



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

(10) **Patent No.:** **US 9,408,366 B2**  
(45) **Date of Patent:** **Aug. 9, 2016**

(54) **MILKING DEVICE**

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(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 277 days.

(21) Appl. No.: **13/980,283**

(22) PCT Filed: **Jan. 19, 2012**

(86) PCT No.: **PCT/NL2012/050030**  
§ 371 (c)(1),  
(2), (4) Date: **Sep. 30, 2013**

(87) PCT Pub. No.: **WO2012/099470**  
PCT Pub. Date: **Jul. 26, 2012**

(65) **Prior Publication Data**  
US 2014/0373786 A1 Dec. 25, 2014

**Related U.S. Application Data**  
(60) Provisional application No. 61/434,939, filed on Jan. 21, 2011.

(30) **Foreign Application Priority Data**  
Jan. 21, 2011 (NL) ..... 2006046

(51) **Int. Cl.**  
**A01J 5/04** (2006.01)  
**A01J 9/00** (2006.01)

(52) **U.S. Cl.**  
CPC .. **A01J 5/047** (2013.01); **A01J 5/04** (2013.01);  
**A01J 5/041** (2013.01); **A01J 5/044** (2013.01);  
**A01J 9/00** (2013.01)

(58) **Field of Classification Search**

CPC ..... **A01J 5/00**; **A01J 5/04**; **A01J 5/041**;  
**A01J 5/042**; **A01J 5/044**; **A01J 5/047**; **A01J 5/10**  
USPC ..... **119/14.01**, **14.02**, **14.24**, **14.25**, **14.27**,  
**119/14.29**, **14.3**, **14.32**, **14.34**, **14.35**, **14.36**,  
**119/14.37**, **14.43**, **14.46**, **14.54**, **14.55**  
IPC ..... **A01J 5/00**, **5/04**, **5/10**  
See application file for complete search history.

(56) **References Cited**

**U.S. PATENT DOCUMENTS**

2,887,986 A 5/1956 Golemon  
2,836,148 A \* 5/1958 Eades ..... 119/14.08  
(Continued)

**FOREIGN PATENT DOCUMENTS**

CN 2340184 Y 9/1999  
CN 1241008 C 12/2000  
(Continued)

**OTHER PUBLICATIONS**

C. T. Rodgers, "Practical aspects of milk collection in the rat" *Laboratory Animals* (1995) 29, 450-455.\*  
(Continued)

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(57) **ABSTRACT**

A milking device includes a vessel and cover plate. The vessel and the cover plate form a sealed volume that is internally divided into a collecting chamber, a vacuum chamber and an air intake chamber. The collecting chamber is arranged between the vacuum chamber and the air intake chamber. The vessel has a first internal wall that separates the collecting chamber from the air intake chamber, with a first passage between the collecting chamber and the air intake chamber arranged at the first internal wall. The vessel has a second internal wall that separates the collecting chamber from the vacuum chamber, with a second passage between the collecting chamber and the vacuum chamber arranged at the second internal wall.

**17 Claims, 6 Drawing Sheets**

