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# (12) United States Patent Barney et al.

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### (54) DRY POWDER INHALATION APPARATUS

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(\*) Notice: Subject to any disclaimer, the term of this

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This patent is subject to a terminal dis-

claimer.

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#### Related U.S. Application Data

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#### (56) References Cited

#### U.S. PATENT DOCUMENTS

#### FOREIGN PATENT DOCUMENTS

AU 2001270112 B2 6/2000 WO 9405359 3/1994 WO 9405360 3/1994

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#### (57) ABSTRACT

A dry powder inhalation apparatus includes a housing, a reservoir for medicament located within the housing, a mouthpiece disposed on the housing for insertion in the mouth of a user for inhalation of a predetermined dose of medicament, a delivery channel between a discharge outlet of the reservoir and the mouthpiece for delivering the predetermined dose of medicament, a device positioned within the housing and normally held adjacent the reservoir for receiving the predetermined dose of medicament from the discharge outlet and transferring it to the delivery channel, and a release mechanism adapted to release the device and permit controlled movement thereof to the delivery channel for the delivery, the release mechanism being located at least partially outside of the housing for manual operation by the user.

#### 4 Claims, 12 Drawing Sheets

