

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In Re the Application of:

Jeffrey L. Adair

Serial No.:

Filed: .

Atty. File No.:

Entitled: "Reduced Area Imaging Device  
Incorporated Within Endoscopic Devices"

SUPPLEMENTAL  
INFORMATION DISCLOSURE  
STATEMENT

Electronically Submitted

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Commissioner:

The references cited on attached Form PTO/SB08 are being called to the attention of the Examiner.

- ☐ Copies of the cited non-patent and/or foreign references are enclosed herewith.
- ☐ Copies of the cited U.S. patents and/or patent applications are enclosed herewith.
- ☒ Copies of the cited U.S. patents/patent application publications are not enclosed in accordance with 37 C.F.R. § 1.98(a).
- ☒ Copies of the cited references are not enclosed, in accordance with 37 C.F.R. § 1.98(d), because the references were cited by or submitted to the U.S. Patent and Trademark Office in prior application Serial No. 13/732,908 filed 01-02-2013, which is relied upon for an earlier filing date under 35 U.S.C. § 120.
- ☐ To the best of applicants' belief, the pertinence of the foreign-language references is believed to be summarized in the attached English abstracts and/or in the figures, although applicants do not necessarily vouch for the accuracy of the translation.
- ☒ Examiner's attention is drawn to the following related applications:
- Serial No. 08/944,322 filed 10/06/1997 now U.S. Patent No. 5,929,901 (Attorney's Ref. No. 7311-23)
  - Serial No. 08/976,976 filed 11/24/1997 now U.S. Patent No. 5,986,693 (Attorney's Ref. No. 7311-23-CIP)
  - Serial No. 09/175,685 filed 10/20/1998 now U.S. Patent No. 6,043,839 (Attorney's Ref. No. 7311-23-CIP-2)

- Serial No. 09/496,312 filed 02/01/2000 now U.S. Patent No. 6,275,255 (Attorney's Ref. No. 7311-23-CIP2-CON)
- Serial No. 09/368,246 filed 08/03/1999 now U.S. Patent No. 6,310,642 (Attorney's Ref. No. 7311-23-CIP-4)
- Serial No. 09/544,528 filed 04/06/2000 now U.S. Patent No. 6,211,904 (Attorney's Ref. No. 7311-23-CIP-5)
- Serial No. 09/613,027 filed 07/10/2000 now U.S. Patent No. 6,452,626 (Attorney's Ref. No. 7311-23-CIP-6)
- Serial No. 10/198,189 filed 07/17/2002 now U.S. Patent No. 6,862,036 (Attorney's Ref. No. 7311-23-CIP6-CON)
- Serial No. 09/638,976 filed 08/15/2000 now U.S. Patent No. 6,424,369 (Attorney's Ref. No. 7311-23-CIP-7)
- Serial No. 10/171,906 filed 06/13/2002 (Attorney's Ref. No. 7311-23-CIP7-CON)
- Serial No. 09/934,201 filed 08/21/2001 now U.S. Patent No. 7,002,621 (Attorney's Ref. No. 7311-23-CIP-9)
- Serial No. 09/935,993 filed 08/23/2001 now U.S. Patent No. 6,982,742 (Attorney's Ref. No. 7311-23-CIP-10)
- Serial No. 09/971,749 filed 10/04/2001 now U.S. Patent No. 6,982,740 (Attorney's Ref. No. 7311-23-CIP-11)

**Certification (37 C.F.R. 1.97(e))**  
(Applicable only if checked)

- ☐ The undersigned certifies that:
- ☐ Each item of information contained in this information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this statement. 37 C.F.R. 1.97(e)(1).
  - ☐ A copy of the communication from the foreign patent office is enclosed.

OR

- ☐ No item of information contained in this information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the undersigned after making reasonable inquiry, no item of information contained in this Information Disclosure Statement was known to any individual designated in 37 C.F.R. 1.56(c) more than three months prior to the filing of this statement. 37 C.F.R. 1.97(e)(2).

Respectfully submitted,

/clifford kraft/

By: Clifford H. Kraft  
Reg. No. 35,229  
Attorney of Record

<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> ( Not for submission under 37 CFR 1.99)	Application Number		
	Filing Date		
	First Named Inventor	Jeffrey Adair	
	Art Unit		
	Examiner Name		
	Attorney Docket Number		

U.S.PATENTS						
Examiner Initial*	Cite No	Patent Number	Kind Code <sup>1</sup>	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No. <sup>1</sup>	Document Number Number-kind Code <sup>2</sup> (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1	4164182	08/14/1979	Sato	
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	93	EP 1575092	08/06/2008	ADAIR		
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	96	JP S61-254917	11/12/1986	ASAHI OPTICAL CO LTD		
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	106	JP H11-275416	10/08/1999	SONY CORP		
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	116	WO 97/26744	07/24/1997	ROBB		
	117	WO 98/19435	05/07/1998	KOPIN CORPORATION		
	118	WO 99/18613	04/15/1999	ADAIR		
	119	WO 00/36583	06/22/2000	KOPIN CORP		
	120	WO 01/08549	02/08/2001	ADAIR		
	121	WO 01/48477	07/05/2001	ADAIR		
	122	WO 01/56458	08/09/2001	ADAIR		
	123	WO 02/05546	01/17/2002	ADAIR		
	124	WO 02/09023	01/31/2002	PSC SCANNING INC		
	125	WO 02/15567	02/21/2002	ADAIR		
	126	WO 03/015619	02/27/2003	ADAIR		
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	128	WO 03/019940	03/06/2003	ADAIR		
	129	WO 03/030525	04/10/2003	MICRO MEDICAL DEVICES INC		

**NON-PATENT LITERATURE DOCUMENTS**

Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
	130	"Camera phone technology," eWebsite.com, 1997, 3 pages. Supplied in Parent Case

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140	JAKL, "Why CMOS Image Sensors are Poised to Surpass CCDs," International IC '99, Conference Proceedings, 1999, pp. 64-71.
141	MENDIS et al., "CMOS Active Pixel Image Sensor," IEEE Transactions on Electron Devices, 1994, Vol. 41, Iss. 3, 7 pages.
142	MEYERSON, "Kids, I'm dialing Grandma now, so stand straight... and smile," Denver Rocky Mountain News, Sep. 5, 2000, 1 page.
143	NISHIKAWA et al., "A 60MHz 240mW MPEG-4 Video-Phone LSI with 16Mb Embedded DRAM," IEEE International Solid-State Circuits Conference, 2000, pp. 230-231.
144	NIXON et al., "256x256 CMOS Active Pixel Sensor Camera-on-a-Chip," IEEE Journal of Solid-State Circuits, 1996, Vol. 31, Iss. 12, pp. 2046-2050.
145	PARULSKI et al. "The Continuing Evolution of Digital Cameras and Digital Photography Systems," Proceedings of the IEEE International Symposium on Circuits and Systems, 2000, Vol. 5, pp. 101-104.
146	TAKAHASHI et al., "A scalable MPEG-4 video codec architecture for IMT-2000 multimedia applications," Proceedings of the IEEE International Symposium on Circuits and Systems, 2000, Vol. 2, pp. 188-191.

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				First Named Inventor	
				Art Unit	
				Examiner Name	
Sheet	7	of	9	Attorney Docket Number	

147	TARIQ et al., "Robust and scalable matching pursuits video transmission using the Bluetooth air interface standard," IEEE Transactions on Consumer Electronics, 2000, Vol. 46, No. 3, pp. 673-681.
148	International Search Report for International (PCT) Patent Application No. PCT/US98/19379 mailed Feb. 1, 1999 (Attorney Ref. No. 7311-23-PCT), 3 pages.
149	Written Opinion for International (PCT) Patent Application No. PCT/US98/19379 mailed Jul. 1, 1999 (Attorney Ref. No. 7311-23-PCT), 8 pages.
150	International Preliminary Examination Report for International (PCT) Patent Application No. PCT/US98/19379 mailed Nov. 5, 1999 (Attorney Ref. No. 7311-23-PCT), 8 pages.
151	Official Action for European Patent Application No. 98948297.1 dated Mar. 28, 2002 (Attorney Ref. No. 7311-23-PEP), 4 pages.
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154	International Search Report for International (PCT) Patent Application No. PCT/US00/10118 mailed Oct. 25, 2000 (Attorney Ref. No. 7311-23-CIP5-PCT), 6 pages.
155	Official Action for Canadian Patent Application No. 2,368,245 dated May 3, 2006 (Attorney Ref. No. 7311-23-CIP5-PCA), 5 pages.
156	European Search Report for European Patent Application No. 00928180.9 dated Feb. 1, 2005 (Attorney Ref. No. 7311-23-CIP5-PEP), 2 pages.
157	International Search Report for International (PCT) Patent Application No. PCT/US01/19854 mailed Oct. 26, 2001 (Attorney Ref. No. 7311-23-CIP6-PCT), 3 pages.
158	Written Opinion for International (PCT) Patent Application No. PCT/US01/19854 mailed Jan. 11, 2002 (Attorney Ref. No. 7311-23-CIP6-PCT), 2 pages.
159	International Preliminary Examination Report for International (PCT) Patent Application No. PCT/US01/19854 dated Nov. 28, 2002 (Attorney Ref. No. 7311-23-CIP6-PCT), 6 pages.
160	International Search Report for International (PCT) Patent Application No. PCT/US01/19855 mailed Nov. 20, 2001 (Attorney Ref. No. 7311-23-CIP7-PCT), 3 pages.
161	Written Opinion for International (PCT) Patent Application No. PCT/US01/19855 mailed May 7, 2002 (Attorney Ref. No. 7311-23-CIP7-PCT), 5 pages.
162	International Preliminary Examination Report for International (PCT) Patent Application No. PCT/US01/19855 dated Jul. 1, 2004 (Attorney Ref. No. 7311-23-CIP7-PCT), 6 pages.
163	International Search Report for International (PCT) Patent Application No. PCT/US01/30155 mailed Jul. 16, 2002 (Attorney Ref. No. 7311-23-CIP8-PCT), 3 pages.
164	International Search Report for International (PCT) Patent Application No. PCT/US01/30154 mailed Jan. 28, 2003 (Attorney Ref. No. 7311-23-CIP9-PCT), 5 pages.
165	International Search Report for International (PCT) Patent Application No. PCT/US01/44069 mailed Aug. 1, 2002 (Attorney Ref. No. 7311-23-CIP11-PCT), 3 pages.

Examiner Signature		Date Considered	
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\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. Applicant's unique citation designation number (optional). See Kinds Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04. Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. Applicant is to place a check mark here if English language Translation is attached.

ALL REFERENCES SUPPLIED IN PARENT CASE

Samsung Exhibit 1028

Page 11 of 272

<b>REFERENCES SUPPLIED BY APPLICANTS</b>	Application/Control No.	Applicant(s) Jeffrey L. Adair	

**U.S. PATENT DOCUMENTS**

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
	A	US-6,141,037	10-2000	Upton et al.	348/65
	B	US-5,603,697	02-1997	Grundy et al.	604/95.04
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

**FOREIGN PATENT DOCUMENTS**

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

**NON-PATENT DOCUMENTS**

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
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	X	

\*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)  
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.



Substitute for form 1449/PTO  <b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> <i>(Use as many sheets as necessary)</i>			<b>Complete if Known</b>		
			Application Number		
			Filing Date		
			First Named Inventor		
			Art Unit		
			Examiner Name		
Sheet		of		Attorney Docket Number	

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No. <sup>1</sup>	Document Number Number-Kind Code <sup>2</sup> (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1	4491865	01/01/1985	Danna, et al.	
	2	4745471	05/17/1988	Takamura, et al.	
	3	4786965	11/22/1988	Yabe	
	4	4814648	03/21/1989	Hynecek	
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	6	4869246	09/26/1989	Adair	
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	8	RE33854	03/24/1992	Adair	
	9	5116317	05/26/1992	Carson, Jr. et al.	
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	11	5220198	06/15/1993	Tsuji	
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	21	5630783	05/20/1997	Steinberg	
	22	5682199	10/28/1997	Lankford	
	23	5701155	12/23/1997	Wood, et al.	
	24	5734418	03/31/1998	Danna	
	25	5754313	05/19/1998	Pelchy et al.	
	26	5879289	03/09/1999	Yarush et al.	
	27	5929901	07/27/1999	Adair et al.	
	28	5980450	11/09/1999	Thompson	
	29	5986693	11/16/1999	Adair et al.	
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	31	6141037	10/31/2000	Upton et al.	
	32	6275255	08/14/2001	Adair et al.	

Examiner Signature		Date Considered	
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Substitute for form 1449/PTO  <b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> <i>(Use as many sheets as necessary)</i>			<b>Complete if Known</b>		
			Application Number		
			Filing Date		
			First Named Inventor	Jeffrey L. Adair	
			Art Unit		
			Examiner Name		
Sheet		of		Attorney Docket Number	

	33	6310642	10/30/2001	Adair et al.	
	34	6413209	07/02/ 2002	Thompson	
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	36	6659940	12/09/2003	Adler	
	37	6729726	05/04/2004	Miller et al.	
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	41	7030904	04/18/2006	Adair et al.	
	42	2006/0022234	02/02/2006	Adair et al.	
	43	2011/0034769	02/10/2011	Adair et al.	

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document Country Code <sup>3</sup> ; Number <sup>4</sup> ; Kind Code <sup>5</sup> (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T <sup>6</sup>
	44	DE 10028080	02/22/2001	ASAHI OPTICAL CO LTD		(With English Abstract)
	45	DE 10028081	02/22/2001	ASAHI OPTICAL CO LTD		(With English Abstract)
	46	EP 0492349	07/01/1992	MATSUSHITA ELECTRIC IND CO LTD		
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	48	WO 93/15648	08/19/1993	Wilk et al.		
	49	WO 98/11816	03/26/1998	University College London		
	50	WO 01/45793	06/28/2001	Medtronic, Inc.		

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Examiner Signature		Date Considered	
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Substitute for form 1449/PTO  <b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> <i>(Use as many sheets as necessary)</i>		<b>Complete if Known</b>			
		Application Number			
		Filing Date			
		First Named Inventor	Jeffrey L. Adair		
		Art Unit			
		Examiner Name			
Sheet		of		Attorney Docket Number	

## ALL REFERENCES SUPPLIED IN PARENT CASE

NON-PATENT LITERATURE DOCUMENTS		
Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
	51	Device named "Digital Doc Intra Oral Camera"; sold by Digital Doc, Inc., Folsom, CA date unknown, [retrieved on 08/13/2001], 3 pages.
	52	ARMSTRONG et al., "NASA's Tiny Camera Has a Wide-Angle Future"; Business Week, March 6, 1995, 3 pages.
	53	LOCKYER, "Applications Hold the Key to Imager Choice"; Photonics Spectra, March 1997, pp. 80-90.
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	55	ZARNOWSKI et al., "Imaging Options Expand With CMOS Technology"; Laser Focus World, June 1997, 5 pages.
	56	Official Action for U.S. Patent Application No. 09/929,531, mailed Dec. 29, 2004 (Attorney's Ref. No. 7018-23-CIP8)
	57	Notice of Allowance for U.S. Patent Application No. 09/929,531, mailed Sep. 16, 2005 (Attorney's Ref. No. 7311-23-CIP8)
	58	Official Action for U.S. Patent Application No. 11/245,960, mailed Apr. 28, 2010 (Attorney's Ref. No. 7018-23-CIP8-CON)
	59	Official Action for U.S. Patent Application No. 12/889,287, mailed Nov. 7, 2012 (Attorney's Ref. No. 7018-23-CIP8-CON-CIP), 9 pages.

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<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> ( Not for submission under 37 CFR 1.99)	Application Number		
	Filing Date		
	First Named Inventor	Jeffrey Adair	
	Art Unit		
	Examiner Name		
	Attorney Docket Number		

	1		<input type="checkbox"/>
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If you wish to add additional non-patent literature document citation information please click the Add button

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Examiner Signature		Date Considered	
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<sup>1</sup> See Kind Codes of USPTO Patent Documents at [www.USPTO.GOV](http://www.USPTO.GOV) or MPEP 901.04. <sup>2</sup> Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>3</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>4</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. <sup>5</sup> Applicant is to place a check mark here if English language translation is attached.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	Micro-052-565-Cont
		Application Number	
Title of Invention	Reduced area imaging device incorporated within endoscopic devices		
<p>The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.</p> <p>This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.</p>			

## Secrecy Order 37 CFR 5.2

<input type="checkbox"/>	Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)
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## Inventor Information:

Inventor 1					<a href="#">Remove</a>	
Legal Name						
Prefix	Given Name	Middle Name	Family Name	Suffix		
	Jeffrey	L.	Adair			
Residence Information (Select One) <input checked="" type="radio"/> US Residency <input type="radio"/> Non US Residency <input type="radio"/> Active US Military Service						
City	Highlands Ranch	State/Province	CO	Country of Residence i	US	
Mailing Address of Inventor:						
Address 1		1861 East Redfox Place				
Address 2						
City	Highlands Ranch	State/Province	CO			
Postal Code	80126	Country i	US			
Inventor 2					<a href="#">Remove</a>	
Legal Name						
Prefix	Given Name	Middle Name	Family Name	Suffix		
	Edwin		Adair			
Residence Information (Select One) <input checked="" type="radio"/> US Residency <input type="radio"/> Non US Residency <input type="radio"/> Active US Military Service						
City	DECEASED	State/Province		Country of Residence i		
Mailing Address of Inventor:						
Address 1						
Address 2						
City	DECEASED	State/Province				
Postal Code		Country i				
Inventor 3					<a href="#">Remove</a>	
Legal Name						
Prefix	Given Name	Middle Name	Family Name	Suffix		
	Randall		Adair			
Residence Information (Select One) <input checked="" type="radio"/> US Residency <input type="radio"/> Non US Residency <input type="radio"/> Active US Military Service						

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<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	Micro-052-565-Cont
		Application Number	
Title of Invention	Reduced area imaging device incorporated within endoscopic devices		

City	Denver	State/Province	CO	Country of Residence i	US
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**Mailing Address of Inventor:**

Address 1	3134 Wyandot Street				
Address 2					
City	Denver	State/Province	CO		
Postal Code	80211	Country i	US		
All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the <b>Add</b> button.					

**Correspondence Information:**

Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a).			
<input type="checkbox"/> An Address is being provided for the correspondence Information of this application.			
Customer Number	74642		
Email Address		<input type="button" value="Add Email"/>	<input type="button" value="Remove Email"/>

**Application Information:**

Title of the Invention	Reduced area imaging device incorporated within endoscopic devices		
Attorney Docket Number	Micro-052-565-Cont	Small Entity Status Claimed	<input checked="" type="checkbox"/>
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	17	Suggested Figure for Publication (if any)	1A

**Filing By Reference :**

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country i

**Publication Information:**

<input type="checkbox"/> Request Early Publication (Fee required at time of Request 37 CFR 1.219)
<input type="checkbox"/> <b>Request Not to Publish.</b> I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application <b>has not and will not</b> be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

**Samsung Exhibit 1028**

<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	Micro-052-565-Cont
		Application Number	
Title of Invention	Reduced area imaging device incorporated within endoscopic devices		

## Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	<input checked="" type="radio"/> Customer Number	<input type="radio"/> US Patent Practitioner	<input type="radio"/> Limited Recognition (37 CFR 11.9)
Customer Number	74642		

## Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.

When referring to the current application, please leave the application number blank.

Prior Application Status	Pending		<a href="#">Remove</a>		
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)		
present	Continuation of	14705334	2015-05-06		
Prior Application Status	Pending		<a href="#">Remove</a>		
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)		
14705334	Continuation of	14333260	2014-07-16		
Prior Application Status	Patented		<a href="#">Remove</a>		
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
14333260	Continuation of	13732908	2013-01-02	8885034	2014-11-11
Prior Application Status	Abandoned		<a href="#">Remove</a>		
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)		
13732908	Continuation of	12889287	2010-09-23		
Prior Application Status	Abandoned		<a href="#">Remove</a>		
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)		
12889287	Continuation in part of	11245960	2005-10-06		
Prior Application Status	Patented		<a href="#">Remove</a>		
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
11245960	Continuation of	09929531	2001-08-13	7030904	2006-04-18
Prior Application Status	Patented		<a href="#">Remove</a>		

<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	Micro-052-565-Cont
		Application Number	
Title of Invention	Reduced area imaging device incorporated within endoscopic devices		

Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
09929531	Continuation in part of	09496312	2000-02-01	6275255	2001-08-14
Prior Application Status		Patented	<a href="#">Remove</a>		
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
09496312	Continuation of	09175685	1998-10-20	6043839	2000-03-28
Prior Application Status		Patented	<a href="#">Remove</a>		
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
09175685	Continuation in part of	08944322	1997-10-06	5929901	1999-07-27
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the <b>Add</b> button.					

## Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(d). When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX) the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(h)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

[Remove](#)

Application Number	Country <sup>i</sup>	Filing Date (YYYY-MM-DD)	Access Code <sup>j</sup> (if applicable)

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.

## Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.

NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.



<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	Micro-052-565-Cont
		Application Number	
Title of Invention	Reduced area imaging device incorporated within endoscopic devices		

## Authorization to Permit Access:

☒ Authorization to Permit Access to the Instant Application by the Participating Offices

If checked, the undersigned hereby grants the USPTO authority to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the World Intellectual Property Office (WIPO), and any other intellectual property offices in which a foreign application claiming priority to the instant patent application is filed access to the instant patent application. See 37 CFR 1.14(c) and (h). This box should not be checked if the applicant does not wish the EPO, JPO, KIPO, WIPO, or other intellectual property office in which a foreign application claiming priority to the instant patent application is filed to have access to the instant patent application.

In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the instant patent application with respect to: 1) the instant patent application-as-filed; 2) any foreign application to which the instant patent application claims priority under 35 U.S.C. 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the instant patent application; and 3) any U.S. application-as-filed from which benefit is sought in the instant patent application.

In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date of filing this Authorization.

## Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

### Applicant 1

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

☐ Assignee

☒ Legal Representative under 35 U.S.C. 117

☐ Joint Inventor

☐ Person to whom the inventor is obligated to assign.

☐ Person who shows sufficient proprietary interest

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor :

If the Applicant is an Organization check here. ☐

Prefix	Given Name	Middle Name	Family Name	Suffix
Mr.				

<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	Micro-052-565-Cont
		Application Number	
Title of Invention	Reduced area imaging device incorporated within endoscopic devices		

<b>Mailing Address Information:</b>			
Address 1			
Address 2			
City		State/Province	
Country i		Postal Code	
Phone Number		Fax Number	
Email Address			
Additional Applicant Data may be generated within this form by selecting the Add button.			

## Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

<b>Assignee 1</b>			
Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.			
If the Assignee or Non-Applicant Assignee is an Organization check here. <input checked="" type="checkbox"/>			
Organization Name	Micro-Imaging Solutions LLC		

<b>Mailing Address Information For Assignee including Non-Applicant Assignee:</b>			
Address 1		3134 Wyandot Street	
Address 2			
City	Denver	State/Province	CO
Country i	US	Postal Code	80211
Phone Number		Fax Number	
Email Address			
Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button.			

## Signature:

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications			
Signature	/clifford kraft/	Date (YYYY-MM-DD)	2015-11-13

<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	Micro-052-565-Cont		
		Application Number			
Title of Invention	Reduced area imaging device incorporated within endoscopic devices				
First Name	Clifford	Last Name	Kraft	Registration Number	35229
Additional Signature may be generated within this form by selecting the Add button.					

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

# Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> ( Not for submission under 37 CFR 1.99)	Application Number		
	Filing Date		
	First Named Inventor	Jeffrey L. Adair	
	Art Unit		
	Examiner Name		
	Attorney Docket Number		

U.S.PATENTS						
Examiner Initial*	Cite No	Patent Number	Kind Code <sup>1</sup>	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	7369176		2008-05-06	Sonnenchein et al.	entire document
	2	6263229		2001-07-17	Atalar et al.	entire document

If you wish to add additional U.S. Patent citation information please click the Add button.

U.S.PATENT APPLICATION PUBLICATIONS						
Examiner Initial*	Cite No	Publication Number	Kind Code <sup>1</sup>	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20020081096	A!	2002-06-27	Watanabe et al.	entire document
	2	20070194243	A1	2007-08-23	Augusto	entire document

If you wish to add additional U.S. Published Application citation information please click the Add button.

FOREIGN PATENT DOCUMENTS								
Examiner Initial*	Cite No	Foreign Document Number <sup>3</sup>	Country Code <sup>2</sup> i	Kind Code <sup>4</sup>	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T <sup>5</sup>
	1							<input type="checkbox"/>

References Supplied by the Applicant	Application/Control No.	Applicant(s)/Patent Under Reexamination ADAIR ET AL.	
	Examiner	Art Unit	

**U.S. PATENT DOCUMENTS**

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-4,592,029 A	05-1986	Altmann et al.	367/7
*	B	US-5,879,289 A	03-1999	Yarush et al.	600/179
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

**FOREIGN PATENT DOCUMENTS**

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

**NON-PATENT DOCUMENTS**

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

\*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)  
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**  
( Not for submission under 37 CFR 1.99)

Application Number	
Filing Date	
First Named Inventor	Jeffrey L. Adair
Art Unit	
Examiner Name	
Attorney Docket Number	

If you wish to add additional Foreign Patent Document citation information please click the Add button

**NON-PATENT LITERATURE DOCUMENTS**

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>5</sup>
	1		<input type="checkbox"/>

If you wish to add additional non-patent literature document citation information please click the Add button

**EXAMINER SIGNATURE**

Examiner Signature		Date Considered	
--------------------	--	-----------------	--

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> See Kind Codes of USPTO Patent Documents at [www.USPTO.GOV](http://www.USPTO.GOV) or MPEP 901.04. <sup>2</sup> Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>3</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>4</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. <sup>5</sup> Applicant is to place a check mark here if English language translation is attached.

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**  
( Not for submission under 37 CFR 1.99)

Application Number	
Filing Date	
First Named Inventor	Jeffrey L. Adair
Art Unit	
Examiner Name	
Attorney Docket Number	

**CERTIFICATION STATEMENT**

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

**OR**

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ A certification statement is not submitted herewith.

**SIGNATURE**

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/clifford kraft/	Date (YYYY-MM-DD)	2015-11-13
Name/Print	Clifford H. Kraf	Registration Number	35229

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**



<b>DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION (37 CFR 1.63)</b>		Attorney Docket Number	
		First Named Inventor	Jeffrey Adair
<input checked="" type="checkbox"/> Declaration Submitted With Initial Filing      OR <input type="checkbox"/> Declaration Submitted After Initial Filing (surcharge (37 CFR 1.16(f)) required)		COMPLETE IF KNOWN	
		Application Number	
		Filing Date	
		Art Unit	
		Examiner Name	

Reduced area imaging device incorporated within endoscopic devices

(Title of the Invention)

As a below named inventor, I hereby declare that:

This declaration is directed to:

I give power of attorney to Clifford Kraft 35,229 at  
customer number 74642.

☒ The attached application,

OR

☐ United States Application Number or PCT International application number \_\_\_\_\_  
filed on \_\_\_\_\_

The above-identified application was made or authorized to be made by me.

I believe I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

#### Authorization To Permit Access To Application by Participating Office

☒ If checked, the undersigned hereby grants the USPTO authority to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the World Intellectual Property Office (WIPO), and any other intellectual property offices in which a foreign application claiming priority to the above-identified patent application is filed access to the above-identified patent application. See 37 CFR 1.14(c) and (h). This box should not be checked if the applicant does not wish the EPO, JPO, KIPO, WIPO, or other intellectual property office in which a foreign application claiming priority to the above-identified patent application is filed to have access to the above-identified patent application.

In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the above-identified patent application with respect to: 1) the above-identified patent application-as-filed; 2) any foreign application to which the above-identified patent application claims priority under 35 U.S.C. 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the above-identified patent application; and 3) any U.S. application-as-filed from which benefit is sought in the above-identified patent application.

In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date of filing the Authorization to Permit Access to Application by Participating Offices.

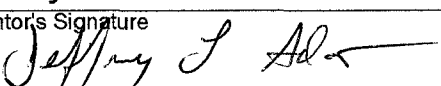
[Page 1 of 2]

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 21 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

**DECLARATION — Utility or Design Patent Application**

Direct all correspondence to:	<input checked="" type="checkbox"/>	The address associated with Customer Number:	<b>74642</b>	OR	<input type="checkbox"/>		Correspondence address below
Name							
Address							
City			State		Zip		
Country		Telephone		Email			
<b>WARNING:</b> Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available. Petitioner/applicant is advised that documents which form the record of a patent application (such as the PTO/SB/01) are placed into the Privacy Act system of records DEPARTMENT OF COMMERCE, COMMERCE-PAT-7, System name: <i>Patent Application Files</i> . Documents not retained in an application file (such as the PTO-2038) are placed into the Privacy Act system of COMMERCE/PAT-TM-10, System name: <i>Deposit Accounts and Electronic Funds Transfer Profiles</i> .							
POWER OF ATTORNEY TO CLIFFORD KRAFT 35,229 AT CUSTOMER NO. 74642							
<b>LEGAL NAME OF SOLE OR FIRST INVENTOR:</b>							
(E.g., Given Name (first and middle (if any)) and Family Name or Surname)							
<b>Jeffrey L. Adair</b>							
Inventor's Signature 					Date (Optional)		
Residence: City		State		Country			
<b>Highlands Ranch</b>		<b>CO</b>		<b>US</b>			
Mailing Address							
<b>1861 East Redfox Place</b>							
City		State		Zip		Country	
<b>Highlands Ranch</b>		<b>CO</b>		<b>80126</b>		<b>US</b>	
<input type="checkbox"/> Additional inventors are being named on the _____ supplemental sheet(s) PTO/AIA/10 attached hereto							

[Page 2 of 2]

## Privacy Act Statement

**The Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

**SUBSTITUTE STATEMENT IN LIEU OF AN OATH OR DECLARATION FOR UTILITY  
OR DESIGN PATENT APPLICATION (35 U.S.C. 115(d) AND 37 CFR 1.64)**

<b>Title of Invention</b>	Reduced area imaging device incorporated within endoscopic devices		
This statement is directed to:			
<input checked="" type="checkbox"/> The attached application,			
OR			
<input type="checkbox"/> United States application or PCT international application number _____ filed on _____			
<b>LEGAL NAME of inventor to whom this substitute statement applies:</b>			
(E.g., Given Name (first and middle (if any)) and Family Name or Surname)			
Edwin Adair			
Residence (except for a deceased or legally incapacitated inventor):			
City	Deceased	State	Country
Mailing Address (except for a deceased or legally incapacitated inventor):			
City	Deceased	State	Zip Country
I believe the above-named inventor or joint inventor to be the original inventor or an original joint inventor of a claimed invention in the application.			
I give power of attorney to			
The above-identified application was made or authorized to be made by me. Clifford Kraft Reg. No. 35,229 of customer no. 74642.			
I hereby acknowledge that any willful false statement made in this statement is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.			
Relationship to the inventor to whom this substitute statement applies:			
<input checked="" type="checkbox"/> Legal Representative (for deceased or legally incapacitated inventor only),			
<input type="checkbox"/> Assignee,			
<input type="checkbox"/> Person to whom the inventor is under an obligation to assign,			
<input type="checkbox"/> Person who otherwise shows a sufficient proprietary interest in the matter (petition under 37 CFR 1.46 is required), or			
<input type="checkbox"/> Joint Inventor.			

[Page 1 of 2]

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

**SUBSTITUTE STATEMENT**

Circumstances permitting execution of this substitute statement:

- ☒ Inventor is deceased,  
☐ Inventor is under legal incapacity,  
☐ Inventor cannot be found or reached after diligent effort, or  
☐ Inventor has refused to execute the oath or declaration under 37 CFR 1.63.

If there are joint inventors, please check the appropriate box below:

- ☒ An application data sheet under 37 CFR 1.76 (PTO/AIA/14 or equivalent) naming the entire inventive entity has been or is currently submitted.

OR

- ☐ An application data sheet under 37 CFR 1.76 (PTO/AIA/14 or equivalent) has not been submitted. Thus, a Substitute Statement Supplemental Sheet (PTO/AIA/11 or equivalent) naming the entire inventive entity and providing inventor information is attached. See 37 CFR 1.64(b).

**WARNING:**

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

**PERSON EXECUTING THIS SUBSTITUTE STATEMENT:**

Name: John Gregory Adair Date (Optional):

Signature: John G Adair EXECUTOR OF ESTATE

**APPLICANT NAME AND TITLE OF PERSON EXECUTING THIS SUBSTITUTE STATEMENT:**

If the applicant is a juristic entity, list the applicant name and the title of the signer.

NA

Applicant Name:

Title of Person Executing  
This Substitute Statement: Executor of Estate

The signer, whose title is supplied above, is authorized to act on behalf of the applicant.

**Residence of the signer (unless provided in an application data sheet, PTO/AIA/14 or equivalent):**

City Denver State Colorado Country USA

**Mailing Address of the signer (unless provided in an application data sheet, PTO/AIA/14 or equivalent)**

3134 Wyandot st

City Denver State COLORADO Zip 80211 Country USA

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<b>DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION</b> <b>(37 CFR 1.63)</b>		Attorney Docket Number	
		First Named Inventor	Jeffrey Adair
		COMPLETE IF KNOWN	
<input checked="" type="checkbox"/> Declaration Submitted With Initial Filing	OR	<input type="checkbox"/> Declaration Submitted After Initial Filing (surcharge (37 CFR 1.16(f) required))	Application Number
			Filing Date
			Art Unit
			Examiner Name

Reduced area imaging device incorporated within endoscopic devices

(Title of the Invention)

As a below named inventor, I hereby declare that:

This declaration is directed to:

I give power of attorney to Clifford Kraft 35,229 at customer number 74642.

☒ The attached application,

OR

☐ United States Application Number or PCT International application number \_\_\_\_\_  
filed on \_\_\_\_\_.

The above-identified application was made or authorized to be made by me.

I believe I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

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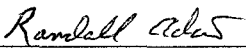
[Page 1 of 2]

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POWER OF ATTORNEY TO CLIFFORD KRAFT 35,229 AT CUSTOMER NO. 74642			
<b>LEGAL NAME OF SOLE OR FIRST INVENTOR:</b>			
(E.g., Given Name (first and middle (if any)) and Family Name or Surname)			
Randall Adair			
Inventor's Signature 		Date (Optional)	
Residence: City	State	Country	
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[Page 2 of 2]

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<b>EFS ID:</b>	24080710
<b>Application Number:</b>	14941040
<b>International Application Number:</b>	
<b>Confirmation Number:</b>	2975
<b>Title of Invention:</b>	Reduced area imaging device incorporated within endoscopic devices
<b>First Named Inventor/Applicant Name:</b>	Jeffrey Adair
<b>Customer Number:</b>	74642
<b>Filer:</b>	Clifford H. Kraft
<b>Filer Authorized By:</b>	
<b>Attorney Docket Number:</b>	MICRO-052-065-cont
<b>Receipt Date:</b>	13-NOV-2015
<b>Filing Date:</b>	
<b>Time Stamp:</b>	16:30:48
<b>Application Type:</b>	Utility under 35 USC 111(a)

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### File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Specification	specification.pdf	1774153 4080cf25e6dceb67acfd9f972881ef7aedd7464c	no	31

### Warnings:

### Information:

2	Claims	claims.pdf	306692	no	11
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Warnings:					
Information:					
3	Abstract	abstract.pdf	20665	no	1
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4	Drawings-only black and white line drawings	figs.pdf	451063	no	17
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5	Information Disclosure Statement (IDS) Form (SB08)	IDS0.pdf	98455	no	3
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6	Information Disclosure Statement (IDS) Form (SB08)	IDS1.pdf	827863	no	13
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7	Application Data Sheet	ap_data.pdf	420710	no	8
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8	Information Disclosure Statement (IDS) Form (SB08)	IDS2.pdf	131546	no	4
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9	Oath or Declaration filed	Jeff_declaration.pdf	222052	no	3
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10	Oath or Declaration filed	Edwin_deceased.pdf	265922	no	2
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Warnings:					
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11	Oath or Declaration filed	Randy_declaration.pdf	222280	no	3
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**REDUCED AREA IMAGING DEVICE INCORPORATED**  
**WITHIN ENDOSCOPIC DEVICES**

This is a continuation of application 14/705,334 filed 06/05/2015 which was a continuation of application 14/333,260 filed 07/16/2014 which was a continuation of application 13/732,908 filed 01/02/2013 which was a continuation of U.S. Serial No. 12/889,287 filed on September 23, 2010, and entitled "Reduced Area Imaging Device Incorporated Within Wireless Endoscopic Devices", which is a continuation-in-part of U.S. Serial No. 11/245,960, filed on October 6, 2005, and entitled "Reduced Area Imaging Device Incorporated Within Wireless Endoscopic Devices", which is a continuation of U.S. Patent Application Serial No. 09/929,531, filed on August 13, 2001, and entitled "Reduced Area Imaging Device Incorporated Within Wireless Endoscopic Devices", now U.S. Patent No. 7,030,904 which is a continuation-in-part of U.S. Serial No. 09/496,312 filed on February 1, 2000, and entitled "Reduced Area Imaging Devices", now U.S. Patent No. 6,275,255", which is a continuation of U.S. Serial No. 09/175,685 filed October 20, 1998 entitled "Reduced Area Imaging Devices", now U.S. Patent No. 6,043,839, which is a continuation-in-part of U.S. Serial No. 08/944,322, filed October 6, 1997, and entitled "Reduced Area Imaging Devices Incorporated Within Surgical Instruments", now U.S. Patent No. 5,929,901. Applications 13/732,908, 12/889,287, 11/245,960, 09/929,531, 09/496,312, 09/175,685, 08/944,322, 14/333,260 and 14/705,334 are hereby incorporated by reference in their entireties.

**Field of the Invention**

This invention relates to solid state image sensors incorporated within wireless endoscopes, and more particularly, to solid state image sensors which are incorporated within wireless endoscopes that wirelessly transmit video images for viewing.

**Background of the Invention**

In recent years, endoscopic surgery has become the accepted standard for conducting many types of surgical procedures, both in the medical and dental arenas. The availability of imaging devices enabling a surgeon or dentist to view a particular surgical area through a small diameter endoscope which is introduced into small cavities or openings in the body results in much less patient trauma as well as many other advantages.

In many hospitals, the rod lens endoscope is still used in endoscopic surgery. The rod lens endoscope includes a very precise group of lenses in an elongate and rigid tube which are able to accurately transmit an image to a remote camera in line with the lens group. The rod lens

endoscope, because of its cost of manufacture, failure rate, and requirement to be housed within a rigid and straight housing, is being increasingly replaced by solid state imaging technology which enables the image sensor to be placed at the distal tip of the investigating device. The three most common solid state image sensors include charged coupled devices (CCD), charge  
5 injection devices (CID) and photo diode arrays (PDA). In the mid-1980s, complementary metal oxide semiconductors (CMOS) were developed for industrial use. CMOS imaging devices offer improved functionality and simplified system interfacing. Furthermore, many CMOS imagers can be manufactured at a fraction of the cost of other solid state imaging technologies.

One particular advance in CMOS technology has been in the active pixel-type CMOS  
10 imagers which consist of randomly accessible pixels with an amplifier at each pixel site. One advantage of active pixel-type imagers is that the amplifier placement results in lower noise levels than CCDs or other solid state imagers. Another major advantage is that these CMOS imagers can be mass produced on standard semiconductor production lines. One particularly notable advance in the area of CMOS imagers including active pixel-type arrays is the CMOS  
15 imager described in U.S. Patent No. 5,471,515 to Fossum, et al. This CMOS imager can incorporate a number of other different electronic controls that are usually found on multiple circuit boards of much larger size. For example, timing circuits, and special functions such as zoom and anti-jitter controls can be placed on the same circuit board containing the CMOS pixel array without significantly increasing the overall size of the host circuit board. Furthermore, this  
20 particular CMOS imager requires 100 times less power than a CCD-type imager. In short, the CMOS imager disclosed in Fossum, et al. has enabled the development of a "camera on a chip."

Passive pixel-type CMOS imagers have also been improved so that they too can be used in an imaging device which qualifies as a "camera on a chip." In short, the major difference between passive and active CMOS pixel arrays is that a passive pixel-type imager does not  
25 perform signal amplification at each pixel site. One example of a manufacturer which has developed a passive pixel array with performance nearly equal to known active pixel devices and being compatible with the read out circuitry disclosed in the U.S. Patent No. 5,471,515 is VLSI Vision, Ltd., 1190 Saratoga Avenue, Suite 180, San Jose, California 95129. A further description of this passive pixel device may be found in applicant's U.S. Patent No. 5,986,693  
30 entitled "Reduced Area Imaging Devices Incorporated Within Surgical Instruments," which is hereby incorporated by reference.

In addition to the active pixel-type CMOS imager which is disclosed in U.S. Patent No. 5,471,515, there have been developments in the industry for other solid state imagers which have resulted in the ability to have a "camera on a chip." For example, Suni Microsystems, Inc. of Mountain View, California, has developed a CCD/CMOS hybrid which combines the high quality image processing of CCDs with standard CMOS circuitry construction. In short, Suni Microsystems, Inc. has modified the standard CMOS and CCD manufacturing processes to create a hybrid process providing CCD components with their own substrate which is separate from the P well and N well substrates used by the CMOS components. Accordingly, the CCD and CMOS components of the hybrid may reside on different regions of the same chip or wafer. Additionally, this hybrid is able to run on a low power source (5 volts) which is normally not possible on standard CCD imagers which require 10 to 30 volt power supplies. A brief explanation of this CCD/CMOS hybrid can be found in the article entitled "Startup Suni Bets on Integrated Process" found in *Electronic News*, January 20, 1997 issue. This reference is hereby incorporated by reference for purposes of explaining this particular type of imaging processor.

Another example of a recent development in solid state imaging is the development of a CMOS imaging sensor which is able to achieve analog to digital conversion on each of the pixels within the pixel array. This type of improved CMOS imager includes transistors at every pixel to provide digital instead of analog output that enable the delivery of decoders and sense amplifiers much like standard memory chips. With this new technology, it may, therefore, be possible to manufacture a true digital "camera on a chip." This CMOS imager has been developed by a Stanford University joint project and is headed by Professor Abbas el-Gamal.

A second approach to creating a CMOS-based digital imaging device includes the use of an over-sample converter at each pixel with a one bit comparator placed at the edge of the pixel array instead of performing all of the analog to digital functions on the pixel. This new design technology has been called MOSAD (multiplexed over sample analog to digital) conversion. The result of this new process is low power usage, along with the capability to achieve enhanced dynamic range, possibly up to 20 bits. This process has been developed by Amain Electronics of Simi Valley, California. A brief description of both of the processes developed by Stanford University and Amain Electronics can be found in an article entitled "A/D Conversion

Revolution for CMOS Sensor?," September 1998 issue of *Advanced Imaging*. This reference is also hereby incorporated by reference for purposes of explaining these particular types of imaging processors.

The above-mentioned developments in solid state imaging technology have shown that "camera on a chip" devices will continue to be enhanced not only in terms of the quality of imaging which may be achieved, but also in the specific construction of the devices which may be manufactured by new breakthrough processes.

Although the "camera on a chip" concept is one which has great merit for application in many industrial areas, a need still exists for a reduced area imaging device which can be used in even the smallest type of endoscopic instruments in order to view areas in the body that are particularly difficult to access, and to further minimize patient trauma by an even smaller diameter invasive instrument.

It is one general object of this invention to provide a wireless endoscope incorporating reduced area imaging devices which take advantage of "camera on a chip" technology, but rearrange the circuitry in a stacked relationship so that there is a minimum profile presented when used within a surgical instrument or other investigative device. It is another object of this invention to provide a wireless endoscope utilizing low cost imaging devices which may be "disposable." It is yet another object of this invention to provide reduced area imaging devices capable of wireless communications which may be used in conjunction with standard endoscopes by placing the imaging device through channels which normally receive other surgical devices, or receive liquids or gases for flushing a surgical area. It is yet another object of this invention to provide a surgical device with imaging capability which may be battery powered and may wirelessly communicate for viewing video images.

In addition to the intended use of the wireless endoscope with respect to surgical procedures conducted by medical doctors, it is also contemplated that the invention described herein has great utility with respect to oral surgery and general dental procedures wherein a very small imaging device can be used to provide an image of particularly difficult to access locations. Additionally, while the foregoing invention has application with respect to the medical and dental fields, it will also be appreciated by those skilled in the art that the small size

of the imaging device set forth herein coupled with the wireless communication feature can be applied to other functional disciplines wherein the imaging device can be used to view difficult to access locations for industrial equipment and the like. Therefore, the imaging device of this invention could be used to replace many industrial boroscopes.

5           The “camera on a chip” technology can be furthered improved with respect to reducing its profile area and incorporating such a reduced area imaging device into very small investigative instruments which can be used in the medical, dental, or other industrial fields.

### **Summary of the Invention**

In accordance with the present invention, reduced area imaging devices are provided.

10       The term “imaging device” as used herein describes the imaging elements and processing circuitry which is used to produce a video signal which may be accepted by a standard video device such as a television or video monitor accompanying a personal computer. The term “image sensor” as used herein describes the components of a solid state imaging device which captures images and stores them within the structure of each of the pixels in the array of pixels  
15       found in the imaging device. As further discussed below, the timing and control circuits can be placed either on the same planar structure as the pixel array, in which case the image sensor can also be defined as an integrated circuit, or the timing and control circuitry can be placed remote from the pixel array. The terms “signal” or “image signal” as used herein, and unless otherwise more specifically defined, refer to an image which at some point during its processing by the  
20       imaging device, is found in the form of electrons which have been placed in a specific format or domain. The term “processing circuitry” as used herein refers to the electronic components within the imaging device which receive the image signal from the image sensor and ultimately place the image signal in a usable format. The terms “timing and control circuits” or “circuitry” as used herein refer to the electronic components which control the release of the image signal  
25       from the pixel array.

In a first embodiment of the endoscope, the imaging device utilizes wired connections for interconnecting the various elements of the imaging device, and utilizes wired connections for transferring video images to a video display.

In a second embodiment of the endoscope, a wireless communications means may be  
30       used to allow various elements of the imaging device to communicate with one another.



Transfer of video images to a video display can also be achieved by the wireless communications means. Thus in the second embodiment, the endoscope does not have to be physically connected to other operating room equipment which greatly enhances the ease of using the wireless endoscope. Particularly in endoscopic procedures which are conducted in hard to reach locations within the body, a wireless endoscope is advantageous because there are no trailing cables or sterile drapes which otherwise complicate maneuvering of the endoscope. In general, enhanced maneuverability of the endoscope is provided by the wireless communications.

One particularly advantageous wireless technology usable with the endoscope of this invention is known as "Bluetooth". Another recent wireless technology which is usable with the invention is a wireless protocol known as "IEEE 802.15.13". This wireless standard is developing under the joint efforts of Kodak, Motorola, Cisco and the International Electronic and Electrical Engineers Standards Association (IEEE) Wireless Personal Area Network Working Group (WPAN). Bluetooth technology provides a universal radio interface in the 2.4GHz frequency band that enables portable electronic devices to connect and communicate wirelessly via short-range ad hoc networks. Bluetooth radios operate in an unlicensed Instrumentation, Scientific, Medical (ISM) band at 2.4 Ghz. Bluetooth is a combination of circuit and packet switching. Slots can be reserved for synchronous packets. Each packet is transmitted in a different hop frequency. A packet nominally covers a single slot, but can be extended to cover up to five slots. Bluetooth can support an asynchronous data channel, up to three simultaneous synchronous voice channels, or a channel that simultaneously supports asynchronous data and synchronous voice. Spectrum spreading is accomplished by frequency hopping 79 hops displaced by 1 MHZ starting at 2.402 Ghz and stopping at 2.480GHz. The maximum frequency hopping rate is 1600 hops per second. The nominal link range is 10 centimeters to 10 meters, but can be extended to more than 100 meters by increasing the transmit power. A shaped binary FM modulation is applied to minimize transceiver complexity. The gross data rate is 1 Mb/second. A time division multiplex scheme is used for full-duplex transmission. Additional information describing the Bluetooth global specification is found on the world wide web at [www.bluetooth.com](http://www.bluetooth.com). Additional information regarding the technical specification for the IEEE 802.15.13 standard may be found [www.ieee802.org/15](http://www.ieee802.org/15) under the link

for the Task Force Three (TG3). The content of both of these websites is hereby incorporated by reference for purposes of disclosing these types of communication standards.

In a first arrangement of the imaging device, the image sensor, with or without the timing and control circuitry, may be placed at the distal tip of the endoscopic instrument while the remaining processing circuitry may be found in a small remote control box which may wirelessly communicate with the image sensor.

In a second arrangement of the imaging device, the image sensor and the processing circuitry may all be placed in a stacked arrangement of circuit boards and positioned at the distal tip of the endoscopic instrument. In this second arrangement, the pixel array of the image sensor may be placed by itself on its own circuit board while the timing and control circuitry and processing circuitry are placed on one or more other circuit boards. Alternatively, the circuitry for timing and control may be placed with the pixel array on one circuit board, while the remaining processing circuitry can be placed on one or more of the other circuit boards.

In another alternative arrangement, the imaging device may be adapted for use with a standard rod lens endoscope wherein the imaging device is placed within a standard camera housing which is configured to connect to a standard "C" or "V" mount connector.

In yet another arrangement, the timing and control circuitry and/or the processing circuitry may be placed in the handle of the endoscope. It is even contemplated that some circuitry could be placed in the handle of the endoscope while remaining circuitry is placed within the remote control box. Because of the small size of the elements making up the imaging device coupled with the ability to provide wireless communications between the elements, great diversification is provided for the combinations of locations at which the different elements may be employed.

A simplified endoscope may be used which includes a very small diameter tubular portion which is inserted within the patient. The tubular portion may be made of a flexible material having a central lumen or opening therein for receiving the elements of the imaging device. The tubular portion may be modified to include an additional concentric tube placed within the central lumen and which enables a plurality of light fibers to be placed circumferentially around the periphery of the distal end of the tubular portion. Additionally, control wires may extend along the tubular portion in order to make the endoscope steerable.

The material used to make the endoscope can be compatible with any desired sterilization protocol, or the entire endoscope can be made sterile and disposable after use.

In the second embodiment of the endoscope wherein processing circuitry is housed within the endoscope, and for the arrangement of the imaging device which calls for the array of pixels and the timing and control circuitry to be placed on the same circuit board, only one conductor is required in order to electrically transfer the image signal to the processing circuitry.

In the other configuration of the imaging device wherein the timing and control circuits are incorporated onto other circuit boards, a plurality of connections are required in order to connect the timing and control circuitry to the pixel array and the one conductor is also required to transfer the image signal.

In each of the different arrangements of the imaging device where circuitry is housed in the handle of the endoscope, the handle can have one or more channels or bores for making space available for such circuitry.

Thus, the wireless communications made integral with the endoscope of the second embodiment provides an improved endoscope wherein the improvement comprises variations of wireless communications for transmission of image signals that are viewed on a desired video display.

In another aspect of the invention, the imaging device is housed within an endoscopic instrument in which the endoscope is steerable by incorporating a steering connector assembly located near the imaging device. The connector assembly is constructed so that it does not enlarge the profile of the capsule that houses the imaging device, yet the connector assembly facilitates precise and accurate control of the distal end of the endoscope with a four-way deflection capability. More specifically, the image sensor has a frontal profile defined by a length and width dimension, and the connector assembly does not extend beyond this frontal profile or a slightly larger frontal profile defined by the length and width dimension of the capsule.

The connector assembly has dual functionality in providing a means to anchor the distal ends of the steering wires as well as to provide a structure for attaching the electrical leads of an image/power cable to electrical traces housed in the connector assembly that extend to electrically contact electrical connection points on the imaging device.

### **Brief Description of the Drawings**

Figure 1a illustrates a first arrangement of the imaging device including a fragmentary cross-sectional view of a generic endoscopic instrument in the first embodiment, and a fragmentary perspective view of a control box, the endoscope and control box each incorporating  
5 elements of a reduced area imaging device;

Figure 1b is an enlarged fragmentary partially exploded perspective view of the distal end of the endoscopic instrument specifically illustrating the arrangement of the image sensor with respect to the other elements of the tubular portion of the endoscope;

Figure 2a is a fragmentary cross-sectional view of the endoscope in the first embodiment,  
10 and a second arrangement of the imaging device wherein the imaging device is incorporated in its entirety at the distal tip of the endoscope;

Figure 2b is an enlarged fragmentary partially exploded perspective view of the distal end of the endoscope of Figure 2a illustrating the imaging device;

Figure 3a is a fragmentary cross-sectional view of the image sensor incorporated with a  
15 standard camera housing for connection to a rod lens endoscope;

Figure 3b is a fragmentary cross-sectional view of the imaging device incorporated within the camera housing of Figure 3a;

Figure 3c is a fragmentary cross-sectional view similar to that of Figure 3b illustrating a battery as an alternate source of power;

20 Figure 4 is a schematic diagram of the functional electronic components which make up the imaging device;

Figure 4a is an enlarged schematic diagram of a circuit board which may include the array of pixels and the timing and control circuitry;

25 Figure 4b is an enlarged schematic diagram of a video processing board having placed thereon the processing circuitry which processes the pre-video signal generated by the array of pixels and which converts the pre-video signal to a post-video signal which may be accepted by a standard video device;

Figures 5a-5e are schematic diagrams that illustrate an example of specific circuitry which may be used to make the imaging device.

Figure 6 is a fragmentary cross-sectional view of an endoscope in the second embodiment wherein image signals in a desired video ready format are wirelessly transmitted to a remote video display monitor for viewing by a user;

5 Figure 6a is another fragmentary cross-sectional view of the endoscope of Figure 6 showing an alternate source of light in the form of a fiber optic cable connected to an external light source;

Figure 6b is another fragmentary cross-sectional view of the endoscope of Figure 6 showing processing circuitry incorporated within the handle of the endoscope as opposed to the circuitry placed within the tubular portion of the endoscope;

10 Figure 7 illustrates a transceiver radio module which receives image signals transmitted by the wireless endoscope of Figure 6\Figure 6a, and conditions the received image signals for direct reception by a display monitor;

Figure 8 illustrates another endoscope of the second embodiment wherein some image signal processing is conducted remote from the endoscope;

15 Figure 8a illustrates a removable battery housing which may be recharged by removing the housing and plugging it into the recharge receptacle on the control box of Figure 9; and

Figure 9 illustrates the arrangement of the imaging device which incorporates the control box wherein image signals from the endoscope in Figure 8 are in a first or pre-format and are transmitted wirelessly to the control box, circuitry in the control box processes the image signals  
20 in a second or final format, and the control box then wirelessly transmits the image signals to a secondary receiver which receives the image signals and conditions the image signals for direct reception by the display monitor.

Figure 10 is a partially exploded fragmentary perspective view of an endoscopic instrument incorporating the imaging device of the present invention, along with a connector  
25 assembly to facilitate steering of the instrument;

Figure 11 is a greatly enlarged fragmentary perspective view of Figure 10 showing further details of the connector assembly;

Figure 12 is another greatly enlarged fragmentary perspective view illustrating details of the connector assembly; and

Figure 13 is a fragmentary perspective view illustrating the endoscopic instrument connected to a conventional steering device enabling precise and accurate steering of the distal tip of the endoscopic instrument.

### **Best Mode for Carrying Out the Invention**

5 In accordance with one arrangement of the imaging device as shown in Figure 1a, an endoscope 10 in the first embodiment is provided which incorporates a reduced area imaging device 11, shown in Figure 1b. As further discussed below, the elements of the imaging device may all be found at one location or the elements may be separated from one another and interconnected by the appropriate cable(s). The array of pixels making up the image sensor  
10 captures images and stores them in the form of electrical energy by conversion of light photons to electrons. This conversion takes place by the photo diodes in each pixel which communicate with one or more capacitors which store the electrons. The structure of the endoscope 10 in the first embodiment includes a flexible or rigid tubular portion 14 which is inserted into the body of the patient and is placed at the appropriate location for viewing a desired surgical area. The  
15 tubular portion 14 attaches at its proximal end to a handle portion 12 which may be grasped by a surgeon who is conducting the endoscopic procedure. The handle 12 may include a central lumen or channel 13 which receives one or more cables or other structures which extend to the distal end 16 of tubular portion 14. Handle portion 12 may further include a supplementary channel 15 which intersects with central channel 13 and which may provide another point of  
20 entry for other cables, fluids or operative instruments to be placed through the endoscope.

Figure 1b illustrates the distal end of the endoscope 16. The distal end 16 may be characterized by an outer tube 18 which traverses the length of the tubular portion 14 and connects to the handle portion 12. Placed concentrically within the outer tube 18 may be one or more inner tubes 20. In Figure 1b, the gap between inner tube 20 and outer tube 18 forms a  
25 space in which one or more light fibers 22 or control wires 24 may be placed. As well understood by those skilled in the art, a plurality of circumferentially spaced light fibers as illustrated in Figure 1b can be used to illuminate the surgical site. Additionally, the control wires 24 may communicate with a control mechanism (not shown) integrated on the handle portion 12 for manipulating the distal end 16 of the endoscope in a desired direction. The

flexible tubular portion 14 coupled with a steerable feature enables the endoscope to be placed within winding bodily passages or other locations difficult to reach within the body.

An image sensor 40 may be placed within the central channel defined by inner tube 20. In the configuration shown in Figure 1b, a cable 26 is used to house the conductors which communicate with the image sensor 40. An intermediate support tube 28 may be placed concentrically outside of cable 26 and concentrically within inner tube 20 to provide the necessary support for the cable 26 as it traverses through the inner channel defined by inner tube 20. In lieu of support tube 28, other well-known means may be provided to stabilize the cable 26 such as clips or other fastening means which may attach to the inner concentric surface of inner tube 20.

A control box 30 may be placed remote from the endoscope 10. The control box 30 contains some of the processing circuitry which is used to process the image signal produced by image sensor 40. Therefore, the imaging device 11 as previously defined would include the processing circuitry within control box 30 and the image sensor 40 located at the distal tip of the endoscope. Control box 30 communicates with image sensor 40 by means of cable 32 which may simply be an insulated and shielded cable which houses therein cable 26. Cable 32 is stabilized with respect to the handle portion 12 by means of a fitting 34 which ensures that cable 32 cannot be inadvertently pushed or pulled within channel 13. Additionally, an additional fitting 35 may be provided to stabilize the entry of a light cable 36 which houses the plurality of light fibers 22. Light cable 36 runs along cable 32 to the distal end of the endoscope, or light cable 36 can join cable 32 within the channel 13 as shown in Figure 1a. Thus cable 32 would house both the light fibers and the conductors which interconnect the control box 30 to the image sensor 40.

Image sensor 40 is illustrated as being a planar and square shaped member. However, the image sensor may be modified to be in a planar and circular shape to better fit within the channel defined by inner tube 20. Accordingly, Figure 1b further shows an alternate shaped image sensor 40' which is round. A lens group or system 42 may be incorporated at the distal end of the endoscope in order to manipulate the image prior to it being impinged upon the array of pixels on the image sensor 40. This lens system 42 may be sealed at the distal end 16 of the

endoscope so that the tubular portion 14 is impervious to fluids entering through the distal end 16. In the configuration of the imaging device 11 in Figures 1a and 1b, there are only three conductors which are necessary for providing power to the image sensor 40, and for transmitting an image from the image sensor 40 back to the processing circuitry found within control box 30.

5 Namely, there is a power conductor 44, a grounding conductor 46, and an image signal conductor 48 each of which are hard wired to the image sensor. Thus, cable 26 may simply be a three-conductor 50 ohm cable.

Image sensor 40 can be as small as 1 mm in its largest dimension. However, a more preferable size for most endoscopic procedures would dictate that the image sensor 40 be  
10 between 4 mm to 8 mm in its largest dimension. The image signal electrically transmitted from the image sensor through conductor 48 is also herein referred to as a pre-video signal. Once the pre-video signal has been electrically transmitted from image sensor 40 by means of conductor 48, it is received by video processing board 50. Video processing board 50 then carries out all the necessary conditioning of the pre-video signal and places it in a form so that it may be  
15 viewed directly on a standard video device, television or standard computer video monitor. The signal produced by the video processing board 50 can be further defined as a post-video signal which can be accepted by a standard video device. As shown in Figure 1a, a conductor 49 is provided which electrically transmits the post-video signal to an output connector 58 on the exterior surface of control box 30. The cable (not shown) extending from the desired video  
20 device (not shown) may receive the post-video signal by means of connector 58. Power supply board 52 may convert incoming power received through power source 54 into the desired voltage. In the preferred imager incorporated in this invention, the power to the imaging device is simply a direct current which can be a 1.5 volt to a 12 volt source. Incoming power from, for example, a wall receptacle, communicates with power supply board 52 by connector 56. Power  
25 supply board 52 takes the incoming power source and regulates it to the desired level. Additionally, ground 46 is also shown as extending back to the source of power through connector 56.

Figure 2a illustrates a second arrangement of the imaging device wherein the imaging device is self-contained entirely within the distal end 16 of the endoscope, and a power source



which drives the circuitry within the imaging device may come from a battery 66 housed within handle portion 12.

As shown in Figure 2b, the video processing board 50 may be placed directly behind image sensor 40. A plurality of pin connectors 62 serve to electrically couple image sensor 40 with video processing board 50 depending upon the specific configuration of image sensor 40, pin connectors 62 may be provided either for structural support only, or to provide a means by which image signals are electrically transmitted between image sensor 40 and board 50. When necessary, one or more supplementary boards 60 may be provided which further contain processing circuitry to process the image signal and present it in a form which may be directly received by a desired video device. The area which is occupied by image sensor 40 may be defined as the profile area of the imaging device and which determines its critical dimensions. Any imaging elements that are found on boards 50 or 60 must be able to be placed on one or more circuit boards which are longitudinally aligned with image sensor 40 along longitudinal axis XX. If the profile area is not critical in terms of limiting the largest sized imaging element within the imaging device, then the additional circuit boards 50 and 60 which are normally placed in line with image sensor 40 can be aligned in an offset manner or may be larger than the profile area of image sensor 40. In the configuration of Figure 2b, it is desirable that elements 40, 50 and 60 be approximately the same size so that they may fit uniformly within the central channel of the endoscope. Additionally, image sensor 40 may be bonded to lens system 42 in order to provide further structural support to the imaging device 11 when mounted within the distal end 16.

Referring back to the handle portion 12 in Figure 2a, an additional channel 64 may be provided in order that a power supply cable 68 may communicate with battery 66. Conveniently, battery 66 may itself be mounted within a well 65 formed in handle portion 12. Cable 68 carries the conductor 44 and ground 46. Cable 68 may intersect with cable 33 within channel 13, cables 68 and 33 extending then to the distal end 16. Cable 33 can be a single conductor cable which transmits the post-video signal to a desired video device. In other words, cable 33 may simply be an insulated and shielded housing for conductor 49 which carries the post-video signal. Because a preferred image sensor of the imaging device 11 may only require a 5 volt power

supply, a battery is an ideal power source in lieu of a conductor which would trail the endoscope. Accordingly, the endoscope is made more mobile and easier to handle by eliminating at least one of the trailing cables.

Figure 3a illustrates yet another arrangement or configuration of the imaging device wherein the imaging device can be used in conjunction with a standard rod lens endoscope 70. As shown, rod lens endoscope 70 includes a lens train 72 which includes a plurality of highly precise lenses (not shown) which are able to transmit an image from the distal end of the endoscope, to a camera in line with the endoscope. The rod lens endoscope is equipped with a light guide coupling post 74. Light guide post 74 connects to a source of light in the form of a cable 77 having a plurality of fiber optic strands (not shown) which communicate with a source of light (not shown). The most common arrangement of the rod lens endoscope also includes a "C" or "V" mount connector 78 which attaches to the eyepiece 76. The "C" or "V" mount attaches at its other end to a camera group 80. The camera group 80 houses one or more of the elements of the imaging device. In this configuration, the small size of the imaging device is not a critical concern since the imaging device is not being placed at the distal end of the endoscope. However, the incorporation of the imaging device in a housing which would normally hold a traditional camera still provides an advantageous arrangement. As shown, the camera group 80 may include a housing 82 which connects to a power/video cable 86. Fitting 87 is provided to couple cable 86 to the interior elements of the camera group 80 found within housing 82. Figure 3a illustrates an arrangement of the imaging device 11 wherein the image sensor 40 is placed by itself within the housing 82 and the processing circuitry of the imaging device can be positioned in a remote control box as shown in Figure 1a. Accordingly, only three conductors 44, 46 and 48 are necessary for providing power to the image sensor 40 and for transmitting the pre-video signal to the control box. Alternatively, as shown in Figure 3b, the entire imaging device 11 may be incorporated within camera group 80, each of the elements of the imaging device being placed in the stacked arrangement similar to Figure 2b. As discussed above, size is not as much of a concern in the embodiment of Figure 3a and 3b since the camera group housing 82 is much larger than the distal tip of the endoscope of Figures 1a and 2a.

Figure 3c also illustrates the use of a battery 66 which provides source of power to the imaging device in either Figure 3a or 3b. In this arrangement, housing 82 is altered to include a battery housing 69 which houses the battery 66 therein. Battery housing 69 may include a very small diameter channel which may allow conductor 48 or 49 to communicate directly with the processing circuitry or video device, respectively. It will also be understood that the embodiment in Figure 1a may incorporate the use of a battery 66 as the source of power. Thus, handle 12 in Figure 1a may be altered in the same way as housing 82 to allow a battery to be attached to the handle portion 12.

In all of the arrangements of the imaging device discussed above with respect to the first embodiment of the endoscope, each of the elements or components of the imaging device electrically communicate with one another through a wired connection.

Figure 4 is a schematic diagram illustrating one way in which the imaging device 11 may be constructed. As illustrated, the image sensor 40 may include the timing and control circuits on the same planar structure. Power is supplied to image sensor 40 by power supply board 52. The connection between image sensor 40 and board 52 may simply be a cable having two conductors therein, one for ground and another for transmitting the desired voltage. These are illustrated as conductors 44 and 46. The output from image sensor 40 in the form of the pre-video signal is input to video processor board 50 by means of the conductor 48. In the configuration of Figure 4, conductor 48 may simply be a 50 ohm conductor. Power and ground also are supplied to video processing board 50 by conductors 44 and 46 from power supply board 52. The output signal from the video processor board 50 is in the form of the post-video signal and which may be carried by conductor 49 which can also be a 50 ohm conductor.

In the first arrangement of the imaging device illustrated in Figure 1a, cable 32 can be used to house conductors 44, 46 and 48. In the arrangement shown in Figure 2a, cable 33 can be used to house conductor 49 by itself when a battery power source is used, or alternatively, cable 33 may house conductors 44, 46 and 49 if the arrangement of Figure 2a utilizes a power source from board 52.

Optionally, a supplementary processing board 60 may be provided to further enhance the pre-video signal. As shown in Figure 4, the supplementary board 60 may be placed such that the

pre-video signal from image sensor 40 is first sent to the supplementary board and then output to the video processor board 50. In this case, the output from board 50 can be carried along conductor 51. This output can be defined as an enhanced pre-video signal. Furthermore, the post-video signal from video processor board 50 may return to the supplementary board 60 for further processing, as further discussed below. The conductor used to electrically transmit the post-video signal back to the supplementary board is shown as conductor 59. The power supply board 52 may also provide power to the supplementary board in the same manner as to image sensor 40 and board 50. That is, a simple hard-wired connection is made onto the supplementary board for the ground and voltage carrying conductors. As discussed above, image sensor 40 may be placed remotely from boards 50 and 60. Alternatively, image sensor 40, and boards 50 and 60 each may be placed within the distal end of the endoscope.

Although Figure 4 illustrates the image sensor and the timing and control circuits being placed on the same planar structure, it is possible to separate the timing and control circuits from the pixel array and place the timing and control circuits onto video processing board 50. The advantage in placing the timing and control circuits on the same planar structure as the image sensor is that only three connections are required between image sensor 40 and the rest of the imaging device, namely, conductors 44, 46 and 48. Additionally, placing the timing and control circuits on the same planar structure with the pixel array results in the pre-video signal having less noise. Furthermore, the addition of the timing and control circuits to the same planar structure carrying the image sensor only adds a negligible amount of size to one dimension of the planar structure. If the pixel array is to be the only element on the planar structure, then additional connections must be made between the planar structure and the video processing board 50 in order to transmit the clock signals and other control signals to the pixel array. For example, a ribbon-type cable (not shown) or a plurality of 50 ohm coaxial cables (not shown) must be used in order to control the downloading of information from the pixel array. Each of these additional connections would be hard wired between the boards.

Figure 4a is a more detailed schematic diagram of image sensor 40 which contains an array of pixels 90 and the timing and control circuits 92. One example of a pixel array 90 which can be used within the invention is similar to that which is disclosed in U.S. Patent No.

5,471,515 to Fossum, et al., said patent being incorporated by reference herein. More specifically, Figure 3 of Fossum, et al. illustrates the circuitry which makes up each pixel in the array of pixels 90. The array of pixels 90 as described in Fossum, et al. is an active pixel group with intra-pixel charged transfer. The image sensor made by the array of pixels is formed as a monolithic complementary metal oxide semiconductor integrated circuit which may be manufactured in an industry standard complementary metal oxide semiconductor process. The integrated circuit includes a focal plane array of pixel cells, each one of the cells including a photo gate overlying the substrate for accumulating the photo generated charges. In broader terms, as well understood by those skilled in the art, an image impinges upon the array of pixels, the image being in the form of photons which strike the photo diodes in the array of pixels. The photo diodes or photo detectors convert the photons into electrical energy or electrons which are stored in capacitors found in each pixel circuit. Each pixel circuit has its own amplifier which is controlled by the timing and control circuitry discussed below. The information or electrons stored in the capacitors is unloaded in the desired sequence and at a desired frequency, and then sent to the video processing board 50 for further processing.

Although the active pixel array disclosed in U.S. Patent No. 5,471,515 is mentioned herein, it will be understood that the hybrid CCD/CMOS described above, or any other solid state imaging device may be used wherein timing and control circuits can be placed either on the same planar structure with the pixel array, or may be separated and placed remotely.

Furthermore, it will be clearly understood that the invention claimed herein is not specifically limited to an image sensor as disclosed in the U.S. Patent No. 5,471,515, but encompasses any image sensor which may be configured for use in conjunction with the other processing circuitry which makes up the imaging device of this invention.

The timing and control circuits 92 are used to control the release of the image information or image signal stored in the pixel array. In the image sensor of Fossum, et al., the pixels are arranged in a plurality of rows and columns. The image information from each of the pixels is first consolidated in a row by row fashion, and is then downloaded from one or more columns which contain the consolidated information from the rows. As shown in Figure 4a, the control of information consolidated from the rows is achieved by latches 94, counter 96, and

decoder 98. The operation of the latches, counter and decoder is similar to the operation of similar control circuitry found in other imaging devices. That is, a latch is a means of controlling the flow of electrons from each individual addressed pixel in the array of pixels. When a latch 94 is enabled, it will allow the transfer of electrons to the decoder 98. The counter 5 96 is programmed to count a discrete amount of information based upon a clock input from the timing and control circuits 92. When the counter 96 has reached its set point or overflows, the image information is allowed to pass through the latches 94 and be sent to the decoder 98 which places the consolidated information in a serial format. Once the decoder 98 has decoded the information and placed it in the serial format, then the row driver 100 accounts for the serial 10 information from each row and enables each row to be downloaded by the column or columns. In short, the latches 94 will initially allow the information stored in each pixel to be accessed. The counter 96 then controls the amount of information flow based upon a desired time sequence. Once the counter has reached its set point, the decoder 98 then knows to take the information and place it in the serial format. The whole process is repeated, based upon the 15 timing sequence that is programmed. When the row driver 100 has accounted for each of the rows, the row driver reads out each of the rows at the desired video rate.

The information released from the column or columns is also controlled by a series of latches 102, a counter 104 and a decoder 106. As with the information from the rows, the column information is also placed in a serial format which may then be sent to the video 20 processing board 50. This serial format of column information is the pre-video signal carried by conductor 48. The column signal conditioner 108 places the column serial information in a manageable format in the form of desired voltage levels. In other words, the column signal conditioner 108 only accepts desired voltages from the downloaded column(s).

The clock input to the timing and control circuits 92 may simply be a quartz crystal 25 timer. This clock input is divided into many other frequencies for use by the various counters. The run input to the timing and control circuit 92 may simply be an on/off control. The default input can allow one to input the pre-video signal to a video processor board which may run at a frequency of other than 30 hertz. The data input controls functions such as zoom. At least for a CMOS type active pixel array which can be accessed in a random manner, features such as zoom

are easily manipulated by addressing only those pixels which locate a desired area of interest by the surgeon.

A further discussion of the timing and control circuitry which may be used in conjunction with an active pixel array is disclosed in U.S. Patent No. 5,471,515 and is also described in an article entitled "Active Pixel Image Sensor Integrated With Readout Circuits" appearing in *NASA Tech Briefs*, October 1996, pp. 38 and 39. This particular article is also incorporated by reference.

Once image sensor 40 has created the pre-video signal, it is sent to the video processing board 50 for further processing. At board 50, as shown in Figure 4b, the pre-video signal is passed through a series of filters. One common filter arrangement may include two low pass filters 114 and 116, and a band pass filter 112. The band pass filter only passes low frequency components of the signal. Once these low frequency components pass, they are then sent to detector 120 and white balance circuit 124, the white balance circuit distinguishing between the colors of red and blue. The white balance circuit helps the imaging device set its normal, which is white. The portion of the signal passing through low pass filter 114 then travels through gain control 118 which reduces the magnitude or amplitude of this portion to a manageable level. The output from gain control 118 is then fed back to the white balance circuit 124. The portion of the signal traveling through filter 116 is placed through the processor 122. In the processor 122, the portion of the signal carrying the luminance or non-chroma is separated and sent to the Y chroma mixer 132. Any chroma portion of the signal is held in processor 122.

Referring to the output of the white balance circuit 124, this chroma portion of the signal is sent to a delay line 126 where the signal is then further reduced by switch 128. The output of switch 128 is sent through a balanced modulator 130 and also to the Y chroma mixer 132 where the processed chroma portion of the signal is mixed with the processed non-chroma portion. Finally, the output from the Y chroma mixer 132 is sent to the NTSC/PAL encoder 134, commonly known in the art as a "composite" encoder. The composite frequencies are added to the signal leaving the Y chroma mixer 132 in encoder 134 to produce the post-video signal which may be accepted by a television or other video display device.

Referring back to Figure 4, it further illustrates supplementary board 60 which may be used to digitally enhance or otherwise further condition the pre-video signal produced from image sensor 40. For example, digital enhancement can brighten or otherwise clarify the edges of an image viewed on a video screen. Additionally, the background images may be removed thus leaving only the foreground images or vice versa. The connection between image sensor 40 and board 60 may simply be the conductor 48 which may also transfer the pre-video signal to board 50. Once the pre-video signal has been digitally enhanced on supplementary board 60, it is then sent to the video processor board 50 by means of another conductor 51. The pre-video signal is an analog signal. The digitally enhanced pre-video signal may either be a digital signal or it may be converted back to the analog domain prior to being sent to board 50.

In addition to digital enhancement, supplementary board 60 may further include other circuitry which may further condition the post-video signal so that it may be viewed in a desired format other than NTSC/PAL. As shown in Figures 4, intermediate conductor 59 may transmit the signal output from Y chroma mixer 132 back to the supplementary board 60 where the signal is further encoded for viewing in a particular format. One common encoder which can be used includes an RGB encoder 154. The RGB encoder separates the signal into three separate colors (red, green and blue) so that the surgeon may selectively choose to view only those images containing one or more of the colors. Particularly in tissue analysis where dyes are used to color the tissue, the RGB encoder may help the surgeon to identify targeted tissue.

The next encoder illustrated in Figure 4 is a SVHS encoder 156 (super video home system). This encoder splits or separates the luminance portion of the signal and the chroma portion of the signal prior to entering the video device. Some observers believe that a cleaner signal is input to the video device by such a separation which in turn results in a more clear video image viewed on the video device. The last encoder illustrated in Figure 4 is a VGA encoder 158 which enables the signal to be viewed on a standard VGA monitor which is common to many computer monitors.

One difference between the arrangement of image sensor 40 and the outputs found in Figure 3 of the Fossum, et al. patent is that in lieu of providing two analog outputs [namely, VS



out (signal) and VR out (reset)], the reset function takes place in the timing and control circuitry 92. Accordingly, the pre-video signal only requires one conductor 48.

Figures 5a-5e illustrate in more detail one example of circuitry which may be used in the video processing board 50 in order to produce a post-video signal which may be directly  
5 accepted by a video device such as a television. The circuitry disclosed in Figures 5a-5e is very similar to circuitry which is found in a miniature quarter-inch Panasonic camera, Model KS-162. It will be understood by those skilled in the art that the particular arrangement of elements found in Figures 5a-5e are only exemplary of the type of video processing circuitry which may be incorporated in order to take the pre-video signal and condition it to be received by a desired  
10 video device.

As shown in Figure 5a, 5 volt power is provided along with a ground by conductors 44 and 46 to board 50. The pre-video signal carried by conductor 48 is buffered at buffer 137 and then is transferred to amplifying group 138. Amplifying group 138 amplifies the signal to a usable level as well as achieving impedance matching for the remaining circuitry.

15 The next major element is the automatic gain control 140 shown in Figure 5b. Automatic gain control 140 automatically controls the signal from amplifying group 138 to an acceptable level and also adds other characteristics to the signal as discussed below. More specifically, automatic gain control 140 conditions the signal based upon inputs from a 12 channel digital to analog converter 141. Converter 141 retrieves stored information from EEPROM (electrically  
20 erasable programmable read only memory) 143. EEPROM 143 is a non-volatile memory element which may store user information, for example, settings for color, tint, balance and the like. Thus, automatic gain control 140 changes the texture or visual characteristics based upon user inputs. The signal leaving the automatic gain control 140 is an analog signal until being converted by analog to digital converter 142.

25 Digital signal processor 144 of Figure 5c further processes the converted signal into a serial type digital signal. One function of the microprocessor 146 is to control the manner in which digital signal processor 144 sorts the digital signals emanating from converter 142. Microprocessor 146 also controls analog to digital converter 142 in terms of when it is activated, when it accepts data, when to release data, and the rate at which data should be released.

Microprocessor 146 may also control other functions of the imaging device such as white balance. The microprocessor 146 may selectively receive the information stored in the EEPROM 143 and carry out its various commands to further control the other elements within the circuitry.

5 After the signal is processed by digital signal processor 144, the signal is sent to digital encoder 148 illustrated in Figure 5d. Some of the more important functions of digital encoder 148 are to encode the digital signal with synchronization, modulated chroma, blanking, horizontal drive, and the other components necessary so that the signal may be placed in a condition for reception by a video device such as a television monitor. As also illustrated in  
10 Figure 5d, once the signal has passed through digital encoder 148, the signal is reconverted into an analog signal through digital to analog converter 150.

This reconverted analog signal is then buffered at buffers 151 and then sent to amplifier group 152 of Figure 5e which amplifies the signal so that it is readily accepted by a desired video device. Specifically, as shown in Figure 5e, one SVHS outlet is provided at 160, and two  
15 composite or NTSC outlets are provided at 162 and 164, respectively.

Now turning to a discussion of the endoscope of the second embodiment, attention is first directed to Figure 6. In this second embodiment, like reference numerals denote matching elements from the endoscope of the first embodiment. The endoscope of the second embodiment also can be characterized as a common or generic endoscope except for the imaging device and  
20 the wireless communications means incorporated in this second embodiment. Figure 6 more specifically illustrates the arrangement of the imaging device wherein processing of the image signals is conducted within the endoscope such that a post-video signal is ready for transmission to a display monitor. As shown, video processing board 50 is mounted adjacent the image sensor 40 in the distal tip of the endoscope. As discussed above, one or more supplementary  
25 boards 60 may also be mounted adjacent the video processing board 50 for further processing of the image signals to produce a post-video signal of a desired format. Alternatively, and as further discussed below, some or all of the processing circuitry may be mounted within the handle 12, in a specified portion of the channel 13. There is ample room within channel 13, or some other bore which could be formed in the handle to receive processing circuitry. The

construction of the distal tip of the endoscope in the second embodiment can be the same as in the first embodiment. Thus, steering wires (not shown) and circumferentially spaced light fibers (not shown) may be incorporated in the endoscope. Cable 32 carrying the post-video signals electrically connects to a transceiver radio element 170 which is housed within channel 13 towards the proximal end of the handle 12. Transceiver radio element 170 conditions the post video signals in accordance with the desired wireless standard. More specifically, the transceiver radio element adds a high frequency carrier signal and baseband protocol to the post video signals, and then wirelessly transmits the post video signals via antennae 174 to the transceiver radio module 178. The transceiver radio module 178 authenticates the received signals, strips the signals of the carrier frequency, and then routes the signals in the final video format to a display monitor 196. It should also be understood that the communications between the transceiver radio element 170 and the transceiver radio module 178 are not simply one-way communications; rather, the communications are two way in accordance with the Bluetooth standard or IEEE standard. For example, not only does the transceiver radio element 170 transmit image signals, but the transceiver radio element 170 also receives and processes authentication signals from the radio transceiver module 178. Similarly, not only does the transceiver radio module 178 receive and process image signals, but the module 178 also transmits authentication signals. A power switch (not shown) may also be incorporated within the endoscope to selectively energize or de-energize the image sensor 40 and the transceiver radio element 170.

Transceiver radio module 178 receives the post-video signals via antennae 180, decodes the signals, and then electrically transmits them to the monitor 196 for viewing by the user. The endoscope in this second embodiment is powered by a battery 176 which is housed adjacent the antennae 174. Electrical leads (not shown) extend from the battery 176 to power the image sensor and the transceiver radio element 170. As discussed further below, antennae 174 and battery 176 may be secured within their own casing or housing 172 which then connects to the handle 12 of the endoscope. Transceiver radio module 178 may simply be powered by the same electrical power source (not shown) which powers the display monitor 196, such as conventional 110 volt, 3 phase power. In order to recharge the battery 176 of the endoscope, the

transceiver radio module may be a combination unit which also has a battery charge circuit 182 for recharging battery 176. Charge circuit 182 would also be powered by a conventional power source, preferably the same power source powering the transceiver module 178 and the display monitor 196. Circuit 182 would have a charging receptacle, shown schematically as receptacle 186, for receiving the battery 176. Figure 6 also shows a self-contained white light source in the form of light source 192 which is housed in channel 15 between interior plug 194 and exterior plug or access cover 195. Alternatively, as shown in Figure 6a, an exterior source of light 198 could be used which transmits light through the cable 36. The self contained light source 192 is preferred because the endoscope is then free from all trailing cables or other wiring.

Figure 6b illustrates the endoscope having another cavity or opening 210 formed therein for housing some or all of the processing circuitry. As shown, the video processor board 50 has been moved to the opening 210 and is supported in the opening by support 212 which is placed in the opening 210 at a selected depth to accommodate the particular sized circuitry placed in the opening. Conductor 214 interconnects the board 50 with image sensor 40, and conductor 214 can run coterminously with cable 32. Accordingly, the only imaging device element remaining in the distal end of the endoscope is the image sensor 40. Additionally, the timing and control circuits 92 could also be placed in the opening 210 along with the video processing circuitry. The co-pending application serial number 09/368,246 is also incorporated herein by reference for purposes of disclosing circuitry placed in the handle of the endoscope.

Figures 8 and 9 illustrate another arrangement of the imaging device incorporated within the endoscope of the second embodiment. In preface, Figures 8 and 9 illustrate the arrangement in which some elements of the imaging device are placed within the endoscope, and remaining elements of the imaging device are placed within the control box 30. Wireless transmission of image signals takes place between the endoscope and the control box. Final transmission of the post-video signal can then be conducted either electrically through a cable interconnecting the display monitor and the control box, or final transmission may take place via another wireless transmission of the post-video signal from the control box to the display monitor.

Referring first to Figure 8, the endoscope is shown which is identical to the endoscope shown in Figure 6 with the exception that there is no video processor board 50 or other

associated video processing circuitry housed within the endoscope. Thus, the transceiver radio element 170 receives a pre-video signal from the image sensor 40, and then wirelessly transmits the pre-video signal to the control box 30. The transceiver radio module 178 receives the pre-video signal and transfers the same to video processor board 50. Video processor board 50 alone or in conjunction with other processing circuitry such as a supplementary processing board 60 (not shown) places the image signal in a post-video format for direct reception by the display monitor 196. Additionally, it is also contemplated that the timing and control circuitry 92 could be placed in the control box 30. In such a case, the transceiver radio module 178 would not only transmit authentication signals, but also signals generated from the timing and control circuitry 92 for controlling the image sensor 40.

In lieu of a camera battery charge circuit incorporated within a unit which is co-located with the display monitor as shown in Figure 7, the charge circuit 182 may be housed within the control box 30. Accordingly, circuit 182 could be powered by power supply board 52. Additionally, a camera power switch 184 could be included within control box 30 to selectively energize or de-energize the video processor board and its function in converting pre-video signals to post-video signals. As in the endoscope of Figure 6, the endoscope of Figure 8 could also have its own power switch (not shown) to energize or de-energize functioning of the imaging elements and the transceiver radio module 170.

Figure 9 also illustrates a secondary communications scheme whereby the post video signals could be wirelessly transmitted to the display monitor 196. Optionally, video processor board 50 (or other processing circuitry) could electrically communicate with a secondary RF transmitter 200 which would transmit the post-video signals via antennae 202. These post-video signals would then be received via antennae 206 by a secondary RF receiver 204 mounted adjacent the display monitor 196. For this secondary transmission, Bluetooth could be used; however, it would be preferable to use a different transmission standard between the primary and the secondary communications to prevent potential interference. One example of a secondary RF transmitter which could be used is an rf-video transmitter model no. SDX-22, manufactured by RF-Video.com of Toronto, Canada. This type of transmitter also operates in the 2.4GHz frequency, and provides 80 mW of RF power. An example of an acceptable secondary RF

receiver which could be used is an rf-video receiver model no. VRX-24 also manufactured by RF-Video.com. This type of receiver has an adjustable frequency of 2.2 to 2.7 Ghz.

Figure 8a illustrates that the battery 176 may be removed from the endoscope for recharge. As shown, housing 172 carries both the antennae 174 and the battery 176; however, it shall be understood that the housing 176 could alternatively only carry the battery 176, while the antennae 174 could be housed within channel 13 of the endoscope. One practical reason for placing antennae 174 within housing 172 is that the antennae is more easily replaced if it is located within a removable element. The distal end of the housing 172 is received within well or bore 208 in the endoscope. Well 208 could be threaded to match external threads on the distal end of the housing 172, or other means such as a clip or a friction fit could be used as understood by those skilled in the art in order to connect housing 172 to the endoscope. Similarly, the proximal end of the housing 172 could be threaded or otherwise adapted so that the proximal end of the housing 172 could be received by receptacle 186 for recharge of the battery 176. As yet another option for recharge of the battery 176, a recharge cable 188 including respective fittings/connectors 190 at each end of the cable 188 could be used to interconnect battery 176 with receptacle 186. Thus if cable 188 were used, housing 172 could remain attached to the endoscope. One situation which might lend itself for use of cable 188 would be if battery 176 became discharged to the point where it failed or was in danger of failing to provide enough potential to the image sensor and transceiver radio element during a surgical procedure. Cable 188 could then be used to provide instantaneous power to the endoscope.

Referring to Figures 10-12, in another aspect of the present invention, a steering connector assembly is provided in combination with the imaging device to provide a steering capability for the endoscope without increasing the size of the profile for the endoscopic device.

One common prior art method of incorporating a steering capability involves the use of externally mounted steering wires and a yoke or bracket that is fitted over the distal end of the endoscope. The use of an externally mounted steering device greatly enlarges the front profile of the endoscope, and thereby prevents use of the endoscope in small passages or cavities within the body. Additionally, externally mounted steering devices can complicate overall maneuverability of the endoscope by further limiting the flexibility of the endoscope. The

connector assembly of the present invention provides a fully contained or internally isolated steering capability that avoids these disadvantages of the prior art. Referring to the Figures 10-12, an endoscopic device is illustrated including a steering connector assembly 300 that interconnects a CMOS camera module 302 with the body of the endoscopic device. A polymer jacket 304 houses the camera elements shown in phantom lines. The endoscopic device includes one or more flexible distal body portions 306 that may articulate or bend based upon control of the steering wires 310 that extend through passages formed in the sheath of the endoscope. Preferably, the steering wires 310 run through the jacket or sheath of the endoscopic device from the proximal end as shown in Figure 10 to the distal end as shown in Figures 11 and 12. The endoscopic device may also include a more rigid proximal body portion 308 that connects to a steering assembly 340 as shown in Figure 13.

Referring to Figure 11, details of the steering connector assembly 300 are shown. The connector assembly includes a connector body or base 320 that may be a molded piece characterized by a plurality of transverse or laterally extending flanges 324 interconnected by an orthogonally extending center member 325. The connector body 320 provides gaps or spaces in which electrical traces 322 may be housed. The electrical traces 322 electrically interconnect the CMOS imager 316 to the electrical wires 315 of the image/power cable 314, as also shown in Figure 12. The distal end of the connector body 320 includes an imager support base 318 that is used to mount the CMOS imager 316. The electrical traces 322 therefore also extend through the mount 318 and connect to the various electrical pins or connections (not shown) of the imager 316. The proximal end of the body 320 has a smaller width dimension defined by a pair of cutouts or notches formed on opposite lateral sides of the proximal end. A strain relief member or cap 326 is mounted over the proximal end of the body 320 at the location of the notches. The strain relief member 326 serves to protect the electrical traces 322, and also serves as the anchoring point for the distal ends of the steering wires 310. As shown, the strain relief member 326 may be two channel shaped elements that attach to the opposite lateral sides of the body 320 at its proximal end. The exterior lateral edges of the member 326 are substantially planar with the exterior lateral edges of the distal end of the body 320. As illustrated, the distal ends 328 of the steering wires 310 may be embedded within the facing surface of the strain relief

member 326, and the steering wires then extend proximally through the sheath of the distal body portion 306 of the endoscopic device. As illustrated, four steering wires are arranged in a rectangular arrangement and located at corners of the rectangular arrangement. The strain relief member 326 as mounted results in a frontal profile for the connector assembly 300 that does not extend beyond the frontal profile of the imaging device or the capsule 302. As shown in Figure 11, the upper surface of the strain relief member 326 is mounted over the upper surface of the body 320, and this arrangement is also repeated with respect to the lower surface of the member 326. Therefore, the strain relief member extends slightly beyond the upper and lower surfaces of the body 320. The imaging device 316 has a slightly larger frontal profile than that of the distal end of the body 320, so the strain relief member can be incorporated to not extend beyond the profile of the imaging device since the thickness of the strain relief elements are very small. Therefore, the strain relief member fits easily within the jacket 304 of the capsule 302 and the capsule size does not have to be enlarged.

Also referring to Figure 12, in the reverse perspective view, a plurality of openings 330 can be seen that are formed through the sheath to receive the steering wires 310. The image/power cable 314 is also illustrated that houses the plurality of wires 315. These wires 315 carry the power and electronic signals to and from the CMOS imager. For clarity, Figure 11 does not show the electrical cable 314 and wires 315. In use, the distal ends of the wires 315 (not shown) are anchored in the gaps between the flanges 324, and these wires make contact with the electrical traces 322 that also extend through the gaps 324.

Referring to Figure 13, the endoscopic device is illustrated as connected to a conventional steering assembly 340 that is used to facilitate a number of functions for the endoscopic device, to include steering of the endoscopic device and the introduction of various fluids or instruments through the endoscopic device. Accordingly, the steering assembly 340 is illustrated with conventional controls, to include, steering controls 342 which can tension or loosen the wires to effect a desired articulation of the distal end of the endoscope. For example, one of the knobs/dials can control transverse movement while the other knob/dial can control longitudinal movement. The Figure 13 also shows other conventional controls such as frame and shutter controls 344 for the imaging device, and various ports to receive gas, fluids and/or



instruments. For example, the Figure 13 shows a suction port 346, an air port 348, an auxiliary port 350, and a biopsy port 352. The ports 350 and 352 may receive instruments for conducting the desired surgical procedure, such as forceps, electrodes, etc.

The connector assembly 300 provides a structure for anchoring steering wires and for stabilizing and supporting electrical connections between the imaging device and the image/power cable. The connector assembly facilitates a steering capability but does not enlarge the frontal profile of the imaging device since the steering wires are housed within the sheath of the endoscope and are anchored internally within the distal end of the endoscope. Accordingly, the imaging device is maintained in a very small configuration which provides great advantages in terms of reducing the invasive nature of surgical procedures, as well as providing additional options for use of the imaging device to be steered into an optimal location for imaging difficult to access locations within a body. Additionally, the location at which the steering wires are anchored, namely, at the connector assembly itself, allows for optimum control in which the distal end of the endoscopic device can be maneuvered. In summary, the connector assembly fulfills two distinct purposes, namely, providing strain relief and support to the electrical traces and electrical wires, and serving to anchor the distal ends of the steering wires. The steering capability provided is usable with any of the imaging embodiments disclosed herein, to include both wired and wireless imaging capabilities.

From the foregoing, it is apparent that an entire imaging device may be incorporated within the distal tip of an endoscope, or may have some elements of the imaging device being placed in a small remote box adjacent to the endoscope. Based upon the type of image sensor used, the profile area of the imaging device may be made small enough to be placed into an endoscope which has a very small diameter tube. Additionally, the imaging device may be placed into the channels of existing endoscopes to provide additional imaging capability without increasing the size of the endoscope. The imaging device may be powered by a standard power input connection in the form of a power cord, or a small battery may be used. In order to enhance the freedom of using the endoscope without trailing cables, the endoscope may include wireless transmission capabilities. A wireless endoscope also has advantages with respect to overall surgical efficiency in conducting procedures by minimizing requirements to drape or

shield cables in the sterile field, and by providing an endoscope which has unlimited movement capabilities without having to orient or otherwise handle the endoscope to account for twisted cables, drapes, or other components which are normally associated with endoscopic devices. A wireless transmission of post-video signals from the endoscope directly to the video display can be done to provide video images. Alternatively, the imaging device can be separated into components which are located in the endoscope and in a remote control box. Pre-video signals are wirelessly transmitted to the control box, and then post-video signals are provided to the video display either through a secondary wireless transmission, or by a conventional hard wired connection.

This invention has been described in detail with reference to particular embodiments thereof, but it will be understood that various other modifications can be effected within the spirit and scope of this invention.

Claim 1. An imaging device comprising:

a housing;

an image sensor mounted in said housing, said image sensor including a first circuit board having a length and a width thereto, wherein said length and width of said first circuit board define a first plane, said first circuit board including an array of CMOS pixels thereon, wherein a plurality of CMOS pixels within said array of CMOS pixels each include an amplifier, said first circuit board further including timing and control circuitry thereon, said timing and control circuitry being coupled to said array of CMOS pixels, said image sensor producing a pre-video signal, wherein the image sensor is generally square shape along the first plane;

a second circuit board mounted in said housing, said second circuit board being electrically coupled to said first circuit board, said second circuit board having a length and a width thereto, wherein said length and width of said second circuit board define a second plane, said second circuit board including circuitry thereon to convert said pre-video signal to a post-video signal, said second circuit board being offset from said first circuit board, said second plane of said second circuit board being substantially parallel to said first plane of said first circuit board;

a lens mounted in said housing, said lens being integral with said imaging device, said lens focusing images on said array of CMOS pixels of said image sensor;

a video screen, said video screen being electrically coupled to said second circuit board, said video screen receiving said post-video signal and displaying images from said post-video signal; and

a power supply mounted in said housing, said power supply being electrically coupled to said first circuit board to provide power to said array of CMOS pixels and said timing and control circuitry, said power supply also being electrically coupled to said second circuit board to provide power thereto.

Claim 2. The imaging device of claim 1, wherein:

a largest dimension of said image sensor along said first plane is between 4 and 8 millimeters.

Claim 3. The imaging device of claim 1, wherein:

a largest dimension of said image sensor along said first plane is between 2 and 12 millimeters.

Claim 4. The imaging device of claim 1, wherein:

a largest dimension of said second circuit board along said second plane is greater than a largest dimension of said image sensor along said first plane.

Claim 5. The imaging device of claim 1, wherein:

power provided by said power supply is direct current between 1.5 and 12 volts.

Claim 6. The imaging device of claim 1, wherein:

said power supply is a battery.

Claim 7. An imaging device comprising:

a housing;

an image sensor mounted in said housing, said image sensor including a first circuit board having a length and a width thereto, wherein said length and width of said first circuit board define a first plane, said first circuit board including an array of CMOS pixels thereon, wherein a plurality of CMOS pixels within said array of CMOS pixels each include an amplifier, said first circuit board further including timing and control circuitry thereon, said timing and control circuitry being coupled to said array of CMOS pixels, said image sensor producing a pre-video signal, wherein the image sensor is generally square shape along the first plane;

a second circuit board mounted in said housing, said second circuit board being electrically coupled to said first circuit board, said second circuit board having a length and a width thereto, wherein said length and width of said second circuit board define a second plane, said second circuit board including circuitry thereon to convert said pre-video signal to a post-video signal, said second circuit board being positioned in a stacked arrangement with respect to said first circuit board, said second plane of said second circuit board being substantially parallel to said first plane of said first circuit board;

a lens mounted in said housing, said lens being integral with said imaging device, said lens focusing images on said array of CMOS pixels of said image sensor;

a video screen, said video screen being electrically coupled to said second circuit board, said video screen receiving said post-video signal and displaying images from said post-video signal; and

a power supply mounted in said housing, said power supply being electrically coupled to said first circuit board to provide power to said array of CMOS pixels and said timing and control circuitry, said power supply also being electrically coupled to said second circuit board to provide power thereto.

Claim 8. The imaging device of claim 7, wherein:

a largest dimension of said image sensor along said first plane is between 4 and 8 millimeters.

Claim 9. The imaging device of claim 7, wherein:

a largest dimension of said image sensor along said first plane is between 2 and 12 millimeters.

Claim 10. The imaging device of claim 7, wherein:

a largest dimension of said second circuit board along said second plane is greater than a largest dimension of said image sensor along said first plane.

Claim 11. The imaging device of claim 7, wherein:

power provided by said power supply is direct current between 1.5 and 12 volts.

Claim 12. The imaging device of claim 7, wherein:

said power supply is a battery.

Claim 13. An imaging device comprising:

a housing;

an image sensor mounted in said housing, said image sensor including a planar substrate having a length and a width thereto, wherein said length and width of said planar substrate define a first plane, said planar substrate including an array of CMOS pixels thereon, wherein a plurality of CMOS pixels within said array of CMOS pixels each include an amplifier, said image sensor further including a first circuit board having a length and a width thereto, wherein said length and width of said first circuit board define a second plane, said first circuit board including timing and control circuitry thereon, said timing and control circuitry being coupled to said array of CMOS pixels, said first circuit board being positioned in a stacked arrangement with respect to said planar substrate, said second plane of said first circuit board being substantially parallel to said first plane of said planar substrate, said image sensor producing a pre-video signal, wherein the image sensor is generally square shape along the first plane;

a second circuit board mounted in said housing, said second circuit board being electrically coupled to said planar substrate and to said first circuit board, said second circuit board having a length and a width thereto, wherein said length and width of said second circuit board define a third plane, said second circuit board including circuitry thereon to convert said pre-video signal to a post-video signal, said second circuit board being offset from said first circuit board and from said planar substrate, said third plane of said second circuit board being substantially parallel to said second plane of said first circuit board and to said first plane of said planar substrate;

a lens mounted in said housing, said lens being integral with said imaging device, said lens focusing images on said array of CMOS pixels of said image sensor;

a video screen, said video screen being electrically coupled to said second circuit board, said video screen receiving said post-video signal and displaying images from said post-video signal; and

a power supply mounted said housing, said power supply being electrically coupled to said planar substrate to provide power to said array of CMOS pixels, said power supply also being electrically coupled to said first circuit board to provide power to said timing and control circuitry, said power supply also being electrically coupled to said second circuit board to provide power thereto.

Claim 14. The imaging device of claim 13, wherein:



a largest dimension of said image sensor along said first plane is between 4 and 8 millimeters.

Claim 15. The imaging device of claim 13, wherein:

a largest dimension of said image sensor along said first plane is between 2 and 12 millimeters.

Claim 16. The imaging device of claim 13, wherein:

a largest dimension of said second circuit board along said third plane is greater than a largest dimension of said image sensor along said first plane.

Claim 17. The imaging device of claim 13, wherein:

power provided by said power supply is direct current between 1.5 and 12 volts.

Claim 18. The imaging device of claim 13, wherein:

said power supply is a battery.

Claim 19. An imaging device comprising:

a housing;

an image sensor mounted in said housing, said image sensor including a planar substrate having a length and a width thereto, wherein said length and

width of said planar substrate define a first plane, said planar substrate including an array of CMOS pixels thereon, wherein a plurality of CMOS pixels within said array of CMOS pixels each include an amplifier, said image sensor further including a first circuit board having a length and a width thereto, wherein said length and width of said first circuit board define a second plane, said first circuit board including timing and control circuitry thereon, said timing and control circuitry being coupled to said array of CMOS pixels, said first circuit board being positioned in a stacked arrangement with respect to said planar substrate, said second plane of said first circuit board being substantially parallel to said first plane of said planar substrate, said image sensor producing a pre-video signal, wherein the image sensor is generally square shape along the first plane;

a second circuit board mounted in said housing, said second circuit board, being electrically coupled to said planar substrate and to said first circuit board, said second circuit board having a length and a width thereto, wherein said length and width of said second circuit board define a third plane, said second circuit board including circuitry thereon to convert said pre-video signal to a post-video signal, said second circuit board being positioned in a stacked arrangement with respect to said first circuit board and further with respect to said planar substrate, said third plane of said second circuit board being substantially parallel to said second plane of said first circuit board and to said first plane of said planar substrate;

a lens mounted in said housing, said lens being integral with said imaging device, said lens focusing images on said array of CMOS pixels of said image sensor;

a video screen, said video screen being electrically coupled to said second circuit board, said video screen receiving said post-video signal and displaying images from said post-video signal; and

a power supply mounted said housing, said power supply being electrically coupled to said planar substrate to provide power to said array of CMOS pixels, said power supply also being electrically coupled to said first circuit board to provide power to said timing and control circuitry, said power supply also being electrically coupled to said second circuit board to provide power thereto.

Claim 20. The imaging device of claim 19, wherein:

a largest dimension of said image sensor along said first plane is between 4 and 8 millimeters.

Claim 21. The imaging device of claim 19, wherein:

a largest dimension of said image sensor along said first plane is between 2 and 12 millimeters.

Claim 22. The imaging device of claim 19, wherein:

a largest dimension of said second circuit board along said third plane is greater than a largest dimension of said image sensor along said first plane.

Claim 23. The imaging device of claim 19, wherein:

power provided by said power supply is direct current between 1.5 and 12 volts.

Claim 24. The imaging device of claim 19, wherein:

said power supply is a battery.

Claim 25. An imaging device comprising:

a housing;

an image sensor mounted in said housing, said image sensor including a planar substrate having a length and a width thereto, wherein said length and width of said planar substrate define a first plane, said planar substrate including an array of CMOS pixels thereon, wherein a plurality of CMOS pixels within said array of CMOS pixels each include an amplifier, said planar substrate further including timing and control circuitry thereon, said timing and control circuitry being coupled to said array of CMOS pixels, said image sensor producing a pre-video signal, wherein the image sensor is generally square shape along the first plane;

a circuit board mounted in said housing, said circuit board being electrically coupled to said planar substrate, said circuit board having a length

and a width thereto, wherein said length and width of said circuit board define a second plane, said circuit board including circuitry thereon to convert said pre-video signal to a post-video signal, said circuit board being offset from said planar substrate, said second plane of said circuit board being substantially parallel to said first plane of said planar substrate;

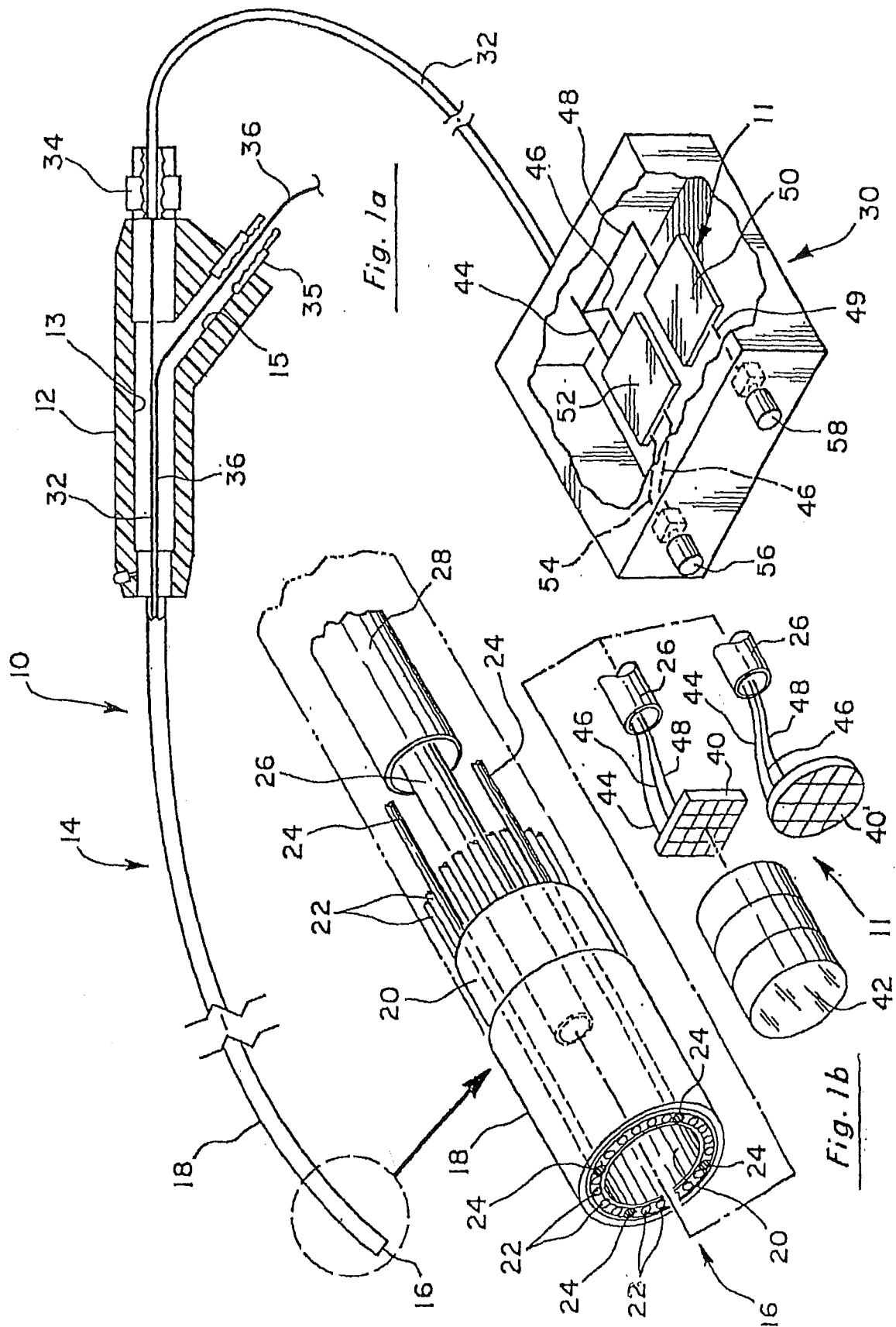
a lens mounted in said housing, said lens being integral with said imaging device, said lens focusing images on said array of CMOS pixels of said image sensor;

a video screen, said video screen being electrically coupled to said circuit board, said video screen receiving said post-video signal and displaying images from said post-video signal; and

a power supply mounted in said housing, said power supply being electrically coupled to said planar substrate to provide power to said array of CMOS pixels and said timing and control circuitry, said power supply also being electrically coupled to said circuit board to provide power thereto.

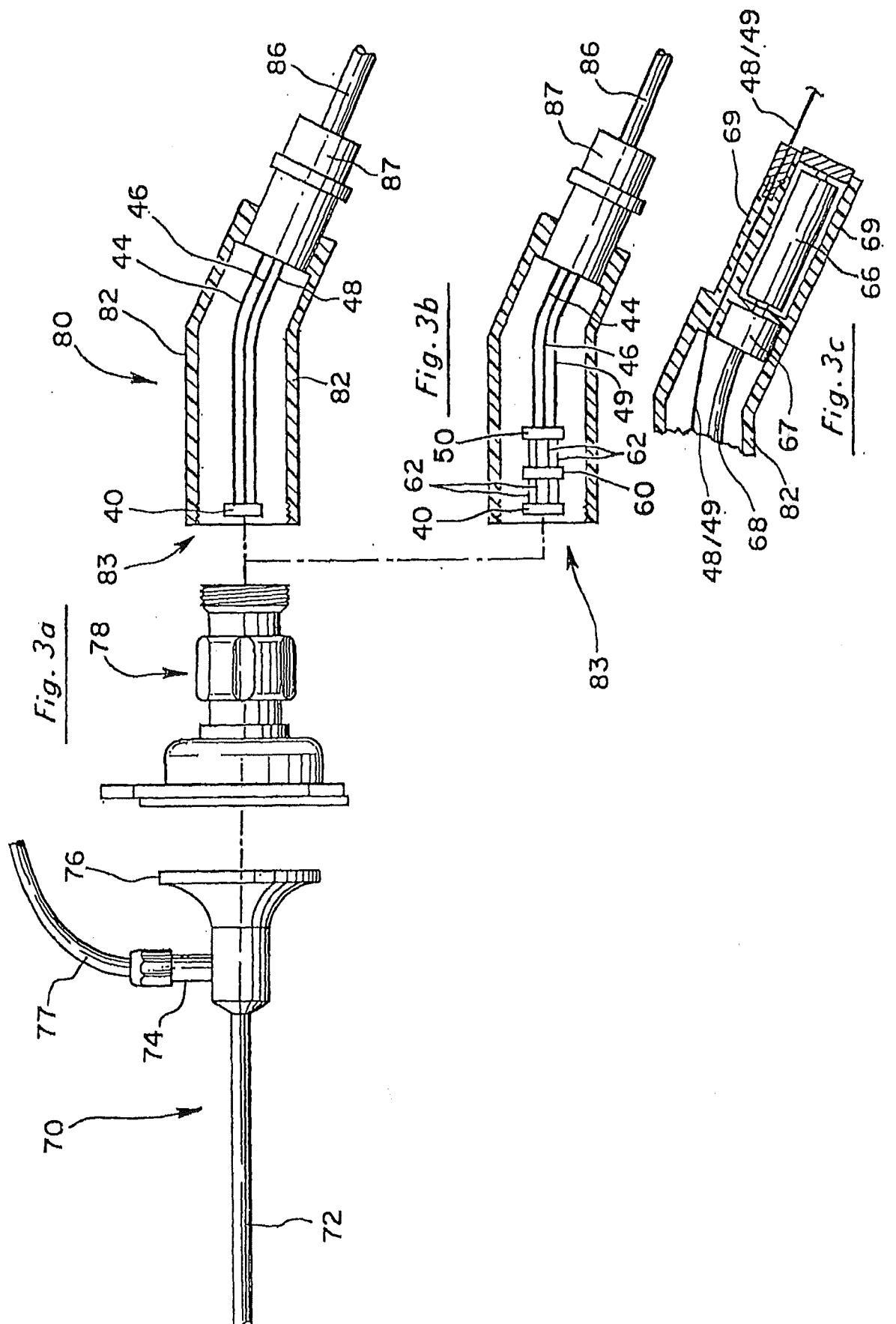
### **ABSTRACT**

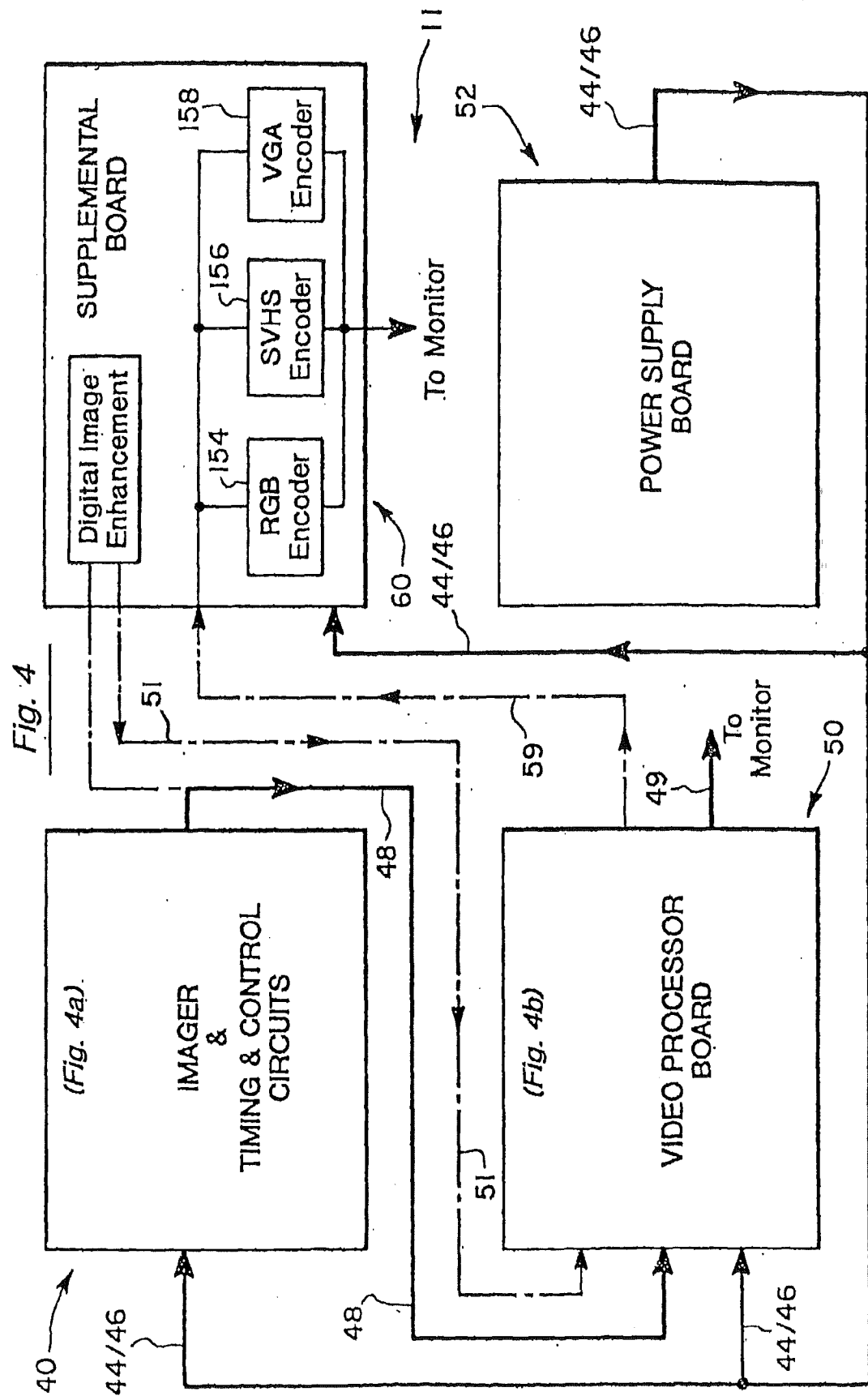
A reduced area imaging device is provided for use in medical or dental instruments such as an endoscope. The imaging device is provided in various configurations, and connections between the imaging device elements and a video display may be achieved by wired or wireless connections. A connector assembly located near the imaging device interconnects the imaging device to an image/power cable extending through the endoscope. The connector provides strain relief and stabilization for electrically interconnecting the imager to the cable. The connector also serves as the structure for anchoring the distal ends of steering wires extending through the body of the endoscopic device. The connector includes a strain relief member mounted over a body of the connector. The connector allows a steering wire capability without enlarging the profile of the distal tip of the endoscopic device.

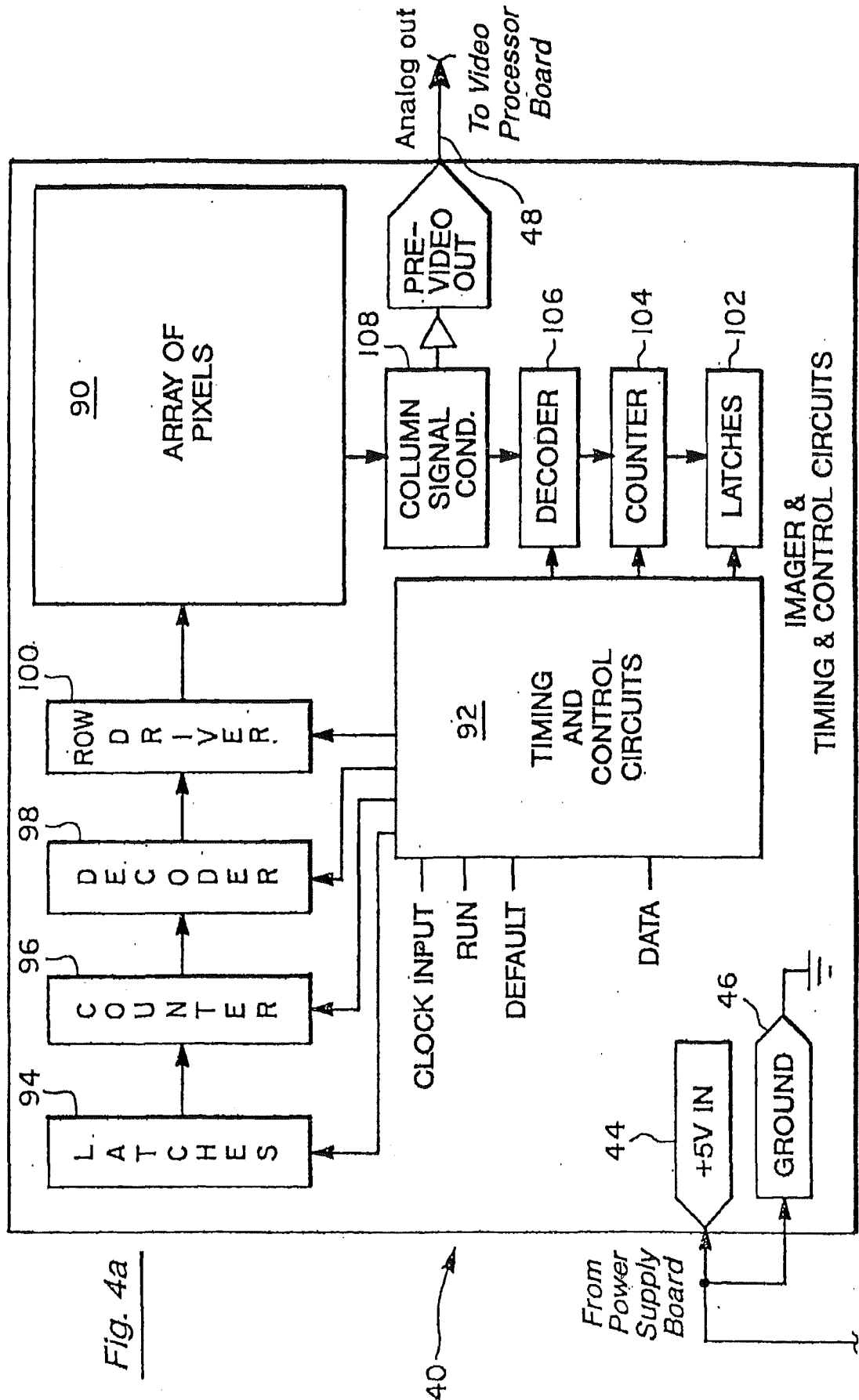












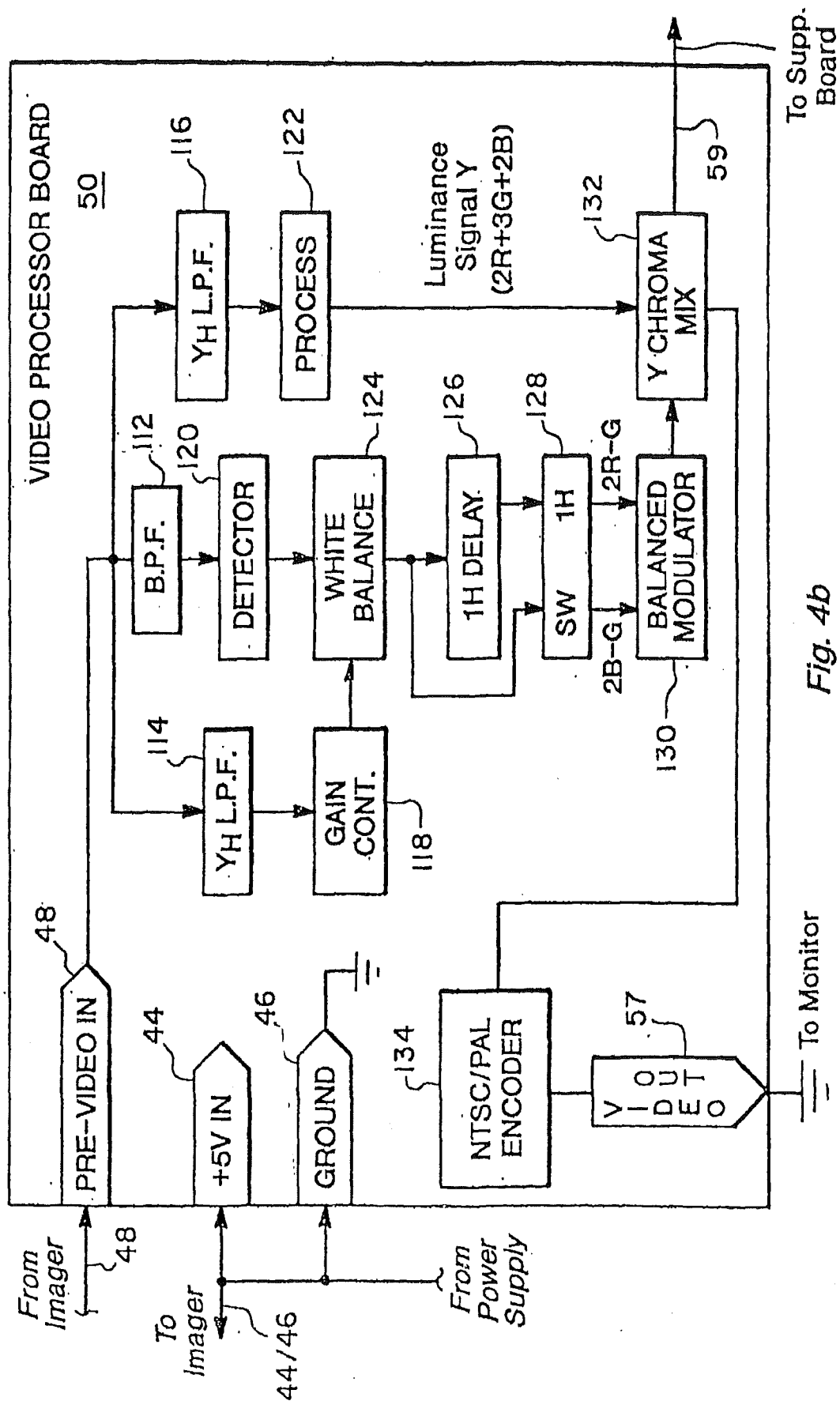


Fig. 4b

Fig. 5a

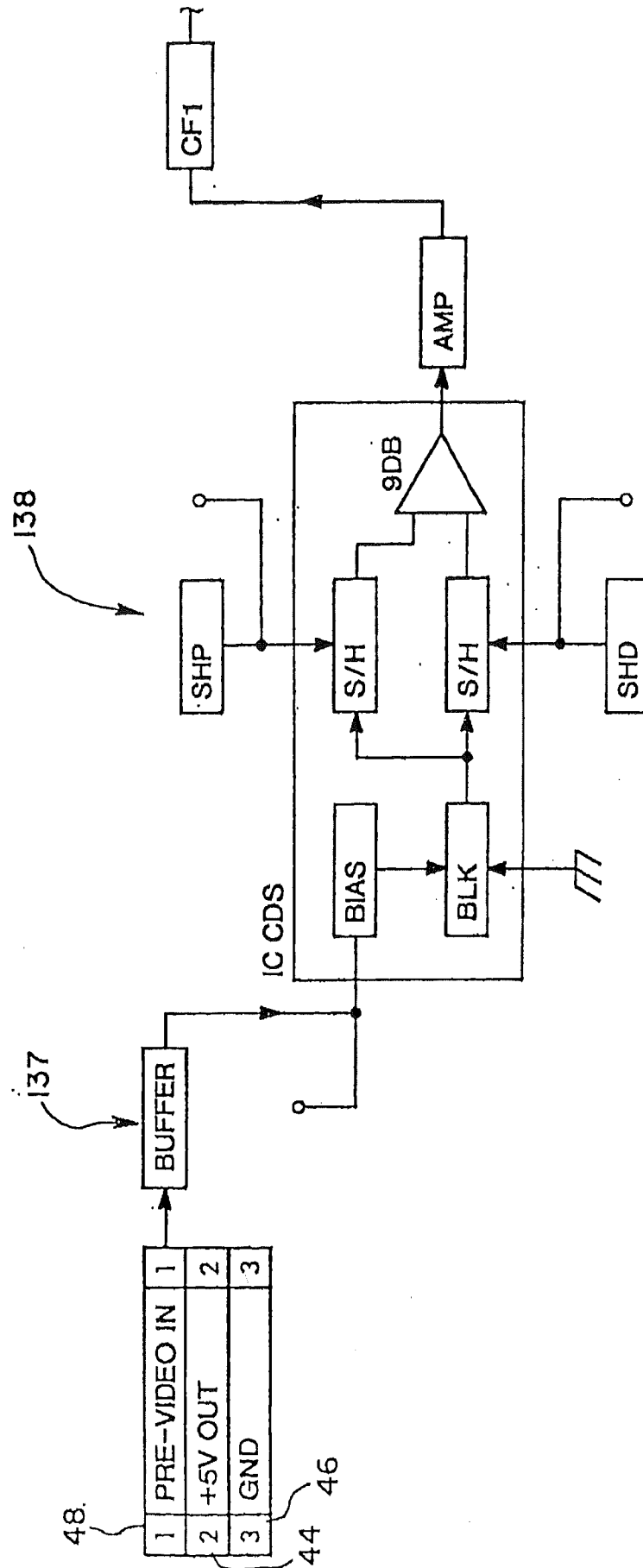


Fig. 5b

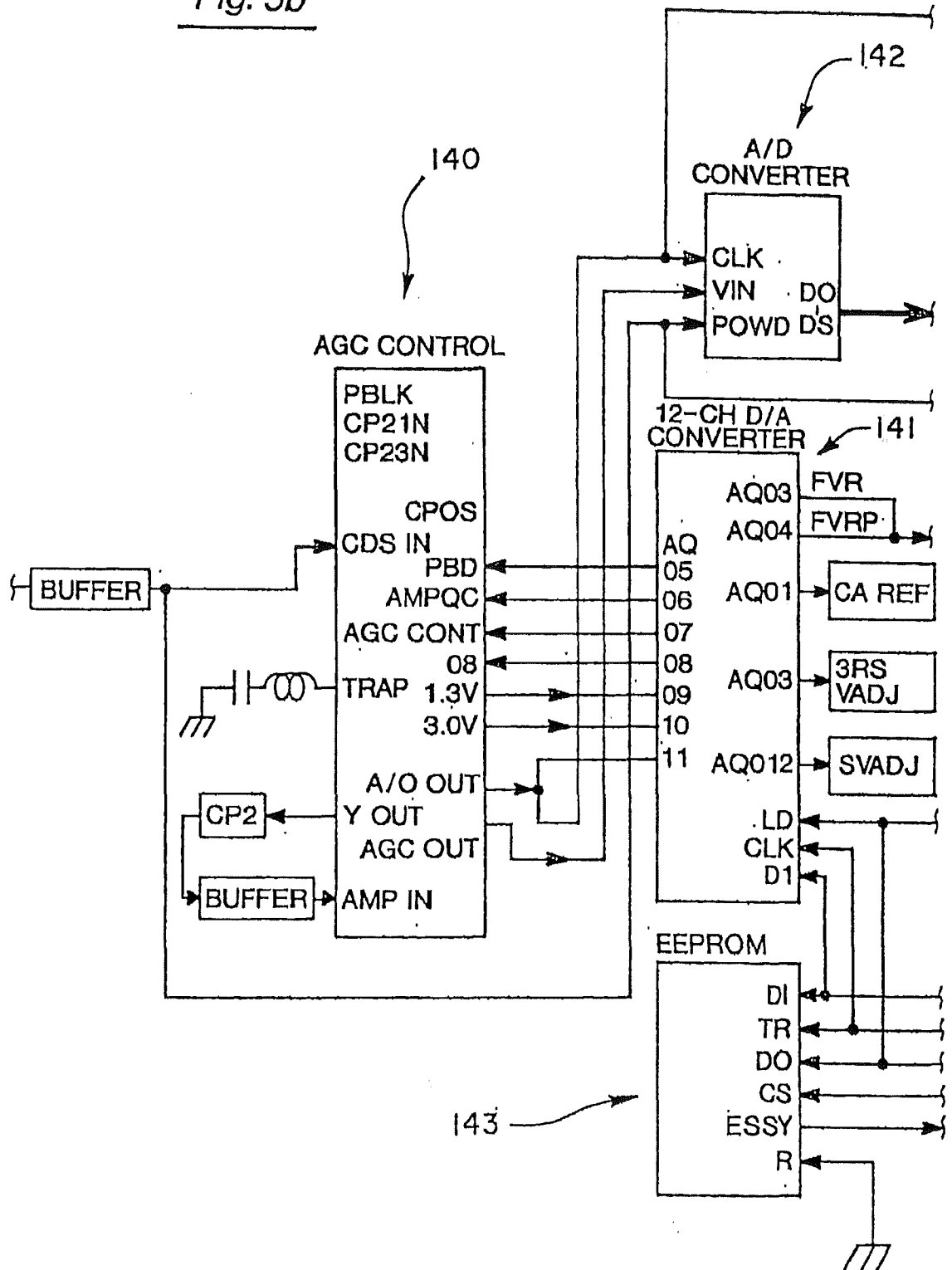
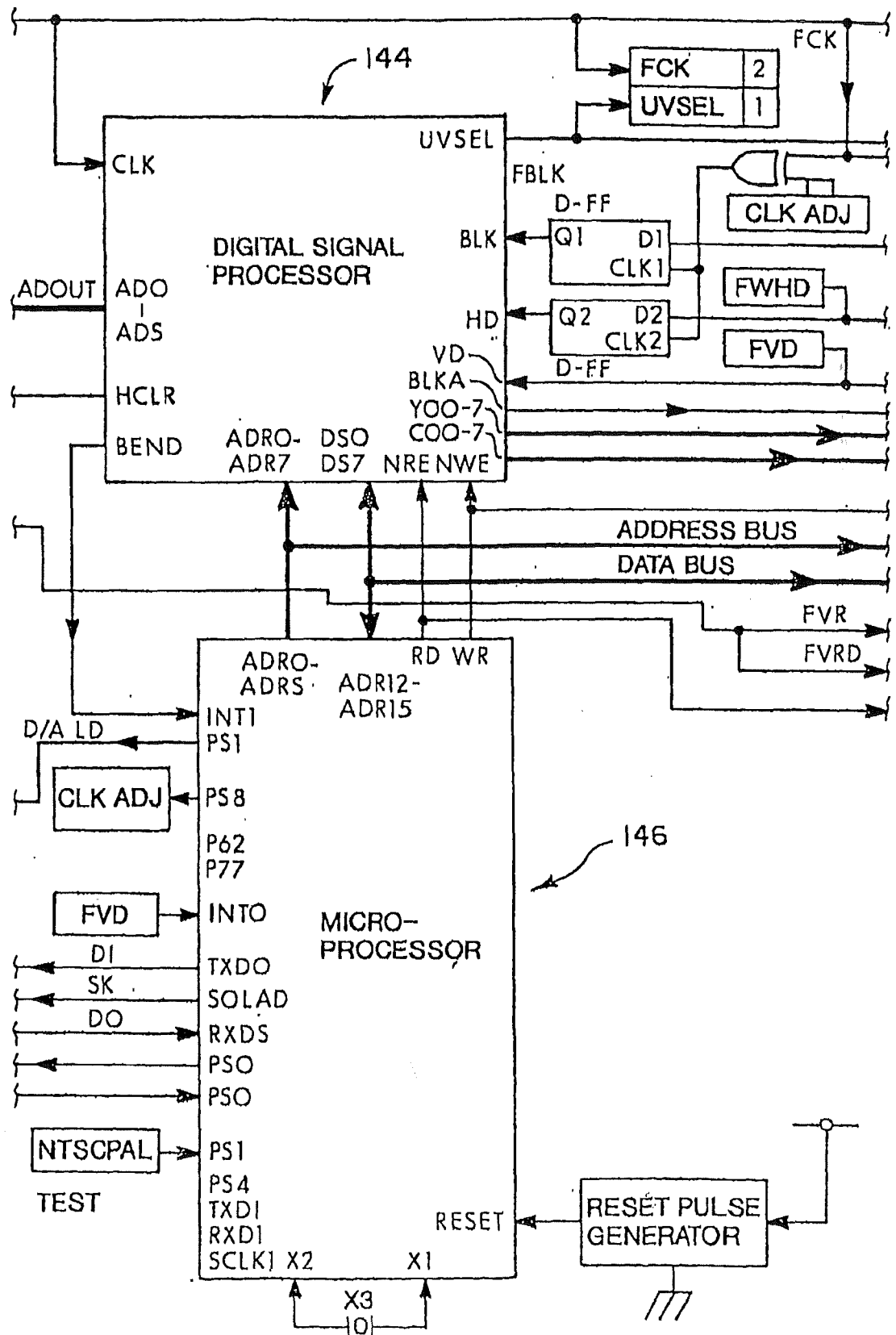
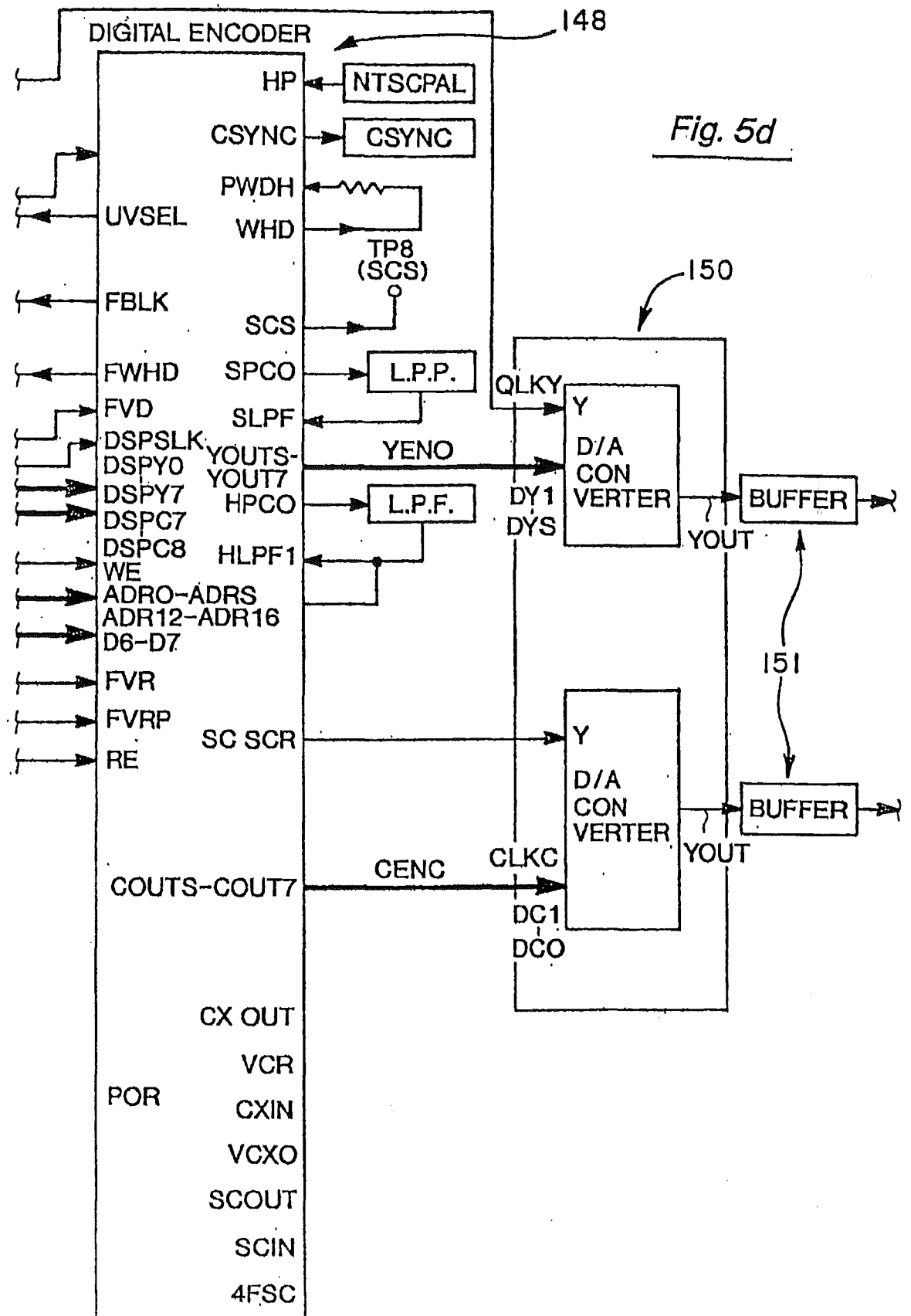


Fig. 5c







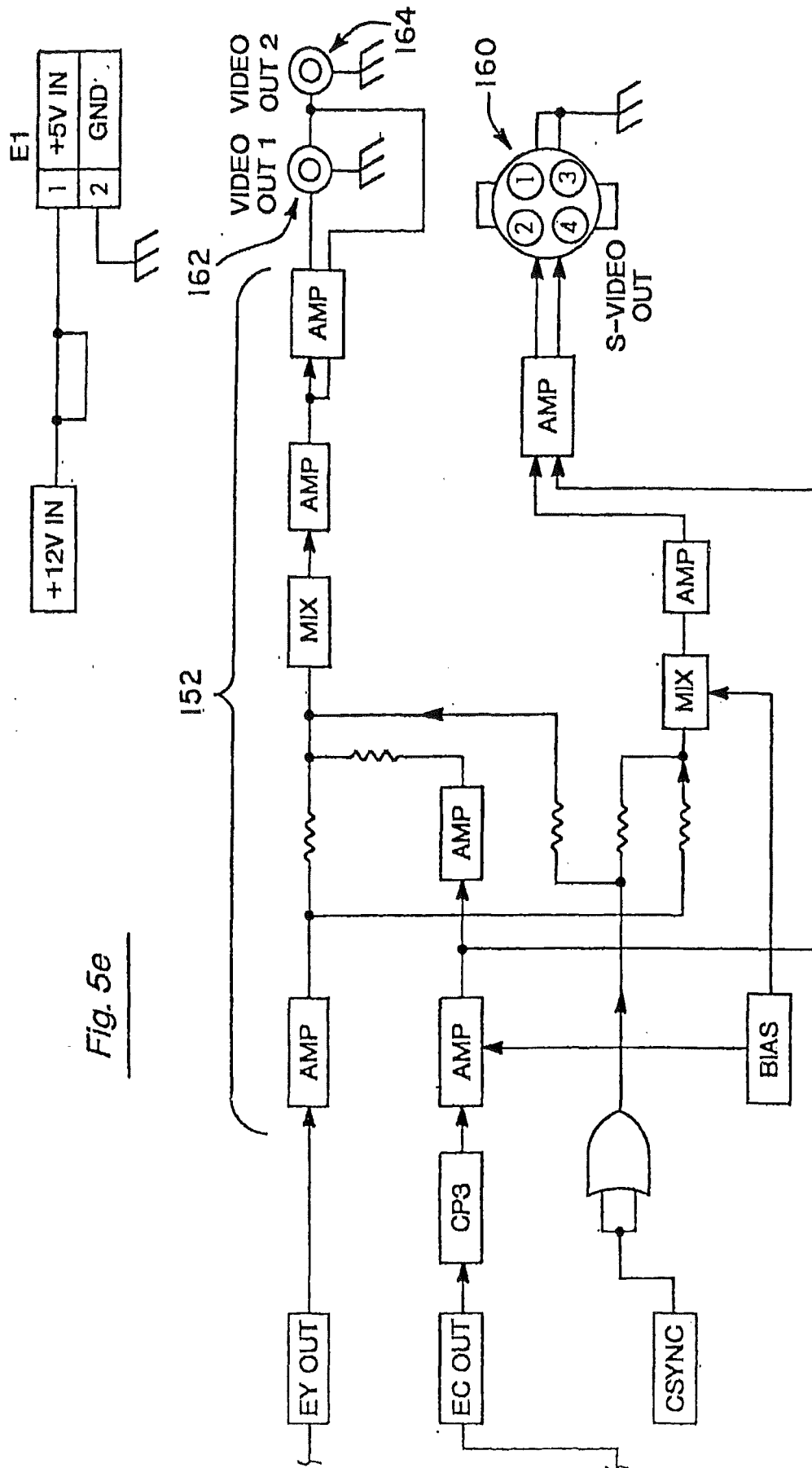
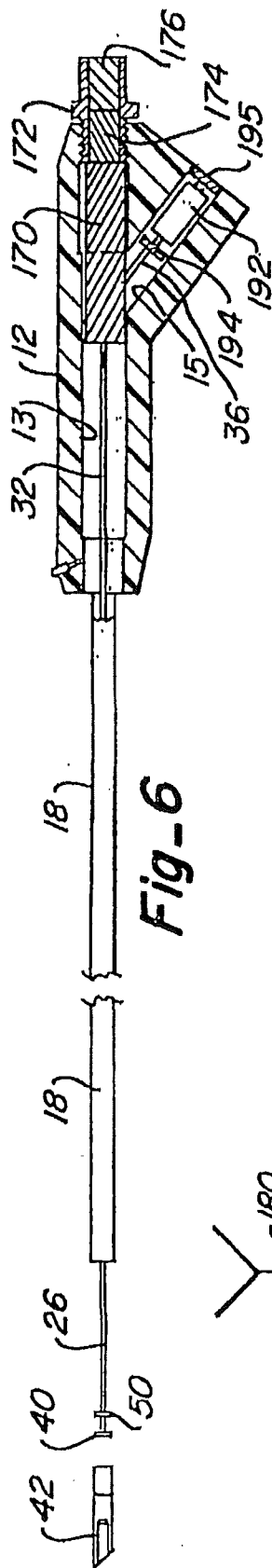
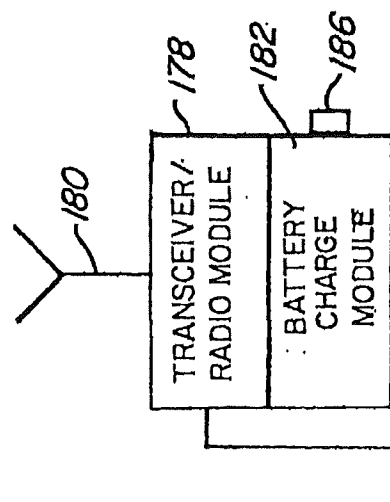


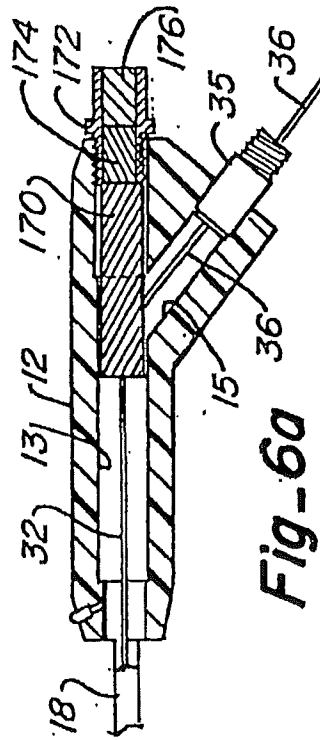
Fig. 5e



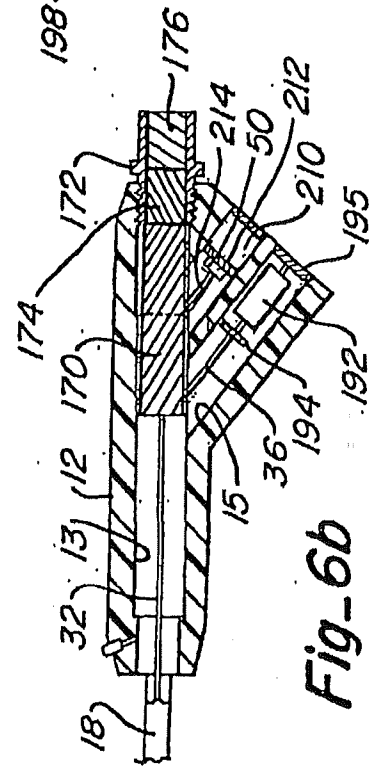
**Fig-6**



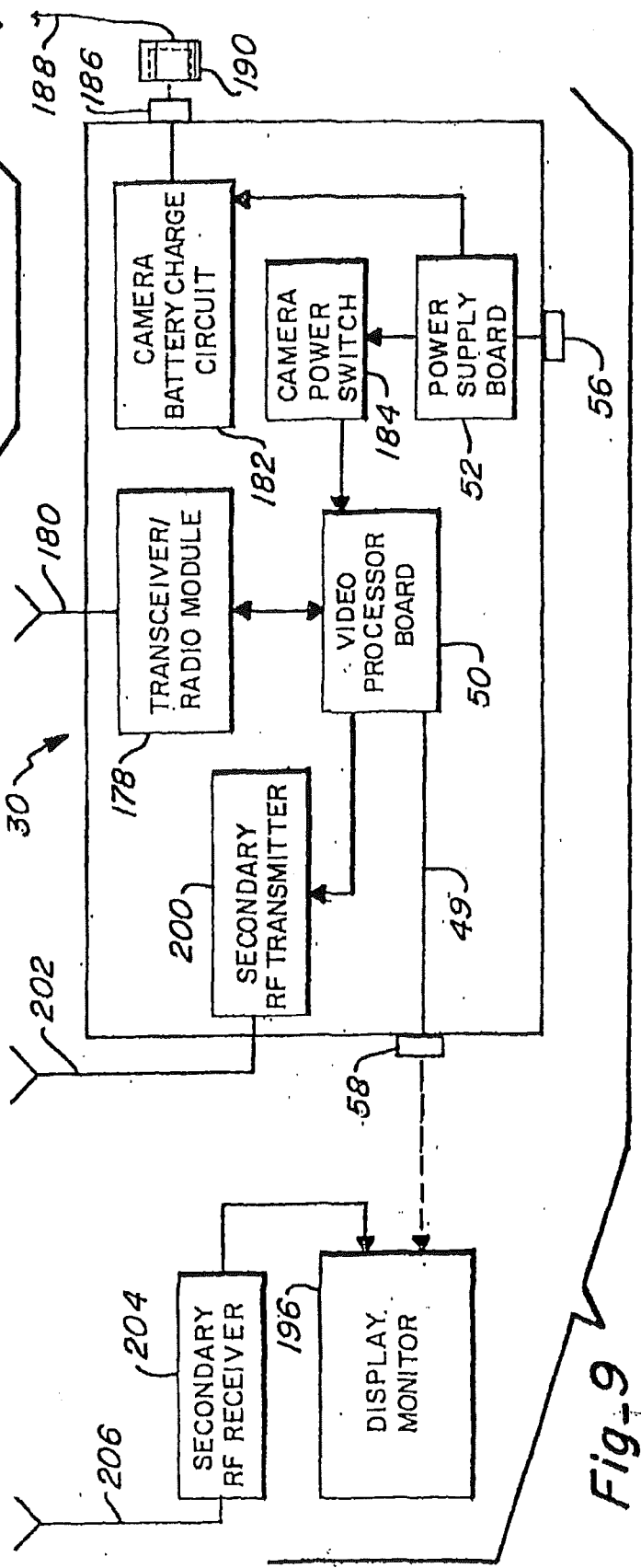
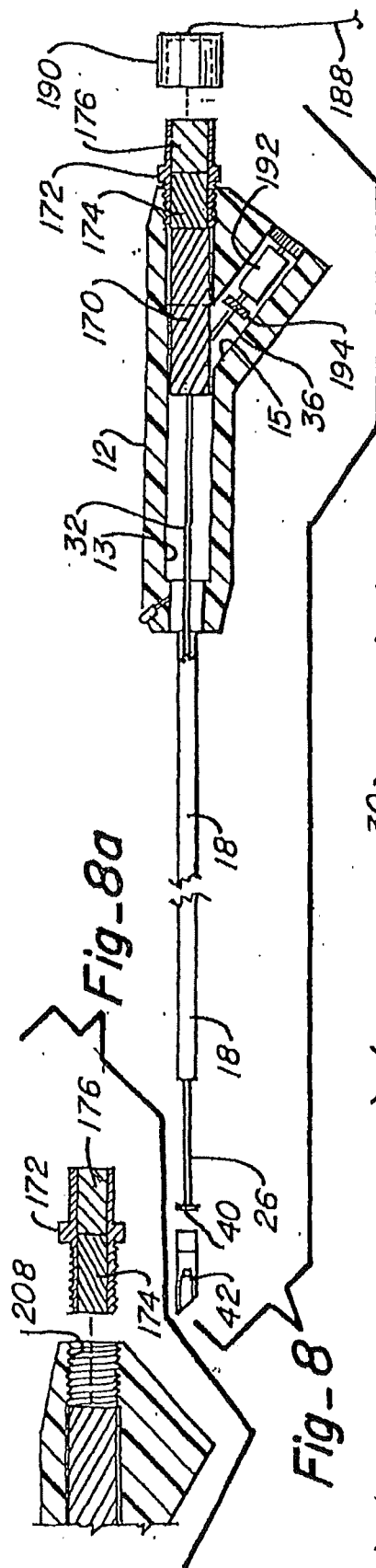
**Fig-7**



**Fig-6a**



**Fig-6b**



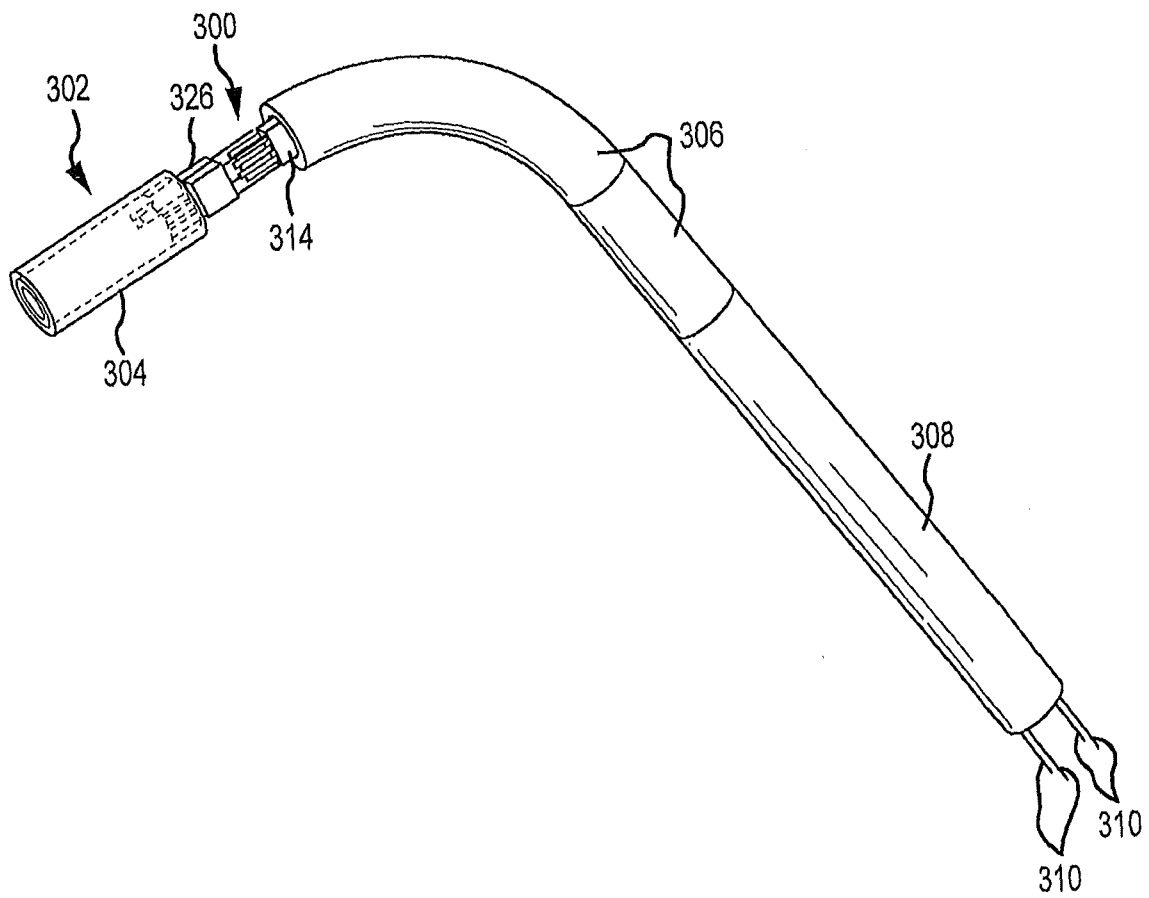


FIG.10

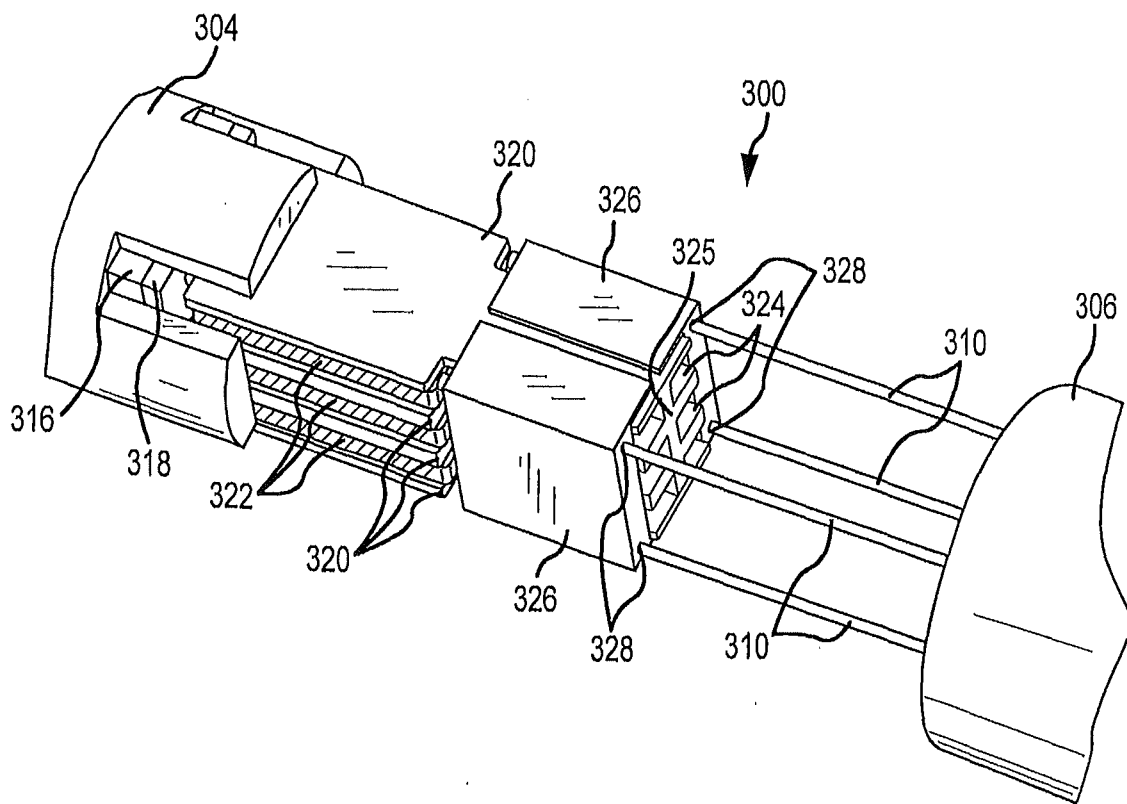


FIG.11

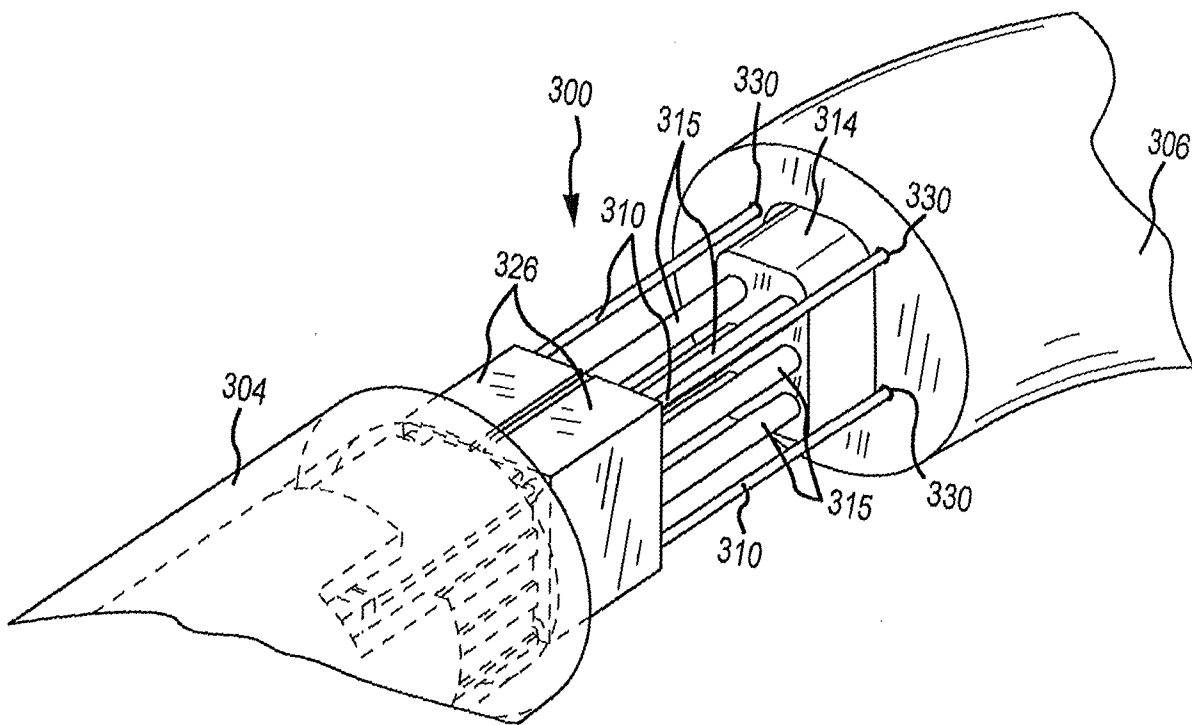


FIG. 12

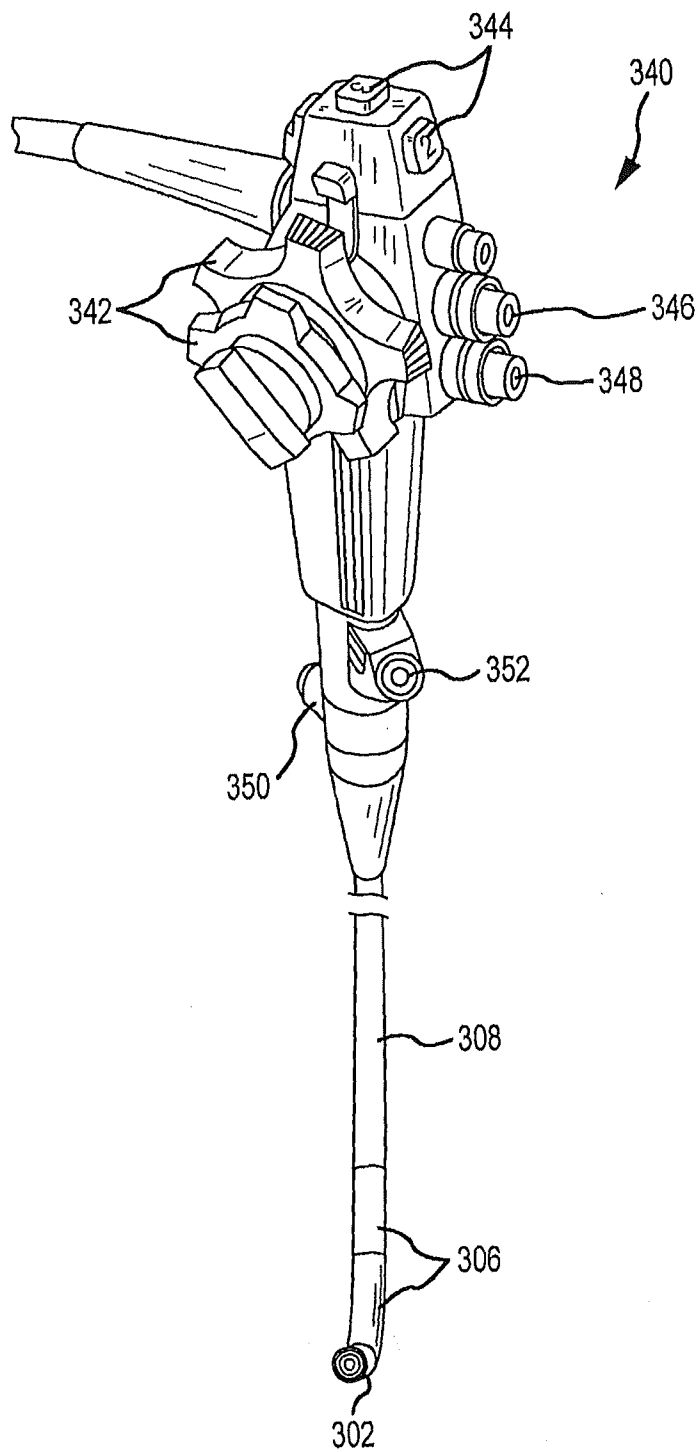


FIG.13



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/941,040	11/13/2015	Jeffrey L. Adair	MICRO-052-065-cont

CONFIRMATION NO. 2975

FORMALITIES LETTER



74642  
CLIFFORD H. KRAFT  
320 ROBIN HILL DR.  
NAPERVILLE, IL 60540

Date Mailed: 11/30/2015

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

*Filing Date Granted*

**Items Required To Avoid Abandonment:**

An application number and filing date have been accorded to this application. The item(s) indicated below, however, are missing. Applicant is given **TWO MONTHS** from the date of this Notice within which to file all required items below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- The statutory basic filing fee is missing.
- The application search fee must be submitted.
- The application examination fee must be submitted.
- Additional claim fees of \$ **620** as a small entity, including any required multiple dependent claim fee, are required. Applicant must submit the additional claim fees or cancel the additional claims for which fees are due.
- Surcharge as set forth in 37 CFR 1.16(f) must be submitted.

The surcharge is due for any one of:

- late submission of the basic filing fee, search fee, or examination fee,
- late submission of inventor's oath or declaration,
- filing an application that does not contain at least one claim on filing, or
- submission of an application filed by reference to a previously filed application.

**SUMMARY OF FEES DUE:**

The fee(s) required within **TWO MONTHS** from the date of this Notice to avoid abandonment is/are itemized below. Small entity discount is in effect. If applicant is qualified for micro entity status, an acceptable Certification of Micro Entity Status must be submitted to establish micro entity status. (See 37 CFR 1.29 and forms PTO/SB/15A and 15B.)

- \$ **70** basic filing fee.
- \$ **70** surcharge.
- \$ **300** search fee.
- \$ **360** examination fee.
- \$ **420** for **2** independent claims over 3.
- \$ **200** for **5** total claims over 20.



- \$( 0) previous unapplied payment amount.
- **\$ 1420** TOTAL FEE BALANCE DUE.

Replies must be received in the USPTO within the set time period or must include a proper Certificate of Mailing or Transmission under 37 CFR 1.8 with a mailing or transmission date within the set time period. For more information and a suggested format, see Form PTO/SB/92 and MPEP 512.

Replies should be mailed to:

Mail Stop Missing Parts  
Commissioner for Patents  
P.O. Box 1450  
Alexandria VA 22313-1450

Registered users of EFS-Web may alternatively submit their reply to this notice via EFS-Web, including a copy of this Notice and selecting the document description "Applicant response to Pre-Exam Formalities Notice".  
<https://sportal.uspto.gov/authenticate/AuthenticateUserLocalEPF.html>

For more information about EFS-Web please call the USPTO Electronic Business Center at 1-866-217-9197 or visit our website at <http://www.uspto.gov/ebc>.

If you are not using EFS-Web to submit your reply, you must include a copy of this notice.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at  
**(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/mabebe/

---



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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
14/941,040	11/13/2015	2486	0.00	MICRO-052-065-cont	25	5

CONFIRMATION NO. 2975

## FILING RECEIPT



0000000078908088

74642  
CLIFFORD H. KRAFT  
320 ROBIN HILL DR.  
NAPERVILLE, IL 60540

Date Mailed: 11/30/2015

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

### Inventor(s)

Jeffrey L. Adair, Highlands Ranch, CO;  
Edwin Adair, Residence Not Provided;  
Randall Adair, Denver, CO;

### Applicant(s)

Jeffrey L. Adair, Highlands Ranch, CO;  
Edwin Adair, Residence Not Provided;  
Randall Adair, Denver, CO;

### Assignment For Published Patent Application

Micro-Imaging Solutions LLC, Denver, CO

Power of Attorney: None

### Domestic Priority data as claimed by applicant

This application is a CON of 14/705,334 05/06/2015 PAT 9186052  
which is a CON of 14/333,260 07/16/2014 PAT 9198565  
which is a CON of 13/732,908 01/02/2013 PAT 8885034  
which is a CON of 12/889,287 09/23/2010 ABN  
which is a CIP of 11/245,960 10/06/2005  
which is a CON of 09/929,531 08/13/2001 PAT 7030904  
which is a CIP of 09/496,312 02/01/2000 PAT 6275255  
which is a CON of 09/175,685 10/20/1998 PAT 6043839  
which is a CIP of 08/944,322 10/06/1997 PAT 5929901

**Foreign Applications** for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see <http://www.uspto.gov> for more information.) - None.

*Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.*

**Permission to Access Application via Priority Document Exchange:** Yes

**Permission to Access Search Results:** No

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

**If Required, Foreign Filing License Granted:** 11/25/2015

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 14/941,040**

**Projected Publication Date:** To Be Determined - pending completion of Missing Parts

**Non-Publication Request:** No

**Early Publication Request:** No

**\*\* SMALL ENTITY \*\***

**Title**

Reduced area imaging device incorporated within endoscopic devices

**Preliminary Class**

348

**Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications:** No

## **PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES**

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign

patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

## **LICENSE FOR FOREIGN FILING UNDER**

### **Title 35, United States Code, Section 184**

### **Title 37, Code of Federal Regulations, 5.11 & 5.15**

#### **GRANTED**

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign Assets Control, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

#### **NOT GRANTED**

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

## ***SelectUSA***

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit <http://www.SelectUSA.gov> or call +1-202-482-6800.

<b>PATENT APPLICATION FEE DETERMINATION RECORD</b> Substitute for Form PTO-875						Application or Docket Number 14/941,040	
<b>APPLICATION AS FILED - PART I</b>							
(Column 1)		(Column 2)		SMALL ENTITY		OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE(\$)	FEE(\$)		RATE(\$)	FEE(\$)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	70		N/A	
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A	300		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	360		N/A	
TOTAL CLAIMS (37 CFR 1.16(j))	25	minus 20 = * 5	x 40 =	200	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	5	minus 3 = * 2	x 210 =	420			
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0.00			
			TOTAL	1350		TOTAL	
* If the difference in column 1 is less than zero, enter "0" in column 2.							
<b>APPLICATION AS AMENDED - PART II</b>							
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY	
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)
	Total (37 CFR 1.16(i))	*	Minus **	=	x =	OR	x =
	Independent (37 CFR 1.16(h))	*	Minus ***	=	x =	OR	x =
	Application Size Fee (37 CFR 1.16(s))					OR	
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					OR	
				TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY	
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)
	Total (37 CFR 1.16(i))	*	Minus **	=	x =	OR	x =
	Independent (37 CFR 1.16(h))	*	Minus ***	=	x =	OR	x =
	Application Size Fee (37 CFR 1.16(s))					OR	
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					OR	
				TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.							



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www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/941,040	11/13/2015	Jeffrey L. Adair	MICRO-052-065-cont

**CONFIRMATION NO. 2975**

**IMPROPER LETTER**

74642  
CLIFFORD H. KRAFT  
320 ROBIN HILL DR.  
NAPERVILLE, IL 60540



Date Mailed: 11/30/2015

**NOTICE OF ACCEPTANCE OF AUTHORIZATION TO PERMIT  
ACCESS TO APPLICATION VIA PRIORITY DOCUMENT EXCHANGE**

This is in response to the applicant's authorization to permit access to the application-as-filed by participating offices under 37 CFR 1.14(h)(1) submitted on 11/13/2015.

The authorization to permit access to the application under 37 CFR 1.14(h)(1) is accepted.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/mabebe/



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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/941,040	11/13/2015	Jeffrey L. Adair	MICRO-052-065-cont

CONFIRMATION NO. 2975

## FORMALITIES LETTER



OC000000078908089

Date Mailed: 11/30/2015

74642

CLIFFORD H. KRAFT  
320 ROBIN HILL DR.  
NAPERVILLE, IL 60540



## NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

Filing Date Granted

Items Required To Avoid Abandonment:

An application number and filing date have been accorded to this application. The item(s) indicated below, however, are missing. Applicant is given **TWO MONTHS** from the date of this Notice within which to file all required items below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- The statutory basic filing fee is missing.
- The application search fee must be submitted.
- The application examination fee must be submitted.
- Additional claim fees of \$ 620 as a small entity, including any required multiple dependent claim fee, are required. Applicant must submit the additional claim fees or cancel the additional claims for which fees are due.
- Surcharge as set forth in 37 CFR 1.16(f) must be submitted.  
The surcharge is due for any one of:
  - late submission of the basic filing fee, search fee, or examination fee,
  - late submission of inventor's oath or declaration,
  - filing an application that does not contain at least one claim on filing, or
  - submission of an application filed by reference to a previously filed application.

SUMMARY OF FEES DUE:

The fee(s) required within **TWO MONTHS** from the date of this Notice to avoid abandonment is/are itemized below. Small entity discount is in effect. If applicant is qualified for micro entity status, an acceptable Certification of Micro Entity Status must be submitted to establish micro entity status. (See 37 CFR 1.29 and forms PTO/SB/15A and 15B.)

- \$ 70 basic filing fee.
- \$ 70 surcharge.
- \$ 300 search fee.
- \$ 360 examination fee.
- \$ 420 for 2 independent claims over 3.
- \$ 200 for 5 total claims over 20.

03/07/2016 HVUONG1 00000039 14941040

01 FC:1011	
02 FC:1111	280.00 OP
03 FC:1311	600.00 OP
04 FC:1051	720.00 OP
05 FC:1202	140.00 OP
06 FC:1201	400.00 OP
	840.00 OP



- \$( 0) previous unapplied payment amount.
- **\$ 1420 TOTAL FEE BALANCE DUE.**

Replies must be received in the USPTO within the set time period or must include a proper Certificate of Mailing or Transmission under 37 CFR 1.8 with a mailing or transmission date within the set time period. For more information and a suggested format, see Form PTO/SB/92 and MPEP 512.

Replies should be mailed to:

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<https://portal.uspto.gov/authenticate/AuthenticateUserLocalEPF.html>

For more information about EFS-Web please call the USPTO Electronic Business Center at 1-866-217-9197 or visit our website at <http://www.uspto.gov/ebc>.

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Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/mabebe/

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This paper is being submitted by United States First Class Mail addressed to:  
Commissioner for Patents, P.O. Box 1450, Alexandria VA 22313-1450 with  
sufficient postage on:

Date: FEB. 29, 2016

Signature: Clifford Kraft

Name: Clifford H. Kraft



## Electronic Patent Application Fee Transmittal

<b>Application Number:</b>	14941040			
<b>Filing Date:</b>	13-Nov-2015			
<b>Title of Invention:</b>	Reduced area imaging device incorporated within endoscopic devices			
<b>First Named Inventor/Applicant Name:</b>	Jeffrey L. Adair			
<b>Filer:</b>	Clifford H. Kraft			
<b>Attorney Docket Number:</b>	MICRO-052-065-cont			
Filed as Large Entity				
<b>Filing Fees for Utility under 35 USC 111(a)</b>				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
<b>Basic Filing:</b>				
Utility application filing	1011	1	280	280
Utility Search Fee	1111	1	600	600
Utility Examination Fee	1311	1	720	720
<b>Pages:</b>				
<b>Claims:</b>				
Claims in Excess of 20	1202	5	80	400
Independent claims in excess of 3	1201	2	420	840
<b>Miscellaneous-Filing:</b>				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Late Filing Fee for Oath or Declaration	1051	1	140	140
<b>Petition:</b>				
<b>Patent-Appeals-and-Interference:</b>				
<b>Post-Allowance-and-Post-Issuance:</b>				
<b>Extension-of-Time:</b>				
Extension - 1 month with \$0 paid	1251	1	200	200
<b>Miscellaneous:</b>				
<b>Total in USD (\$)</b>				<b>3180</b>



PTO/AIA/22 (03-13)

Approved for use through 7/31/2016. OMB 0651-0031  
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

<b>PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)</b>		Docket Number (Optional) <b>MICRO-052-065-cont</b>																														
Application Number <b>14/941,040</b>	Filed <b>11/13/2015</b>																															
For <b>Reduced area imaging device incorporated within endoscopic devices</b>																																
Art Unit	Examiner																															
This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above-identified application. The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):																																
<table style="width: 100%; border-collapse: collapse;"><thead><tr><th></th><th style="text-align: center;"><u>Fee</u></th><th style="text-align: center;"><u>Small Entity Fee</u></th><th style="text-align: center;"><u>Micro Entity Fee</u></th><th></th></tr></thead><tbody><tr><td><input checked="" type="checkbox"/> One month (37 CFR 1.17(a)(1))</td><td style="text-align: center;">\$200</td><td style="text-align: center;">\$100</td><td style="text-align: center;">\$50</td><td style="text-align: right;">\$ <u>200.00</u></td></tr><tr><td><input type="checkbox"/> Two months (37 CFR 1.17(a)(2))</td><td style="text-align: center;">\$600</td><td style="text-align: center;">\$300</td><td style="text-align: center;">\$150</td><td style="text-align: right;">\$ _____</td></tr><tr><td><input type="checkbox"/> Three months (37 CFR 1.17(a)(3))</td><td style="text-align: center;">\$1,400</td><td style="text-align: center;">\$700</td><td style="text-align: center;">\$350</td><td style="text-align: right;">\$ _____</td></tr><tr><td><input type="checkbox"/> Four months (37 CFR 1.17(a)(4))</td><td style="text-align: center;">\$2,200</td><td style="text-align: center;">\$1,100</td><td style="text-align: center;">\$550</td><td style="text-align: right;">\$ _____</td></tr><tr><td><input type="checkbox"/> Five months (37 CFR 1.17(a)(5))</td><td style="text-align: center;">\$3,000</td><td style="text-align: center;">\$1,500</td><td style="text-align: center;">\$750</td><td style="text-align: right;">\$ _____</td></tr></tbody></table>				<u>Fee</u>	<u>Small Entity Fee</u>	<u>Micro Entity Fee</u>		<input checked="" type="checkbox"/> One month (37 CFR 1.17(a)(1))	\$200	\$100	\$50	\$ <u>200.00</u>	<input type="checkbox"/> Two months (37 CFR 1.17(a)(2))	\$600	\$300	\$150	\$ _____	<input type="checkbox"/> Three months (37 CFR 1.17(a)(3))	\$1,400	\$700	\$350	\$ _____	<input type="checkbox"/> Four months (37 CFR 1.17(a)(4))	\$2,200	\$1,100	\$550	\$ _____	<input type="checkbox"/> Five months (37 CFR 1.17(a)(5))	\$3,000	\$1,500	\$750	\$ _____
	<u>Fee</u>	<u>Small Entity Fee</u>	<u>Micro Entity Fee</u>																													
<input checked="" type="checkbox"/> One month (37 CFR 1.17(a)(1))	\$200	\$100	\$50	\$ <u>200.00</u>																												
<input type="checkbox"/> Two months (37 CFR 1.17(a)(2))	\$600	\$300	\$150	\$ _____																												
<input type="checkbox"/> Three months (37 CFR 1.17(a)(3))	\$1,400	\$700	\$350	\$ _____																												
<input type="checkbox"/> Four months (37 CFR 1.17(a)(4))	\$2,200	\$1,100	\$550	\$ _____																												
<input type="checkbox"/> Five months (37 CFR 1.17(a)(5))	\$3,000	\$1,500	\$750	\$ _____																												
<input type="checkbox"/> Applicant asserts small entity status. See 37 CFR 1.27.																																
<input type="checkbox"/> Applicant certifies micro entity status. See 37 CFR 1.29. Form PTO/SB/15A or B or equivalent must either be enclosed or have been submitted previously.																																
<input checked="" type="checkbox"/> A check in the amount of the fee is enclosed.																																
<input type="checkbox"/> Payment by credit card. Form PTO-2038 is attached.																																
<input type="checkbox"/> The Director has already been authorized to charge fees in this application to a Deposit Account.																																
<input type="checkbox"/> The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number _____																																
<input type="checkbox"/> Payment made via EFS-Web.																																
<b>WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.</b>																																
I am the																																
<input type="checkbox"/> applicant.																																
<input checked="" type="checkbox"/> attorney or agent of record. Registration number <u>35,229</u>																																
<input type="checkbox"/> attorney or agent acting under 37 CFR 1.34. Registration number _____																																
<u>/clifford kraft/</u> Signature		<u>Feb. 29, 2016</u> Date																														
<u>Clifford H. Kraft</u> Typed or printed name		<u>708 528-9092</u> Telephone Number																														
<b>NOTE:</b> This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below*.																																

☐ \* Total of \_\_\_\_\_ forms are submitted.

This collection of information is required by 37 CFR 1.136(a). The information is required to obtain or retain a benefit by the public, which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 6 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop PCT, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

03/07/2016 HVUONG1 00000039 14941040

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:	)	Art Unit:
	)	
Jeffrey L. Adair	)	Examiner:
	)	
Serial: 14/941,040	)	
	)	
Filing date: Nov. 13, 2015	)	
	)	
Title: REDUCED AREA IMAGING	)	
DEVICE INCORPORATED	)	
WITHIN ENDOSCOPIC	)	
DEVICES	)	
	)	

REQUEST TO MAKE APPLICATION NON-DISCOUNTED

Commissioner for Patents  
P.O. Box 1450  
Alexandria VA 22313

Honorable Commissioner:

This is a request to make the status of the present application non-discounted (Large Entity).

Respectfully Submitted

/clifford kraft/

Clifford H. Kraft  
Reg. No. 35,229  
Attorney of Record

**CORRESPONDENCE ADDRESS****CUSTOMER 74642**

Clifford H. Kraft  
320 Robin Hill Dr.  
Naperville, IL 60540  
708 528-9092 tel.  
630 393-9114 fax.



UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
14/941,040	11/13/2015	2486	2980	MICRO-052-065-cont	25	5

74642  
CLIFFORD H. KRAFT  
320 ROBIN HILL DR.  
NAPERVILLE, IL 60540

**CONFIRMATION NO. 2975**  
**UPDATED FILING RECEIPT**



Date Mailed: 03/25/2016

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

**Inventor(s)**

Jeffrey L. Adair, Highlands Ranch, CO;  
Edwin Adair, Residence Not Provided;  
Randall Adair, Denver, CO;

**Applicant(s)**

Jeffrey L. Adair, Highlands Ranch, CO;  
Edwin Adair, Residence Not Provided;  
Randall Adair, Denver, CO;

**Assignment For Published Patent Application**

Micro-Imaging Solutions LLC, Denver, CO

**Power of Attorney:** None

**Domestic Priority data as claimed by applicant**

This application is a CON of 14/705,334 05/06/2015 PAT 9186052  
which is a CON of 14/333,260 07/16/2014 PAT 9198565  
which is a CON of 13/732,908 01/02/2013 PAT 8885034  
which is a CON of 12/889,287 09/23/2010 ABN  
which is a CIP of 11/245,960 10/06/2005  
which is a CON of 09/929,531 08/13/2001 PAT 7030904  
which is a CIP of 09/496,312 02/01/2000 PAT 6275255  
which is a CON of 09/175,685 10/20/1998 PAT 6043839  
which is a CIP of 08/944,322 10/06/1997 PAT 5929901

**Foreign Applications** for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see <http://www.uspto.gov> for more information.) - None.



*Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.*

**Permission to Access Application via Priority Document Exchange:** Yes

**Permission to Access Search Results:** No

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

**If Required, Foreign Filing License Granted:** 11/25/2015

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 14/941,040**

**Projected Publication Date:** 07/07/2016

**Non-Publication Request:** No

**Early Publication Request:** No

**Title**

Reduced area imaging device incorporated within endoscopic devices

**Preliminary Class**

348

**Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications:** No

## **PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES**

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign

patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

## **LICENSE FOR FOREIGN FILING UNDER**

### **Title 35, United States Code, Section 184**

### **Title 37, Code of Federal Regulations, 5.11 & 5.15**

#### **GRANTED**

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign Assets Control, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

#### **NOT GRANTED**

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

## ***SelectUSA***

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit <http://www.SelectUSA.gov> or call +1-202-482-6800.

<b>PATENT APPLICATION FEE DETERMINATION RECORD</b> Substitute for Form PTO-875						Application or Docket Number 14/941,040			
<b>APPLICATION AS FILED - PART I</b>									
(Column 1)		(Column 2)		SMALL ENTITY		OTHER THAN SMALL ENTITY			
FOR	NUMBER FILED	NUMBER EXTRA	RATE(\$)	FEE(\$)		RATE(\$)	FEE(\$)		
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	280		
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A			N/A	600		
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	720		
TOTAL CLAIMS (37 CFR 1.16(j))	25	minus 20 = *	5			x 80 =	400		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	5	minus 3 = *	2			x 420 =	840		
APPLICATION SIZE FEE (37 CFR 1.16(s))		If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).				0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))						0.00			
				TOTAL		TOTAL	2840		
* If the difference in column 1 is less than zero, enter "0" in column 2.									
<b>APPLICATION AS AMENDED - PART II</b>									
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY		OTHER THAN SMALL ENTITY	
AMENDMENT A		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)	RATE(\$)	ADDITIONAL FEE(\$)
	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		x =	
	Application Size Fee (37 CFR 1.16(s))								
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))								
						TOTAL ADD'L FEE		TOTAL ADD'L FEE	
AMENDMENT B		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)	RATE(\$)	ADDITIONAL FEE(\$)
	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		x =	
	Application Size Fee (37 CFR 1.16(s))								
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))								
						TOTAL ADD'L FEE		TOTAL ADD'L FEE	
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.									



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/941,040	11/13/2015	Jeffrey L. Adair	MICRO-052-065-cont	2975
74642	7590	06/27/2016		
CLIFFORD H. KRAFT 320 ROBIN HILL DR. NAPERVILLE, IL 60540			EXAMINER TARKO, ASMAMAW G	
			ART UNIT	PAPER NUMBER
			2482	
			MAIL DATE	DELIVERY MODE
			06/27/2016	PAPER

**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.

<b>Office Action Summary</b>	<b>Application No.</b> 14/941,040	<b>Applicant(s)</b> ADAIR ET AL.	
	<b>Examiner</b> ASMAMAW G. TARKO	<b>Art Unit</b> 2482	<b>AIA (First Inventor to File) Status</b> Yes

**-- 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 MONTHS 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 11/13/2015.  
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on \_\_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on \_\_\_\_\_; the restriction requirement and election have been incorporated into this action.
- 4) ☐ 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\*

- 5) ☒ Claim(s) 1-25 is/are pending in the application.  
5a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 6) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 7) ☒ Claim(s) 1,3,5-7,9,11-13,15,17-19,21,23 and 24 is/are rejected.
- 8) ☒ Claim(s) 2,4,8,10,14,16,20 and 22 is/are objected to.
- 9) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

\* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see [http://www.uspto.gov/patents/init\\_events/pph/index.jsp](http://www.uspto.gov/patents/init_events/pph/index.jsp) or send an inquiry to [PPHfeedback@uspto.gov](mailto:PPHfeedback@uspto.gov).

### Application Papers

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☒ The drawing(s) filed on 11/13/2015 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).

### 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).

#### Certified copies:

- a) ☐ All    b) ☐ Some\*\*    c) ☐ None of the:
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) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 3) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b)<br>Paper No(s)/Mail Date _____ | 4) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Notice of Pre-AIA or AIA Status***

1. The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

### ***Information Disclosure Statement***

2. The information disclosure statement (IDS) submitted on 11/13/2015 are in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

3. The information disclosure statement filed 11/13/2015 fails to comply with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609 because the relevance of the cited references are not presented and due the large number of references cited, applicant must submit the relevancy parts to the instant application. It has been placed in the application file, but the information referred to therein has not been considered as to the merits. Applicant is advised that the date of any re-submission of any item of information contained in this information disclosure statement or the submission of any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the statement, including all certification requirements for statements under 37 CFR 1.97(e). See MPEP § 609.05(a).

### ***Double Patenting***

4. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory double patenting rejection is

Art Unit: 2482

appropriate where the claims at issue are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the reference application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement. A terminal disclaimer must be signed in compliance with 37 CFR 1.321(b).

The USPTO internet Web site contains terminal disclaimer forms which may be used. Please visit <http://www.uspto.gov/forms/>. The filing date of the application will determine what form should be used. A web-based eTerminal Disclaimer may be filled out completely online using web-screens. An eTerminal Disclaimer that meets all requirements is auto-processed and approved immediately upon submission. For more information about eTerminal Disclaimers, refer to <http://www.uspto.gov/patents/process/file/efs/guidance/eTD-info-I.jsp>.

5. Claims 1, 7, 13 and 25 rejected on the ground of nonstatutory double patenting as being unpatentable over claims 25-27 of U.S. Patent No. 9186052. Although the claims at issue are not identical, they are not patentably distinct from each other because the instant application is broader than the allowed application.



Art Unit: 2482

***Allowable Subject Matter***

6. Claims 2, 4, 8, 10, 14, 16, 20 and 22 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.

***Claim Rejections - 35 USC § 103***

7. In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

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

A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102 of this title, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

9. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103 are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. This application currently names joint inventors. In considering patentability of the claims the examiner presumes that the subject matter of the various claims was commonly owned as

Art Unit: 2482

of the effective filing date of the claimed invention(s) absent any evidence to the contrary.

Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and effective filing dates of each claim that was not commonly owned as of the effective filing date of the later invention in order for the examiner to consider the applicability of 35 U.S.C. 102(b)(2)(C) for any potential 35 U.S.C. 102(a)(2) prior art against the later invention.

**11. Claims 1, 5-7, 11-13, 17-19 and 23-25 are rejected under 35 U.S.C. 103 as being unpatentable over Yarush et al. on US 5879289 hereinafter referred as “Yarush”, and further in view of Sonnenchein et al. on US 7369176 hereinafter referred as “Sonnenchein”.**

Regarding Claim 1,

Yarush teaches an imaging device (figure 1) comprising: a housing (figure 1); an image sensor mounted in said housing, said image sensor including a first circuit board having a length and a width thereto, wherein said length and width of said first circuit board define a first plane, said first circuit board including an array of CMOS pixels thereon, wherein a plurality of CMOS pixels within said array of CMOS pixels each include an amplifier, said first circuit board further including timing and control circuitry thereon, said timing and control circuitry being coupled to said array of CMOS pixels, said image sensor producing a pre-video signal (column 1 lines 28-31, lines 48-54), wherein the image sensor has a generally square shape along said first plane (column 7 lines 13-35; figure 3); a lens mounted in said housing, said lens being integral with said imaging device, said lens focusing images on said array of CMOS pixels of said image sensor (column 15 lines 12-28); a video screen, said video screen being electrically coupled to said second circuit board, said video screen receiving said post-video signal and displaying images from said post-video signal (section G, column 8 lines 53 – column 9 lines 19); and a

Art Unit: 2482

power supply mounted in said housing, said power supply being electrically coupled to said first circuit board to provide power to said array of CMOS pixels and said timing and control circuitry, said power supply also being electrically coupled to said second circuit board to provide power thereto (section F, column 8 lines 17-52), but Yarush failed to teach a second circuit board mounted in said housing, said second circuit board being electrically coupled to said first circuit board, said second circuit board having a length and a width thereto, wherein said length and width of said second circuit board define a second plane, said second circuit board including circuitry thereon to convert said pre- video signal to a post-video signal, said second circuit board being offset from said first circuit board, said second plane of said second circuit board being substantially parallel to said first plane of said first circuit board.

However, Sonnenchein teaches a second circuit board mounted in said housing, said second circuit board being electrically coupled to said first circuit board, said second circuit board having a length and a width thereto, wherein said length and width of said second circuit board define a second plane, said second circuit board including circuitry thereon to convert said pre- video signal to a post-video signal, said second circuit board being offset from said first circuit board, said second plane of said second circuit board being substantially parallel to said first plane of said first circuit board (abstract, column 2 lines 45-56, figures 3A and 3B). At the time of invention, it would have been obvious to a person of having ordinary skill in the art to combine circuit arrangement as shown in Sonnenchein with the endoscopic camera of Yarush to produce relatively small endoscope which can be introduced in small cavities that may result much less patient trauma.

Regarding Claim 3,

Sonnenchein teaches the largest dimension of said image sensor along said first plane is between 2 and 12 millimeters (column 3 lines 18-21, column 9 lines 10-18; and figures 4 A-B).

Art Unit: 2482

Regarding Claim 5,

Yarush teaches the imaging device of claim 1, wherein: power provided by said power supply is direct current between 1.5 and 12 volts (column 14 lines 23-40 and figure 7).

Regarding claim 6,

Yarush teaches the imaging device of claim 1, wherein: said power supply is a battery (column 8 lines 18-53, figure 1).

Regarding claims 7, 9, 11 and 12,

Claims 7, 9, 11 and 12 have limitations similar to those treated in the above rejection and are met by the references as discussed above, and are rejected for the same reasons of obviousness as used above.

Regarding claims 13, 15, 17 and 18,

Claims 13, 15, 17 and 18 have limitations similar to those treated in the above rejection and are met by the references as discussed above, and are rejected for the same reasons of obviousness as used above.

Regarding claims 19, 21, 23 and 24,

Claims 19, 21, 23 and 24 have limitations similar to those treated in the above rejection and are met by the references as discussed above, and are rejected for the same reasons of obviousness as used above.

Regarding claim 25,

Claim 25 has limitations similar to those treated in the above rejection and are met by the references as discussed above, and are rejected for the same reasons of obviousness as used above.

***Conclusion***

12. Examiner cites particular columns and line numbers in the references as applied to the claims below for the convenience of the applicant. Although the specified citations are representative of the teachings in the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested that, in preparing responses, the applicant fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the examiner.

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

- Watanabe et al. (US 20020081096),
- Atalar et al. (US 6263229), and
- Chen et al. (US 20070194243).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ASMAMAW G. TARKO whose telephone number is (571)272-9205. The examiner can normally be reached on Tuesday - Thursday from 9:00 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, CHRISTOPHER S. KELLEY can be reached on (571)272-7331. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2482

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.

/ASMAMAW G TARKO/  
Examiner, Art Unit 2482

/CHRISTOPHER S KELLEY/  
Supervisory Patent Examiner, Art Unit 2482

<b>Notice of References Cited</b>	Application/Control No. 14/941,040		Applicant(s)/Patent Under Reexamination ADAIR ET AL.	
	Examiner ASMAMAW G. TARKO		Art Unit 2482	Page 1 of 1

#### U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-4,592,029 A	05-1986	Altmann; Franz	B06B1/0629	250/208.1
*	B	US-5,879,289 A	03-1999	Yarush; Don	A61B1/00039	600/109
*	C	US-6,263,229 B1	07-2001	Atalar; Ergin	G01R33/34007	324/318
*	D	US-2002/0081096 A1	06-2002	Watanabe, Jun	H04N5/782	386/252
*	E	US-2007/0194243 A1	08-2007	Chen; Henry	G01T1/2928	250/370.13
*	F	US-7,369,176 B2	05-2008	Sonnenschein; Elazar	H04N5/2253	348/374
	G	US-				
	H	US-				
	I	US-				
	J	US-				
	K	US-				
	L	US-				
	M	US-				

#### FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

#### NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

\*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)  
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.



## UNITED STATES PATENT AND TRADEMARK OFFICE

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## BIB DATA SHEET

CONFIRMATION NO. 2975

SERIAL NUMBER	FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.	
14/941,040	11/13/2015	348	2482	MICRO-052-065-cont	
<b>APPLICANTS</b> <b>INVENTORS</b> Jeffrey L. Adair, Highlands Ranch, CO; Edwin Adair, Residence Not Provided; Randall Adair, Denver, CO;					
<b>** CONTINUING DATA *****</b> This application is a CON of 14/705,334 05/06/2015 PAT 9186052 which is a CON of 14/333,260 07/16/2014 PAT 9198565 which is a CON of 13/732,908 01/02/2013 PAT 8885034 which is a CON of 12/889,287 09/23/2010 ABN which is a CIP of 11/245,960 10/06/2005 which is a CON of 09/929,531 08/13/2001 PAT 7030904 which is a CIP of 09/496,312 02/01/2000 PAT 6275255 which is a CON of 09/175,685 10/20/1998 PAT 6043839 which is a CIP of 08/944,322 10/06/1997 PAT 5929901					
<b>** FOREIGN APPLICATIONS *****</b> <b>** IF REQUIRED, FOREIGN FILING LICENSE GRANTED **</b> 11/25/2015					
Foreign Priority claimed <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No 35 USC 119(a-d) conditions met <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Verified and /ASMAMAW G TARKO/ Acknowledged Examiner's Signature	<input type="checkbox"/> Met after Allowance Initials	<b>STATE OR COUNTRY</b> CO	<b>SHEETS DRAWINGS</b> 17	<b>TOTAL CLAIMS</b> 25	<b>INDEPENDENT CLAIMS</b> 5
<b>ADDRESS</b> CLIFFORD H. KRAFT 320 ROBIN HILL DR. NAPERVILLE, IL 60540 UNITED STATES					
<b>TITLE</b> Reduced area imaging device incorporated within endoscopic devices					
<b>FILING FEE RECEIVED</b> 2980	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:		<input type="checkbox"/> All Fees <input type="checkbox"/> 1.16 Fees (Filing) <input type="checkbox"/> 1.17 Fees (Processing Ext. of time) <input type="checkbox"/> 1.18 Fees (Issue) <input type="checkbox"/> Other _____ <input type="checkbox"/> Credit		



<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> ( Not for submission under 37 CFR 1.99)	Application Number		
	Filing Date		
	First Named Inventor	Jeffrey L. Adair	
	Art Unit		
	Examiner Name		
	Attorney Docket Number		

U.S.PATENTS						
Examiner Initial*	Cite No	Patent Number	Kind Code <sup>1</sup>	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	7369176		2008-05-06	Sonnenchein et al.	entire document
	2	6263229		2001-07-17	Atalar et al.	entire document

If you wish to add additional U.S. Patent citation information please click the Add button.

U.S.PATENT APPLICATION PUBLICATIONS						
Examiner Initial*	Cite No	Publication Number	Kind Code <sup>1</sup>	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20020081096	A!	2002-06-27	Watanabe et al.	entire document
	2	20070194243	A1	2007-08-23	AugustoChen et al.	entire document

If you wish to add additional U.S. Published Application citation information please click the Add button.

FOREIGN PATENT DOCUMENTS								
Examiner Initial*	Cite No	Foreign Document Number <sup>3</sup>	Country Code <sup>2</sup> i	Kind Code <sup>4</sup>	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T <sup>5</sup>
	1							<input type="checkbox"/>

References Supplied by the Applicant	Application/Control No.	Applicant(s)/Patent Under Reexamination ADAIR ET AL.	
	Examiner	Art Unit	

**U.S. PATENT DOCUMENTS**

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-4,592,029 A	05-1986	Altmann et al.	367/7
*	B	US-5,879,289 A	03-1999	Yarush et al.	600/179
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

**FOREIGN PATENT DOCUMENTS**

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

**NON-PATENT DOCUMENTS**

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
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	V	
	W	
	X	

\*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)  
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**  
( Not for submission under 37 CFR 1.99)

Application Number		
Filing Date		
First Named Inventor	Jeffrey L. Adair	
Art Unit		
Examiner Name		
Attorney Docket Number		

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**NON-PATENT LITERATURE DOCUMENTS**

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>5</sup>
	1		<input type="checkbox"/>

If you wish to add additional non-patent literature document citation information please click the Add button

**EXAMINER SIGNATURE**

Examiner Signature	/ASMAMAW G TARKO/	Date Considered	06/21/2016
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\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> See Kind Codes of USPTO Patent Documents at [www.USPTO.GOV](http://www.USPTO.GOV) or MPEP 901.04. <sup>2</sup> Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>3</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>4</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. <sup>5</sup> Applicant is to place a check mark here if English language translation is attached.

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**  
( Not for submission under 37 CFR 1.99)

Application Number	
Filing Date	
First Named Inventor	Jeffrey L. Adair
Art Unit	
Examiner Name	
Attorney Docket Number	

**CERTIFICATION STATEMENT**

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

**OR**

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ A certification statement is not submitted herewith.

**SIGNATURE**

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/clifford kraft/	Date (YYYY-MM-DD)	2015-11-13
Name/Print	Clifford H. Kraf	Registration Number	35229

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In Re the Application of:

Jeffrey L. Adair

Serial No.:

Filed: .

Atty. File No.:

Entitled: "Reduced Area Imaging Device  
Incorporated Within Endoscopic Devices"

SUPPLEMENTAL  
INFORMATION DISCLOSURE  
STATEMENT

Electronically Submitted

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Commissioner:

The references cited on attached Form PTO/SB08 are being called to the attention of the Examiner.

- ☐ Copies of the cited non-patent and/or foreign references are enclosed herewith.
- ☐ Copies of the cited U.S. patents and/or patent applications are enclosed herewith.
- ☒ Copies of the cited U.S. patents/patent application publications are not enclosed in accordance with 37 C.F.R. § 1.98(a).
- ☒ Copies of the cited references are not enclosed, in accordance with 37 C.F.R. § 1.98(d), because the references were cited by or submitted to the U.S. Patent and Trademark Office in prior application Serial No. 13/732,908 filed 01-02-2013, which is relied upon for an earlier filing date under 35 U.S.C. § 120.
- ☐ To the best of applicants' belief, the pertinence of the foreign-language references is believed to be summarized in the attached English abstracts and/or in the figures, although applicants do not necessarily vouch for the accuracy of the translation.
- ☒ Examiner's attention is drawn to the following related applications:
- Serial No. 08/944,322 filed 10/06/1997 now U.S. Patent No. 5,929,901 (Attorney's Ref. No. 7311-23)
  - Serial No. 08/976,976 filed 11/24/1997 now U.S. Patent No. 5,986,693 (Attorney's Ref. No. 7311-23-CIP)
  - Serial No. 09/175,685 filed 10/20/1998 now U.S. Patent No. 6,043,839 (Attorney's Ref. No. 7311-23-CIP-2)

- Serial No. 09/496,312 filed 02/01/2000 now U.S. Patent No. 6,275,255 (Attorney's Ref. No. 7311-23-CIP2-CON)
- Serial No. 09/368,246 filed 08/03/1999 now U.S. Patent No. 6,310,642 (Attorney's Ref. No. 7311-23-CIP-4)
- Serial No. 09/544,528 filed 04/06/2000 now U.S. Patent No. 6,211,904 (Attorney's Ref. No. 7311-23-CIP-5)
- Serial No. 09/613,027 filed 07/10/2000 now U.S. Patent No. 6,452,626 (Attorney's Ref. No. 7311-23-CIP-6)
- Serial No. 10/198,189 filed 07/17/2002 now U.S. Patent No. 6,862,036 (Attorney's Ref. No. 7311-23-CIP6-CON)
- Serial No. 09/638,976 filed 08/15/2000 now U.S. Patent No. 6,424,369 (Attorney's Ref. No. 7311-23-CIP-7)
- Serial No. 10/171,906 filed 06/13/2002 (Attorney's Ref. No. 7311-23-CIP7-CON)
- Serial No. 09/934,201 filed 08/21/2001 now U.S. Patent No. 7,002,621 (Attorney's Ref. No. 7311-23-CIP-9)
- Serial No. 09/935,993 filed 08/23/2001 now U.S. Patent No. 6,982,742 (Attorney's Ref. No. 7311-23-CIP-10)
- Serial No. 09/971,749 filed 10/04/2001 now U.S. Patent No. 6,982,740 (Attorney's Ref. No. 7311-23-CIP-11)

**Certification (37 C.F.R. 1.97(e))**  
(Applicable only if checked)

- ☐ The undersigned certifies that:
- ☐ Each item of information contained in this information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this statement. 37 C.F.R. 1.97(e)(1).
  - ☐ A copy of the communication from the foreign patent office is enclosed.

OR

- ☐ No item of information contained in this information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the undersigned after making reasonable inquiry, no item of information contained in this Information Disclosure Statement was known to any individual designated in 37 C.F.R. 1.56(c) more than three months prior to the filing of this statement. 37 C.F.R. 1.97(e)(2).


Respectfully submitted,

/clifford kraft/

By: Clifford H. Kraft  
Reg. No. 35,229  
Attorney of Record

/ASMAMAW G TARKO/

06/21/2016

<b>Search Notes</b>  	<b>Application/Control No.</b>  14941040	<b>Applicant(s)/Patent Under Reexamination</b>  ADAIR ET AL.
	<b>Examiner</b>  ASMAMAW G TARKO	<b>Art Unit</b>  2482

CPC- SEARCHED		
Symbol	Date	Examiner
H04N5/3765	6/22/2016	

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner
A61B1/00009 A61B1/00016 A61B1/00045 A61B1/00064 A61B1/002 A61B1/008 A61B1/042 A61B1/045 A61B1/05 A61B1/051 A61B1/055 A61B1/0607	6/22/2016	
H04N2005/2255 H04N5/23203 H04N5/374 H04N5/3745	6/22/2016	


US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
348	76	6/22/2016	

SEARCH NOTES		
Search Notes	Date	Examiner
Applicant search in EAST	6/20/2016	
EAST Prior art search (Text and class/subclass combination)	6/20/2016	
Consulted SPE Chris Kelley	6/21/2016	

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

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<b><i>Index of Claims</i></b>  	<b>Application/Control No.</b>  14941040	<b>Applicant(s)/Patent Under Reexamination</b>  ADAIR ET AL.
	<b>Examiner</b>  ASMAMAW G TARKO	<b>Art Unit</b>  2482

✓	<b>Rejected</b>	-	<b>Cancelled</b>	N	<b>Non-Elected</b>	A	<b>Appeal</b>
=	<b>Allowed</b>	÷	<b>Restricted</b>	I	<b>Interference</b>	O	<b>Objected</b>

<input type="checkbox"/> Claims renumbered in the same order as presented by applicant		<input type="checkbox"/> CPA		<input type="checkbox"/> T.D.		<input type="checkbox"/> R.1.47			
CLAIM		DATE							
Final	Original	06/22/2016							
	1	✓							
	2	○							
	3	✓							
	4	○							
	5	✓							
	6	✓							
	7	✓							
	8	○							
	9	✓							
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	11	✓							
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	22	○							
	23	✓							
	24	✓							
	25	✓							

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L2	1	"14705334" and largest dimension	US- PGPUB; USPAT; DERWENT	WITH	OFF	2016/06/22 10:30
L4	10155	(H04N2005/2255 OR H04N5/23203 OR H04N5/374 OR H04N5/3745).CPC.	US- PGPUB; USPAT; DERWENT	WITH	OFF	2016/06/22 11:21
L5	1181	(H04N5/3765).CPC.	US- PGPUB; USPAT; DERWENT	WITH	OFF	2016/06/22 11:22
L6	10663	(A61B1/00009 A61B1/00016 A61B1/00045 A61B1/00064 A61B1/002 A61B1/008 A61B1/042 A61B1/045 A61B1/05 A61B1/051 A61B1/055 A61B1/0607).CPC.	US- PGPUB; USPAT; DERWENT	OR	OFF	2016/06/22 11:23
L7	252	4 and (H04N5/3765).CPC.	US- PGPUB; USPAT; DERWENT	WITH	OFF	2016/06/22 11:23
L8	21	6 and (H04N5/3765).CPC.	US- PGPUB; USPAT; DERWENT	WITH	OFF	2016/06/22 11:24
L9	14	(7 or 8) and circuit board	US- PGPUB; USPAT; DERWENT	WITH	OFF	2016/06/22 11:24
L10	5	9 and endoscop\$4	US- PGPUB; USPAT; DERWENT	WITH	OFF	2016/06/22 11:25
L11	172	(7 or 8) and image sensor	US- PGPUB; USPAT; DERWENT	WITH	OFF	2016/06/22 11:26
L12	19	11 and endoscop\$4	US- PGPUB; USPAT; DERWENT	WITH	OFF	2016/06/22 11:26
L13	8	12 and dimension\$4	US- PGPUB; USPAT; DERWENT	WITH	OFF	2016/06/22 11:26
L14	325	348/76.cds.	US- PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/06/22 11:31
L15	29	14 and circuit board and imag\$4 sensor and endoscop\$4 and dimension\$2	US- PGPUB; USPAT; DERWENT	WITH	OFF	2016/06/22 11:31
S1	1	"14705334"	US- PGPUB; USPAT; DERWENT	OR	OFF	2016/06/21 19:30
S2	271	("20010034222"   "20020163578"   "20060022234"   "20070043289"   "20110034769"   "4164182"   "4573450"   "4706654"   "4745471"   "4786965"   "4814648"   "4854302"   "4869246"   "4928300"   "4942473"   "0491865"   "5021888"   "5116317"   "5162913"   "5191601"   "5220198"   "5251613"   "5381784"   "5402768"   "5453785"   "5471515"   "5489256"   "5495114"   "5603697"   "5605531"   "5612732"   "5630782"   "5630783"   "5682199"   "5701155"   "5711013"   "5734418"   "5748411"   "5748441"   "5754313"   "5801919"   "5817015"   "5840013"   "5873814"   "5879289"   "5900875"   "5913816"   "5929901"   "5980450"   "5983073"   "5986693"   "6002437"   "6009336"   "6018670"   "6023241"   "6028764"   "6037034"   "6043839"   "6067313"   "6073034"   "6083353"   "6086528"   "6104334"   "6106457"   "6139489"   "6141037"   "6141052"   "6147366"   "6154254"   "6172950"   "6177950"   "6184804"   "6190877"   "6211904"   "6219560"   "6219793"   "6232589"   "6232937"   "6243131"   "6275255"   "6310642"   "6316215"   "6359837"   "6370282"   "6413209"   "6417882"   "6424369"   "6452626"   "6507336"   "6510325"   "6525715"   "6526653"   "6552746"   "6561669"   "6658272"   "6659940"   "6729726"   "6730900"   "6750037"   "6753160"   "6761561"   "6809358"   "6862036"   "6918872"   "6982740"   "6982742"   "6984498"   "6992699"   "7002621"   "7030904"   "7038716"   "7067276"   "7110808"   "7649548"   "RE33854").PN.	US- PGPUB; USPAT; DERWENT	OR	OFF	2016/06/21 20:02
S3	14	("5748441"   "5817015"   "5841126"   "5873814"   "7649548").PN.	US- PGPUB; USPAT; DERWENT	OR	OFF	2016/06/21 20:03

S4	5081	endoscop\$4 and (CMOS same (sensor\$4 or imag\$4 near2 (device apparatus)))	US- PGPUB; USPAT; DERWENT	OR	OFF	2016/06/21 20:04
S5	4	S4 and (circuit board same lens same video screen same power supply)	US- PGPUB; USPAT; DERWENT	ADJ	OFF	2016/06/21 20:05
S6	4	S4 and (lens same video screen same power supply)	US- PGPUB; USPAT; DERWENT	ADJ	OFF	2016/06/21 20:05
S7	2908	endoscop? and (CMOS and (sensor? or imager?))	US- PGPUB; USPAT; DERWENT	OR	OFF	2016/06/21 20:05
S8	3	S7 and (lens video near5 screen power near3 supply)	US- PGPUB; USPAT; DERWENT	SAME	OFF	2016/06/21 20:05
S9	3	S8 and (circuit adj board)	US- PGPUB; USPAT; DERWENT	OR	OFF	2016/06/21 20:05
S10	634	S7 and (circuit adj board)	US- PGPUB; USPAT; DERWENT	OR	OFF	2016/06/21 20:06
S11	6	S10 and (lens same video near5 screen)	US- PGPUB; USPAT; DERWENT	OR	OFF	2016/06/21 20:06
S12	32	S10 and (lens same video same screen)	US- PGPUB; USPAT; DERWENT	OR	OFF	2016/06/21 20:06
S13	908	endoscop\$4 same two near8 camera	US- PGPUB; USPAT; DERWENT	OR	OFF	2016/06/21 20:07
S14	221	S13 and offset	US- PGPUB; USPAT; DERWENT	OR	OFF	2016/06/21 20:07
S15	88	S14 and CMOS	US- PGPUB; USPAT; DERWENT	OR	OFF	2016/06/21 20:07
S16	42	S15 and (two near8 camera?)	US- PGPUB; USPAT; DERWENT	OR	OFF	2016/06/21 20:07
S17	19663	endoscop\$4 same camera	US- PGPUB; USPAT; DERWENT	OR	OFF	2016/06/21 20:07
S18	21	S17 and (two near8 camera? same offset)	US- PGPUB; USPAT; DERWENT	OR	OFF	2016/06/21 20:07
S19	19	(20020180867 6862036 6452626 20020089589 6424369 6043839 7002621 6275255 5986693 20020163578).pn.	US- PGPUB; USPAT; DERWENT	OR	OFF	2016/06/21 20:07
S20	1167	microsoft same kinect	US- PGPUB; USPAT; DERWENT	OR	OFF	2016/06/21 20:08
S21	442	microsoft same kinect and circuit	US- PGPUB; USPAT; DERWENT	OR	OFF	2016/06/21 20:08
S22	67	S21 and two near8 camera?	US- PGPUB; USPAT; DERWENT	OR	OFF	2016/06/21 20:08
S23	19	S22 and (offset or stack\$4)	US- PGPUB; USPAT; DERWENT	OR	OFF	2016/06/21 20:08
S24	1	S21 and ((two near8 camera?) same (offset or stack\$4))	US- PGPUB; USPAT; DERWENT	OR	OFF	2016/06/21 20:08
S25	46	endoscop\$4 integrat\$4 near8 circuit\$4 same electric\$4 near8 coupl\$4 CMOS near4 pixel\$3	US- PGPUB;	AND	OFF	2016/06/21 20:10

				USPAT; DERWENT			
S26	4	endoscop\$4 and integrat\$4 near8 circuit\$4 same electric\$4 near8 coupl\$4 and CMOS near1 pixel\$3	US- PGPUB; USPAT; DERWENT	OR	OFF	2016/06/21 20:10	
S27	56	S2 and (circuit\$4 near4 board\$2)	US- PGPUB; USPAT; DERWENT	OR	OFF	2016/06/21 20:10	
S28	13	((US-20020081096-\$ or US-20120296166-\$ or US-20080195128-\$ or US-20130231532-\$).did. or (US-6083353-\$ or US-6073034-\$ or US-6106457-\$ or US-5879289-\$ or US-6002437-\$ or US-6387043-\$ or US-6263229-\$ or US-4779130-\$ or US-7369176-\$).did.	US- PGPUB; USPAT	OR	ON	2016/06/21 20:11	
S29	74	endoscop\$4 same (housing same (imag\$4 near7 sensor) same CMOS)	US- PGPUB; USPAT; DERWENT	OR	OFF	2016/06/21 20:15	
S30	14	endoscop\$4 same (circuit\$4 near8 offset)	US- PGPUB; USPAT; DERWENT	OR	OFF	2016/06/21 20:15	
S31	1583	(second near20 circuit\$4 near8 board same offset)	US- PGPUB; USPAT; DERWENT	OR	OFF	2016/06/21 20:15	
S32	76	(camera or (imag\$4 near4 sensor\$4)) same ((first or second or multiple) near20 circuit\$4) same (circuit\$4 near20 dimension\$4) and (circuit\$4 near20 offset)	US- PGPUB; USPAT; DERWENT	OR	OFF	2016/06/21 20:15	
S33	40	(second near20 circuit\$4 near8 board) same ((millimeter\$4 or mm) near8 dimension)	US- PGPUB; USPAT; DERWENT	OR	OFF	2016/06/21 20:15	
S34	16	(second near20 circuit\$4 near8 board) near20 ((milimeter\$4 or mm) near8 dimension)	US- PGPUB; USPAT; DERWENT	OR	OFF	2016/06/21 20:15	
S35	16	((second near20 circuit\$4 near8 board) near20 ((milimeter\$4 or mm) near8 dimension))	US- PGPUB; USPAT; DERWENT	OR	OFF	2016/06/21 20:16	
S36	151	(imag\$4 near4 sensor\$4) near20 ((milimeter\$4 or mm) near8 dimension)	US- PGPUB; USPAT; DERWENT	OR	OFF	2016/06/21 20:16	
S37	36	((("ADAI R") near3 ("Jeffrey")).INV.	US- PGPUB; USPAT; USOCR	OR	ON	2016/06/21 20:16	
S38	19	S22 and (offset or stack\$4)	US- PGPUB; USPAT; DERWENT	OR	OFF	2016/06/21 20:16	
S39	24	((("ADAI R") near3 ("Randall")).INV.	US- PGPUB; USPAT; USOCR	OR	ON	2016/06/21 20:16	
S40	95	((("ADAI R") near3 ("Edwin")).INV.	US- PGPUB; USPAT; USOCR	OR	ON	2016/06/21 20:16	
S41	3	"14333260"	US- PGPUB; USPAT; DERWENT	OR	OFF	2016/06/21 20:16	
S42	6	(7369176 6263229 20020081096 20070194243 4592029 5879289).pn.	US- PGPUB; USPAT	OR	ON	2016/06/21 20:16	
S43	151	(imag\$4 near4 sensor\$4) near20 ((milimeter\$4 or mm) near8 dimension)	US- PGPUB; USPAT; DERWENT	OR	OFF	2016/06/21 20:17	
S44	3	(imag\$4 near4 sensor\$4) near20 ((milimeter\$4 or mm) near8 dimension) same (circuit\$4 near4 board)	US- PGPUB; USPAT; DERWENT	OR	OFF	2016/06/21 20:17	
S45	2	"20070194213"	US- PGPUB; USPAT	OR	ON	2016/06/21 20:18	

EAST Search History (Interference)

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	Art Unit		
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	Attorney Docket Number		

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Examiner Initials*	Cite No. <sup>1</sup>	Document Number Number-kind Code <sup>2</sup> (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1	4164182	08/14/1979	Sato	
	2	4573450	03/04/1986	Arakawa	
	3	4706654	11/17/1987	Ogiu et al.	
	4	4928300	05/22/1990	Ogawa et al.	
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			First Named Inventor		
			Art Unit		
			Examiner Name		
Sheet		of		Attorney Docket Number	

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	65	7002621	02/21/2006	Adair et al.	
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			Application Number		
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			Art Unit		
			Examiner Name		
Sheet		of		Attorney Docket Number	

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	83	DE 19947875	05/10/2001	SIEMENS AKTIENGESELLSCHAFT		(with English abstract)
	84	DE 60117989	12/07/2006	ADAIR		
	85	EP 0932302	07/28/1999	EASTMAN KODAK CO		
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				Art Unit	
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118	WO 99/18613	04/15/1999	ADAIR		
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Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
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Substitute for form 1449/PTO			<b>Complete if Known</b>		
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Page 153 of 272

REFERENCES SUPPLIED BY APPLICANTS	Application/Control No.	Applicant(s) Jeffrey L. Adair	

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	I	US-			
	J	US-			
	K	US-			
	L	US-			
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	O					
	P					
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			First Named Inventor	Jeffrey L. Adair	
			Art Unit		
			Examiner Name		
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	Filing Date		
	First Named Inventor	Jeffrey Adair	
	Art Unit		
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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/941,040	11/13/2015	Jeffrey L. Adair	MICRO-052-065-cont

**CONFIRMATION NO. 2975**

74642  
CLIFFORD H. KRAFT  
320 ROBIN HILL DR.  
NAPERVILLE, IL 60540

## PUBLICATION NOTICE



\*OC00000084196527\*

**Title:**Reduced area imaging device incorporated within endoscopic devices

**Publication No.**US-2016-0198116-A1

**Publication Date:**07/07/2016

## NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at [www.uspto.gov](http://www.uspto.gov). The direct link to access the publication is currently <http://www.uspto.gov/patft/>.

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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of:	)	Art Unit: 2482
	)	
Jeffrey L. Adair	)	
	)	Examiner: TARKO, Asmamaw G.
Serial No. 14/941,040	)	
	)	Atty Dkt: MICRO-052-065-cont
Filing Date: Nov. 13, 2015	)	
	)	Conf: 2975
Title:	)	

**RESPONSE TO OFFICE ACTION AND AMENDMENT**

Commissioner for Patents  
P.O. Box 1450  
Alexandria VA 22313

Honorable Commissioner:

Kindly accept this response to the office action issued June 27, 2016.

## AMENDMENTS TO THE CLAIMS

Kindly amend the claims as indicated:

Claim 1. (currently amended): An imaging device comprising:

a housing;

an image sensor mounted in said housing, said image sensor including a first circuit board having a length and a width thereto, wherein said length and width of said first circuit board define a first plane, said first circuit board including an array of CMOS pixels thereon, wherein a plurality of CMOS pixels within said array of CMOS pixels each include an amplifier, said first circuit board further including timing and control circuitry thereon, said timing and control circuitry being coupled to said array of CMOS pixels, said image sensor producing a pre-video signal, wherein the image sensor is generally square shape along the first plane;

a second circuit board mounted in said housing, said second circuit board being electrically coupled to said first circuit board, said second circuit board having a length and a width thereto, wherein said length and width of said second circuit board define a second plane, said second circuit board including circuitry thereon to convert said pre-video signal to a post-video signal, said second circuit board being offset from said first circuit board, said second plane of said second circuit board being substantially parallel to said first plane of said first circuit board;

a lens mounted in said housing, said lens being integral with said imaging device, said lens focusing images on said array of CMOS pixels of said image sensor;

a video screen, said video screen being electrically coupled to said second circuit board, said video screen receiving said post-video signal and displaying images from said post-video signal; and

a power supply mounted in said housing, said power supply being electrically coupled to said first circuit board to provide power to said array of CMOS pixels and said timing and control circuitry, said power supply also being electrically coupled to said second circuit board to provide power thereto[[]] ;

wherein, a largest dimension of said second circuit board along said second plane is greater than a largest dimension of said image sensor along said first plane.

Claim 2. (original): The imaging device of claim 1, wherein:

a largest dimension of said image sensor along said first plane is between 4 and 8 millimeters.

Claim 3. (original): The imaging device of claim 1, wherein:

a largest dimension of said image sensor along said first plane is between 2 and 12 millimeters.

Claim 4. (cancelled).

Claim 5. (original): The imaging device of claim 1, wherein:

power provided by said power supply is direct current between 1.5 and 12 volts.

Claim 6. (original): The imaging device of claim 1, wherein:

said power supply is a battery.

Claim 7. (currently amended): An imaging device comprising:

a housing;

an image sensor mounted in said housing, said image sensor including a first circuit board having a length and a width thereto, wherein said length and width of said first circuit board define a first plane, said first circuit board including an array of CMOS pixels thereon, wherein a plurality of CMOS pixels within said array of CMOS pixels each include an amplifier, said first circuit board further including timing and control circuitry thereon, said timing and control circuitry being coupled to said array of CMOS pixels, said image sensor producing a pre-video signal, wherein the image sensor is generally square shape along the first plane;

a second circuit board mounted in said housing, said second circuit board being electrically coupled to said first circuit board, said second circuit board having a length and a width thereto, wherein said length and width of said second circuit board define a second plane, said second circuit board including

circuitry thereon to convert said pre-video signal to a post-video signal, said second circuit board being positioned in a stacked arrangement with respect to said first circuit board, said second plane of said second circuit board being substantially parallel to said first plane of said first circuit board;

a lens mounted in said housing, said lens being integral with said imaging device, said lens focusing images on said array of CMOS pixels of said image sensor;

a video screen, said video screen being electrically coupled to said second circuit board, said video screen receiving said post-video signal and displaying images from said post-video signal; and

a power supply mounted in said housing, said power supply being electrically coupled to said first circuit board to provide power to said array of CMOS pixels and said timing and control circuitry, said power supply also being electrically coupled to said second circuit board to provide power thereto[.];

wherein a largest dimension of said second circuit board along said second plane is greater than a largest dimension of said image sensor along said first plane.

Claim 8. (original): The imaging device of claim 7, wherein:

a largest dimension of said image sensor along said first plane is between 4 and 8 millimeters.

Claim 9. (original): The imaging device of claim 7, wherein:



a largest dimension of said image sensor along said first plane is between 2 and 12 millimeters.

Claim 10. (cancelled).

Claim 11. (original): The imaging device of claim 7, wherein:

power provided by said power supply is direct current between 1.5 and 12 volts.

Claim 12. (original): The imaging device of claim 7, wherein:

said power supply is a battery.

Claim 13. (currently amended): An imaging device comprising:

a housing;

an image sensor mounted in said housing, said image sensor including a planar substrate having a length and a width thereto, wherein said length and width of said planar substrate define a first plane, said planar substrate including an array of CMOS pixels thereon, wherein a plurality of CMOS pixels within said array of CMOS pixels each include an amplifier, said image sensor further including a first circuit board having a length and a width thereto, wherein said length and width of said first circuit board define a second plane, said first circuit board including timing and control circuitry thereon, said timing and control circuitry being coupled to said array of CMOS pixels, said first circuit board being

positioned in a stacked arrangement with respect to said planar substrate, said second plane of said first circuit board being substantially parallel to said first plane of said planar substrate, said image sensor producing a pre-video signal, wherein the image sensor is generally square shape along the first plane;

a second circuit board mounted in said housing, said second circuit board being electrically coupled to said planar substrate and to said first circuit board, said second circuit board having a length and a width thereto, wherein said length and width of said second circuit board define a third plane, said second circuit board including circuitry thereon to convert said pre-video signal to a post-video signal, said second circuit board being offset from said first circuit board and from said planar substrate, said third plane of said second circuit board being substantially parallel to said second plane of said first circuit board and to said first plane of said planar substrate;

a lens mounted in said housing, said lens being integral with said imaging device, said lens focusing images on said array of CMOS pixels of said image sensor;

a video screen, said video screen being electrically coupled to said second circuit board, said video screen receiving said post-video signal and displaying images from said post-video signal; and

a power supply mounted said housing, said power supply being electrically coupled to said planar substrate to provide power to said array of CMOS pixels, said power supply also being electrically coupled to said first circuit board to provide power to said timing and control circuitry, said power supply

also being electrically coupled to said second circuit board to provide power thereto[.];

wherein a largest dimension of said second circuit board along said third plane is greater than a largest dimension of said image sensor along said first plane.

Claim 14. (original): The imaging device of claim 13, wherein:

a largest dimension of said image sensor along said first plane is between 4 and 8 millimeters.

Claim 15. (original): The imaging device of claim 13, wherein:

a largest dimension of said image sensor along said first plane is between 2 and 12 millimeters.

Claim 16. (cancelled).

Claim 17. (original): The imaging device of claim 13, wherein:

power provided by said power supply is direct current between 1.5 and 12 volts.

Claim 18. (original): The imaging device of claim 13, wherein:

said power supply is a battery.

Claim 19. (currently amended): An imaging device comprising:

a housing;

an image sensor mounted in said housing, said image sensor including a planar substrate having a length and a width thereto, wherein said length and width of said planar substrate define a first plane, said planar substrate including an array of CMOS pixels thereon, wherein a plurality of CMOS pixels within said array of CMOS pixels each include an amplifier, said image sensor further including a first circuit board having a length and a width thereto, wherein said length and width of said first circuit board define a second plane, said first circuit board including timing and control circuitry thereon, said timing and control circuitry being coupled to said array of CMOS pixels, said first circuit board being positioned in a stacked arrangement with respect to said planar substrate, said second plane of said first circuit board being substantially parallel to said first plane of said planar substrate, said image sensor producing a pre-video signal, wherein the image sensor is generally square shape along the first plane;

a second circuit board mounted in said housing, said second circuit board, being electrically coupled to said planar substrate and to said first circuit board, said second circuit board having a length and a width thereto, wherein said length and width of said second circuit board define a third plane, said second circuit board including circuitry thereon to convert said pre-video signal to a post-video signal, said second circuit board being positioned in a stacked arrangement with respect to said first circuit board and further with respect to

said planar substrate, said third plane of said second circuit board being substantially parallel to said second plane of said first circuit board and to said first plane of said planar substrate;

a lens mounted in said housing, said lens being integral with said imaging device, said lens focusing images on said array of CMOS pixels of said image sensor;

a video screen, said video screen being electrically coupled to said second circuit board, said video screen receiving said post-video signal and displaying images from said post-video signal; and

a power supply mounted said housing, said power supply being electrically coupled to said planar substrate to provide power to said array of CMOS pixels, said power supply also being electrically coupled to said first circuit board to provide power to said timing and control circuitry, said power supply also being electrically coupled to said second circuit board to provide power thereto[.];

a largest dimension of said second circuit board along said third plane is greater than a largest dimension of said image sensor along said first plane.

Claim 20. (original): The imaging device of claim 19, wherein:

a largest dimension of said image sensor along said first plane is between 4 and 8 millimeters.

Claim 21. (original): The imaging device of claim 19, wherein:

a largest dimension of said image sensor along said first plane is between 2 and 12 millimeters.

Claim 22. (cancelled).

Claim 23. (original): The imaging device of claim 19, wherein:

power provided by said power supply is direct current between 1.5 and 12 volts.

Claim 24. (original): The imaging device of claim 19, wherein:

said power supply is a battery.

Claim 25. (currently amended): An imaging device comprising:

a housing;

an image sensor mounted in said housing, said image sensor including a planar substrate having a length and a width thereto, wherein said length and width of said planar substrate define a first plane, said planar substrate including an array of CMOS pixels thereon, wherein a plurality of CMOS pixels within said array of CMOS pixels each include an amplifier, said planar substrate further including timing and control circuitry thereon, said timing and control circuitry being coupled to said array of CMOS pixels, said image sensor producing a pre-video signal, wherein the image sensor is generally square shape along the first plane;

a circuit board mounted in said housing, said circuit board being electrically coupled to said planar substrate, said circuit board having a length and a width thereto, wherein said length and width of said circuit board define a second plane, said circuit board including circuitry thereon to convert said pre-video signal to a post-video signal, said circuit board being offset from said planar substrate, said second plane of said circuit board being substantially parallel to said first plane of said planar substrate;

a lens mounted in said housing, said lens being integral with said imaging device, said lens focusing images on said array of CMOS pixels of said image sensor;

a video screen, said video screen being electrically coupled to said circuit board, said video screen receiving said post-video signal and displaying images from said post-video signal; and

a power supply mounted in said housing, said power supply being electrically coupled to said planar substrate to provide power to said array of CMOS pixels and said timing and control circuitry, said power supply also being electrically coupled to said circuit board to provide power thereto[.];

wherein a largest dimension of said second circuit board along said third plane is greater than a largest dimension of said image sensor along said first plane.

## REMARKS

This is a response to the office action issued June 27, 2016.

In the non-final office action the examiner rejected claims 1, 7, 13 and 25 under the doctrine of non-statutory double patenting over claims 25-27 of U.S. Patent 9,286,052. If claims 1, 7, 13 and 25 remain in the final case, the applicant will file a terminal disclaimer.

Claims 2, 4, 8, 10, 14, 16, 20 and 22 were objected to as being dependent on a rejected base claim, but would be allowable if rewritten in independent form.

Claims 1, 5-7, 11-13, 17-19 and 23-25 were rejected under 35 U.S.C. § 103 as being unpatentable over Yarush et al (5,879,289) in view of Sonnenchein et al. (7,369,176).

The applicant has placed the limitations of claim 4 into claim 1 and canceled claim 4. This should make claims 1-3, and 5-6 allowable.

The applicant has placed the limitations of claim 10 into claim 7 and canceled claim 10. This should make claims 7-10 and 11-12 allowable.

The applicant has placed the limitations of claim 16 into claim 13 and canceled claim 16. This should make claims 13-16 and 17-18 allowable.

The applicant has placed the limitations of claim 22 into claim 19 and canceled claim 22. This should make claims 19-21 and 23-24 allowable.

The applicant has added the same limitation to claim 25. This should make claim 25 allowable.



Therefore, the applicant believes that the claims are now allowable. The examiner is respectfully requested to place the case in condition for allowance at the earliest convenience.

Respectfully Submitted

/clifford kraft/

Clifford H. Kraft  
Reg. No. 35,229  
Attorney of Record

CORRESPONDENCE ADDRESS

Customer No. 74642

Clifford H. Kraft  
320 Robin Hill Dr.  
Naperville, IL 60540

708 528-9092 tel.  
630 428-0104 fax.

## Electronic Acknowledgement Receipt

<b>EFS ID:</b>	27050815
<b>Application Number:</b>	14941040
<b>International Application Number:</b>	
<b>Confirmation Number:</b>	2975
<b>Title of Invention:</b>	Reduced area imaging device incorporated within endoscopic devices
<b>First Named Inventor/Applicant Name:</b>	Jeffrey L. Adair
<b>Customer Number:</b>	74642
<b>Filer:</b>	Clifford H. Kraft
<b>Filer Authorized By:</b>	
<b>Attorney Docket Number:</b>	MICRO-052-065-cont
<b>Receipt Date:</b>	27-SEP-2016
<b>Filing Date:</b>	13-NOV-2015
<b>Time Stamp:</b>	18:05:18
<b>Application Type:</b>	Utility under 35 USC 111(a)

### Payment information:

Submitted with Payment	no
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### File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Amendment/Req. Reconsideration-After Non-Final Reject	amdt.pdf	365202	no	14
			1dc4b8d9cdf464b8e7354c25c62be838347 7608d		

### Warnings:

**Samsung Exhibit 1028**

**Page 174 of 272**

<b>Information:</b>	
<b>Total Files Size (in bytes):</b>	365202
<p><b>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</b></p> <p><b><u>New Applications Under 35 U.S.C. 111</u></b>  <b>If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</b></p> <p><b><u>National Stage of an International Application under 35 U.S.C. 371</u></b>  <b>If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</b></p> <p><b><u>New International Application Filed with the USPTO as a Receiving Office</u></b>  <b>If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</b></p>	

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

<b>PATENT APPLICATION FEE DETERMINATION RECORD</b> Substitute for Form PTO-875	Application or Docket Number <b>14/941,040</b>	Filing Date <b>11/13/2015</b>	<input type="checkbox"/> To be Mailed
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ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO**APPLICATION AS FILED – PART I**

(Column 1)

(Column 2)

FOR	NUMBER FILED	NUMBER EXTRA	RATE (\$)	FEE (\$)
<input type="checkbox"/> BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
<input type="checkbox"/> SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
<input type="checkbox"/> EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X \$ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X \$ =	
<input type="checkbox"/> APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
<input type="checkbox"/> MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

**APPLICATION AS AMENDED – PART II**

(Column 1)

(Column 2)

(Column 3)

	09/27/2016	CLAIMS REMAINING AFTER AMENDMENT	Minus	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)
<b>AMENDMENT</b>	Total (37 CFR 1.16(i))	* 21	Minus	** 25	= 0	X \$80 =	0
	Independent (37 CFR 1.16(h))	* 5	Minus	***5	= 0	X \$420 =	0
	<input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))						
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	<b>0</b>

(Column 1)

(Column 2)

(Column 3)

		CLAIMS REMAINING AFTER AMENDMENT	Minus	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)
<b>AMENDMENT</b>	Total (37 CFR 1.16(i))	*	Minus	**	=	X \$ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X \$ =	
	<input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))						
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	

\* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

\*\* If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

\*\*\* If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE  
DORIS BURNS

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/941,040	11/13/2015	Jeffrey L. Adair	MICRO-052-065-cont	2975
74642	7590	10/05/2016		
CLIFFORD H. KRAFT 320 ROBIN HILL DR. NAPERVILLE, IL 60540			EXAMINER TARKO, ASMAMAW G	
			ART UNIT	PAPER NUMBER
			2482	
			MAIL DATE	DELIVERY MODE
			10/05/2016	PAPER

**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.

<b>Office Action Summary</b>	<b>Application No.</b> 14/941,040	<b>Applicant(s)</b> ADAIR ET AL.	
	<b>Examiner</b> ASMAMAW G. TARKO	<b>Art Unit</b> 2482	<b>AIA (First Inventor to File) Status</b> Yes

**-- 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 MONTHS 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 09/27/2016.  
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on \_\_\_\_\_.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on \_\_\_\_\_; the restriction requirement and election have been incorporated into this action.
- 4) ☐ 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\*

- 5) ☒ Claim(s) 1-3,5-9,11-15,17-21 and 23-25 is/are pending in the application.  
5a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 6) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 7) ☒ Claim(s) 1-3, 5-9, 11-15,17-21 and 23-25 is/are rejected.
- 8) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 9) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

\* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see [http://www.uspto.gov/patents/init\\_events/pph/index.jsp](http://www.uspto.gov/patents/init_events/pph/index.jsp) or send an inquiry to [PPHfeedback@uspto.gov](mailto:PPHfeedback@uspto.gov).

### Application Papers

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☒ The drawing(s) filed on 11/13/2015 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).

### 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).

#### Certified copies:

- a) ☐ All    b) ☐ Some\*\*    c) ☐ None of the:
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) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 3) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b)<br>Paper No(s)/Mail Date _____ | 4) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Notice of Pre-AIA or AIA Status***

1. The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

### ***Remarks***

2. This communication is in response to the amendment to application 14/941,040 filed on 09/27/2016.
3. Applicant amended claims 1, 7, 13, 19 and 25 to incorporate objected claims 4, 10, 16 and 22 to have allowable subject matter. Applicant cancelled claims 4, 10, 16 and 22. Current pending claims for examination are claims 1-3, 5-9, 11-15, 17-21 and 23-25.
4. Applicant failed to file a terminal disclaimer as a response to the Non-Final Rejection mailed on 06/27/2016 expressing the current amendment might be sufficient to overcome the double patenting rejection, examiner would like to remind the applicant the pending claim in the current application contains the limitations of previously patented application, therefore, the filing of terminal disclosure is still required in order to overcome the non-statutory double patenting rejection. The nonstatutory double patenting rejection remains.

### ***Double Patenting***

5. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent

and to prevent possible harassment by multiple assignees. A nonstatutory double patenting rejection is appropriate where the claims at issue are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the reference application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement. A terminal disclaimer must be signed in compliance with 37 CFR 1.321(b).

The USPTO internet Web site contains terminal disclaimer forms which may be used. Please visit <http://www.uspto.gov/forms/>. The filing date of the application will determine what form should be used. A web-based eTerminal Disclaimer may be filled out completely online using web-screens. An eTerminal Disclaimer that meets all requirements is auto-processed and approved immediately upon submission. For more information about eTerminal Disclaimers, refer to <http://www.uspto.gov/patents/process/file/efs/guidance/eTD-info-I.jsp>.



6. Claims 1-3, 5-9, 11-15, 17-21 and 23-25 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1, 3, 4 and 7 of U.S. Patent No. 9186052. Although the claims at issue are not identical, they are not patentably distinct from each other because the instant application is broader than the allowed application or have only minor differences in claim language.

***Allowable Subject Matter***

7. Claims 1-3, 5-9, 11-15, 17-21 and 23-25 (renumbered as claims 1-21) are allowable over the prior art.

***Conclusion***

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ASMAMAW G. TARKO whose telephone number is

Art Unit: 2482


(571)272-9205. The examiner can normally be reached on Tuesday - Thursday from 9:00 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, CHRISTOPHER S. KELLEY can be reached on (571)272-7331. 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.

/ASMAMAW G TARKO/  
Examiner, Art Unit 2482

/CHRISTOPHER S KELLEY/  
Supervisory Patent Examiner, Art Unit 2482

<b>Search Notes</b>  	<b>Application/Control No.</b>  14941040	<b>Applicant(s)/Patent Under Reexamination</b>  ADAIR ET AL.
	<b>Examiner</b>  ASMAMAW G TARKO	<b>Art Unit</b>  2482

CPC- SEARCHED		
Symbol	Date	Examiner
H04N5/3765	6/22/2016	

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner
A61B1/00009 A61B1/00016 A61B1/00045 A61B1/00064 A61B1/002 A61B1/008 A61B1/042 A61B1/045 A61B1/05 A61B1/051 A61B1/055 A61B1/0607	6/22/2016	/A.G.T./
H04N2005/2255 H04N5/23203 H04N5/374 H04N5/3745	6/22/2016	/A.G.T./

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
348	76	6/22/2016	

SEARCH NOTES		
Search Notes	Date	Examiner
Applicant search in EAST	6/20/2016	/A.G.T./
EAST Prior art search (Text and class/subclass combination)	6/20/2016	/A.G.T./
Consulted SPE Chris Kelley	6/21/2016	/A.G.T./
Updated Interference searched	9/30/2016	/A.G.T./

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
H04N2005	2255	9/30/2016	/A.G.T./
H04N5	23203, 374, 3745, 3765	9/30/2016	/A.G.T./

/ASMAMAW G TARKO/ Examiner.Art Unit 2482	
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**EAST Search History****EAST Search History (Prior Art)**


&lt; This search history is empty &gt;

**EAST Search History (Interference)**

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	38	(( "ADAI R" ) near3 ( "Jeffrey" ) ).INV.	US-PGPUB; USPAT	OR	ON	2016/09/30 10:40
L2	25	(( "ADAI R" ) near3 ( "Randall" ) ).INV.	US-PGPUB; USPAT	OR	ON	2016/09/30 10:40
L3	96	(( "ADAI R" ) near3 ( "Edwin" ) ).INV.	US-PGPUB; USPAT	OR	ON	2016/09/30 10:40
L4	7957	(H04N2005/2255 OR H04N5/23203 OR H04N5/374 OR H04N5/3745).CPC.	US-PGPUB; USPAT	WITH	OFF	2016/09/30 10:41
L5	916	(H04N5/3765).CPC.	US-PGPUB; USPAT	WITH	OFF	2016/09/30 10:41
L6	84	(endoscop\$4 same (CMOS and (sensor\$3 imager\$4))).clm.	US-PGPUB; USPAT	OR	OFF	2016/09/30 10:42
L7	24	(4 5) and (endoscop\$4 same (CMOS and (sensor\$3 imager\$4))).clm.	US-PGPUB; USPAT	OR	OFF	2016/09/30 10:43
L8	1	(4 5) and (endoscop\$4 same two same circuit\$4 same camera).clm.	US-PGPUB; USPAT	OR	OFF	2016/09/30 10:45
L9	12	(4 5) and ((endoscop\$4 or (imag\$4 near2 device) or camera) same ((two or multipl\$4) near20 (circuit adj board\$2))).clm.	US-PGPUB; USPAT	OR	OFF	2016/09/30 10:45
L11	12	(4 5) and ((endoscop\$4 or (imag\$4 near2 device)) same ((two or multipl\$4) near20 (circuit adj ill board\$2))).clm.	US-PGPUB; USPAT	OR	OFF	2016/09/30 10:46
L12	0	(9 11) and (square and dimension near8 (larg\$4 small\$4 differen\$4)).clm.	US-PGPUB; USPAT	OR	ON	2016/09/30 10:47
L13	0	(9 11) and (dimension near8 (larg\$4 small\$4 differen\$4)).clm.	US-PGPUB; USPAT	OR	ON	2016/09/30 10:48
L14	0	(9 11) and (square and dimension and (larg\$4 small\$4 differen\$4)).clm.	US-PGPUB; USPAT	OR	ON	2016/09/30 10:48
L15	0	(9 11) and (square and (larg\$4 small\$4 differen\$4)).clm.	US-PGPUB; USPAT	OR	ON	2016/09/30 10:48
L16	0	(9 11) and ((square shape) and (larg\$4 small\$4 differen\$4)).clm.	US-PGPUB;	OR	ON	2016/09/30 10:49

			USPAT			
L17	3	(9 11) and (larg\$4 small\$4 differen\$4).clm.	US- PGPUB; USPAT	OR	ON	2016/09/30 10:49

9/ 30/ 2016 10:50:43 AM  
C:\ Users\ atarko\ Documents\ EAST\ Workspaces\ 14941040.wsp

<b><i>Index of Claims</i></b>  	<b>Application/Control No.</b>  14941040	<b>Applicant(s)/Patent Under Reexamination</b>  ADAIR ET AL.
	<b>Examiner</b>  ASMAMAW G TARKO	<b>Art Unit</b>  2482

✓	<b>Rejected</b>	-	<b>Cancelled</b>	N	<b>Non-Elected</b>	A	<b>Appeal</b>
=	<b>Allowed</b>	÷	<b>Restricted</b>	I	<b>Interference</b>	O	<b>Objected</b>

<input checked="" type="checkbox"/> <b>Claims renumbered in the same order as presented by applicant</b>				<input type="checkbox"/> <b>CPA</b>		<input type="checkbox"/> <b>T.D.</b>		<input type="checkbox"/> <b>R.1.47</b>	
CLAIM		DATE							
Final	Original	06/22/2016	09/30/2016						
1	1	✓	=						
2	2	O	=						
3	3	✓	=						
	4	O	-						
4	5	✓	=						
5	6	✓	=						
6	7	✓	=						
7	8	O	=						
8	9	✓	=						
	10	O	-						
9	11	✓	=						
10	12	✓	=						
11	13	✓	=						
12	14	O	=						
13	15	✓	=						
	16	O	-						
14	17	✓	=						
15	18	✓	=						
16	19	✓	=						
17	20	O	=						
18	21	✓	=						
	22	O	-						
19	23	✓	=						
20	24	✓	=						
21	25	✓	=						

**POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO**

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(c).

I hereby appoint:

☐

Practitioners associated with Customer Number:

**OR**

☒

Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number
Clifford H. Kraft	35,229

Name	Registration Number

As attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignments documents attached to this form in accordance with 37 CFR 3.73(c).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(c) to:

☐

The address associated with Customer Number:

**OR**

<input type="checkbox"/>	Firm or Individual Name			
	Address			
	City	State	Zip	
	Country			
	Telephone	Email		

Assignee Name and Address:

**A copy of this form, together with a statement under 37 CFR 3.73(c) (Form PTO/AIA/96 or equivalent) is required to be Filed in each application in which this form is used. The statement under 37 CFR 3.73(c) may be completed by one of The practitioners appointed in this form, and must identify the application in which this Power of Attorney is to be filed.**

**SIGNATURE of Assignee of Record**

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee

Signature	/jeffrey adair/	Date	Dec. 3, 2016
Name	Jeffrey Adair	Telephone	
Title	President Collect LLC		

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

## Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.



## Electronic Acknowledgement Receipt

<b>EFS ID:</b>	27685600
<b>Application Number:</b>	14941040
<b>International Application Number:</b>	
<b>Confirmation Number:</b>	2975
<b>Title of Invention:</b>	Reduced area imaging device incorporated within endoscopic devices
<b>First Named Inventor/Applicant Name:</b>	Jeffrey L. Adair
<b>Customer Number:</b>	74642
<b>Filer:</b>	Clifford H. Kraft
<b>Filer Authorized By:</b>	
<b>Attorney Docket Number:</b>	MICRO-052-065-cont
<b>Receipt Date:</b>	03-DEC-2016
<b>Filing Date:</b>	13-NOV-2015
<b>Time Stamp:</b>	20:11:52
<b>Application Type:</b>	Utility under 35 USC 111(a)

### Payment information:

Submitted with Payment	no
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### File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Assignee showing of ownership per 37 CFR 3.73	sb0096.pdf	422791	no	2
			c0ca330ca9980739e6aa8ffe0f0301341b9c054d		

### Warnings:

<b>Information:</b>					
2	Power of Attorney	aia0080.pdf	79974	no	2
			8a4cf68f61711024888303935226b258a151188e		
<b>Warnings:</b>					
<b>Information:</b>					
Total Files Size (in bytes):			502765		
<p><b>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</b></p> <p><b><u>New Applications Under 35 U.S.C. 111</u></b>  <b>If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</b></p> <p><b><u>National Stage of an International Application under 35 U.S.C. 371</u></b>  <b>If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</b></p> <p><b><u>New International Application Filed with the USPTO as a Receiving Office</u></b>  <b>If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</b></p>					

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

**STATEMENT UNDER 37 CFR 3.73(b)**

Applicant/Patent Owner: Collect LLC

Application No./Patent No.: 14/941,040 Filed/Issue Date: Nov. 13, 2015

Titled: Reduced area imaging device incorporated within endoscopic devices

Collect LLC, a LLC  
(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that it is:

1. ☒ the assignee of the entire right, title, and interest in;
2. ☐ an assignee of less than the entire right, title, and interest in  
(The extent (by percentage) of its ownership interest is \_\_\_\_\_ %); or
3. ☐ the assignee of an undivided interest in the entirety of (a complete assignment from one of the joint inventors was made)

the patent application/patent identified above, by virtue of either:

A. ☒ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel 038096, Frame 0069, or for which a copy therefore is attached.

OR

B. ☐ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: \_\_\_\_\_ To: \_\_\_\_\_

The document was recorded in the United States Patent and Trademark Office at  
Reel \_\_\_\_\_, Frame \_\_\_\_\_, or for which a copy thereof is attached.

2. From: \_\_\_\_\_ To: \_\_\_\_\_

The document was recorded in the United States Patent and Trademark Office at  
Reel \_\_\_\_\_, Frame \_\_\_\_\_, or for which a copy thereof is attached.

3. From: \_\_\_\_\_ To: \_\_\_\_\_

The document was recorded in the United States Patent and Trademark Office at  
Reel \_\_\_\_\_, Frame \_\_\_\_\_, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

☐ As required by 37 CFR 3.73(b)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/Jeffrey adair/  
Signature

Dec. 3, 2016  
Date

Jeffrey Adair  
Printed or Typed Name

President Collect LLC  
Title

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

**Samsung Exhibit 1028**

*If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.*

**Page 191 of 272**

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UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/941,040	11/13/2015	Jeffrey L. Adair	MICRO-052-065-cont

74642  
CLIFFORD H. KRAFT  
320 ROBIN HILL DR.  
NAPERVILLE, IL 60540

**CONFIRMATION NO. 2975**  
**IMPROPER CPOA LETTER**



Date Mailed: 12/06/2016

**NOTICE REGARDING POWER OF ATTORNEY**

This is in response to the power of attorney filed 12/03/2016. The power of attorney in this application is not accepted for the reason(s) listed below:

- The power of attorney has not been accepted because the party who is giving power has not been identified. Power of attorney may only be signed by the applicant for patent (37 CFR 1.42) or the patent owner. A party who is not the applicant must become the applicant in accordance with 37 CFR 1.46(c) and appoint any power of attorney in compliance with 37 CFR 3.71 and 3.73. For a reissue application, reexamination proceeding, or supplemental examination proceeding, a patent owner who was not the applicant under 37 CFR 1.46 must appoint any power of attorney in compliance with 37 CFR 3.71 and 3.73. See 37 CFR 1.32(b)(4).

/zabaha/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/941,040	11/13/2015	Jeffrey L. Adair	MICRO-052-065-cont

**CONFIRMATION NO. 2975**

**IMPROPER CFR REQUEST**



\*OC000000087699139\*

74642  
CLIFFORD H. KRAFT  
320 ROBIN HILL DR.  
NAPERVILLE, IL 60540

Date Mailed: 12/06/2016

**RESPONSE TO REQUEST FOR CORRECTED FILING RECEIPT**

***Power of Attorney, Claims, Fees, System Limitations, and Miscellaneous***

In response to your request for a corrected Filing Receipt, the Office is unable to comply with your request because:

- Any request to correct or update the name of the applicant must include an application data sheet (ADS) in compliance with 37 CFR 1.76 specifying the correct or updated name of the applicant in the applicant information section. Any request to change the applicant after an original applicant has been specified under 37 CFR 1.46(b) must include a new ADS in compliance with 37 CFR 1.76 specifying the applicant in the applicant information section and comply with 37 CFR 3.71 and 3.73. See 37 CFR 1.46(c).

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/zabaha/

**POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO**

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(c).

I hereby appoint:

☐

Practitioners associated with Customer Number:

**OR**

☒

Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number
Clifford H. Kraft	35,229

Name	Registration Number

As attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignments documents attached to this form in accordance with 37 CFR 3.73(c).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(c) to:

☐

The address associated with Customer Number:

**OR**

<input type="checkbox"/>	Firm or Individual Name			
	Address			
	City	State	Zip	
	Country			
	Telephone	Email		

Assignee Name and Address:

**A copy of this form, together with a statement under 37 CFR 3.73(c) (Form PTO/AIA/96 or equivalent) is required to be Filed in each application in which this form is used. The statement under 37 CFR 3.73(c) may be completed by one of The practitioners appointed in this form, and must identify the application in which this Power of Attorney is to be filed.**

**SIGNATURE of Assignee of Record**

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee

Signature	/jeffrey adair/	Date	Dec. 3, 2016
Name	Jeffrey Adair	Telephone	
Title	President Collect LLC		

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

## Electronic Acknowledgement Receipt

<b>EFS ID:</b>	27810386
<b>Application Number:</b>	14941040
<b>International Application Number:</b>	
<b>Confirmation Number:</b>	2975
<b>Title of Invention:</b>	Reduced area imaging device incorporated within endoscopic devices
<b>First Named Inventor/Applicant Name:</b>	Jeffrey L. Adair
<b>Customer Number:</b>	74642
<b>Filer:</b>	Clifford H. Kraft
<b>Filer Authorized By:</b>	
<b>Attorney Docket Number:</b>	MICRO-052-065-cont
<b>Receipt Date:</b>	15-DEC-2016
<b>Filing Date:</b>	13-NOV-2015
<b>Time Stamp:</b>	16:53:38
<b>Application Type:</b>	Utility under 35 USC 111(a)

### Payment information:

Submitted with Payment	no
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### File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Application Data Sheet	Supp_ADS.pdf	360992	no	7
			c2f95e1c907040337c924f8720a6cdcb60da141e		

### Warnings:

**Samsung Exhibit 1028**

**Page 196 of 272**



<b>Information:</b>					
This is not an USPTO supplied ADS fillable form					
2	Assignee showing of ownership per 37 CFR 3.73	assignee_stmt.pdf	56671 101097502567a2d4eaa0462efb1d566118238eff	no	1
<b>Warnings:</b>					
<b>Information:</b>					
3	Power of Attorney	POA.pdf	123299 d77b4ca9c4b7eb0845c39ce4cc3a5952a56542c1	no	1
<b>Warnings:</b>					
<b>Information:</b>					
<b>Total Files Size (in bytes):</b>			540962		
<p><b>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</b></p> <p><b><u>New Applications Under 35 U.S.C. 111</u></b>  If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><b><u>National Stage of an International Application under 35 U.S.C. 371</u></b>  If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><b><u>New International Application Filed with the USPTO as a Receiving Office</u></b>  If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

<b>Supplementary</b> <b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	Micro-052-565-Cont
		Application Number	
Title of Invention	Reduced area imaging device incorporated within endoscopic devices		
<p>The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.</p> <p>This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.</p>			

## Secrecy Order 37 CFR 5.2

<input type="checkbox"/>	Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)
--------------------------	---

## Inventor Information:

Inventor 1					Remove	
Legal Name						
Prefix	Given Name	Middle Name	Family Name	Suffix		
	Jeffrey	L.	Adair			
Residence Information (Select One) <input checked="" type="radio"/> US Residency <input type="radio"/> Non US Residency <input type="radio"/> Active US Military Service						
City	Highlands Ranch	State/Province	CO	Country of Residence i	US	

Mailing Address of Inventor:						
Address 1		1861 East Redfox Place				
Address 2						
City	Highlands Ranch	State/Province	CO			
Postal Code	80126	Country i	US			

Inventor 2					Remove	
Legal Name						
Prefix	Given Name	Middle Name	Family Name	Suffix		
	Edwin		Adair			
Residence Information (Select One) <input checked="" type="radio"/> US Residency <input type="radio"/> Non US Residency <input type="radio"/> Active US Military Service						
City	DECEASED	State/Province		Country of Residence i		

Mailing Address of Inventor:						
Address 1						
Address 2						
City	DECEASED	State/Province				
Postal Code		Country i				

Inventor 3					Remove	
Legal Name						
Prefix	Given Name	Middle Name	Family Name	Suffix		
	Randall		Adair			
Residence Information (Select One) <input checked="" type="radio"/> US Residency <input type="radio"/> Non US Residency <input type="radio"/> Active US Military Service						

<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number		Micro-052-565-Cont	
		Application Number			
Title of Invention		Reduced area imaging device incorporated within endoscopic devices			
City	Denver	State/Province	CO	Country of Residence i	US
<b>Mailing Address of Inventor:</b>					
Address 1		3134 Wyandot Street			
Address 2					
City	Denver	State/Province	CO		
Postal Code		80211	Country i	US	
All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the <b>Add</b> button.					<input type="button" value="Add"/>

### Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a).			
<input type="checkbox"/> An Address is being provided for the correspondence Information of this application.			
Customer Number	74642		
Email Address		<input type="button" value="Add Email"/>	<input type="button" value="Remove Email"/>

### Application Information:

Title of the Invention	Reduced area imaging device incorporated within endoscopic devices		
Attorney Docket Number	Micro-052-565-Cont	Small Entity Status Claimed	<input checked="" type="checkbox"/>
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	17	Suggested Figure for Publication (if any)	1A

### Filing By Reference :

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country i

### Publication Information:

<input type="checkbox"/> Request Early Publication (Fee required at time of Request 37 CFR 1.219)
<input type="checkbox"/> <b>Request Not to Publish.</b> I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application <b>has not and will not</b> be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

**Samsung Exhibit 1028**

<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	Micro-052-565-Cont
		Application Number	
Title of Invention	Reduced area imaging device incorporated within endoscopic devices		

## Representative Information:

<p>Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.</p>			
<p>Please Select One: <input checked="" type="radio"/> Customer Number <input type="radio"/> US Patent Practitioner <input type="radio"/> Limited Recognition (37 CFR 11.9)</p>			
Customer Number	74642		

## Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.

When referring to the current application, please leave the application number blank.

Prior Application Status	Pending		<a href="#">Remove</a>		
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)		
present	Continuation of	14705334	2015-05-06		
Prior Application Status	Pending		<a href="#">Remove</a>		
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)		
14705334	Continuation of	14333260	2014-07-16		
Prior Application Status	Patented		<a href="#">Remove</a>		
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
14333260	Continuation of	13732908	2013-01-02	8885034	2014-11-11
Prior Application Status	Abandoned		<a href="#">Remove</a>		
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)		
13732908	Continuation of	12889287	2010-09-23		
Prior Application Status	Abandoned		<a href="#">Remove</a>		
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)		
12889287	Continuation in part of	11245960	2005-10-06		
Prior Application Status	Patented		<a href="#">Remove</a>		
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
11245960	Continuation of	09929531	2001-08-13	7030904	2006-04-18
Prior Application Status	Patented		<a href="#">Remove</a>		

<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	Micro-052-565-Cont
		Application Number	
Title of Invention	Reduced area imaging device incorporated within endoscopic devices		

Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
09929531	Continuation in part of	09496312	2000-02-01	6275255	2001-08-14
Prior Application Status		Patented	<a href="#">Remove</a>		
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
09496312	Continuation of	09175685	1998-10-20	6043839	2000-03-28
Prior Application Status		Patented	<a href="#">Remove</a>		
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
09175685	Continuation in part of	08944322	1997-10-06	5929901	1999-07-27
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the <b>Add</b> button.					

## Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(d). When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX) the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(h)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

[Remove](#)

Application Number	Country <sup>i</sup>	Filing Date (YYYY-MM-DD)	Access Code <sup>j</sup> (if applicable)

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.

## Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.

NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	Micro-052-565-Cont
		Application Number	
Title of Invention	Reduced area imaging device incorporated within endoscopic devices		

## Authorization to Permit Access:

☒ Authorization to Permit Access to the Instant Application by the Participating Offices

If checked, the undersigned hereby grants the USPTO authority to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the World Intellectual Property Office (WIPO), and any other intellectual property offices in which a foreign application claiming priority to the instant patent application is filed access to the instant patent application. See 37 CFR 1.14(c) and (h). This box should not be checked if the applicant does not wish the EPO, JPO, KIPO, WIPO, or other intellectual property office in which a foreign application claiming priority to the instant patent application is filed to have access to the instant patent application.

In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the instant patent application with respect to: 1) the instant patent application-as-filed; 2) any foreign application to which the instant patent application claims priority under 35 U.S.C. 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the instant patent application; and 3) any U.S. application-as-filed from which benefit is sought in the instant patent application.

In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date of filing this Authorization.

## Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

### Applicant 1

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

☒ Assignee      ☐ Legal Representative under 35 U.S.C. 117      ☐ Joint Inventor

☐ Person to whom the inventor is obligated to assign.      ☐ Person who shows sufficient proprietary interest

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor :

If the Applicant is an Organization check here. ☒

Organization Name Collect LLC

<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	Micro-052-565-Cont
		Application Number	
Title of Invention	Reduced area imaging device incorporated within endoscopic devices		

<b>Mailing Address Information:</b>			
Address 1	<u>3134 Wyandot St.</u>		
Address 2			
City	<u>Denver</u>	State/Province	<u>CO</u>
Country i	<u>US</u>	Postal Code	<u>80211</u>
Phone Number		Fax Number	
Email Address			
Additional Applicant Data may be generated within this form by selecting the Add button.			

## Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

<b>Assignee 1</b>			
Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.			
If the Assignee or Non-Applicant Assignee is an Organization check here. <input checked="" type="checkbox"/>			
Organization Name	<del>Micro Imaging Solutions LLC</del> <u>Collect LLC</u>		

<b>Mailing Address Information For Assignee including Non-Applicant Assignee:</b>			
Address 1	3134 Wyandot Street		
Address 2			
City	Denver	State/Province	CO
Country i	US	Postal Code	80211
Phone Number		Fax Number	
Email Address			
Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button.			

## Signature:

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications			
Signature	<del>/clifford kraft/</del> <u>/clifford kraft/</u>	Date (YYYY-MM-DD)	<del>2016-12-25</del> <u>2015-11-15</u>

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<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	Micro-052-565-Cont		
		Application Number			
Title of Invention	Reduced area imaging device incorporated within endoscopic devices				
First Name	Clifford	Last Name	Kraft	Registration Number	35229
Additional Signature may be generated within this form by selecting the Add button.					

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**



Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

**STATEMENT UNDER 37 CFR 3.73(b)**

Applicant/Patent Owner: Collect LLC

Application No./Patent No.: 14/941,040

Filed/Issue Date: Nov. 13, 2015

Titled: Reduced area imaging device incorporated within endoscopic devices

Collect LLC, a LLC

(Name of Assignee)

(Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that it is:

1. ☒ the assignee of the entire right, title, and interest in;
2. ☐ an assignee of less than the entire right, title, and interest in  
(The extent (by percentage) of its ownership interest is \_\_\_\_\_ %); or
3. ☐ the assignee of an undivided interest in the entirety of (a complete assignment from one of the joint inventors was made)

the patent application/patent identified above, by virtue of either:

A. ☒ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel 038096, Frame 0069, or for which a copy therefore is attached.

OR

B. ☐ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: \_\_\_\_\_ To: \_\_\_\_\_

The document was recorded in the United States Patent and Trademark Office at  
Reel \_\_\_\_\_, Frame \_\_\_\_\_, or for which a copy thereof is attached.

2. From: \_\_\_\_\_ To: \_\_\_\_\_

The document was recorded in the United States Patent and Trademark Office at  
Reel \_\_\_\_\_, Frame \_\_\_\_\_, or for which a copy thereof is attached.

3. From: \_\_\_\_\_ To: \_\_\_\_\_

The document was recorded in the United States Patent and Trademark Office at  
Reel \_\_\_\_\_, Frame \_\_\_\_\_, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

☐ As required by 37 CFR 3.73(b)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/Jeffrey adair/

Dec. 3, 2016

Signature

Date

Jeffrey Adair

President Collect LLC

Printed or Typed Name

Title

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

**Samsung Exhibit 1028**

*If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.*

**Page 205 of 272**



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United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/941,040	11/13/2015	Jeffrey L. Adair	MICRO-052-065-cont

**CONFIRMATION NO. 2975**

**POA ACCEPTANCE LETTER**

74642  
CLIFFORD H. KRAFT  
320 ROBIN HILL DR.  
NAPERVILLE, IL 60540



Date Mailed: 12/20/2016

**NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY**

This is in response to the Power of Attorney filed 12/15/2016.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/vnguyen/

<b>Doc Code: DIST.E.FILE</b> <b>Document Description: Electronic Terminal Disclaimer - Filed</b>		PTO/SB/26 U.S. Patent and Trademark Office Department of Commerce
Electronic Petition Request	<b>TERMINAL DISCLAIMER TO OBIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT</b>	
Application Number	14941040	
Filing Date	13-Nov-2015	
First Named Inventor	Jeffrey Adair	
Attorney Docket Number	MICRO-052-065-cont	
Title of Invention	Reduced area imaging device incorporated within endoscopic devices	
<input checked="" type="checkbox"/> Filing of terminal disclaimer does not obviate requirement for response under 37 CFR 1.111 to outstanding Office Action  <input checked="" type="checkbox"/> This electronic Terminal Disclaimer is not being used for a Joint Research Agreement.		
Owner	Percent Interest	
Collect LLC	100%	
<p>The owner(s) with percent interest listed above in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of prior patent number(s)</p> <p>9186052</p> <p>as the term of said prior patent is presently shortened by any terminal disclaimer. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the prior patent are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.</p> <p>In making the above disclaimer, the owner does not disclaim the terminal part of the term of any patent granted on the instant application that would extend to the expiration date of the full statutory term of the prior patent, "as the term of said prior patent is presently shortened by any terminal disclaimer," in the event that said prior patent later:</p> <ul style="list-style-type: none"> <li>- expires for failure to pay a maintenance fee;</li> <li>- is held unenforceable;</li> <li>- is found invalid by a court of competent jurisdiction;</li> <li>- is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321;</li> <li>- has all claims canceled by a reexamination certificate;</li> <li>- is reissued; or</li> <li>- is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.</li> </ul> <p><input checked="" type="radio"/> Terminal disclaimer fee under 37 CFR 1.20(d) is included with Electronic Terminal Disclaimer request.</p>		

<input type="radio"/> I certify, in accordance with 37 CFR 1.4(d)(4), that the terminal disclaimer fee under 37 CFR 1.20(d) required for this terminal disclaimer has already been paid in the above-identified application.	
Applicant claims the following fee status:  <input type="radio"/> Small Entity  <input type="radio"/> Micro Entity  <input checked="" type="radio"/> Regular Undiscounted	
I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.	
THIS PORTION MUST BE COMPLETED BY THE SIGNATORY OR SIGNATORIES  I certify, in accordance with 37 CFR 1.4(d)(4) that I am:  <input checked="" type="radio"/> An attorney or agent registered to practice before the Patent and Trademark Office who is of record in this application  Registration Number <u>35229</u>  <input type="radio"/> A sole inventor  <input type="radio"/> A joint inventor; I certify that I am authorized to sign this submission on behalf of all of the inventors as evidenced by the power of attorney in the application  <input type="radio"/> A joint inventor; all of whom are signing this request	
Signature	/clifford kraft/
Name	Clifford H. Kraft

\*Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner).  
 Form PTO/SB/96 may be used for making this certification. See MPEP § 324.

## Electronic Patent Application Fee Transmittal

<b>Application Number:</b>	14941040			
<b>Filing Date:</b>	13-Nov-2015			
<b>Title of Invention:</b>	Reduced area imaging device incorporated within endoscopic devices			
<b>First Named Inventor/Applicant Name:</b>	Jeffrey L. Adair			
<b>Filer:</b>	Clifford H. Kraft			
<b>Attorney Docket Number:</b>	MICRO-052-065-cont			
Filed as Large Entity				
<b>Filing Fees for Utility under 35 USC 111(a)</b>				
<b>Description</b>	<b>Fee Code</b>	<b>Quantity</b>	<b>Amount</b>	<b>Sub-Total in USD(\$)</b>
<b>Basic Filing:</b>				
STATUTORY OR TERMINAL DISCLAIMER	1814	1	160	160
<b>Pages:</b>				
<b>Claims:</b>				
<b>Miscellaneous-Filing:</b>				
<b>Petition:</b>				
<b>Patent-Appeals-and-Interference:</b>				
<b>Post-Allowance-and-Post-Issuance:</b>				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				160

Doc Code: DISQ.E.FILE

Document Description: Electronic Terminal Disclaimer – Approved

Application No.: 14941040

Filing Date: 13-Nov-2015

Applicant/Patent under Reexamination: Adair

Electronic Terminal Disclaimer filed on January 5, 2017

☒ APPROVED

**This patent is subject to a terminal disclaimer**

☐ DISAPPROVED

Approved/Disapproved by: Electronic Terminal Disclaimer automatically approved by EFS-Web

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## Electronic Acknowledgement Receipt

<b>EFS ID:</b>	27977599
<b>Application Number:</b>	14941040
<b>International Application Number:</b>	
<b>Confirmation Number:</b>	2975
<b>Title of Invention:</b>	Reduced area imaging device incorporated within endoscopic devices
<b>First Named Inventor/Applicant Name:</b>	Jeffrey L. Adair
<b>Customer Number:</b>	74642
<b>Filer:</b>	Clifford H. Kraft
<b>Filer Authorized By:</b>	
<b>Attorney Docket Number:</b>	MICRO-052-065-cont
<b>Receipt Date:</b>	05-JAN-2017
<b>Filing Date:</b>	13-NOV-2015
<b>Time Stamp:</b>	12:40:43
<b>Application Type:</b>	Utility under 35 USC 111(a)

### Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$ 160
RAM confirmation Number	010517INTEFSW12404100
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<b>File Listing:</b>					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Electronic Terminal Disclaimer-Filed	eTerminal-Disclaimer.pdf	33405	no	2
			98887b7a4a88c6cdf480d2b32725132c337f e26b		
<b>Warnings:</b>					
<b>Information:</b>					
2	Fee Worksheet (SB06)	fee-info.pdf	30586	no	2
			509dcb6f49a0806c58eafcd1ea78d29d55e4 16cf		
<b>Warnings:</b>					
<b>Information:</b>					
<b>Total Files Size (in bytes):</b>			63991		
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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of:	)	Art Unit: 2482
	)	
Jeffrey L. Adair	)	
	)	Examiner: TARKO, Asmamaw G.
Serial No. 14/941,040	)	
	)	Atty Dkt: MICRO-052-065-cont
Filing Date: Nov. 13, 2015	)	
	)	Conf: 2975
Title: REDUCED AREA IMAGING	)	
DEVICE INCORPORATED	)	
WITHIN ENDOSCOPIC	)	
DEVICES	)	
	)	

**RESPONSE AFTER FINAL OFFICE ACTION UNDER 37 C.F.R. § 1.116**

Commissioner for Patents  
P.O. Box 1450  
Alexandria VA 22313

Honorable Commissioner:

Kindly enter this after-final response.

## AMENDMENTS TO THE CLAIMS

Kindly amend the claims as indicated:

Claim 1. (previously presented): An imaging device comprising:

a housing;

an image sensor mounted in said housing, said image sensor including a first circuit board having a length and a width thereto, wherein said length and width of said first circuit board define a first plane, said first circuit board including an array of CMOS pixels thereon, wherein a plurality of CMOS pixels within said array of CMOS pixels each include an amplifier, said first circuit board further including timing and control circuitry thereon, said timing and control circuitry being coupled to said array of CMOS pixels, said image sensor producing a pre-video signal, wherein the image sensor is generally square shape along the first plane;

a second circuit board mounted in said housing, said second circuit board being electrically coupled to said first circuit board, said second circuit board having a length and a width thereto, wherein said length and width of said second circuit board define a second plane, said second circuit board including circuitry thereon to convert said pre-video signal to a post-video signal, said second circuit board being offset from said first circuit board, said second plane of said second circuit board being substantially parallel to said first plane of said first circuit board;

a lens mounted in said housing, said lens being integral with said imaging device, said lens focusing images on said array of CMOS pixels of said image sensor;

a video screen, said video screen being electrically coupled to said second circuit board, said video screen receiving said post-video signal and displaying images from said post-video signal; and

a power supply mounted in said housing, said power supply being electrically coupled to said first circuit board to provide power to said array of CMOS pixels and said timing and control circuitry, said power supply also being electrically coupled to said second circuit board to provide power thereto; wherein, a largest dimension of said second circuit board along said second plane is greater than a largest dimension of said image sensor along said first plane.

Claim 2. (original): The imaging device of claim 1, wherein:

a largest dimension of said image sensor along said first plane is between 4 and 8 millimeters.

Claim 3. (original): The imaging device of claim 1, wherein:

a largest dimension of said image sensor along said first plane is between 2 and 12 millimeters.

Claim 4. (cancelled).

Claim 5. (original): The imaging device of claim 1, wherein:

power provided by said power supply is direct current between 1.5 and 12 volts.

Claim 6. (original): The imaging device of claim 1, wherein:

said power supply is a battery.

Claim 7. (previously presented): An imaging device comprising:

a housing;

an image sensor mounted in said housing, said image sensor including a first circuit board having a length and a width thereto, wherein said length and width of said first circuit board define a first plane, said first circuit board including an array of CMOS pixels thereon, wherein a plurality of CMOS pixels within said array of CMOS pixels each include an amplifier, said first circuit board further including timing and control circuitry thereon, said timing and control circuitry being coupled to said array of CMOS pixels, said image sensor producing a pre-video signal, wherein the image sensor is generally square shape along the first plane;

a second circuit board mounted in said housing, said second circuit board being electrically coupled to said first circuit board, said second circuit board having a length and a width thereto, wherein said length and width of said second circuit board define a second plane, said second circuit board including

circuitry thereon to convert said pre-video signal to a post-video signal, said second circuit board being positioned in a stacked arrangement with respect to said first circuit board, said second plane of said second circuit board being substantially parallel to said first plane of said first circuit board;

a lens mounted in said housing, said lens being integral with said imaging device, said lens focusing images on said array of CMOS pixels of said image sensor;

a video screen, said video screen being electrically coupled to said second circuit board, said video screen receiving said post-video signal and displaying images from said post-video signal; and

a power supply mounted in said housing, said power supply being electrically coupled to said first circuit board to provide power to said array of CMOS pixels and said timing and control circuitry, said power supply also being electrically coupled to said second circuit board to provide power thereto;

wherein a largest dimension of said second circuit board along said second plane is greater than a largest dimension of said image sensor along said first plane.

Claim 8. (original): The imaging device of claim 7, wherein:

a largest dimension of said image sensor along said first plane is between 4 and 8 millimeters.

Claim 9. (original): The imaging device of claim 7, wherein:

a largest dimension of said image sensor along said first plane is between 2 and 12 millimeters.

Claim 10. (cancelled).

Claim 11. (original): The imaging device of claim 7, wherein:

power provided by said power supply is direct current between 1.5 and 12 volts.

Claim 12. (original): The imaging device of claim 7, wherein:

said power supply is a battery.

Claim 13. (previously presented): An imaging device comprising:

a housing;

an image sensor mounted in said housing, said image sensor including a planar substrate having a length and a width thereto, wherein said length and width of said planar substrate define a first plane, said planar substrate including an array of CMOS pixels thereon, wherein a plurality of CMOS pixels within said array of CMOS pixels each include an amplifier, said image sensor further including a first circuit board having a length and a width thereto, wherein said length and width of said first circuit board define a second plane, said first circuit board including timing and control circuitry thereon, said timing and control circuitry being coupled to said array of CMOS pixels, said first circuit board being

positioned in a stacked arrangement with respect to said planar substrate, said second plane of said first circuit board being substantially parallel to said first plane of said planar substrate, said image sensor producing a pre-video signal, wherein the image sensor is generally square shape along the first plane;

a second circuit board mounted in said housing, said second circuit board being electrically coupled to said planar substrate and to said first circuit board, said second circuit board having a length and a width thereto, wherein said length and width of said second circuit board define a third plane, said second circuit board including circuitry thereon to convert said pre-video signal to a post-video signal, said second circuit board being offset from said first circuit board and from said planar substrate, said third plane of said second circuit board being substantially parallel to said second plane of said first circuit board and to said first plane of said planar substrate;

a lens mounted in said housing, said lens being integral with said imaging device, said lens focusing images on said array of CMOS pixels of said image sensor;

a video screen, said video screen being electrically coupled to said second circuit board, said video screen receiving said post-video signal and displaying images from said post-video signal; and

a power supply mounted said housing, said power supply being electrically coupled to said planar substrate to provide power to said array of CMOS pixels, said power supply also being electrically coupled to said first circuit board to provide power to said timing and control circuitry, said power supply



also being electrically coupled to said second circuit board to provide power thereto;

wherein a largest dimension of said second circuit board along said third plane is greater than a largest dimension of said image sensor along said first plane.

Claim 14. (original): The imaging device of claim 13, wherein:

a largest dimension of said image sensor along said first plane is between 4 and 8 millimeters.

Claim 15. (original): The imaging device of claim 13, wherein:

a largest dimension of said image sensor along said first plane is between 2 and 12 millimeters.

Claim 16. (cancelled).

Claim 17. (original): The imaging device of claim 13, wherein:

power provided by said power supply is direct current between 1.5 and 12 volts.

Claim 18. (original): The imaging device of claim 13, wherein:

said power supply is a battery.

Claim 19. (previously presented): An imaging device comprising:

a housing;

an image sensor mounted in said housing, said image sensor including a planar substrate having a length and a width thereto, wherein said length and width of said planar substrate define a first plane, said planar substrate including an array of CMOS pixels thereon, wherein a plurality of CMOS pixels within said array of CMOS pixels each include an amplifier, said image sensor further including a first circuit board having a length and a width thereto, wherein said length and width of said first circuit board define a second plane, said first circuit board including timing and control circuitry thereon, said timing and control circuitry being coupled to said array of CMOS pixels, said first circuit board being positioned in a stacked arrangement with respect to said planar substrate, said second plane of said first circuit board being substantially parallel to said first plane of said planar substrate, said image sensor producing a pre-video signal, wherein the image sensor is generally square shape along the first plane;

a second circuit board mounted in said housing, said second circuit board, being electrically coupled to said planar substrate and to said first circuit board, said second circuit board having a length and a width thereto, wherein said length and width of said second circuit board define a third plane, said second circuit board including circuitry thereon to convert said pre-video signal to a post-video signal, said second circuit board being positioned in a stacked arrangement with respect to said first circuit board and further with respect to

said planar substrate, said third plane of said second circuit board being substantially parallel to said second plane of said first circuit board and to said first plane of said planar substrate;

a lens mounted in said housing, said lens being integral with said imaging device, said lens focusing images on said array of CMOS pixels of said image sensor;

a video screen, said video screen being electrically coupled to said second circuit board, said video screen receiving said post-video signal and displaying images from said post-video signal; and

a power supply mounted said housing, said power supply being electrically coupled to said planar substrate to provide power to said array of CMOS pixels, said power supply also being electrically coupled to said first circuit board to provide power to said timing and control circuitry, said power supply also being electrically coupled to said second circuit board to provide power thereto;

a largest dimension of said second circuit board along said third plane is greater than a largest dimension of said image sensor along said first plane.

Claim 20. (original): The imaging device of claim 19, wherein:

a largest dimension of said image sensor along said first plane is between 4 and 8 millimeters.

Claim 21. (original): The imaging device of claim 19, wherein:

a largest dimension of said image sensor along said first plane is between 2 and 12 millimeters.

Claim 22. (cancelled).

Claim 23. (original): The imaging device of claim 19, wherein:

power provided by said power supply is direct current between 1.5 and 12 volts.

Claim 24. (original): The imaging device of claim 19, wherein:

said power supply is a battery.

Claim 25. (currently amended): An imaging device comprising:

a housing;

an image sensor mounted in said housing, said image sensor including a planar substrate having a length and a width thereto, wherein said length and width of said planar substrate define a first plane, said planar substrate including an array of CMOS pixels thereon, wherein a plurality of CMOS pixels within said array of CMOS pixels each include an amplifier, said planar substrate further including timing and control circuitry thereon, said timing and control circuitry being coupled to said array of CMOS pixels, said image sensor producing a pre-video signal, wherein the image sensor is generally square shape along the first plane;

a circuit board mounted in said housing, said circuit board being electrically coupled to said planar substrate, said circuit board having a length and a width thereto, wherein said length and width of said circuit board define a second plane, said circuit board including circuitry thereon to convert said pre-video signal to a post-video signal, said circuit board being offset from said planar substrate, said second plane of said circuit board being substantially parallel to said first plane of said planar substrate;

a lens mounted in said housing, said lens being integral with said imaging device, said lens focusing images on said array of CMOS pixels of said image sensor;

a video screen, said video screen being electrically coupled to said circuit board, said video screen receiving said post-video signal and displaying images from said post-video signal; and

a power supply mounted in said housing, said power supply being electrically coupled to said planar substrate to provide power to said array of CMOS pixels and said timing and control circuitry, said power supply also being electrically coupled to said circuit board to provide power thereto;

wherein a largest dimension of said second circuit board along said ~~third~~ second plane is greater than a largest dimension of said image sensor along said first plane.

## REMARKS

This is an after-final response under Rule 116 to the final office action issued Oct. 5, 2016.

The Examiner indicated that the claims were allowable except for filing a terminal disclaimer (the claims were rejected under the doctrine of non-judicial double patenting – claims 1-3, 5-9, 11-15, 17-21 and 23-25 were rejected over claims 1, 3, 4 and 7 of U.S. Patent number 9,186,052).

The applicant has filed an electronic terminal disclaimer over U.S. Patent number 9,186,052.

Please note that claim 25 has been AMENDED to correct an error. There is no third plane defined in claim 25, and the previous amendment should have read second plane.

Therefore, the applicant believes that the claims are now allowable. The examiner is respectfully requested to enter this amendment and place the case in condition for allowance at the earliest convenience.

Respectfully Submitted

/clifford kraft/

Clifford H. Kraft  
Reg. No. 35,229  
Attorney of Record

CORRESPONDENCE ADDRESS

Customer No. 74642

Clifford H. Kraft  
320 Robin Hill Dr.  
Naperville, IL 60540

708 528-9092 tel.  
630 428-0104 fax.

## Electronic Acknowledgement Receipt

<b>EFS ID:</b>	27977841
<b>Application Number:</b>	14941040
<b>International Application Number:</b>	
<b>Confirmation Number:</b>	2975
<b>Title of Invention:</b>	Reduced area imaging device incorporated within endoscopic devices
<b>First Named Inventor/Applicant Name:</b>	Jeffrey L. Adair
<b>Customer Number:</b>	74642
<b>Filer:</b>	Clifford H. Kraft
<b>Filer Authorized By:</b>	
<b>Attorney Docket Number:</b>	MICRO-052-065-cont
<b>Receipt Date:</b>	05-JAN-2017
<b>Filing Date:</b>	13-NOV-2015
<b>Time Stamp:</b>	12:51:34
<b>Application Type:</b>	Utility under 35 USC 111(a)

### Payment information:

Submitted with Payment	no
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### File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Response After Final Action	amdt.pdf	353671	no	14
			27eea591bb2d2af3cf45bb5ebde64e7b4d21e54c		

### Warnings:

**Samsung Exhibit 1028**

**Page 228 of 272**



<b>Information:</b>	
<b>Total Files Size (in bytes):</b>	353671
<p><b>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</b></p> <p><b><u>New Applications Under 35 U.S.C. 111</u></b>  <b>If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</b></p> <p><b><u>National Stage of an International Application under 35 U.S.C. 371</u></b>  <b>If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</b></p> <p><b><u>New International Application Filed with the USPTO as a Receiving Office</u></b>  <b>If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</b></p>	

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<b>PATENT APPLICATION FEE DETERMINATION RECORD</b> Substitute for Form PTO-875	Application or Docket Number <b>14/941,040</b>	Filing Date <b>11/13/2015</b>	<input type="checkbox"/> To be Mailed
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ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO**APPLICATION AS FILED – PART I**

(Column 1)

(Column 2)

FOR	NUMBER FILED	NUMBER EXTRA	RATE (\$)	FEE (\$)
<input type="checkbox"/> BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
<input type="checkbox"/> SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
<input type="checkbox"/> EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X \$ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X \$ =	
<input type="checkbox"/> APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
<input type="checkbox"/> MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

**APPLICATION AS AMENDED – PART II**

(Column 1)

(Column 2)

(Column 3)

AMENDMENT	01/05/2017	CLAIMS REMAINING AFTER AMENDMENT	Minus	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	* 21	Minus	** 25	= 0	X \$80 =	0
	Independent (37 CFR 1.16(h))	* 5	Minus	***5	= 0	X \$420 =	0
	<input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))						
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
TOTAL ADD'L FEE							<b>0</b>

(Column 1)

(Column 2)

(Column 3)

AMENDMENT	CLAIMS REMAINING AFTER AMENDMENT	Minus	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X \$ =
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X \$ =
	<input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))					
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					
TOTAL ADD'L FEE						

\* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

\*\* If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

\*\*\* If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE  
/JACQUELYN WILLIAMS/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
14/941,040	11/13/2015	2482	2980	MICRO-052-065-cont	25	5

**CONFIRMATION NO. 2975**  
**CORRECTED FILING RECEIPT**

74642  
CLIFFORD H. KRAFT  
320 ROBIN HILL DR.  
NAPERVILLE, IL 60540



Date Mailed: 01/11/2017

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

**Inventor(s)**

Jeffrey L. Adair, Highlands Ranch, CO;  
Edwin Adair, Residence Not Provided;  
Randall Adair, Denver, CO;

**Applicant(s)**

Cellect LLC, Denver, CO;

**Assignment For Published Patent Application**

Cellect LLC, Denver, CO

**Power of Attorney:**

Clifford Kraft--35229

**Domestic Priority data as claimed by applicant**

This application is a CON of 14/705,334 05/06/2015 PAT 9186052  
which is a CON of 14/333,260 07/16/2014 PAT 9198565  
which is a CON of 13/732,908 01/02/2013 PAT 8885034  
which is a CON of 12/889,287 09/23/2010 ABN  
which is a CIP of 11/245,960 10/06/2005  
which is a CON of 09/929,531 08/13/2001 PAT 7030904  
which is a CIP of 09/496,312 02/01/2000 PAT 6275255  
which is a CON of 09/175,685 10/20/1998 PAT 6043839  
which is a CIP of 08/944,322 10/06/1997 PAT 5929901

**Foreign Applications** for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see <http://www.uspto.gov> for more information.) - None.

*Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.*

**Permission to Access Application via Priority Document Exchange:** Yes

**Permission to Access Search Results:** No

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

**If Required, Foreign Filing License Granted:** 11/25/2015

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 14/941,040**

**Projected Publication Date:** Not Applicable

**Non-Publication Request:** No

**Early Publication Request:** No

**Title**

Reduced area imaging device incorporated within endoscopic devices

**Preliminary Class**

348

**Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications:** No

## **PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES**

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

## **LICENSE FOR FOREIGN FILING UNDER**

### **Title 35, United States Code, Section 184**

### **Title 37, Code of Federal Regulations, 5.11 & 5.15**

#### **GRANTED**

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign Assets Control, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

#### **NOT GRANTED**

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

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The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor

community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit <http://www.SelectUSA.gov> or call +1-202-482-6800.



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United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
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## NOTICE OF ALLOWANCE AND FEE(S) DUE

74642 7590 02/02/2017  
CLIFFORD H. KRAFT  
320 ROBIN HILL DR.  
NAPERVILLE, IL 60540

EXAMINER

TARKO, ASMAMAW G

ART UNIT

PAPER NUMBER

2482

DATE MAILED: 02/02/2017

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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14/941,040

11/13/2015

Jeffrey L. Adair

MICRO-052-065-cont

2975

TITLE OF INVENTION: Reduced area imaging device incorporated within endoscopic devices

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$960	\$0	\$0	\$960	05/02/2017

**THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.**

**THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.**

### HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

**IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.**

## PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **Mail** **Mail Stop ISSUE FEE**  
**Commissioner for Patents**  
**P.O. Box 1450**  
**Alexandria, Virginia 22313-1450**  
**or Fax (571)-273-2885**

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

74642 7590 02/02/2017  
**CLIFFORD H. KRAFT**  
**320 ROBIN HILL DR.**  
**NAPERVILLE, IL 60540**

## Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/941,040	11/13/2015	Jeffrey L. Adair	MICRO-052-065-cont	2975

TITLE OF INVENTION: Reduced area imaging device incorporated within endoscopic devices

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$960	\$0	\$0	\$960	05/02/2017

EXAMINER	ART UNIT	CLASS-SUBCLASS
TARKO, ASMAMAW G	2482	348-076000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) The names of up to 3 registered patent attorneys or agents OR, alternatively, 1 \_\_\_\_\_
- (2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 \_\_\_\_\_
- 3 \_\_\_\_\_

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies \_\_\_\_\_

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☐ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number \_\_\_\_\_ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ Applicant certifying micro entity status. See 37 CFR 1.29
- ☐ Applicant asserting small entity status. See 37 CFR 1.27
- ☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature \_\_\_\_\_

Date \_\_\_\_\_

Typed or printed name \_\_\_\_\_

Registration No. \_\_\_\_\_





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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/941,040	11/13/2015	Jeffrey L. Adair	MICRO-052-065-cont	2975

74642	7590	02/02/2017
CLIFFORD H. KRAFT 320 ROBIN HILL DR. NAPERVILLE, IL 60540		

EXAMINER	
TARKO, ASMAMAW G	

ART UNIT	PAPER NUMBER
2482	

DATE MAILED: 02/02/2017

## Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

## OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

### Privacy Act Statement

**The Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

<b>Notice of Allowability</b>	<b>Application No.</b> 14/941,040	<b>Applicant(s)</b> ADAIR ET AL.	
	<b>Examiner</b> ASMAMAW G. TARKO	<b>Art Unit</b> 2482	<b>AIA (First Inventor to File) Status</b> Yes

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

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 01/05/2017.  
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on \_\_\_\_\_.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on \_\_\_\_\_; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are 1-3,5-9,11-15,17-21 and 23-25. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see [http://www.uspto.gov/patents/init\\_events/pph/index.jsp](http://www.uspto.gov/patents/init_events/pph/index.jsp) or send an inquiry to PPHfeedback@uspto.gov.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

**Certified copies:**

- a) ☐ All    b) ☐ Some    \*c) ☐ None of the:
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)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.  
☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.  
**Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).**
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

- |  |   |
|--|---|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892)   | 5. <input type="checkbox"/> Examiner's Amendment/Comment                  |
| 2. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08),<br>Paper No./Mail Date _____    | 6. <input type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| 3. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br>of Biological Material | 7. <input type="checkbox"/> Other _____.                                  |
| 4. <input type="checkbox"/> Interview Summary (PTO-413),<br>Paper No./Mail Date _____.                     |   |

/ASMAMAW G TARKO/  
Examiner, Art Unit 2482

/CHRISTOPHER S KELLEY/  
Supervisory Patent Examiner, Art Unit 2482



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## BIB DATA SHEET

CONFIRMATION NO. 2975

SERIAL NUMBER	FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.		
14/941,040	11/13/2015	348	2482	MICRO-052-065-cont		
<b>APPLICANTS</b> Collect LLC, Denver, CO; <b>INVENTORS</b> Jeffrey L. Adair, Highlands Ranch, CO; Edwin Adair, Residence Not Provided; Randall Adair, Denver, CO; <b>** CONTINUING DATA *****</b> This application is a CON of 14/705,334 05/06/2015 PAT 9186052 which is a CON of 14/333,260 07/16/2014 PAT 9198565 which is a CON of 13/732,908 01/02/2013 PAT 8885034 which is a CON of 12/889,287 09/23/2010 ABN which is a CIP of 11/245,960 10/06/2005 which is a CON of 09/929,531 08/13/2001 PAT 7030904 which is a CIP of 09/496,312 02/01/2000 PAT 6275255 which is a CON of 09/175,685 10/20/1998 PAT 6043839 which is a CIP of 08/944,322 10/06/1997 PAT 5929901 <b>** FOREIGN APPLICATIONS *****</b> <b>** IF REQUIRED, FOREIGN FILING LICENSE GRANTED **</b> 11/25/2015						
Foreign Priority claimed <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	35 USC 119(a-d) conditions met <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Met after Allowance	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
Verified and /ASMAMAW G TARKO/ Acknowledged Examiner's Signature		Initials	CO	17	25 21	5
<b>ADDRESS</b> CLIFFORD H. KRAFT 320 ROBIN HILL DR. NAPERVILLE, IL 60540 UNITED STATES						
<b>TITLE</b> Reduced area imaging device incorporated within endoscopic devices						
<b>FILING FEE RECEIVED</b> 2980	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:		<input type="checkbox"/> All Fees			
			<input type="checkbox"/> 1.16 Fees (Filing)			
			<input type="checkbox"/> 1.17 Fees (Processing Ext. of time)			
			<input type="checkbox"/> 1.18 Fees (Issue)			
			<input type="checkbox"/> Other _____			
			<input type="checkbox"/> Credit			

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of:	)	Art Unit: 2482
	)	
Jeffrey L. Adair	)	
	)	Examiner: TARKO, Asmamaw G.
Serial No. 14/941,040	)	
	)	Atty Dkt: MICRO-052-065-cont
Filing Date: Nov. 13, 2015	)	
	)	Conf: 2975
Title: REDUCED AREA IMAGING	)	
DEVICE INCORPORATED	)	
WITHIN ENDOSCOPIC	)	
DEVICES	)	
	)	

**RESPONSE AFTER FINAL OFFICE ACTION UNDER 37 C.F.R. § 1.116**

Commissioner for Patents  
P.O. Box 1450  
Alexandria VA 22313

Honorable Commissioner:


Kindly enter this after-final response.

<b>Issue Classification</b> 	<b>Application/Control No.</b> 14941040	<b>Applicant(s)/Patent Under Reexamination</b> ADAIR ET AL.	
	<b>Examiner</b> ASMAMAW G TARKO	<b>Art Unit</b> 2482	

CPC						
Symbol					Type	Version
H04N		5		3765	F	2013-01-01
A61B		1		00016	A	2013-01-01
A61B		1		002	A	2013-01-01
A61B		1		042	A	2013-01-01
A61B		1		05	I	2013-01-01
A61B		1		055	I	2013-01-01
A61B		1		0607	I	2013-01-01
H04N		5		23203	I	2013-01-01
H04N		5		374	I	2013-01-01
H04N		2005		2255	A	2013-01-01
A61B		1		00064	I	2013-01-01
A61B		1		008	I	2013-01-01
A61B		1		051	I	2013-01-01
A61B		1		00009	A	2013-01-01
A61B		1		00045	I	2013-01-01
A61B		1		045	I	2013-01-01
H04N		5		3745	I	2013-01-01
A61B		1		00032	I	2013-01-01
A61B		1		00163	I	2013-01-01
H04N		5		2252	I	2013-01-01
H04N		5		2253	I	2013-01-01
H04N		5		2254	I	2013-01-01
A61B		1		00101	I	2013-01-01
A61B		1		00124	I	2013-01-01
A61B		1		00128	I	2013-01-01

CPC Combination Sets				
Symbol	Type	Set	Ranking	Version


/ASMAMAW G TARKO/ Examiner.Art Unit 2482  (Assistant Examiner)	01/09/2017  (Date)	<b>Total Claims Allowed:</b>  21	
/CHRISTOPHER S KELLEY/ Supervisory Patent Examiner.Art Unit 2482  (Primary Examiner)	01/11/2017  (Date)	O.G. Print Claim(s)  1	O.G. Print Figure  1A-B

<b>Issue Classification</b> 	<b>Application/Control No.</b> 14941040	<b>Applicant(s)/Patent Under Reexamination</b> ADAIR ET AL.
	<b>Examiner</b> ASMAMAW G TARKO	<b>Art Unit</b> 2482

/ASMAMAW G TARKO/ Examiner.Art Unit 2482  (Assistant Examiner)	01/09/2017  (Date)	<b>Total Claims Allowed:</b>  21	
/CHRISTOPHER S KELLEY/ Supervisory Patent Examiner.Art Unit 2482  (Primary Examiner)	01/11/2017  (Date)	O.G. Print Claim(s)  1	O.G. Print Figure  1A-B





<b>Issue Classification</b> 	<b>Application/Control No.</b> 14941040	<b>Applicant(s)/Patent Under Reexamination</b> ADAIR ET AL.
	<b>Examiner</b> ASMAMAW G TARKO	<b>Art Unit</b> 2482

<input checked="" type="checkbox"/> <b>Claims renumbered in the same order as presented by applicant</b> <input type="checkbox"/> <b>CPA</b> <input checked="" type="checkbox"/> <b>T.D.</b> <input type="checkbox"/> <b>R.1.47</b>															
Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1	17	20												
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/ASMAMAW G TARKO/ Examiner.Art Unit 2482  (Assistant Examiner)	01/09/2017  (Date)	<b>Total Claims Allowed:</b>  21	
/CHRISTOPHER S KELLEY/ Supervisory Patent Examiner.Art Unit 2482  (Primary Examiner)	01/11/2017  (Date)	O.G. Print Claim(s)  1	O.G. Print Figure  1A-B

## EAST Search History

## EAST Search History (Prior Art)


Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	4	"9186052"	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2017/01/09 16:15

## EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S76	38	((("ADAI R") near3 ("Jeffrey"))).INV.	US-PGPUB; USPAT	OR	ON	2017/01/09 16:12
S77	25	((("ADAI R") near3 ("Randall"))).INV.	US-PGPUB; USPAT	OR	ON	2017/01/09 16:12
S78	96	((("ADAI R") near3 ("Edwin"))).INV.	US-PGPUB; USPAT	OR	ON	2017/01/09 16:12
S79	8438	(H04N2005/2255 OR H04N5/23203 OR H04N5/374 OR H04N5/3745).CPC.	US-PGPUB; USPAT	WITH	OFF	2017/01/09 16:12
S80	997	(H04N5/3765).CPC.	US-PGPUB; USPAT	WITH	OFF	2017/01/09 16:12
S81	27	(S79 S80) and (endoscop\$4 same (CMOS and (sensor\$3 imager\$4))).clm.	US-PGPUB; USPAT	OR	OFF	2017/01/09 16:12
S82	1	(S79 S80) and (endoscop\$4 same two same circuit\$4 same camera).clm.	US-PGPUB; USPAT	OR	OFF	2017/01/09 16:13
S83	12	(S79 S80) and ((endoscop\$4 or (imag\$4 near2 device) or camera) same ((two or multipl\$4) near20 (circuit adj board\$2))).clm.	US-PGPUB; USPAT	OR	OFF	2017/01/09 16:13
S84	88	(endoscop\$4 same (CMOS and (sensor\$3 imager\$4))).clm.	US-PGPUB; USPAT	OR	OFF	2017/01/09 16:13
S85	12	(S79 S80) and ((endoscop\$4 or (imag\$4 near2 device)) same ((two or multipl\$4) near20 (circuit adj ill board\$2))).clm.	US-PGPUB; USPAT	OR	OFF	2017/01/09 16:13
S86	0	(S83 S85) and (square and dimension near8 (larg\$4 small\$4 differen\$4)).clm.	US-PGPUB; USPAT	OR	ON	2017/01/09 16:13
S87	0	(S83 S85) and (dimension near8 (larg\$4 small\$4 differen\$4)).clm.	US-PGPUB; USPAT	OR	ON	2017/01/09 16:13
S88	0	(S83 S85) and (square and dimension and (larg\$4 small\$4 differen\$4)).clm.	US-PGPUB; USPAT	OR	ON	2017/01/09 16:13
S89	0	(S83 S85) and (square and (larg\$4 small\$4	US-	OR	ON	2017/01/09

		differen\$4)).clm.	PGPUB; USPAT			16:14
S90	0	(S83 S85) and ((square shape) and (larg\$4 small\$4 differen\$4)).clm.	US- PGPUB; USPAT	OR	ON	2017/01/09 16:14
S91	3	(S83 S85) and (larg\$4 small\$4 differen\$4)).clm.	US- PGPUB; USPAT	OR	ON	2017/01/09 16:14

1/ 9/ 2017 4:28:06 PM  
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<b>Search Notes</b>  	<b>Application/Control No.</b>  14941040	<b>Applicant(s)/Patent Under Reexamination</b>  ADAIR ET AL.
	<b>Examiner</b>  ASMAMAW G TARKO	<b>Art Unit</b>  2482

CPC- SEARCHED		
Symbol	Date	Examiner
H04N5/3765	6/22/2016	

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner
A61B1/00009 A61B1/00016 A61B1/00045 A61B1/00064 A61B1/002 A61B1/008 A61B1/042 A61B1/045 A61B1/05 A61B1/051 A61B1/055 A61B1/0607	6/22/2016	/A.G.T./
H04N2005/2255 H04N5/23203 H04N5/374 H04N5/3745	6/22/2016	/A.G.T./

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
348	76	6/22/2016	

SEARCH NOTES		
Search Notes	Date	Examiner
Applicant search in EAST	6/20/2016	/A.G.T./
EAST Prior art search (Text and class/subclass combination)	6/20/2016	/A.G.T./
Consulted SPE Chris Kelley	6/21/2016	/A.G.T./
Updated Interference searched	9/30/2016	/A.G.T./
Updated EAST interference Searchr	1/9/2017	

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
H04N2005	2255	9/30/2016	/A.G.T./
H04N5	23203, 374, 3745, 3765	9/30/2016	/A.G.T./
H04N2005	2255	1/9/2017	/A.G.T./
H04N5	23203, 374, 3745, 3765	1/9/2017	

/ASMAMAW G TARKO/ Examiner, Art Unit 2482	
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<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> ( Not for submission under 37 CFR 1.99)	Application Number		
	Filing Date		
	First Named Inventor	Jeffrey Adair	
	Art Unit		
	Examiner Name		
	Attorney Docket Number		

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.G.T/

U.S.PATENTS						
Examiner Initial*	Cite No	Patent Number	Kind Code <sup>1</sup>	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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	1							<input type="checkbox"/>

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U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No. <sup>1</sup>	Document Number Number-kind Code <sup>2</sup> (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1	4164182	08/14/1979	Sato	
	2	4573450	03/04/1986	Arakawa	
	3	4706654	11/17/1987	Ogiu et al.	
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Examiner Signature	/ASMAMAW G TARKO/	Date Considered	06/21/2016
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			First Named Inventor	Jeffrey L. Adair	
			Art Unit		
			Examiner Name		
Sheet		of		Attorney Docket Number	

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Sheet		of		Attorney Docket Number	

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FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document Country Code <sup>3</sup> ; Number <sup>4</sup> ; Kind Code <sup>5</sup> (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T <sup>6</sup>
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	75	AU 7004201	02/25/2002	ADAIR		(abstract only)
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	104	JP H09-46566	02/14/1997	OLYMPUS OPTICAL CO LTD		
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Examiner Signature	/ASMAMAW G TARKO/	Date Considered	06/21/2016
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			First Named Inventor	Jeffrey L. Adair	
			Art Unit		
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Sheet		of		Attorney Docket Number	

## ALL REFERENCES SUPPLIED IN PARENT CASE

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	120	WO 01/08549	02/08/2001	ADAIR		
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	129	WO 03/030525	04/10/2003	MICRO MEDICAL DEVICES INC		

## NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
	130	"Camera phone technology," eWebsite.com, 1997, 3 pages. Supplied in Parent Case

## ALL REFERENCES SUPPLIED IN PARENT CASE

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		First Named Inventor	Jeffrey L. Adair		
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		Examiner Name			
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				Application Number	
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Page 256 of 272

<b>REFERENCES SUPPLIED BY APPLICANTS</b>	Application/Control No.	Applicant(s) Jeffrey L. Adair	

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*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
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	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
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	K	US-			
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			First Named Inventor	Jeffrey L. Adair	
			Art Unit		
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U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No. <sup>1</sup>	Document Number Number-kind Code <sup>2</sup> (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
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				Filing Date	
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Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document Country Code <sup>3</sup> ; Number <sup>4</sup> ; Kind Code <sup>5</sup> (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T <sup>6</sup>
	44	DE 10028080	02/22/2001	ASAHI OPTICAL CO LTD		(With English Abstract)
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		First Named Inventor	Jeffrey L. Adair		
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NON-PATENT LITERATURE DOCUMENTS		
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**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**  
( Not for submission under 37 CFR 1.99)

Application Number		
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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
14/941,040	11/13/2015	2482	2980	MICRO-052-065-cont	25	5

74642  
CLIFFORD H. KRAFT  
320 ROBIN HILL DR.  
NAPERVILLE, IL 60540

**CONFIRMATION NO. 2975**  
**CORRECTED FILING RECEIPT**



Date Mailed: 04/19/2017

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

**Inventor(s)**

Jeffrey L. Adair, Highlands Ranch, CO;  
Edwin Adair, Residence Not Provided, Deceased;  
Randall Adair, Denver, CO;

**Applicant(s)**

Collect LLC, Denver, CO;  
John Gregory Adair, Denver, CO, Legal Representative;

**Assignment For Published Patent Application**

Collect LLC, Denver, CO

**Power of Attorney:**

Clifford Kraft--35229

**Domestic Priority data as claimed by applicant**

This application is a CON of 14/705,334 05/06/2015 PAT 9186052  
which is a CON of 14/333,260 07/16/2014 PAT 9198565  
which is a CON of 13/732,908 01/02/2013 PAT 8885034  
which is a CON of 12/889,287 09/23/2010 ABN  
which is a CIP of 11/245,960 10/06/2005  
which is a CON of 09/929,531 08/13/2001 PAT 7030904  
which is a CIP of 09/496,312 02/01/2000 PAT 6275255  
which is a CON of 09/175,685 10/20/1998 PAT 6043839  
which is a CIP of 08/944,322 10/06/1997 PAT 5929901

**Foreign Applications** for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see <http://www.uspto.gov> for more information.) - None.

*Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.*

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The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 14/941,040**

**Projected Publication Date:** Not Applicable

**Non-Publication Request:** No

**Early Publication Request:** No

**Title**

Reduced area imaging device incorporated within endoscopic devices

**Preliminary Class**

348

**Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications:** No

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## PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **Mail** **Mail Stop ISSUE FEE**  
**Commissioner for Patents**  
**P.O. Box 1450**  
**Alexandria, Virginia 22313-1450**  
**or Fax (571)-273-2885**

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

74642 7590 02/02/2017  
**CLIFFORD H. KRAFT**  
**320 ROBIN HILL DR.**  
**NAPERVILLE, IL 60540**

## Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/941,040	11/13/2015	Jeffrey L. Adair	MICRO-052-065-cont	2975

TITLE OF INVENTION: Reduced area imaging device incorporated within endoscopic devices

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$960	\$0	\$0	\$960	05/02/2017

EXAMINER	ART UNIT	CLASS-SUBCLASS
TARKO, ASMAMAW G	2482	348-076000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
- (2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Clifford H. Kraft

2 \_\_\_\_\_

3 \_\_\_\_\_

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

**Cellect LLC**

**Denver CO**

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☒ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies \_\_\_\_\_

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed. **EFS-Web**
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☐ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number \_\_\_\_\_ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ Applicant certifying micro entity status. See 37 CFR 1.29
- ☐ Applicant asserting small entity status. See 37 CFR 1.27
- ☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature /clifford kraft/

Typed or printed name Clifford H. Kraft

Date April 21, 2017

Registration No. 35,229

## Electronic Patent Application Fee Transmittal

<b>Application Number:</b>	14941040			
<b>Filing Date:</b>	13-Nov-2015			
<b>Title of Invention:</b>	Reduced area imaging device incorporated within endoscopic devices			
<b>First Named Inventor/Applicant Name:</b>	Jeffrey L. Adair			
<b>Filer:</b>	Clifford H. Kraft			
<b>Attorney Docket Number:</b>	MICRO-052-065-cont			
Filed as Large Entity				
<b>Filing Fees for    Utility under 35 USC 111(a)</b>				
<b>Description</b>	<b>Fee Code</b>	<b>Quantity</b>	<b>Amount</b>	<b>Sub-Total in USD(\$)</b>
<b>Basic Filing:</b>				
<b>Pages:</b>				
<b>Claims:</b>				
<b>Miscellaneous-Filing:</b>				
<b>Petition:</b>				
<b>Patent-Appeals-and-Interference:</b>				
<b>Post-Allowance-and-Post-Issuance:</b>				
UTILITY APPL ISSUE FEE	1501	1	960	960

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				960



## Electronic Acknowledgement Receipt

<b>EFS ID:</b>	28997182
<b>Application Number:</b>	14941040
<b>International Application Number:</b>	
<b>Confirmation Number:</b>	2975
<b>Title of Invention:</b>	Reduced area imaging device incorporated within endoscopic devices
<b>First Named Inventor/Applicant Name:</b>	Jeffrey L. Adair
<b>Customer Number:</b>	74642
<b>Filer:</b>	Clifford H. Kraft
<b>Filer Authorized By:</b>	
<b>Attorney Docket Number:</b>	MICRO-052-065-cont
<b>Receipt Date:</b>	21-APR-2017
<b>Filing Date:</b>	13-NOV-2015
<b>Time Stamp:</b>	17:03:42
<b>Application Type:</b>	Utility under 35 USC 111(a)

### Payment information:

Submitted with Payment	yes
Payment Type	EFT
Payment was successfully received in RAM	\$960
RAM confirmation Number	042417INTEFSW17065300
Deposit Account	
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

<b>File Listing:</b>					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	PTOL-85.pdf	77885	no	1
			32c9a7b43ffac100671c961996de493845e8fad4		
<b>Warnings:</b>					
<b>Information:</b>					
2	Fee Worksheet (SB06)	fee-info.pdf	30565	no	2
			ce766d52ff179b634369c14f81bf12672ee2e26b		
<b>Warnings:</b>					
<b>Information:</b>					
<b>Total Files Size (in bytes):</b>			108450		
<p><b>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</b></p> <p><b><u>New Applications Under 35 U.S.C. 111</u></b>  If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><b><u>National Stage of an International Application under 35 U.S.C. 371</u></b>  If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><b><u>New International Application Filed with the USPTO as a Receiving Office</u></b>  If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					



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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/941,040	05/30/2017	9667896	MICRO-052-065-cont	2975

74642 7590 05/10/2017  
CLIFFORD H. KRAFT  
320 ROBIN HILL DR.  
NAPERVILLE, IL 60540

## ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

### **Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)** (application filed on or after May 29, 2000)

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site <http://pair.uspto.gov> for additional applicants):

Jeffrey L. Adair, Highlands Ranch, CO;  
Collect LLC, Denver, CO;  
Edwin Adair, Residence Not Provided, Deceased;  
John Gregory Adair, Denver, CO, Legal Representative;  
Randall Adair, Denver, CO;

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit [SelectUSA.gov](http://SelectUSA.gov).

<b>PATENT APPLICATION FEE DETERMINATION RECORD</b> Substitute for Form PTO-875	Application or Docket Number <b>14/941,040</b>	Filing Date <b>11/13/2015</b>	<input type="checkbox"/> To be Mailed
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ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

### APPLICATION AS FILED – PART I

(Column 1)

(Column 2)

FOR	NUMBER FILED	NUMBER EXTRA	RATE (\$)	FEE (\$)
<input type="checkbox"/> BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
<input type="checkbox"/> SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
<input type="checkbox"/> EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X \$ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X \$ =	
<input type="checkbox"/> APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
<input type="checkbox"/> MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

### APPLICATION AS AMENDED – PART II

(Column 1)

(Column 2)

(Column 3)

AMENDMENT	06/22/2018	CLAIMS REMAINING AFTER AMENDMENT	Minus	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	* 15	Minus	** 21	= 0	X \$100 =	0
	Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X \$460 =	0
	<input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))						
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
TOTAL ADD'L FEE						<b>0</b>	

(Column 1)

(Column 2)

(Column 3)

AMENDMENT	CLAIMS REMAINING AFTER AMENDMENT	Minus	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X \$ =
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X \$ =
	<input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))					
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					
TOTAL ADD'L FEE						

\* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

\*\* If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

\*\*\* If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

SLIE  
TONYA MCBRIDE

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.