



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

(10) **Patent No.:** **US 9,408,657 B2**
(45) **Date of Patent:** **Aug. 9, 2016**

(54) **CRYOGENIC TREATMENT SYSTEMS**

A61B 2018/00232; A61B 2018/00565; A61B 2018/00577; A61B 2018/00648; A61B 2018/00714; A61B 2018/00744; A61B 2018/00791; A61B 2018/00863; A61B 2018/0212; A61B 2018/0262; A61B 2017/4216; A61B 2017/4233
USPC 606/20-26
See application file for complete search history.

(71) Applicant: **Channel Medsystems, Inc.**, Emeryville, CA (US)

(72) Inventors: **Daniel R. Burnett**, San Francisco, CA (US); **Ric Cote**, Oakland, CA (US); **William W. Malecki**, Piedmont, CA (US); **Brian M. Neil**, San Francisco, CA (US); **David Beaulieu**, El Cerrito, CA (US); **Benjamin D. Voiles**, San Francisco, CA (US)

(56) **References Cited**

U.S. PATENT DOCUMENTS

(73) Assignee: **Channel Medsystems, Inc.**, Emeryville, CA (US)

2,849,002 A 8/1958 Oddo
3,398,738 A 8/1968 Lamb et al.

(Continued)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

FOREIGN PATENT DOCUMENTS

(21) Appl. No.: **14/086,050**

GB 2094636 9/1982
JP 5-168646 7/1993

(Continued)

(22) Filed: **Nov. 21, 2013**

OTHER PUBLICATIONS

(65) **Prior Publication Data**

US 2014/0074081 A1 Mar. 13, 2014

International Patent Application No. PCT/US2012/023176 filed Dec. 19, 2003 in the name of Channel Medsystems, Inc., International Search Report and Written Opinion mailed Jun. 21, 2012.

Related U.S. Application Data

Primary Examiner — Daniel Fowler

(63) Continuation of application No. 13/900,916, filed on May 23, 2013, which is a continuation-in-part of application No. 13/361,779, filed on Jan. 30, 2012.

(74) *Attorney, Agent, or Firm* — Levine Bagade Han LLP

(60) Provisional application No. 61/462,328, filed on Feb. 1, 2011, provisional application No. 61/571,123, filed on Jun. 22, 2011.

(57) **ABSTRACT**

(51) **Int. Cl.**
A61B 18/02 (2006.01)
A61B 18/04 (2006.01)
(Continued)

Methods and apparatus for the treatment of a body cavity or lumen are described where a heated fluid and/or gas may be introduced through a catheter and into treatment area within the body contained between one or more inflatable/expandable members. The catheter may also have optional pressure and temperature sensing elements which may allow for control of the pressure and temperature within the treatment zone and also prevent the pressure from exceeding a pressure of the inflatable/expandable members to thereby contain the treatment area between these inflatable/expandable members. Optionally, a chilled, room temperature, or warmed fluid such as water may then be used to rapidly terminate the treatment session.

(52) **U.S. Cl.**
CPC **A61B 18/0218** (2013.01); **A61B 5/01** (2013.01); **A61B 5/4836** (2013.01);
(Continued)

(58) **Field of Classification Search**
CPC A61B 18/02; A61B 2018/00166;

28 Claims, 74 Drawing Sheets

