



US009731087B2

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

(10) **Patent No.:** **US 9,731,087 B2**
(45) **Date of Patent:** ***Aug. 15, 2017**

(54) **DOSE COUNTER FOR INHALER HAVING A BORE AND SHAFT ARRANGEMENT**

(71) Applicants: **IVAX PHARMACEUTICALS IRELAND**, Waterford (IE); **NORTON (WATERFORD) LIMITED**, Waterford (IE); **TEVA PHARMACEUTICALS IRELAND**, Waterford (IE)

(72) Inventors: **Declan Walsh**, County Kilkenny (IE); **Derek Fenlon**, County Wexford (IE); **Simon Kaar**, County Cork (IE); **Jan Geert Hazenberg**, County Kilkenny (IE); **Daniel Buck**, County Waterford (IE); **Paul Clancy**, Waterford City (IE); **Robert Charles Uschold**, Leominster, MA (US); **Jeffrey A. Karg**, Hopkinton, MA (US)

(73) Assignees: **IVAX PHARMACEUTICALS IRELAND (IE)**; **TEVA PHARMACEUTICALS IRELAND (IE)**; **NORTON (WATERFORD) LIMITED (IE)**

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

(21) Appl. No.: **14/699,578**

(22) Filed: **Apr. 29, 2015**

(65) **Prior Publication Data**
US 2015/0238715 A1 Aug. 27, 2015

Related U.S. Application Data

(60) Continuation of application No. 14/103,353, filed on Dec. 11, 2013, which is a division of application No. (Continued)

(51) **Int. Cl.**
G06M 1/06 (2006.01)
A61M 11/00 (2006.01)

(Continued)

(52) **U.S. Cl.**
CPC **A61M 15/0078** (2014.02); **A61M 11/00** (2013.01); **A61M 15/009** (2013.01); (Continued)

(58) **Field of Classification Search**
USPC 235/8, 103, 87 R; 128/200.23, 200.1
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,174,890 A 11/1979 Johnson
4,669,838 A 6/1987 Hibbard
(Continued)

FOREIGN PATENT DOCUMENTS

CA 2501726 9/2006
EP 1330280 7/2003
(Continued)

OTHER PUBLICATIONS

Entire patent prosecution history of U.S. Appl. No. 14/699,567, filed Apr. 29, 2015, entitled, "Dose Counter for Inhaler and Method for Counting Doses."

(Continued)

Primary Examiner — Daniel Hess

(74) *Attorney, Agent, or Firm* — Morgan, Lewis & Bockius LLP

(57) **ABSTRACT**

A dose counter for an inhaler, the dose counter having a display tape arranged to be incrementally driven from a tape stock bobbin onto an incremental tape take-up drive shaft, the bobbin having an internal bore supported by and for rotation about a support shaft, at least one of the bore and support shaft having a protrusion which is resiliently biased

(Continued)

