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Jiang et al.

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(54) **MULTI-CHECKPOINT TYPE CLUSTERED FRUIT FLY COUNTING DEVICE**

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See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,698,208 A * 12/1997 Nigg et al. 424/84
6,493,363 B1 * 12/2002 Weaver et al. 370/539
6,653,971 B1 * 11/2003 Guice et al. 342/27
7,516,572 B2 * 4/2009 Yang et al. 43/114
2006/0086039 A1 * 4/2006 Israely et al. 43/132.1

FOREIGN PATENT DOCUMENTS

JP 11155458 A * 6/1999

* cited by examiner

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(57) **ABSTRACT**

A multi-checkpoint type clustered animal counting device is proposed, which is capable of providing a counting function that can be used for statistically determining the number of animals (such as fruit flies) within a region such as farmland or garden. The proposed animal counting device is characterized by the utilized to at least two object sensors, wherein the first object sensor is disposed at a first checkpoint while the second object sensor is disposed at a second checkpoint, and wherein the first object sensor is initially set to power-on state while the second object sensor is initially set to power-off state and can be switched on only when the first object sensor is triggered. When the second object sensor is triggered, the counting operation will increase the output count number by one. This feature allows a more accurate result and can help save power consumption.

22 Claims, 5 Drawing Sheets

