



US009510733B2

(12) **United States Patent**
Yen et al.

(10) **Patent No.:** **US 9,510,733 B2**
(45) **Date of Patent:** **Dec. 6, 2016**

(54) **ENDOSCOPE AND A METHOD FOR CHEMICAL MODIFICATION OF THE MEMBERS THEREOF**

600/139, 141, 146; 427/2.12; 604/95.04, 604/528

See application file for complete search history.

(71) Applicant: **NATIONAL TAIWAN UNIVERSITY**, Taipei (TW)

(56) **References Cited**

(72) Inventors: **Men-Luh Yen**, Taipei (TW); **Tai-Horng Young**, Taipei (TW); **Hsu-Hsien Chang**, Taipei (TW); **Yu-Shin Wang**, Taipei (TW)

U.S. PATENT DOCUMENTS

(73) Assignee: **NATIONAL TAIWAN UNIVERSITY**, Taipei (TW)

5,993,380 A * 11/1999 Yabe A61B 1/00142
600/121
6,004,263 A * 12/1999 Nakaichi A61B 1/00165
600/120
D583,266 S * 12/2008 Wong D10/78
2005/0085692 A1 * 4/2005 Kiehn A61B 1/00105
600/130
2006/0089533 A1 * 4/2006 Ziegler A61B 1/00156
600/114
2010/0174144 A1 * 7/2010 Hsu A61B 1/00087
600/122
2012/0041268 A1 * 2/2012 Grey A61B 1/00105
600/199
2012/0178995 A1 * 7/2012 Newton, IV A61B 1/00101
600/121

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 116 days.

* cited by examiner

(21) Appl. No.: **14/084,811**

(22) Filed: **Nov. 20, 2013**

Primary Examiner — Timothy J Neal

(65) **Prior Publication Data**

US 2014/0371528 A1 Dec. 18, 2014

(74) *Attorney, Agent, or Firm* — Chun-Ming Shih

(30) **Foreign Application Priority Data**

Jun. 17, 2013 (TW) 102121438 A

(57) **ABSTRACT**

(51) **Int. Cl.**

A61B 1/04 (2006.01)
A61B 1/00 (2006.01)
A61B 1/12 (2006.01)
G02B 27/00 (2006.01)
G02B 23/24 (2006.01)

An endoscope and a method for chemical modification of the members thereof are provided, on one hand, a transparent isolation film is utilized such that the tissue fluid inside a subject cannot stick to a lens of the endoscope to maintain the optimal image capturing status of the lens of the endoscope without the need to extract the endoscope frequently from the body of the subject, such that not only the time consumed in the examination process may be reduced, but also the uncomfortable feeling of the subject in the examination process may be decreased; on the other hand, a chemical modification method for members of the endoscope is provided to reduce the negative impact on the lens of the endoscope resulted from liquid pollutant or mist, moisture.

(52) **U.S. Cl.**

CPC **A61B 1/00142** (2013.01); **A61B 1/126** (2013.01); **A61B 1/127** (2013.01); **G02B 23/2476** (2013.01); **G02B 27/0006** (2013.01); **A61B 1/0011** (2013.01)

(58) **Field of Classification Search**

USPC 600/104, 109, 114, 121–125, 153–159,

8 Claims, 7 Drawing Sheets

