



US010549007B2

(12) **United States Patent**
Kirschman

(10) **Patent No.:** **US 10,549,007 B2**

(45) **Date of Patent:** ***Feb. 4, 2020**

(54) **FLUID STERILIZATION SYSTEM**

(56) **References Cited**

(71) Applicant: **David Louis Kirschman**, Dayton, OH (US)

U.S. PATENT DOCUMENTS

(72) Inventor: **David Louis Kirschman**, Dayton, OH (US)

3,683,638 A 8/1972 Devon
3,744,216 A 7/1973 Halloran
(Continued)

(73) Assignee: **Aerobiotix, Inc.**, Miamisburg, OH (US)

FOREIGN PATENT DOCUMENTS

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 558 days.

DE 19614893 10/1997
EP 1491218 12/2004
WO 0160419 8/2001

This patent is subject to a terminal disclaimer.

OTHER PUBLICATIONS

(21) Appl. No.: **15/164,109**

Ace Glass Inc., "What is the difference between borosilicate glass and quartz?", Original Jul. 2, 2007 Updated Dec. 20, 2016, all pages https://web.archive.org/web/20190708182936/https://www.aceglass.com/dpro/kb_article.php?ref=1326-OSCV-6189 (Year: 2007).*

(22) Filed: **May 25, 2016**

(Continued)

(65) **Prior Publication Data**

US 2016/0263267 A1 Sep. 15, 2016

Primary Examiner — Amber R Orlando

Assistant Examiner — Brit E. Anbacht

(74) *Attorney, Agent, or Firm* — Jacox, Meckstroth & Jenkins

Related U.S. Application Data

(63) Continuation of application No. 13/838,367, filed on Mar. 15, 2013, now Pat. No. 9,457,119.
(Continued)

(57) **ABSTRACT**

A fluid filtration system is shown. The fluid filtration system utilizes a one-piece or multiple piece containers having a plurality of radiation-transmissible media adapted to receive light, such as ultraviolet light, white light or other wavelength light. The radiation-transmissible media are situated in the container and at least one or a plurality of radiation sources, such as ultraviolet lamps, are situated in an array in proximity to the radiation-transmissible media. The radiation-transmissible media interrupts the flow and velocity of the fluid stream passing through the container to extend the duration of radiation for any contaminants and also provide enlarged surface areas for the contaminants to be received and ultimately exposed to the radiation. In one example, the radiation-transmissible media may be tubular or spherical sections that are hollow or solid and made of quartz.

(51) **Int. Cl.**
A61L 2/08 (2006.01)
A61L 2/26 (2006.01)

(Continued)

(52) **U.S. Cl.**
CPC **A61L 9/20** (2013.01); **A61L 2/087** (2013.01); **A61L 2/26** (2013.01); **B01D 46/0028** (2013.01)

(58) **Field of Classification Search**
None
See application file for complete search history.

37 Claims, 12 Drawing Sheets

