



US007975690B2

(12) **United States Patent**
Djupesland

(10) **Patent No.:** **US 7,975,690 B2**
(45) **Date of Patent:** **Jul. 12, 2011**

(54) **NASAL DEVICES**

(75) Inventor: **Per Gisle Djupesland**, Oslo (NO)

(73) Assignee: **OptiNose AS**, Oslo (NO)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 1296 days.

(21) Appl. No.: **10/480,582**

(22) PCT Filed: **Jun. 12, 2002**

(86) PCT No.: **PCT/IB02/03034**

§ 371 (c)(1),

(2), (4) Date: **Sep. 23, 2004**

(87) PCT Pub. No.: **WO03/000310**

PCT Pub. Date: **Jan. 3, 2003**

(65) **Prior Publication Data**

US 2005/0072430 A1 Apr. 7, 2005

(30) **Foreign Application Priority Data**

Jun. 12, 2001 (GB) 0114272.8

(51) **Int. Cl.**

A61M 15/00 (2006.01)

A61M 15/08 (2006.01)

A61M 16/00 (2006.01)

A61M 31/00 (2006.01)

A61M 13/00 (2006.01)

A61M 5/28 (2006.01)

A61M 1/00 (2006.01)

(52) **U.S. Cl.** **128/203.22; 128/203.12; 128/203.15; 128/200.26; 128/207.18; 128/203.18; 128/200.13;**

128/203.23; 128/203.24; 128/202.22; 128/204.11; 128/204.12; 604/275; 604/58; 604/206; 604/28

(58) **Field of Classification Search** 128/203.12, 128/203.22, 203.15, 200.26, 207.18, 203.18, 128/200.13, 203.23, 203.24, 202.22, 204.11, 128/204.12; 604/275, 58, 206, 28
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,269,296 A * 12/1993 Landis 128/207.18
5,666,948 A 9/1997 Matson
5,687,715 A * 11/1997 Landis et al. 128/207.18
5,687,746 A * 11/1997 Rose et al. 131/273
6,076,520 A 6/2000 Cooper
6,269,810 B1 * 8/2001 Brooker et al. 128/203.12

(Continued)

FOREIGN PATENT DOCUMENTS

EP 0 658 356 6/1995

(Continued)

OTHER PUBLICATIONS

U.S. Appl. No. 11/816,984, filed Aug. 23, 2007, Djupesland.

(Continued)

Primary Examiner — Patricia M Bianco

Assistant Examiner — Nihir Patel

(74) *Attorney, Agent, or Firm* — Proskauer Rose LLP; Kristin H. Neuman, Esq.; Isaac A. Hubner

(57) **ABSTRACT**

The present invention relates to a nasal delivery device for and a method of delivering a substance, in particular one of a liquid, as a suspension or solution, or a powder containing a medicament, especially systemic or topical pharmaceuticals, or a vaccine to the nasal airway of a subject.

132 Claims, 36 Drawing Sheets

