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EXAMINER	
HOGUE, DENNIS A	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 11/416,939	Applicant(s) AJITO ET AL.	
	Examiner DENNIS HOGUE	Art Unit 2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 November 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) *11 and 13* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,7,8,10 and 12* is/are rejected.

7)☒ Claim(s) *5,6 and 9* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *03 May 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

1. This is the initial Office Action based on the 11/416,939 application filed 5/3/2006. Claims 1-13, as originally filed, are currently pending and have been considered below.

Election/Restrictions

2. Applicant's election without traverse of Species I, Figure 1, in the reply filed on 11/14/2008 is acknowledged. The Applicant designates claims 1-10 as reading on the elected species. However, in the Examiner's opinion, claim 12 also reads on the elected species because it is analogous to claim 3, but having "means for" language. Therefore, claims 1-10 and 12 are examined in this Office Action. Claims 11 and 13 are withdrawn from consideration.

Priority

3. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by Gono et al. (US PGPub 2003/0176768).

Regarding claim 1, Gono et al. teach a multispectral image capturing apparatus (endoscope device 1, Fig. 1) having different spectral sensitivity characteristics of at least four bands (endoscope device 1 is equipped with rotating filter 14, par. 117; the rotating filter has six color filters R1, G1, B1, R2, G2, and B2, par. 118, see Fig. 2; the spectral characteristics of the R1, G1, and B1 filters are shown in Fig. 3; the spectral characteristics of the R2, G2, and B2 filters are shown in Fig. 4; as can be seen from Fig. 4 vs. Fig. 3, the spectral bandwidths of the R2, G2, and B2 filters are narrower than those of the R1, G1, and B1 filters), comprising: spectral sensitivity characteristics of three primary bands of the at least four bands having spectral sensitivity characteristics of standard RGB (see Fig. 3); and spectral sensitivity characteristic of at least one auxiliary band of the rest of the at least four bands excluding the three primary bands having a spectral sensitivity characteristic of a narrower bandwidth than bandwidths of the RGB (see Fig. 4; the spectral bandwidths of the R2, G2, and B2 filters are narrower than those of the R1, G1, and B1 filters; also see Fig. 20 which shows an alternate set of R2, G2, and B2 filters).

Regarding claim 2, Gono et al. teach the multispectral image capturing apparatus according to claim 1, wherein a sensitivity value of a main wavelength in the spectral sensitivity characteristic of the auxiliary band is smaller than a half of a sensitivity value of a main wavelength in each of the spectral sensitivity characteristics of the three primary bands (see Fig. 20; the G2 band is less than half of the sensitivity of the G1 band of Fig. 3, par. 138-140).

6. Claims 3 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Yahagi et al. (Japanese Patent Application Publication 2002-365517, published on 12/18/2002, which is a publication of application JP-2001-168246; US PGPub 2004/0165276 is taken as a representative translation of the Japanese document and citations as used herein refer to the US document).

Regarding claim 3, Yahagi et al. teach a multispectral image capturing apparatus (focus state determining device, see Fig. 1), comprising: a half mirror configured to divide light from an image capturing lens into two light paths (beam splitter 24 divides light from the taking lens 12 into two portions, a portion which propagates through lens R2 and impinges on imaging surface 22, and a portion which propagates through lens R3 and impinges on imaging surfaces A, B, and C, see Fig. 1); a band-pass filter configured to modulate a spectral characteristic of one portion of the light divided by the half mirror (the beam splitter 24 is also a bandpass filter because it splits light beams with a wavelength range of approximately 500 nm to 600 nm into two beams, and transmits substantially 100% of the light outside this wavelength range, par. 23; that is, essentially all light that enters the beam splitter propagates to lens R2 and the main imaging sensor 22, except for wavelengths in the range of 500-600 nm which are split into two beams; therefore, the splitter 24 is a bandpass filter because it passes the wavelengths in the band 500-600 nm to the focus determination sensors A, B, and C); an image capturing unit configured to receive the light modulated by the band-pass filter and capture an image of a subject (focusing state determination imaging elements A, B, and C detect image signals from the incoming light, par. 25); and a color image capturing unit configured to receive the other portion of the light divided by the half mirror as three decomposed colors of red, blue, and green and capture a color image of the subject (the imaging unit 20 comprises a sensor at imaging surface 22 and resolves the incoming light into three colors, red, blue, and green, by a color resolution optical system, par. 22).

Regarding claim 12, Yahagi et al. teach a multispectral image capturing apparatus (focus state determining device, see Fig. 1), comprising: half mirror means for dividing light from an image capturing lens means into two light paths (beam splitter 24 divides light from the taking lens 12 into two portions, a portion which propagates through lens R2 and impinges on imaging surface 22, and a portion which propagates through lens R3 and impinges on imaging surfaces A, B, and C, see Fig. 1); band-pass filtering means for modulating a spectral characteristic of one portion of the light divided by the half mirror means (the beam splitter 24 is also a bandpass filter because it splits light beams with a wavelength range of approximately 500 nm to 600 nm into two beams, and transmits substantially 100% of the light outside this wavelength range, par. 23; that is, essentially all light that enters the beam splitter propagates to lens R2 and the main imaging sensor 22, except for wavelengths in the range of 500-600 nm which are split into two beams; therefore, the splitter 24 is a bandpass filter because it passes the wavelengths in the band 500-600 nm to the focus determination sensors A, B, and C); image capturing means for receiving the light modulated by the band-pass filtering means and capturing an image of a subject (focusing state determination imaging elements A, B, and C detect image signals from the incoming light, par. 25); and color image capturing means for receiving the other portion of the light divided by the half mirror means as three decomposed colors of red, blue, and green and capturing a color image of the subject (the imaging unit 20 comprises a sensor at imaging surface 22 and resolves the incoming light into three colors, red, blue, and green, by a color resolution optical system, par. 22).

7. Claims 3 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Yoshikawa (US Patent 7,095,443).

Regarding claim 3, Yoshikawa teaches a multispectral image capturing apparatus (optical system of a television camera, Fig. 8), comprising: a half mirror configured to divide light from an image capturing lens into two light paths (color separation optical system 6 comprises several half-mirror surfaces 30, 36, and 42, see Fig. 8; the color separation optical system divides the subject light into a path that impinges upon the focusing sensor A, and a path that impinges on the imaging sensors Xr, Xg, and Xb, see Fig. 8); a band-pass filter configured to modulate a spectral characteristic of one portion of the light divided by the half mirror (the light that impinges upon focus sensor A is of only a green component because only green light is transmitted through half mirror 36, col. 8 lines 49-53; therefore, color separation optical system 6 is a bandpass filter that only passes a green component to the focus sensor A); an image capturing unit configured to receive the light modulated by the band-pass filter and capture an image of a subject (focus sensor A captures an image from the green component of the subject light, see Fig. 8); and a color image capturing unit configured to receive the other portion of the light divided by the half mirror as three decomposed colors of red, blue, and green and capture a color image of the subject (imaging sensors Xr, Xg, and Xb capture images of the red, green, and blue components of the subject light respectively, see Fig. 8).

Regarding claim 12, Yoshikawa teaches a multispectral image capturing apparatus (optical system of a television camera, Fig. 8), comprising: half mirror means for dividing light from an image capturing lens means into two light paths (color separation optical system 6 comprises several half-mirror surfaces 30, 36, and 42, see Fig. 8; the color separation optical system divides the subject light into a path that impinges upon the focusing sensor A, and a path that impinges on the imaging sensors Xr, Xg, and Xb, see Fig. 8); band-pass filtering means for modulating a spectral characteristic of one portion of the light divided by the half mirror means (the light that impinges upon focus sensor A is of only a green component because only green light is transmitted through half mirror 36, col. 8 lines 49-53; therefore, color separation optical system 6 is a bandpass filter that only passes a green component to the focus sensor A); image capturing means for receiving the light modulated by the band-pass filtering means and capturing an image of a subject (focus sensor A captures an image from the green component of the subject light, see Fig. 8); and color image capturing means for receiving the other portion of the light divided by the half mirror means as three decomposed colors of red, blue, and green and capturing a color image of the subject (imaging sensors Xr, Xg, and Xb capture images of the red, green, and blue components of the subject light respectively, see Fig. 8).

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 3, 8, and 12 are rejected under 35 U.S.C. 102(e) as being anticipated by Hirose (US PGPub 2004/0095489).

Regarding claim 3, Hirose teaches a multispectral image capturing apparatus (image pickup apparatus 10A that splits light emitted from the surface of the subject into wavelength bands corresponding to a plurality of colors, par. 35), comprising: a half mirror configured to divide light from an image capturing lens into two light paths (spectral prism 31A comprises a spectral face 31f formed from a dichroic film which functions as a dichroic filter, par. 39; the spectral face 31f the incident light Lo is split into optical path La and optical path Lb, par. 40, see Fig. 2); a band-pass filter configured to modulate a spectral characteristic of one portion of the light divided by the half mirror (the dichroic filter has a characteristic as shown in Fig. 3A; light within the passband of the filter is transmitted along optical path La, and light outside the passband is reflected along optical path Lb, par. 50, 53; therefore, the dichroic filter is a filter that modulates the spectral characteristic of both portions of light); an image capturing unit configured to receive the light modulated by the band-pass filter and capture an image of a subject (CCD 32a receives the light from optical path La, par. 41; CCD 32a has a Bayer RGB color filter array for which the spectral characteristics of the R, G, and B filters is shown in Figs. 3A-3C as Fb, Fg, and Fr, par. 41); and a color image capturing unit configured to receive the other portion of the light divided by the half mirror as three decomposed colors of red, blue, and green and capture a color image of the subject (CCD 32b receives the light from optical path Lb, par. 41; CCD 32b has a Bayer RGB color filter array for which the spectral characteristics of the R, G, and B filters is shown in Figs. 3A-3C as Fb, Fg, and Fr, par. 41). That is, the camera apparatus of Hirose features two identical CCDs 32a and 32b, each having a Bayer pattern having spectral characteristics of Fr, Fg, and Fb. The prism/filter 32A essentially splits the light of each of the RGB bands Fb, Fg, and Fr into two portions, transmitting light in the passband of the filter of Fig. 3A to CCD 32a, and reflecting light outside of the passband to CCD 32b. The prism/filter used in conjunction with the Bayer color filter pattern on each of the CCDs means that each CCD receives three narrow color bands (the shaded areas of Figs. 3B and 3C), meaning that the camera receives image information of six color bands.

Regarding claim 8, Hirose teaches the multispectral image capturing apparatus according to claim 3, wherein the band-pass filter has a comb-like spectral shape including a plurality of transmissive wavelength bandwidths and a plurality of non-transmissive wavelength bandwidths within a wavelength range of a visible region (the dichroic filter of the prism 31A has the spectral characteristic of Fig. 3A; as can be seen from Fig. 3A, the filter has a plurality of transmissive wavelength bandwidths and a plurality of non-transmissive wavelength bandwidths), and the image capturing unit configured to receive the light transmitted through the band-pass filter includes a color image capturing unit configured to decompose and receive light of the plurality of transmissive wavelength bandwidths transmitted through the band-pass filter (each CCD 32a and 32b has a Bayer color filter array having the spectral characteristics of Fb, Fg, and Fr in Figs. 3A-3C, par. 41, 50; as shown in Figs. 3B and 3C, each CCD is sensitive to the light it receives from the prism 31A as illustrated by the shaded regions in the drawings).

Regarding claim 12, Hirose teaches a multispectral image capturing apparatus (image pickup apparatus 10A that splits light emitted from the surface of the subject into wavelength bands corresponding to a plurality of colors, par. 35), comprising: half mirror means for dividing light from an image capturing lens means into two light paths (spectral prism 31A comprises a spectral face 31f formed from a dichroic film which functions as a dichroic filter, par. 39; the spectral face 31f the incident light Lo is split into optical path La and optical path Lb, par. 40, see Fig. 2); band-pass filtering means for modulating a spectral characteristic of one portion of the light divided by the half mirror means (the dichroic filter has a characteristic as shown in Fig. 3A; light within the passband of the filter is transmitted along optical path La, and light outside the passband is reflected along optical path Lb, par. 50, 53; therefore, the dichroic filter is a filter that modulates the spectral characteristic of both portions of light); image capturing means for receiving the light modulated by the band-pass filtering means and capturing an image of a subject (CCD 32a receives the light from optical path La, par. 41; CCD 32a has a Bayer RGB color filter array for which the spectral characteristics of the R, G, and B filters is shown in Figs. 3A-3C as Fb, Fg, and Fr, par. 41); and color image capturing means for receiving the other portion of the light divided by the half mirror means as three decomposed colors of red, blue, and green and capturing a color image of the subject (CCD 32b receives the light from optical path Lb, par. 41; CCD 32b has a Bayer RGB color filter array for which the spectral characteristics of the R, G, and B filters is shown in Figs. 3A-3C as Fb, Fg, and Fr, par. 41). That is, the camera apparatus of Hirose features two identical CCDs 32a and 32b, each having a Bayer pattern having spectral characteristics of Fr, Fg, and Fb. The prism/filter 32A essentially splits the light of each of the RGB bands Fb, Fg, and Fr into two portions, transmitting light in the passband of the filter of Fig. 3A to CCD 32a, and reflecting light outside of the passband to CCD 32b. The prism/filter used in conjunction with the Bayer color filter pattern on each of the CCDs means that each CCD receives three narrow color bands (the shaded areas of Figs. 3B and 3C), meaning that the camera receives image information of six color bands.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshikawa (US PGPub 2003/0160888) in view of Yahagi et al. (Japanese Patent Application Publication 2002-365517, published on 12/18/2002, which is a publication of application JP-2001-168246; US PGPub 2004/0165276 is taken as a representative translation of the Japanese document and citations as used herein refer to the US document).

Regarding claim 3, Yoshikawa teaches a multispectral image capturing apparatus (camera and imaging lens that captured an image of a subject in red, green, and blue components, see Fig. 2), comprising: a half mirror configured to divide light from an image capturing lens into two light paths (the beamsplitter 42 comprises two half-mirror surfaces that divide the subject light, see Fig. 2; the subject light is divided into a portion that impinges upon focus detector 50A, a portion that impinges upon focus detector 50B, and a portion that passes through the beamsplitter 42 to the imaging sensors 54R, 54G, and 54B, see Fig. 2); an image capturing unit configured to receive the light in the first path and capture an image of a subject (focus detector 50A receives light in the first optical path and captures an image of the subject, see Fig. 2); and a color image capturing unit configured to receive the other portion of the light divided by the half mirror as three decomposed colors of red, blue, and green and capture a color image of the subject (imaging sensors 54R, 54G, and 54B capture images of the second path in red, green, and blue colors respectively via the color separation prism 52, see Fig. 2). However, Yoshikawa does not teach a band-pass filter configured to modulate a spectral characteristic of the first portion of the light divided by the half mirror. Note that in the camera apparatus of Yoshikawa, the image sensors 54R, 54G, and 54B are used to capture the full color image of the subject for storage to a storage medium, whereas image sensors 50A and 50B are used to capture images of the subject that are used only to estimate a focus value (par. 19, 21).

Yahagi et al. teach an autofocus device for a camera (Fig. 1) where only a green component of wavelengths 500-600 nm is extracted from the subject light via a beamsplitter 24 (see Fig. 1) and used for determining a focus value (par. 23). The extracted green component is sensed by image sensors A, B, and C and used to drive the focus lens F (see Fig. 1). By using the green light as the subject light for focus determination, a focus state is determined on the basis of a color component of highest sensitivity for human eyes (par. 24).

Therefore, it would be obvious to one of ordinary skill in the art to combine the green color filtering of Yahagi et al. with the camera apparatus of Yoshikawa so that focusing could be carried out based on the color component to which the user's eyes are most sensitive. This would increase the quality of the focus determination.

Regarding claim 4, Yoshikawa in view of Yahagi et al. teaches the multispectral image capturing apparatus according to claim 3, wherein the half mirror is configured to divide the light from the image capturing lens into the two light paths at an unequal intensity ratio of equal to or greater than two to one (the amount of light used for image production is in the ratio of 2:1 to the object light used for focus detection, par. 24; that is, 2/3 of the light passes through the splitter, and 1/3 of the light is reflected to the focus detectors; then 1/6 of the light impinges upon each focus detector 50A and 50B, par. 24; therefore, the ratio is 4:1 when considering an individual focus sensor).

12. Claims 7 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshikawa (US PGPub 2003/0160888) in view of Yahagi et al. (Japanese Patent Application Publication 2002-365517, published on 12/18/2002, which is a publication of application JP-2001-168246; US PGPub 2004/0165276 is taken as a representative translation of the Japanese document and citations as used herein refer to the US document) as applied to claim 4 above, and further in view of Parulski et al. (US Patent 5,668,597).

Regarding claim 7, Yoshikawa in view of Yahagi et al. teaches the multispectral image capturing apparatus according to claim 4, wherein the image capturing unit configured to receive the light divided by the half mirror and transmitted through the band-pass filter includes an image capturing device configured to capture an image (in the examiner's opinion, any image capturing unit is by definition an image capturing device configured to capture an image; claim 3 already defines that the multispectral image capturing apparatus includes the image capturing unit configured to receive the light divided by the half mirror and transmitted through the band-pass filter; therefore this language is redundant and unnecessary), and the color image capturing unit configured to receive the light divided by the half mirror as the three decomposed colors of red, blue, and green includes an image capturing device configured to capture an image (in the examiner's opinion, any image capturing unit is by definition an image capturing device configured to capture an image; claim 3 already defines that the multispectral image capturing apparatus includes the color image capturing unit configured to receive the light divided by the half mirror as the three decomposed colors of red, blue, and green; therefore this language is redundant and unnecessary). However, Yoshikawa in view of Yahagi et al. does not teach that a total number of pixels of the image capturing device included in the image capturing unit is smaller than a total number of pixels of the image capturing device included in the color image capturing unit.

Parulski et al. teach an image capturing apparatus wherein an image captured for use in estimating a focus value is lower in resolution than the resolution of an image that is captured and stored in the recording medium (see abstract and col. 6 lines 56-59). In other words, a low resolution image is used for focus evaluation, whereas at the time of shutter release, an image having the full resolution of the sensor is captured. This is well known in the art. The typical single image sensor camera has a full resolution mode which is used to capture high resolution still images, and a low resolution mode which is used to drive the LCD of the camera for use as an electronic viewfinder, to generate focus evaluation values, and as the source image data in movie mode. As Parulski et al. teach, the image used to generate a focus estimation value need not be a full resolution image. Further, using a low resolution mode for generating the focus estimation values allows the focus values to be estimated faster, because low resolution images can be read out faster than high resolution images.

Therefore, it would be obvious to one of ordinary skill in the art to combine the low resolution image sensing of Parulski et al. with the focus determining apparatus of Yoshikawa in view of Yahagi et al. so that low resolution image sensors could be used as image sensors 50A and 50B. This would reduce the cost of the camera apparatus.

Regarding claim 10, Hirose teaches the multispectral image capturing apparatus according to claim 3, wherein the image capturing unit configured to receive the light divided by the half mirror and transmitted through the band-pass filter includes an image capturing device configured to capture an image (in the examiner's opinion, any image capturing unit is by definition an image capturing device configured to capture an image; claim 3 already defines that the multispectral image capturing apparatus includes the image capturing unit configured to receive the light divided by the half mirror and transmitted through the band-pass filter; therefore this language is redundant and unnecessary), and the color image capturing unit configured to receive the light divided by the half mirror as the three decomposed colors of red, blue, and green includes an image capturing device configured to capture an image (in the examiner's opinion, any image capturing unit is by definition an image capturing device configured to capture an image; claim 3 already defines that the multispectral image capturing apparatus includes the color image capturing unit configured to receive the light divided by the half mirror as the three decomposed colors of red, blue, and green; therefore this language is redundant and unnecessary). However, Yoshikawa in view of Yahagi et al. does not teach that a total number of pixels of the image capturing device included in the image capturing unit is smaller than a total number of pixels of the image capturing device included in the color image capturing unit.

Parulski et al. teach an image capturing apparatus wherein an image captured for use in estimating a focus value is lower in resolution than the resolution of an image that is captured and stored in the recording medium (see abstract and col. 6 lines 56-59). In other words, a low resolution image is used for focus evaluation, whereas at the time of shutter release, an image having the full resolution of the sensor is captured. This is well known in the art. The typical single image sensor camera has a full resolution mode which is used to capture high resolution still images, and a low resolution mode which is used to drive the LCD of the camera for use as an electronic viewfinder, to generate focus evaluation values, and as the source image data in movie mode. As Parulski et al. teach, the image used to generate a focus estimation value need not be a full resolution image. Further, using a low resolution mode for generating the focus estimation values allows the focus values to be estimated faster, because low resolution images can be read out faster than high resolution images.

Therefore, it would be obvious to one of ordinary skill in the art to combine the low resolution image sensing of Parulski et al. with the focus determining apparatus of Yoshikawa in view of Yahagi et al. so that low resolution image sensors could be used as image sensors 50A and 50B. This would reduce the cost of the camera apparatus.

Allowable Subject Matter

13. Claims 5, 6, and 9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Hopkins (US Patent 5,982,497) teaches an imaging apparatus that splits subject light into 4 color bands (Fig. 6), and using a comb filter (Fig. 7) and half mirror, splits those 4 bands into 8 bands (Fig. 8).

Duncan et al. (US Patent 6,215,597) teach an imaging apparatus that receives subject light in either 3 wide color bands (Fig. 7), or 3 narrow color bands (Fig 8). See also col. 6 lines 51-63. In the examiner's opinion, it would be obvious to one of ordinary skill to make the trim filters of the narrow bands selectively engageable or provide a separate light path for the trim filters so that a user could select the configuration of his or her preference, because as Duncan et al. teach, in many applications the trim filters are desirable.

Noguchi (US Patent 6,885,394) teaches a multi-spectral camera having either 8 (Figs. 2, 3) or 16 (Fig. 5) color bands.

Hoshuyama (US PGPub 2005/0212934) teaches a camera having a four color color filter array (Fig. 2), where there are two green bands as shown in Fig. 3, the G2 band having a lower sensitivity than the G1 band. This is an intervening reference.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DENNIS HOGUE whose telephone number is (571) 270-5089. The examiner can normally be reached on Mon. - Thurs., 8:00 AM - 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lin Ye can be reached on (571) 272-7372. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Tuan V Ho/

Primary Examiner, Art Unit 2622

DH

Examiner

1/16/2009