Appeal decision

Appeal No. 2014-12792

USA
Appellant XEROX CORPORATION

Tokyo, Japan
Patent Attorney YKI PATENT ATTORNEYS


Conclusion
The appeal of the case was groundless.

Reason
No. 1 History of the procedures

The application was filed on Nov. 25 2008 (priority claim under the Paris Convention : Nov. 28, 2007, the United States), written amendments were submitted on Dec. 13, 2012 and Sep. 18, 2013, a decision of refusal was issued on Feb. 26, 2014, and for this, an appeal against examiner's decision of refusal was requested on Jul. 3, 2014 and, at the same time, a written amendment was submitted.

No. 2 Decision to dismiss the amendment dated on Jul. 3, 2014 (hereinafter, referred to as the "Amendment ")

[Conclusion of Decision to Dismiss Amendment]
The Amendment shall be dismissed.

[Reason]
1 Detail of amendment

The Amendment was to amend the scope of claims, and claim 1 before the Amendment shown in the following (2).

(1) Claim 1 of the scope of claims before the Amendment
"An ink printing device comprising:

- an ink supply for printing a radiation curable ink onto a base material;
- at least one roller for making the base material move;
- a first radiation curing lamp that is located in a side of the substrate opposite to a side of a printed face of the substrate and partially cures the radiation curable ink; and
- a second radiation curing lamp that is located in a side of the substrate that is the same as the side of the printed face of the substrate,

wherein a position of the second radiation curing lamp is offset from a position of the first radiation curing lamp and positioned in a downstream side of the position of the first radiation curing lamp in a processing direction, and the second radiation curing lamp makes ink partly hardened by the first radiation curing lamp be further hardened,

wherein the radiation curable ink includes a radiation curable material and a coloring agent, and

wherein an amount of the radiation curable material is about 20 to about 90 weight%, and an amount of the coloring agent is about 0.1 to about 50 weight% in units of weight in ink components."

(2) Claim 1 of the scope of claims after the Amendment

"An ink printing device comprising:

- an ink supply having an ink jet print head to inject and print radiation curable ink in a form of liquid droplet on a transparent or semi-transparent base material;
- at least one roller to make the transparent or semi-transparent base material move;
- a first radiation curing lamp that is located in a side of the transparent or semi-transparent base material opposite to a side of a printing surface of the base material and partly hardens the radiation curable ink, wherein the first radiation curing lamp is arranged such that light from the first radiation curing lamp does not illuminate the print head or an ink droplet that has come out from the print head and is on the way to the transparent or semi-transparent base material;

- a second radiation curing lamp arranged in a side of the transparent or semi-transparent base material that is same as the side of the printing surface of the base material,

wherein a position of the second radiation curing lamp is offset from a position of the first radiation curing lamp and positioned in a downstream side of the position
of the first radiation curing lamp in a processing direction, and the second radiation curing lamp makes ink partly hardened by the first radiation curing lamp be further hardened,

wherein the radiation curable ink includes a radiation curable material and a coloring agent, and

wherein an amount of the radiation curable material is 20 to 90 weight%, and an amount of the coloring agent is 0.1 to 50 weight% in units of weight in ink components." (The under lines were added in the appeal decision. The same shall apply hereinafter.)

2 Purpose of amendment

The Amendment, relating to "radiation curable ink" which is a matter necessary to specify the invention according to claim 1 before the Amendment, adds the limitation of "in the form of liquid droplet"; relating to "base material", adds the limitation of "transparent or semi-transparent"; relating to "ink supply", adds the limitation of "having an ink jet print head"; relating to "the first radiation curing lamp", adds the limitation of "the first radiation curing lamp is arranged such that light from the first radiation curing lamp does not illuminate the print head or an ink droplet that has come out from the print head and is on the way to the transparent or semi-transparent base material"; and changes the statement of "about 20 to about 90" to "20 to 90"; and changes the statement of "about 0.1 to about 50" to "0.1 to 50". Therefore, the Amendment falls under the purpose of restriction of the scope of claims in Article 17-2(5)(ii) of the Patent Act.

3 Judgment on independent requirements for patentability

Therefore, it will be examined whether the invention according to claim 1 after the Amendment (hereinafter, referred to as the "Amended Invention") fulfils independent requirements for patentability at the time of patent application (whether it falls under the provisions of Article 126(7) of the Patent Act which is applied mutatis mutandis pursuant to the provisions of Article 17-2(6) of the Patent Act).

(1) The Amended Invention

The Amended Invention is recognized as one as described in the above-mentioned "1 (2) Claim 1 of the claims after the Amendment of the case" which is identified by the matters described in claim 1 of the scope of claims in the written amendment dated on Jul. 3, 2014.
(2-1) Publication

Japanese Unexamined Patent Application Publication No. 2005-193527 which was distributed before the priority date of the application (hereinafter, referred to as the "Publication") describes the following statements.

A "[0006]

In this image forming device, although good printing can be carried out when a coated paper having ink absorption properties is used as a recording medium, on the other side of the coin, in the case of a plain paper, there are problems that bleed-through of ink is caused due to infiltration, causing lowered image density, and that, in a case of forming images on the both surfaces of a medium, the image of the opposite surface is seen through from the back side. Of course, in the case of a recording medium not having absorbability such as one having vinyl coated surfaces, ink drips off and an image cannot be formed."

B "[0021]

Hereinafter, embodiments of the present invention will be described in detail referring to a drawing.

Fig. 1 is a sectional view showing a configuration of an image forming device according to the first embodiment of the present invention conceptually. [0022]

The first embodiment takes an ink jet recording device of 1-path image forming system as an example, in which, by combining UV-curable ink (hereinafter, referred to as UV ink) that becomes hardened by irradiation of ultraviolet light (ultraviolet ray) and a recording head (line head) having a nozzle face on which nozzles to eject ink are arranged in a row, image forming is performed when a recording medium passes in front of the nozzle face once. An image forming device 40 of the present embodiment is placed on a frame 50, and is a small device for a console type image forming device (printing device). [0023]

In this image forming device 40, a plurality of recording heads 9 are fixed, and they eject UV ink of four different colors, respectively (for example, indicated by K: Black, C: Cyan, M: Magenta, Y: Yellow) to form a color image on a recording medium that is transported and that is made of a recording paper and the like, for example. [0024]
The image forming device 40 mainly includes a media supply and ejection mechanism to supply and eject a recording medium 2, a transportation mechanism to transport the recording medium 2, an image forming mechanism to eject UV ink on the transported recording medium 2 and to make the ink harden to form an image, and an ink supplying and storing mechanism to supply and store UV ink. (Since "the image forming device 40" is recognized as an error of "the image forming device 40", this summarization was made after correcting this error.)

The media supply and ejection mechanism includes: a media supply tray 1 on which a plurality of pieces of the recording paper 2 are loaded; a supply roller 3 and a separation roller 4, in contact with the uppermost surface of the recording medium 2, to detach the recording paper 2 one by one from the media supply tray 1 and takes the paper 2 out in series; a pair of paper ejection rollers 10 to eject the recording medium 2 on which an image has been formed; and a copy receiving tray 11 to store the ejected recording medium.

The transportation mechanism includes: a registration roller pair (hereinafter, it is referred to as a resist roller pair) 5 to perform correction of oblique motions and adjustment of transportation timing of the recording paper 2 supplied from the supply roller 3; a paper-feeding-side transportation belt 7; a transparent drum 29, on a periphery of which a recording head unit 9 which is discussed below is arranged; and a carrying-out-side transportation belt unit 24 that faces a final ultraviolet photo-hardening unit 23 which is discussed below and transports the recording paper 2 on which an image has been formed.

The transparent drum 29 is part of a transportation mechanism provided between the paper-feeding-side transportation belt 7 and the carrying-out-side transportation belt unit 24, and is a transportation unit of a so called semicylindrical shape (semicylindrical curved surface part) that uses part of a side surface (curved surface) of a shape of a drum that is pushed over sideways. The transparent drum 29 has an electrostatic suctioning part or a gripper and the like provided thereon, and sucks the recording paper 2. The recording paper 2 is transported along with rotation of the drum 29. The transparent drum 29 does not need flexibility like a belt, and should just be of a solid form and have a permeation property for ultraviolet light, and, therefore, it is formed of a glass member such as quartz glass or of transparent resin such as polyimide and polycarbonate. It may be such that the transparent drum
29 includes a lot of holes that are opened in areas that contacts with the recording paper 2, a negative pressure generation unit composed of a suction pump and the like to make the inside of the transparent drum 29 be of negative pressure is provided, and the recording paper 2 is made to be held by suction.

[0028]
When detaching the recording paper 2 being held by the transparent drum 29, it is realized by publicly known constitution such as providing a detaching claw and the like to perform detaching. Meanwhile, in the case where the recording paper 2 is made to be held using a negative pressure, if it is arranged such that holes are not provided in areas after a position at which the paper is made to be detached, the recording paper 2 can be detached naturally.

[0029]
The image forming mechanism is arranged along the outer perimeter portion of the transparent drum 29, and includes: recording heads 9 (9K, 9C, 9M, and 9Y) to eject UV ink of the four colors to the recording paper 2 on the transparent drum 29, respectively; a pre-ultraviolet-light-irradiation unit 22 (including an irradiation source 20), arranged within the transparent drum 29, to irradiate ultraviolet light toward the rear surface side of the recording paper 2; and the final ultraviolet photo-hardening unit 23, provided facing the carrying-out-side transportation belt unit 24, to irradiate ultraviolet light from the front surface side of the image-formed recording paper 2.

[0030]
In the pre-ultraviolet-light-irradiation unit 22, a light shielding plate 25 is arranged in portions facing each of the recording heads 9 K, 9C, 9M, and 9Y, and occurrence of a defect such as an ejection defect and a curved flight and the like due to hardening of UV ink on the nozzle (not shown) of each of the recording heads and on a nozzle plate (not shown) is prevented to make ink ejection be stabilized.

[0031]
In the configuration of the present embodiment, although the recording medium is limited to a material that can transmit ultraviolet light, even in the case of a plain paper such as a copy paper, a light quantity sufficient to harden UV ink is transmitted, enabling to make a drop having landed in be temporary hardened from the lower side of the drop. In other words, since UV ink penetrates into a gap between fibers of the recording paper 2, it is possible, by hardening the bottom part of an ink drop, to delay a speed of penetration sufficiently or stop it, and, therefore, sufficient color development can be obtained even in a plain paper. Furthermore, by making ink be hardened immediately after the landing in, bleeding due to contact
between ink drops can be also prevented."

Because this image formation is carried out in series along with the recording paper 2 being transported on the transparent drum 29, and ultraviolet light keeps on being irradiated during that image formation, after having repeated landing in and temporary fixation for each color for a total of four times to form a final image, the recording paper 2 is transported to the final ultraviolet photo-hardening unit 23 and ultraviolet light is irradiated sufficiently, resulting in UV ink being fixed to the recording paper 2 certainly. On the occasion of this final hardening, it is also possible to stabilize an irradiation distance and a speed of the recording paper 2 by the carrying-out-side transportation belt unit 24, and to conduct complete solidification as needed by providing a heating mechanism and the like and using ultraviolet light irradiation and heat treatment together. The recording paper 2 on which an image is fixed is ejected by the pair of paper ejection rollers 10, and stored in a copy receiving tray 11."

Fig. 3 is a sectional view showing a configuration of an image forming device relating to the third embodiment conceptually. The present embodiment is different from the above-mentioned first embodiment in a configuration of a transparent drum, and components other than that are equivalent. In addition, forming members of the transparent drum and its surface shape and the like with which a recording paper contacts are equivalent to those of the first embodiment. Here, only the inside structure of the transparent drum will be described.

The configuration is such that, inside the transparent drum 29, the pre-ultraviolet-light-irradiation unit 22 is placed in almost the center, and a wedge-shaped light guiding path 31 that doubles as the functions of the pre-ultraviolet-light-irradiation unit 22 and each of the light shielding plate 25 are provided.

By such configuration, ultraviolet light irradiated from the pre-ultraviolet-light-irradiation unit 22 is led by the light guiding path 31, collected between each of the light shielding plate 25, and irradiated to the rear surface side of the recording paper 2 that is transported. Accordingly, ultraviolet light is used more effectively, and, thus, compared with a case that the light guiding path 31 is not provided, an ultraviolet light irradiation source that has a smaller light emitting
quantity can be adopted. By this, it is possible to realize miniaturization and cost reduction of an ultraviolet light irradiation source."

From the above-mentioned statements of A to D, the Publication describes the following invention (hereinafter, referred to as "Cited Invention").

"The image forming device 40 including: the media supply and ejection mechanism to supply and eject the recording medium 2; and the image forming mechanism to eject UV ink on the recording medium 2 that is transported and makes the UV ink be hardened to form an image, wherein the media supply and ejection mechanism includes: the supply roller 3 and the separation roller 4 to detach the recording paper 2 one by one and takes the paper 2 out in series; and the pair of paper ejection rollers 10 to eject the recording medium 2, wherein the image forming mechanism includes: the recording heads 9 that are arranged along the outer perimeter of the transparent drum 29 and ejects UV ink to the recording paper 2 on the transparent drum 29; the pre-ultraviolet-light-irradiation unit 22 (including the irradiation source 20), arranged within the transparent drum 29, to irradiate ultraviolet light to the rear surface side of the recording paper 2; and the final ultraviolet photo-hardening unit 23, provided facing the carrying-out-side transportation belt unit 24, to irradiate ultraviolet light from the front surface side to the recording paper 2 on which an image has been formed and to make UV ink be fixed to the recording paper 2 certainly by irradiating ultraviolet light sufficiently, wherein the recording medium is a material through which ultraviolet light can penetrate, and a landing-in drop can be temporary hardened from its bottom side, wherein, inside the transparent drum 29, the pre-ultraviolet-light-irradiation unit 22 is placed in almost the center, and the wedge-shaped light guiding path 31 that doubles as functions of the pre-ultraviolet-light-irradiation unit 22 and each of the light shielding plate 25 is provided, and wherein ultraviolet light irradiated from the pre-ultraviolet-light-irradiation unit 22 is led by the light guiding path 31 and collected between each light shielding plate 25 and irradiated to the rear surface side of the recording paper 2 that is transported. By this, the image forming device 40 prevents occurrence of a defect such as an ejection defect and a curved flight and the like due to hardening of UV ink on the nozzle of each of the recording heads and a nozzle plate to make ink ejection be stabilized."

(3) Comparison

Therefore, when the Amended Invention and the Cited Invention are compared,
it is as follows.

A  Because "UV ink" of the latter is a UV-curable ink that becomes hardened by irradiation of an ultraviolet light (ultraviolet ray), it can be said that it is radiation curable, and, therefore, it corresponds to "radiation curable ink" of the former.

B  "<<The recording medium 2>> and <<the recording paper 2>>" of the latter correspond to "base material" of the former. Furthermore, "<<the recording medium 2>> and <<the recording paper 2>>" of the latter and "base material" of the former are in common in a concept that they are ones through which ultraviolet rays can be transmitted.

C  "<<To eject UV ink on the recording medium 2 that is transported>> to <<form an image>>" of the latter correspond to "to inject radiation curable ink in the form of liquid droplet to perform print" of the former, and, because "image forming mechanism" of the latter is one to form an image by ejecting UV ink on the recording medium 2 that is transported, it corresponds to "an ink supply having an ink jet print head" of the former. Further, "the image forming device 40" of the latter corresponds to "ink printing device" of the former.

D  Because "media supply and ejection mechanism" of the latter is composed of: the supply roller 3 and the separation roller 4 to detach the recording paper 2 one by one and takes the paper 2 out in series; and the pair of paper ejection rollers 10 to eject the recording medium 2, it correspond to "at least one roller for making a base material move" of the former.

E  "The pre-ultraviolet-light-irradiation unit 22 (including the irradiation source 20)" of the latter is one in which, by providing the wedge-shaped light guiding path 31 that doubles as functions of the pre-ultraviolet-light-irradiation unit 22 and each of the light shielding plate 25, ultraviolet light irradiated from the pre-ultraviolet-light-irradiation unit 22 is led by the light guiding path 31 and collected between each of the light shielding plate 25, and, accordingly, occurrence of a defect such as an ejection defect and a curved flight and the like due to hardening of UV ink on the nozzle of each of the recording heads and on a nozzle plate is prevented to make ink ejection be stabilized. Therefore, it is said to be one in which arrangement is made such that ultraviolet light does not illuminate the image forming mechanism. In addition, because "the pre-ultraviolet-light-irradiation unit 22 (including the irradiation source 20)" of the latter is one that is arranged within the transparent drum 29 and that irradiates ultraviolet light to the rear surface side of the recording paper 2, and, further, that can make a landing-in drop be temporary hardened from its bottom side, it can be said that it hardens radiation curable ink
partly. Consequently, "the pre-ultraviolet-light-irradiation unit 22 (including the irradiation source 20)" of the latter corresponds to "a first radiation curing lamp that is located in a side of the base material opposite to a side of a printing surface of the base material and partly hardens the radiation curable ink, wherein the first radiation curing lamp is arranged such that light from the first radiation curing lamp does not illuminate the print head" of the former.

"The pre-ultraviolet-light-irradiation unit 22 (including the irradiation source 20)" of the latter is arranged within the transparent drum 29, on an outer perimeter of which the recording heads 9 are arranged, whereas "the final ultraviolet photo-hardening unit 23" is one that is provided in a manner facing the carrying-out-side transportation belt unit 24, and, therefore, it can be said that the final ultraviolet photo-hardening unit 23 is offset from the position of the first radiation curing lamp, and, at the same time, is located at downstream compared with the position of the first radiation curing lamp in the processing direction. Furthermore, because "the final ultraviolet photo-hardening unit 23" of the latter is one in which ultraviolet light is irradiated to the recording paper 2 on which an image has been formed from the front surface side and ultraviolet light is irradiated sufficiently to fix UV ink on the recording paper 2 certainly, it can be said to be one that is arranged in the side of the base material that is the same as the side of the printing surface of the base material, and further hardens ink that has been partly hardened by the first radiation curing lamp.

Therefore, the both are common in the point of "an ink printing device comprising:

an ink supply including an ink jet print head to inject and print radiation curable ink in a form of a liquid droplet on a base material capable of transmitting ultraviolet light;

at least one roller for making the ultraviolet light transmissive base material move;

a first radiation curing lamp that is located in a side of the ultraviolet light transmissive base material opposite to a side of a printing surface of the base material and partly hardens the radiation curable ink, wherein the first radiation curing lamp is arranged such that light from the first radiation curing lamp does not illuminate the print head; and

a second radiation curing lamp, located in a side of the ultraviolet light transmissive substrate that is same as the side of the printed face of the substrate,
wherein a position of the second radiation curing lamp is offset from a position of the first radiation curing lamp, and positioned in a downstream side of the position of the first radiation curing lamp in a processing direction, and the second radiation curing lamp makes ink partly hardened by the first radiation curing lamp be further hardened.

[The different feature 1]
A point that an ultraviolet light transmissive base material is transparent or semi-transparent in the Amended Invention, whereas it is not apparent in the Cited Invention.

[The different feature 2]
A point that, in the Amended Invention, radiation curable ink includes a radiation curable material and a coloring agent, the radiation curable material is of an amount of 20 to 90 weight%, and the coloring agent is of an amount of 0.1 to 50 weight% in units of weight in ink components, whereas the Cited Invention does not have such constitution.

(4) Judgment
The above-mentioned different features will be examined as follows.

(4-1) [The different feature 1]
"The recording medium 2" of the Cited Invention is a material through which ultraviolet light can be transmitted, and has a function to transmit ultraviolet light that makes UV ink be hardened. In addition, it is common general knowledge that, generally, a material to make ultraviolet light transmit through it is transparent or semi-transparent. As a consequence, it could have easily arrived at by a person skilled in the art to make "the recording medium 2" of the Cited Invention be transparent or semi-transparent from the idea of an ultraviolet light transmissive material.

Accordingly, in the Cited Invention, a person skilled in the art could have easily arrived at the matter specifying the invention of the Amended Invention relating to the above-mentioned different feature 1.

(4-2) [The different feature 2]
In the technical field of an ink printing device that is the same as that of the Amended Invention, it is a well-known technical matter at the time of the priority date
of the application concerned to include a radiation curable material and a coloring agent as compositions of radiation curable ink, and to make the radiation curable material be of an amount of 20 to 90 weight%, and the coloring agent be of an amount of 0.1 to 50 weight% in units of weight in ink components (for example, refer to Domestic Re-publication of PCT International Publication for Patent Applications No. 2007/100008 ([0017] and [0028]), Japanese Unexamined Patent Application Publication No. 2007-131789 (refer to [0057] and [0066]), Japanese Unexamined Patent Application Publication No. 2007-99836 (refer to [0123] and [0131]), and Japanese Unexamined Patent Application Publication No. 2003-64288 (refer to [0019] and [0025])).

In addition, there is no particular technical significance about the matter specifying the invention relating to the different feature 2 of the Amended Invention. Consequently, it could have easily arrived at by a person skilled in the art to apply the above-mentioned well-known technical matters to the Cited Invention.

Therefore, it could have easily arrived at by a person skilled in the art to make it be the matter specifying the invention relating to the different feature 2 of the Amended Invention by applying the above-mentioned well-known technical matters in the Cited Invention.

Accordingly, the Amended Invention could be provided easily by a person skilled in the art based on the Cited Invention and the above-mentioned well-known technical matters.

Then, an effect produced by the matters specifying the invention of the Amended Invention is also within the scope that can be expected by a person skilled in the art from the Cited Invention and the above-mentioned well-known technical matters.

(5) Conclusion

As described above, the Amendment violates the provisions of Article 126-7 of the Patent Act which is applied mutatis mutandis pursuant to the provisions of Article 17-2(6) of the Patent Act, and, therefore, it should be dismissed under the provisions of Article 53(1) of the Patent Act which is applied mutatis mutandis pursuant to the provisions of Article 159(1) of the Patent Act.

No. 3 The invention
1 The Invention

Since the Amendment was dismissed as the above-mentioned No. 2, the invention according to claims of the application is specified by the matters described in claims of the scope of claims amended by the written amendment dated on Sep. 18, 2013, and the invention according to claim 1 is as follows.

"[Claim 1]

"An ink printing device comprising:

an ink supply for printing a radiation curable ink onto a base material;

at least one roller for making the base material move;

a first radiation curing lamp that is located in a side of the substrate opposite to a side of a printed face of the substrate and partially cures the radiation curable ink; and

a second radiation curing lamp that is located in a side of the substrate that is the same as the side of the printed face of the substrate,

wherein a position of the second radiation curing lamp is offset from a position of the first radiation curing lamp and positioned in a downstream side of the position of the first radiation curing lamp in a processing direction, and the second radiation curing lamp makes ink partly hardened by the first radiation curing lamp be further hardened,

wherein the radiation curable ink includes a radiation curable material and a coloring agent, and

wherein an amount of the radiation curable material is about 20 to about 90 weight%, and an amount of the coloring agent is about 0.1 to about 50 weight% in units of weight in ink components." (hereinafter, referred to as "The Invention")

2 Cited publication

Publications cited in the reasons for refusal of the examiner's decision, having contents stated in the above-mentioned "No. 2 3(2) Cited publication".

3 Comparison/judgment

The Invention is an invention in which: relating to "radiation curable ink" of the Amended Invention examined in the above-mentioned "No. 2 3(1) Amended Invention", the limitation of "in the form of liquid droplet" is omitted; relating to "base material", the limitation of "transparent or semi-transparent" is omitted; relating to "ink supply", the limitation of "having an ink jet print head" is omitted; relating to "the first radiation curing lamp", the limitation of "the first radiation curing lamp,
wherein the first radiation curing lamp is arranged such that light from the first radiation curing lamp does not illuminate the print head or an ink droplet that has come out from the print head and is on the way to the transparent or semi-transparent base material" is omitted; and the statements of "20 to 90" is changed to "about 20 to about 90" and the statement of "0.1 to 50" is changed to "about 0.1 to about 50".

Therefore, a different feature when the Invention and the Cited Invention are compared is substantially only the different feature 2 cited in the above-mentioned "No. 2 3(3) Comparison", and, therefore, in consideration of the contents of the examination in the above-mentioned "No. 2 3(4) Determination", the Invention could be provided easily by a person skilled in the art based on the Cited Invention and the above-mentioned well-known technical matters.

4 Conclusion

As described above, because the Invention could be provided easily by a person skilled in the art based on the Cited Invention and the above-mentioned well-known technical matters, the appellant should not be granted a patent for the Invention in accordance with the provisions of Article 29(2) of the Patent Act.

Therefore, the appeal decision shall be made as described in the conclusion.

May 8, 2015

Chief administrative judge: KUROSE, Masakazu
Administrative judge: FUJIMOTO, Yoshihito
Administrative judge: YOSHIMURA, Hisashi