before the weaving, it is necessary to determine a production image corresponding to the image content description information. In some embodiments of this application, the step of generating the weave data of the logo may include: generating the weave data of the logo according to the weave control information and the production image.

[0054] In some embodiments of this application, the generating the weave data of the logo according to the weave control information and the production image includes: determining a color value and row-column location information of each pixel in the production image; determining, according to the size information of the logo and the thread type information, a quantity of yarns required for weaving a logo region corresponding to each pixel; determining weave data of the logo region corresponding to each pixel according to the row-column location information of each pixel in the production image, the color value of each pixel, the

quantity of yarns required for weaving the logo region corresponding to each pixel, and the thread type information; and arranging the weave data of the logo region corresponding to each pixel in the production image according to a preset rule to obtain the weave data of the logo.

5 **[0055]** For example, for the production image 1.BMP, the quantity of rows and columns of pixels included in the production image, and the row and column locations and the color value of each pixel can be determined by parsing the production image. In specific implementation, information on row and column locations of the pixel may be constructed according to the row and the column in which the pixel is located.

10 **[0056]** Thereafter, the quantity of yarns required for weaving a logo region corresponding to each pixel is determined according to the obtained size information of the logo and thread type information. Using a 21 cm × 21 cm sized logo as an example, if the quantity of rows × columns of pixels in the production image is 21 × 21, each pixel in the production image corresponds to a 1 cm × 1 cm logo region. When a yarn with a diameter of 1 mm is used for
15 weaving, 100 warp yarns and 100 weft yarns are required for weaving a 1 cm × 1 cm sized logo region. That is,

$$\begin{aligned} & \text{the quantity of yarns required for weaving a logo region corresponding to each pixel} \\ & = \text{dimensions of the logo/dimensions of a pixel of a production image/diameter of} \\ & \hspace{15em} \text{each yarn.} \end{aligned}$$

20 **[0057]** Thereafter, the weave data of the logo region corresponding to each pixel is determined according to the row-column location information of each pixel in the production image, the color value of the pixel, the quantity of yarns required for weaving the logo region corresponding to each pixel, and the thread type information. For example, the weave data of the logo region corresponding to a pixel is constructed in a format of [row location, column
25 location, color value, quantity of yarns], Where the row location denotes a row index of the row in which the pixel is located, the column location denotes a column index of the column in which the pixel is located, the color value denotes a color value of the pixel, and the quantity of yarns indicates the quantity of warp yarns or weft yarns required for weaving the logo region corresponding to the pixel.

30 **[0058]** Finally, the weave data of the logo region corresponding to each pixel in the production image is arranged according to a preset rule to obtain the weave data of the logo. For example, in a preset weaving order from the upper left side to the lower right side, the weave data of the logo region corresponding to each pixel is sequentially arranged to obtain the weave data of the logo. The finally generated weave data of the logo may be denoted by
35 the following array:

$$\text{Data}=\{\text{pixi}, j(i, j, \text{colori}, j, \text{width})\}$$

[0059] where M and N are pixel-based dimensions of the production image. Specifically, in this embodiment, M and N are equal to 21; $\text{pixi}, j(i, j, \text{colori}, j, \text{width})$ denotes weave data of a logo region corresponding to a pixel in the i^{th} row and the j^{th} column in the production image, colori, j denotes a color value of the pixel in the i^{th} row and the j^{th} column in the production image, and width denotes the quantity of warp yarns or weft yarns required for weaving the logo region corresponding to the pixel in i^{th} row and the j^{th} column in the production image.

[0060] In other embodiments of this application, if the production image is stored in the cloud database, before the step of determining a color value and row-column location information of each pixel in the production image, the method may further include: obtaining the production image from the cloud database. That is, the production device may access the cloud database anytime to obtain the production image corresponding to the to-be-woven logo.

[0061] Step 250: Store the weave data of the logo into the cloud database.

[0062] In some embodiments of this application, after the step of determining the weave data of the logo according to the weave control information and the production image, the method further includes: storing the weave data of the logo into the cloud database.

[0063] Step 260: Control weaving equipment to weave the logo according to the weave data.

[0064] In specific production, the controlling weaving equipment to weave the logo according to the weave data includes: obtaining the weave data of the logo through the cloud database; sending the weave data of the logo to the weaving equipment; and storing a weave result of the logo woven by the weaving equipment into the cloud database. The obtaining the weave data of the logo through the cloud database includes: determining, according to a quantity of online production lines of the weaving equipment, an upper-limit quantity of logos (i.e., first logos) allowed to be woven simultaneously; and obtaining, through the cloud database, the weave data of the logos that amount to the upper-limit quantity.

[0065] In some embodiments of this application, the weave data of the to-be-woven logo is stored in the cloud database, and therefore, it is necessary to obtain the weave data of the to-be-woven logo through the cloud database first, and then send the weave data of the to-be-woven logo to the weaving equipment, so that the weaving equipment is controlled to weave the logo according to the weave data. According to the weave data, the weaving equipment weaves the logo region corresponding to each pixel in the production image for each row and each column, and finally obtains a woven logo. For example, in the weaving order from the upper left side to the lower right side of the logo, the corresponding weave data

may be selected from the cloud database and sent to the weaving equipment, and the weaving equipment is controlled to weave the corresponding logo.

[0066] To facilitate the customer to view a weave result of the logo in time, the method further includes: storing the weave result of the logo woven by the weaving equipment to the cloud database, where the weave result of the logo may include weaving success and weaving failure. An unsuccessfully woven logo may be woven again.

[0067] Each weaving equipment generally includes multiple production lines. For example, each logo weaving machine generally includes 10 machine heads. For each piece of weave data sent to the logo weaving machine, each live machine head weaves one logo. In some embodiments of this application, the sending the weave data of the to-be-woven logo to the weaving equipment includes: assigning the weave data of the logos that amount to the upper-limit quantity to the online production lines of the weaving equipment respectively. That is, if the weaving equipment has 5 online production lines, a communication control link may be set to send 5 pieces of the same or different weave data to different production lines respectively, to weave 5 same or different logos. By controlling the production lines of the weaving equipment with different weave data, different logos can be manufactured in batches, thereby effectively improving weaving efficiency.

[0068] In a specific embodiment of the logo weaving method disclosed in this application, the method includes three steps: The first step is a step of generating a production image, the second step is a step of generating weaving data, and the third step is a weaving step. The first step is shown in FIG. 3. First, a customer provides image content description information of a to-be-woven logo. The image content description information may be a template picture, or may be an image file, an image generation rule, a string, or the like. Then, for different types of image content description information, a smart plotting program uses a corresponding data processing method to generate a production image corresponding to the image content description information. Finally, the smart plotting program sends the generated production image to a cloud database for storage.

[0069] In the second step, as shown in FIG. 4, the smart plotting program obtains a production image corresponding to the to-be-woven logo from the cloud database first. Then, according to the weave control information configured by the production personnel for weaving the logo (for example, dimensions of the to-be-woven logo, a diameter of yarns for weaving the logo), the weave data required for controlling the weaving equipment to weave the logo is determined and stored in the cloud database.

[0070] In the third step, as shown in FIG. 5, the manufacturer may obtain the weave data of the to-be-woven logo from the cloud database, and send the weave data to the production line

to perform weaving. Finally, the production line sends a weave result of the logo into the cloud database. In this way, by using the cloud database, the customer and the manufacturer can obtain the weaving status of the logo in the cloud database in real time.

[0071] In some embodiments of this application, the step of obtaining the weave control information that is used for weaving the logo may be performed first, and then the step of obtaining the image content description information of the logo is performed. The order of the two steps is not limited in this application.

[0072] In the logo weaving method disclosed in this embodiment of this application, the woven data can be automatically generated according to the image content description information of the to-be-woven logo, thereby effectively improving efficiency of weaving logos. Further, different types of production requirements are converted into production images that are in a uniform file format and stored in the cloud database, thereby performing data processing in real time in a distributed manner and further improving the weaving efficiency. By storing the weave data in the cloud, the weaving equipment can obtain the weave data in real time and weave the logos in batches in a distributed manner, thereby effectively improving the weaving efficiency. Meanwhile, the customer and the manufacturer can obtain the weaving progress and the weave result of a single logo.

Embodiment 3

[0073] This embodiment discloses a logo weaving apparatus. As shown in FIG. 6, the apparatus includes: an image content description information obtaining module 610, a weave control information obtaining module 620, a weave data determining module 630, and a weaving module 640.

[0074] The image content description information obtaining module 610 is configured to obtain image content description information of a to-be-woven logo.

[0075] The weave control information obtaining module 620 is configured to obtain weave control information that is used for weaving the logo.

[0076] The weave data determining module 630 is configured to generate weave data of the logo according to the weave control information and the image content description information.

[0077] The weaving module 640 is configured to control weaving equipment to weave the logo according to the weave data.

[0078] In the logo weaving apparatus disclosed in this embodiment of this application, the woven data can be automatically generated according to the image content description information of the to-be-woven logo, thereby effectively improving efficiency of weaving logos.

[0079] In some embodiments, as shown in FIG. 7, the apparatus further includes a production image determining module 650, configured to determine a production image corresponding to the image content description information. In this case, the weave data determining module 630 is further configured to generate the weave data of the logo according to the weave control information and the production image.

[0080] In some embodiments, the weave control information includes: size information of the logo and thread type information that is used for weaving the logo. In this case, the weave data determining module 630 is further configured to: determine a color value and row-column location information of each pixel in the production image; determine, according to the size information of the logo and the thread type information, a quantity of yarns required for weaving a logo region corresponding to each pixel; determine weave data of the logo region corresponding to each pixel according to the row-column location information of each pixel in the production image, the color value of each pixel, the quantity of yarns required for weaving the logo region corresponding to each pixel, and the thread type information; and arrange the weave data of the logo region corresponding to each pixel in the production image according to a preset rule to obtain the weave data of the logo.

[0081] In some embodiments, as shown in FIG. 7, the apparatus further includes a first upload module 660 and a first download module 670. The first upload module 660 is configured to store the production image into a cloud database; and the first download module 670 is configured to obtain the production image from the cloud database.

[0082] In some embodiments, as shown in FIG. 7, the apparatus further includes a second upload module 680, configured to store the weave data of the logo into a cloud database. In this case, the weaving module 640 is further configured to: obtain the weave data of the logo through the cloud database; send the weave data of the logo to the weaving equipment; and store a weave result of the logo woven by the weaving equipment into the cloud database.

[0083] In some embodiments, the weaving module 640 is further configured to: determine, according to a quantity of online production lines of the weaving equipment, an upper-limit quantity of logos allowed to be woven simultaneously; and obtain, through the cloud database, the weave data of the logos that amount to the upper-limit quantity; and assign the weave data of the logos that amount to the upper-limit quantity to the online production lines of the weaving equipment respectively. In this way, by assigning the weave data of the logos that amount to the upper-limit quantity to the online production lines of the weaving equipment respectively, the weaving equipment can be controlled to simultaneously weave the logos that amount to the upper-limit quantity.

[0084] In some embodiments, the image content description information may be: a template

picture, an image file, an image generation rule, a string, or any one or more thereof.

[0085] Correspondingly, the production image determining module 650 is further configured to: scan, if the image content description information is a template picture, the template picture by using a scanning device, to determine the production image corresponding to the image content description information; generate, if the image content description information is an image generation rule, at least one production image corresponding to the image content description information according to the image generation rule; and generate, if the image content description information is a string, at least one production image corresponding to the image content description information according to the string.

[0086] In some embodiments, the image generation rule includes a code range of the logo and a code image generation rule. In this case, the production image determining module 650 is specifically configured to: determine all logo codes within the code range of the logo; and generate, for each logo code, a production image corresponding the logo code separately according to the code image generation rule of the logo. The logo code may be a string, a barcode, or a quick response code.

[0087] Further, different types of production requirements are converted into production images that are in a uniform file format and stored in the cloud database, thereby performing data processing in real time in a distributed manner and further improving the weaving efficiency. By storing the weave data in the cloud, the weaving equipment can obtain the weave data in real time and weave the logos in batches in a distributed manner, thereby effectively improving the weaving efficiency. Meanwhile, the customer and the manufacturer can obtain the weaving progress and the weave result of a single logo.

[0088] The logo weaving apparatus disclosed in this embodiment of this application is used to implement the steps of the logo weaving method described in Embodiments 1 and 2 of this application. For specific implementation of each module of the apparatus, refer to corresponding steps, and details are omitted here.

[0089] Correspondingly, this application further discloses a woven logo, which is woven by using the logo weaving method described in Embodiments 1 and 2 of this application. FIG. 8 is a photo of a quick response code logo woven by using the logo weaving method disclosed in this embodiment of this application. By using the logo weaving method disclosed in this embodiment of this application, different logos of a large number of patterns can be manufactured quickly, thereby effectively improving the efficiency of weaving massive logos.

Embodiment 4

[0090] Correspondingly, this application also discloses an electronic device. As shown in FIG. 9, the electronic device includes a memory 901, a processor 902, and a computer

program stored in the memory and executable on the processor 902. Execution of the computer program by the processor 902 implements the logo weaving method according to Embodiment 1 and Embodiment 2 of this application. The electronic device may be a personal computer (PC), a mobile terminal, a personal digital assistant, a tablet computer, or the like.

[0091] This application further discloses a computer-readable storage medium, storing a computer program. The program, when executed by a processor, implements the steps of the logo weaving method according to Embodiment 1 and Embodiment 2 of this application.

[0092] The embodiments in this specification are all described in a progressive manner.

Descriptions of each embodiment focus on differences from other embodiments, and same or similar parts among respective embodiments may be mutually referenced. The apparatus embodiments are substantially similar to the method embodiments and therefore are only briefly described, and reference may be made to the method embodiments for the associated part.

[0093] The logo weaving method and apparatus provided in the embodiments of this application are described above in detail. Although the principles and implementations of the embodiments of this application are described by using specific examples in the specification, the foregoing descriptions of the embodiments are only intended to help understand the method and core idea of this application. A person skilled in the art may make modifications to the specific implementations and application range according to the idea of this application. In conclusion, the content of the specification is not to be construed as a limitation to this application.

[0094] Through the description of the foregoing implementations, a person skilled in the art may clearly understand that the implementations may be implemented by software in combination with a necessary universal hardware platform, and may certainly be implemented by hardware. Based on such an understanding, the technical solutions essentially or the part contributing to the prior art may be implemented in a form of a software product. The computer software product may be stored in a computer-readable storage medium, such as a read only memory (ROM)/random access memory (RAM), a magnetic disk, or an optical disc, and includes several instructions for instructing a computer device (which may be a personal computer, a server, a network device, or the like) to perform the methods described in the embodiments or some parts of the embodiments.

CLAIMS

1. A logo weaving method, comprising:

obtaining image content description information of a logo to be woven;

obtaining weave control information for weaving the logo;

5 generating weave data of the logo according to the weave control information and the image content description information; and

controlling weaving equipment to weave the logo according to the weave data.

2. The method according to claim 1, wherein generating the weave data of the logo according to the weave control information and the image content description information comprises:

10 determining a production image corresponding to the image content description information; and

generating the weave data of the logo according to the weave control information and the production image.

3. The method according to claim 2, wherein

15 the weave control information comprises: size information of the logo and thread type information for weaving the logo; and

generating the weave data of the logo according to the weave control information and the production image comprises:

20 determining a color value and row-column location information of each pixel in the production image;

determining, according to the size information of the logo and the thread type information, a quantity of yarns required for weaving a logo region corresponding to each pixel;

25 determining weave data of the logo region corresponding to each pixel according to the row-column location information of each pixel in the production image, the color value of each pixel, the quantity of yarns required for weaving the logo region corresponding to each pixel, and the thread type information; and

arranging the weave data of the logo region corresponding to each pixel in the production image according to a preset rule to obtain the weave data of the logo.

30 4. The method according to claim 3, wherein

after determining the production image corresponding to the image content description information, the method further comprises: storing the production image into a cloud database; and

before determining the color value and the row-column location information of each pixel in the production image, the method further comprises: obtaining the production image from the cloud database.

5. The method according to any one of claims 2 to 4, wherein after generating the weave data of the logo according to the weave control information and the production image, the method further comprises:

storing the weave data of the logo into the cloud database.

6. The method according to claim 5, wherein controlling the weaving equipment to weave the logo according to the weave data comprises:

obtaining the weave data of the logo through the cloud database;

sending the weave data of the logo to the weaving equipment; and

storing a weave result of the logo woven by the weaving equipment into the cloud database.

7. The method according to claim 6, wherein

obtaining the weave data of the logo through the cloud database comprises:

determining, according to a quantity of online production lines of the weaving equipment, an upper-limit quantity of first logos allowed to be woven simultaneously;

obtaining, through the cloud database, weave data of the first logos which comprise at least one logo; and

sending the weave data of the logo to the weaving equipment comprises:

assigning the weave data of the first logos to the online production lines of the weaving equipment respectively.

8. The method according to claim 2, wherein determining the production image corresponding to the image content description information comprises:

scanning, in a case that the image content description information is a template picture, the template picture by using a scanning device, to generate the production image corresponding to the image content description information;

generating, in a case that the image content description information is an image generation rule, at least one production image corresponding to the image content description information according to the image generation rule; and

5 generating, in a case that the image content description information is a string, at least one production image corresponding to the image content description information according to the string.

9. The method according to claim 8, wherein

the image generation rule comprises a code range of the logo and a code image generation rule; and

10 generating the at least one production image corresponding to the image content description information according to the image generation rule comprises:

determining all logo codes within the code range of the logo; and

generating, for each logo code, a production image corresponding to the logo code separately according to the code image generation rule of the logo.

15 10. A logo weaving apparatus, comprising:

an image content description information obtaining module, configured to obtain image content description information of a to-be-woven logo to be woven;

a weave control information obtaining module, configured to obtain weave control information for weaving the logo;

20 a weave data determining module, configured to generate weave data of the logo according to the weave control information and the image content description information; and

a weaving module, configured to control weaving equipment to weave the logo according to the weave data.

25 11. The apparatus according to claim 10, further comprising:

a production image determining module, configured to determine a production image corresponding to the image content description information; and

the weave data determining module is further configured to generate the weave data of the logo according to the weave control information and the production image.

30 12. The apparatus according to claim 11, wherein

the weave control information comprises: size information of the logo and thread type information for weaving the logo; and

the weave data determining module is further configured to:

5 determine a color value and row-column location information of each pixel in the production image;

determine, according to the size information of the logo and the thread type information, a quantity of yarns required for weaving a logo region corresponding to each pixel;

10 determine weave data of the logo region corresponding to each pixel according to the row-column location information of each pixel in the production image, the color value of each pixel, the quantity of yarns required for weaving the logo region corresponding to each pixel, and the thread type information; and

arrange the weave data of the logo region corresponding to each pixel in the production image according to a preset rule to obtain the weave data of the logo.

15 13. The apparatus according to claim 12, further comprising:

a first upload module, configured to store the production image into a cloud database; and

a first download module, configured to obtain the production image from the cloud database.

14. The apparatus according to any one of claims 11 to 13, further comprising:

20 a second upload module, configured to store the weave data of the logo into the cloud database.

15. The apparatus according to claim 14, wherein the weaving module is further configured to:

obtain the weave data of the logo through the cloud database;

25 send the weave data of the logo to the weaving equipment; and

store a weave result of the logo woven by the weaving equipment into the cloud database.

16. The apparatus according to claim 15, wherein the weaving module is further configured to:

30 determine, according to a quantity of online production lines of the weaving equipment, an upper-limit quantity of first logos allowed to be woven simultaneously;

obtain, through the cloud database, weave data of the first logos which comprise at least one logo; and

assign the weave data of the first logos to the online production lines of the weaving equipment respectively.

5 17. The apparatus according to claim 11, wherein the production image determining module is further configured to:

scan, in a case that the image content description information is a template picture, the template picture by using a scanning device, to generate the production image corresponding to the image content description information;

10 generate, in a case that the image content description information is an image generation rule, at least one production image corresponding to the image content description information according to the image generation rule; and

generate, in a case that the image content description information is a string, at least one production image corresponding to the image content description information according to the string.
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18. The apparatus according to claim 17, wherein

the image generation rule comprises a code range of the logo and a code image generation rule; and

the production image determining module is specifically configured to:

20 determine all logo codes within the code range of the logo; and

generate, for each logo code, a production image corresponding to the logo code separately according to the code image generation rule of the logo.

19. A woven logo, woven by using the logo weaving method according to any one of claims 1 to 9.

25 20. An electronic device, comprising a memory, a processor, and a computer program stored in the memory and executable on the processor, wherein when executing the computer program, the processor implements the logo weaving method according to any one of claims 1 to 9.

21. A computer-readable storage medium, storing a computer program, the computer program, when executed by a processor, performing the logo weaving method according to any one of claims 1 to 9.
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