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(54) **TONER CARTRIDGE PRINTER DEVICES, SYSTEMS, AND METHODS FOR OVER PRINTING AND UNDER PRINTING**

(57) A method of converting a CMYK color toner printer to a CMYX color toner printer for under print printing in a single pass, comprising the steps: providing a color toner printer with four toner printing cartridges: a cyan toner printing cartridge, a magenta toner printing cartridge, a yellow toner printing cartridge, and a black toner printing cartridge; wherein the black toner printing cartridge is in a first toner cartridge position; removing the back toner printing cartridge from the first toner cartridge position; providing a non-standard toner printing cartridge; installing the non-standard toner printing cartridge into the first toner cartridge position; providing a raster image processor software; wherein the raster image processor software is configured to remap the four toner printing cartridges of the color toner printer and allows the color toner printer to print a layer of non-standard toner under an image in a single pass; and wherein the image is printed from at least one of a cyan toner, a yellow toner, and a magenta toner.

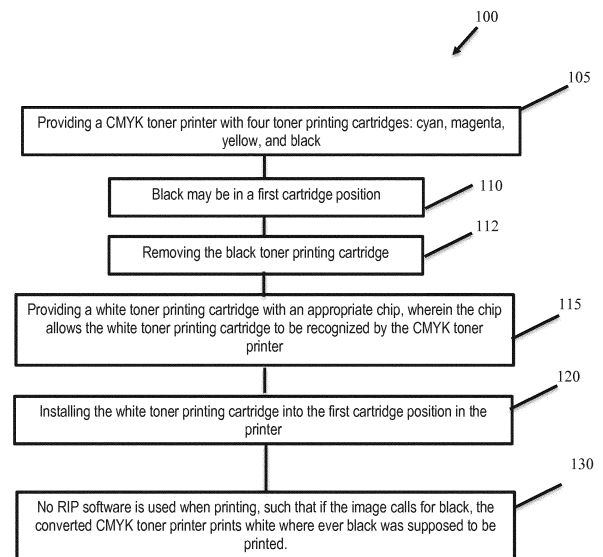


FIG. 1



EUROPEAN SEARCH REPORT

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 9 383 684 B1 (JOSIAH MICHAEL RAYMOND [US] ET AL) 5 July 2016 (2016-07-05) * column 1, line 64 - column 2, line 8 *	1,2, 11-15	INV. G03G15/01 G03G15/00 G03G15/08
A	US 2014/037307 A1 (KUO CHUNG-HUI [US] ET AL) 6 February 2014 (2014-02-06) * abstract; claim 1 *	1,2	
			TECHNICAL FIELDS SEARCHED (IPC)
			G03G
<p>The present search report has been drawn up for all claims</p>			
Place of search		Date of completion of the search	Examiner
Munich		29 January 2018	Thieme, Markus
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

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EPO FORM 1503 03.82 (P04C01)



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CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☒ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

1, 2(completely); 11-15(partially)

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).



**LACK OF UNITY OF INVENTION
SHEET B**

Application Number

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The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1, 2(completely); 11-15(partially)

Converting a standard CMYK color toner printer into a CMYW toner printer. Special technical feature: The CMYW toner printer does not distinguish the white toner cartridge from the black toner cartridge. Technical effect and solved problem: More versatile usage of a standard printer for white printing.

2. claims: 3-6(completely); 11-15(partially)

Converting a CMYK color toner printer into a CMYX color toner printer for under print printing. Raster image processor software configured to allow printing a layer of non-standard toner under the image in a single pass. Technical effect and solved problem: Allows printing of upright (non-mirrored) images on a darker media without having the colors of the print job be washed out by the darker media

3. claims: 7-10(completely); 11-15(partially)

Converting a CMYK color toner printer to a CMYX color toner printer for over print printing. Raster image processor software configured to print a layer of non-standard toner over an image in a single pass. Technical effect and solved problem: Allows for a heat transfer print operation to a darker media without having the colors of the print job be washed out by the darker media.

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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29-01-2018

10	Patent document cited in search report	Publication date	Patent family member(s)	Publication date
	US 9383684	B1	05-07-2016	NONE

15	US 2014037307	A1	06-02-2014	NONE

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82