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(54) Title: SYSTEMS AND METHODS FOR AUTOMATED IMAGE SELECTION IN DOPPLER ULTRASOUND IMAGING SYSTEMS

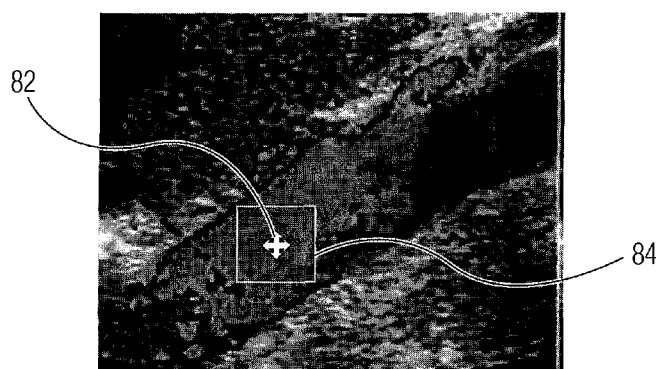


FIG. 6

(57) Abstract: An ultrasound system (10) is disclosed for selecting a diagnostic image from a series of ultrasound images. An image characterization parameter, such as the standard deviation, is calculated for each of a series of Doppler ultrasound images. The image characterization parameters are then analyzed to select an image corresponding to a predetermined point in a patient's cardiac cycle. The selected image is then displayed. In some embodiments, Doppler images are processed to identify an area of interest corresponding to an individual blood vessel. The image characterization parameter is then calculated based on the area of interest. The area of interest may be identified by receiving a user input, such as positioning a cursor at a specific point on an image. In other embodiments, ultrasound images are mapped to points on an ECG waveform and an image is selected based on analysis of the ECG waveform.

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	WO 02/45586 A (KONINKL PHILIPS ELECTRONICS NV [NL]) 13 June 2002 (2002-06-13) page 3, line 10 - page 4, line 15 page 15, lines 18-30 figure 2	1,2, 11-20 3-10, 21-24
Y	EP 1 652 477 A (TOKYO SHIBAURA ELECTRIC CO [JP]; TOSHIBA MEDICAL SYS CORP [JP] TOSHIBA) 3 May 2006 (2006-05-03) claims 1,2 figure 9 abstract	3-10, 21-24
A	US 2002/062078 A1 (CRUTCHFIELD KEVIN [US] ET AL) 23 May 2002 (2002-05-23) abstract	1-24



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Information on patent family members

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Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 0245586	A	13-06-2002	AT 387144 T	15-03-2008
			EP 1349499 A1	08-10-2003
			JP 4152746 B2	17-09-2008
			JP 2004514526 T	20-05-2004
			US 2002072670 A1	13-06-2002
EP 1652477	A	03-05-2006	CN 1819798 A	16-08-2006
			JP 2005342006 A	15-12-2005
			WO 2005115249 A1	08-12-2005
			US 2006122512 A1	08-06-2006
US 2002062078	A1	23-05-2002	US 2005038342 A1	17-02-2005
			US 2004152984 A1	05-08-2004