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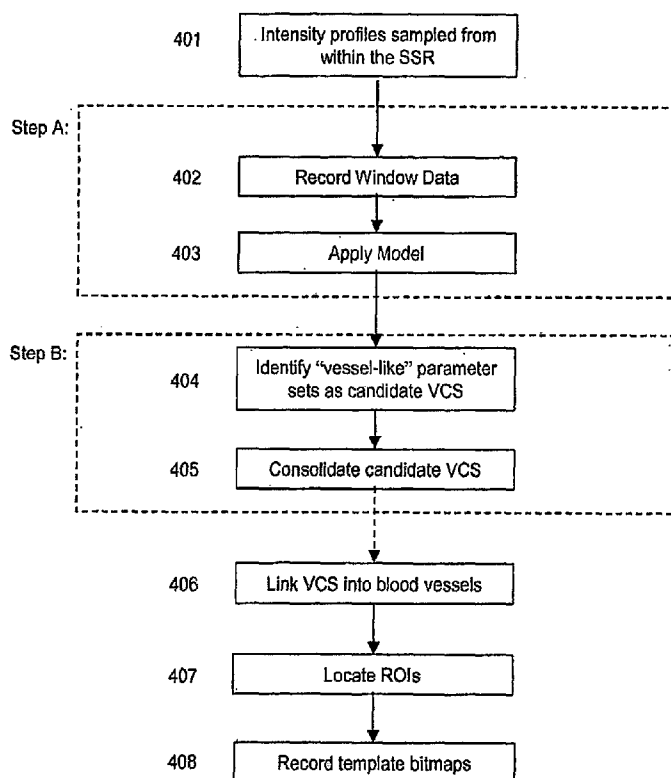
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[Continued on next page]

(54) Title: SYSTEM AND METHOD FOR BIOMETRIC RETINAL IDENTIFICATION



(57) Abstract: Retinal blood vessels are detected for biometric identification by: receiving at least one image with retinal data; detecting, an area in the image corresponding to a spatial variation in the image; and determining a blood vessel pattern relative to the area. The spatial variation may be determined according to a spatial intensity gradient. The area corresponding to the spatial variation may be defined by a fitted shape. A specific embodiment determines a structural measurement, such as a structural center of mass, in the area, and the blood vessel pattern is determined relative to the structural measurement. The blood vessel pattern may be determined by identifying blood vessel cross sections within the area and linking the blood vessel cross sections to determine blood vessels. Furthermore, each of the blood vessel cross sections may be represented by an N-vector determined by a N-parameter non-linear fitting function or a linear function combination.

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FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, PL,  
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## A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - H04K 1/00, G06K 9/00 (2007.10)

USPC - 713/186; 382/117

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)

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USPC - 713/186, 382/117

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  
USPC - 713/186, 382/100, 115Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
PubWEST (USPT, PGPB, EPAB, JPAB); DIALOG PRO (Engineering) & Google; blood vessel, Retinal blood vessels, biometric identification, image, retinal data, blood vessel pattern, area corresponding, spatial variation, spatial intensity gradient, fitted shape, polar coordinate system, Cartesian coordinate system, focus, sharpness.

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2005/0231688 A1 Jones et al. 20 October 2005 (20.10.2005), entire document, especially, Abstract, Para [0003]-[0004], [0007], [0011], [0014], [0029], [0041]-[0042], [0050], [0052] and [0055].	1, 14, 18-20, 22-24, 27, 33, 50-52, 54-55 and 59
-		2-13, 15-17, 21, 25-26, 28-32, 34-49, 53, 56-58 and 60-64
Y		
Y	US 5,035,500 A Rorabaugh et al. 30 July 1991 (30.07.1991), entire document, especially, Abstract, Fig. 16c; Col 1 Ln 56, 58; Col 2 Ln 8-10, 3, 17, 58; Col 3 Ln 30, 37, 40; Col 9 Ln 8; Col 11 Ln 50 and Col 32 Ln 10-11.	2-13, 15-17, 28, 31, 34-49, 60 and 63
Y	US 2006/0067548 A1 Slaney et al. 30 March 2006 (30.03.2006), entire document, especially, Para [0007] and [0028]-[0032].	9-13, 21, 25-26, 29-32, 41-43, 53, 56-58 and 61-64

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