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— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*

— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

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— *with international search report (Art. 21(3))*

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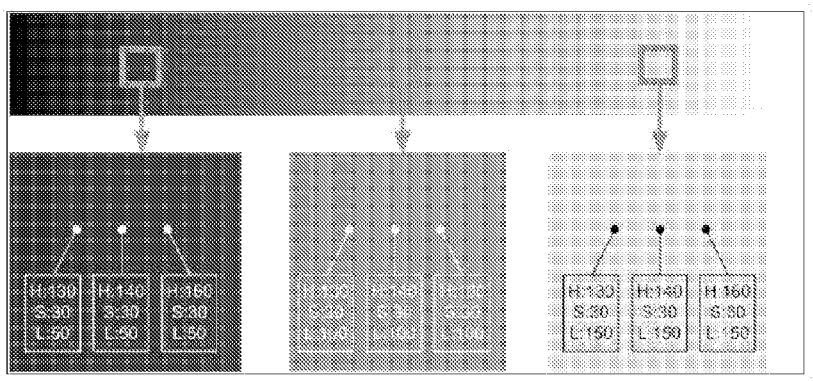

FIG. 3

(57) Abstract: The systems and methods described herein disclose creating an Intensity Based Colormap by interweaving different Hues between two end points (e.g., black and white) with increasing Luminance. An Intensity Based Colormap may be used to convert Computer Input image data using a Computer Machine encoded with an Intensity Based Colormap.

WO 2014/200586 A3

INTERNATIONAL SEARCH REPORT

International application No.
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A. CLASSIFICATION OF SUBJECT MATTER

H04N 1/46(2006.01)i, H04N 1/56(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
H04N 1/46; G06F 17/50; G06T 17/00; H04N 1/56

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Korean utility models and applications for utility models
Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
eKOMPASS(KIPO internal) & Keywords: Hue, Saturation, Luminance, colormap, grayscale, colorization, combine, mapping

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5093717 A (BARRY B. SANDREW) 03 March 1992 See column 2, lines 21-25; column 3, lines 17-68; column 5, lines 26-29; column 6, lines 20-22; column 9, line 12; and column 13, line 66.	16-20
Y		1-15
Y	LUIZ FILIPE M. VIEIRA et al., `Fully automatic coloring of grayscale images`, Image and Vision Computing, January 2007, Volume 25, Issue 1, pages 50-60 <http://www.sciencedirect.com/science/article/pii/S0262885606000254> See page 51, left column, lines 11-14.	1-15
A	INGMAR LISSNER et al., `Image-Difference Prediction: From Grayscale to Color`, In: Image Processing, IEEE Transactions, February 2013, Vol.22, Issue.2, pages 435-446 <http://ieeexplore.ieee.org/xpl/articleDetails.jsp?arnumber=6307862> See page 436, left column, line 13 - page 437, left column, line 17.	1-20
A	US 2010-0238165 A1 (WILLIAM WATKINS et al.) 23 September 2010 See paragraphs [0005], [0023]-[0031]; and figures 4-5.	1-20

☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:
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Date of the actual completion of the international search	Date of mailing of the international search report
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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	VIVEK GEORGE JACOB et al., `COLORIZATION OF GRAYSCALE IMAGES AND VIDEOS USING A SEMIAUTOMATIC APPROACH`, In: Image Processing (ICIP), 2009 16th IEEE International Conference, November 2009, pages 1653-1656 <http://ieeexplore.ieee.org/xpl/articleDetails.jsp?arnumber=5413392> See page 1653, left column, line 1 - page 1654, left column, line 32.	1-20

INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5093717 A	03/03/1992	CN 1026928 C	07/12/1994
		CN 1036279 A	11/10/1989
		EP 0302454 A2	08/02/1989
		EP 0302454 A3	11/07/1990
		EP 0302454 B1	06/12/1995
		JP 02-001077 A	05/01/1990
		JP 2935459 B2	16/08/1999
		KR 10-1997-0005225 B1	14/04/1997
		US 4984072 A	08/01/1991
US 2010-0238165 A1	23/09/2010	CA 2754133 A1	23/09/2010
		CN 102356406 A	15/02/2012
		EP 2409278 A1	25/01/2012
		JP 2012-520534 A	06/09/2012
		KR 10-2011-0134479 A	14/12/2011
		TW 201044316 A	16/12/2010
		WO 2010-107747 A1	23/09/2010