(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
29 November 2007 (29.11.2007)

PCT

(10) International Publication Number
WO 2007/136879 A3

(51) International Patent Classification:
A61B 1/05 (2006.01) *A61B 1/005* (2006.01)
G02B 23/24 (2006.01) *A61B 1/00* (2006.01)

(21) International Application Number:
PCT/US2007/012358

(22) International Filing Date: 21 May 2007 (21.05.2007)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/801,748 19 May 2006 (19.05.2006) US

(71) Applicant *(for all designated States except US)*: **AVANTIS MEDICAL SYSTEMS, INC.** [US/US]; 263 Santa Ana Court, Sunnyvale, CA 94085-4511 (US).

(72) Inventors; and
(75) Inventors/Applicants *(for US only)*: **BAYER, Lex** [ZA/US]; 4080 Amarantha Avenue, Palo Alto, CA 94306 (US). **STEWART, Michael** [US/US]; 92 Amherst, Menlo Park, CA 94025 (US).

(74) Agent: **ZHU, Song**; Squire, Sanders and Dempsey L.L.P., One Maritime Plaza, Suite 300, San Francisco, CA 94111 (US).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

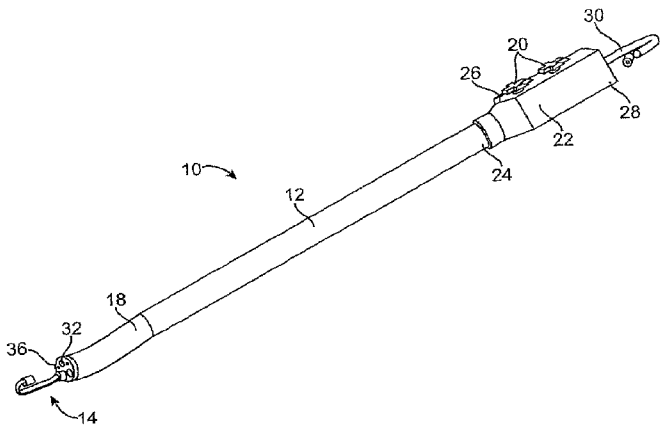
(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report*
— *with amended claims*

(88) Date of publication of the international search report:
31 January 2008

Date of publication of the amended claims: 22 May 2008

(54) Title: SYSTEM AND METHOD FOR PRODUCING AND IMPROVING IMAGES



(57) Abstract: A method for displaying images includes adjusting at least one characteristic of an image from a first imaging device of an endoscope to match at least one corresponding characteristic of an image from a second imaging device of the endoscope. The at least one characteristic may be one or more of color, contrast and brightness. An endoscopic system includes an endoscope including a first imaging device and a second imaging device, and a display device that displays an image from the first imaging device of the endoscope and an image from the second imaging device of the endoscope, wherein the images are sized so that an object, when placed at the same distance from the imaging devices, appears to have about the same size in the images.

WO 2007/136879 A3

received by the International Bureau on 09 Feb 2008 (09.02.08)

14. A method for sizing images, comprising:

placing an image from a first imaging device of an endoscope and an image from a second imaging device of the same or a different endoscope on a display device; and

sizing the images so that an object, when placed at the same distance from the imaging devices, appears to have about the same size in both images.

15. A method for processing images, comprising:

placing image data from first and second imaging devices of an endoscope in one computer file for simultaneous display on a display device.

16. The method of claim 15, wherein the image data from the imaging devices are time-correlated.

17. The method of claim 15, further comprising:

placing patient information data from only one of the images in the computer file for simultaneous display with the images on the display device.

18. An endoscopic system comprising:

a first imaging device;

a second imaging device; and

a controller that adjusts at least one characteristic of an image from the first imaging device to match at least one corresponding characteristic of an image from the second imaging device.

19. The system of claim 18, wherein the characteristic is color.

20. The system of claim 18, wherein the characteristic is contrast.

21. The system of claim 18, wherein the characteristic is brightness.

22. The system of claim 18, wherein the at least one characteristic includes first and second characteristics.

23. The system of claim 22, wherein the first and second characteristics are color and contrast.

24. The method of claim 22, wherein the first and second characteristics are color and brightness.

25. The system of claim 22, wherein the first and second characteristics are contrast and brightness.

26. The system of claim 22, wherein the at least one characteristic includes first, second and third characteristics.

27. The system of claim 26, wherein the first, second and third characteristics are color, contrast and brightness.

28. The system of claim 18, wherein the controller

creates a histogram for each of RGB colors for the image from the first imaging device and a histogram for each of the RGB colors for the image from the second imaging device;

adjusts the gamut of each histogram of the image from the first imaging device to match the gamut of the corresponding histogram of the image from the second imaging device; and

uses gamma coefficients to adjust a color level of each histogram of the image from the first imaging device to match a color level of the corresponding histogram of the image from the second imaging device.

29. An endoscopic system comprising:

a first imaging device;

a second imaging device; and

a display device that displays, side by side, an image from the first imaging device and an image from the second imaging device, wherein the imaging devices face each other, and wherein one of the images is reversed left for right.

30. An endoscopic system comprising:

a first imaging device;

a second imaging device; and

a display device that displays an image from the first imaging device and an image from the second imaging device, wherein the images are sized so that an object, when placed at the same distance from the imaging devices, appears to have about the same size in the images.

31. An endoscopic system comprising:

a first imaging device;

a second imaging device; and

a controller that places image data from the first and second imaging devices in one computer file for simultaneous display on a display device.

32. The system of claim 31, wherein the image data from the imaging devices are time-correlated.

33. The system of claim 31, wherein the controller places patient information data from only one image in the computer file for simultaneous display with the images on the display device.

34. An endoscopic system comprising:

an endoscope including

a first imaging device, and

a second imaging device facing the first imaging device; and

a display device that displays a reversed image from the second imaging device.

35. An endoscopic system comprising:

an endoscope including

a first imaging device, and

a second imaging device facing the first imaging device