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Therefore, this

United States Patent

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David J. Kypos

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(54) BIO TURBO TECHNOLOGY OF REMOVING ETHYLENE GAS

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- (*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35

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(56) References Cited

U.S. PATENT DOCUMENTS

788,557			Sahlstrom 422/186.18
935,457	A *	9/1909	Bridge 422/186.18
5,430,228	A *	7/1995	Ciambrone et al 588/320
6,358,374	B1 *	3/2002	Obee et al 204/157.3
7,407,624	B2 *	8/2008	Cumberland et al 422/28
2004/0120845	A1*	6/2004	Potember et al 422/4
2005/0089458	A1*	4/2005	Oke 422/207
2010/0158749	AI*	6/2010	Benedek et al 422/4
2010/0296966	AI*	11/2010	Bae et al 422/4

FOREIGN PATENT DOCUMENTS

JP	58183928 A	*	10/1983
JP	01300184 A	*	12/1989
JP	2001162116 A	*	6/2001

OTHER PUBLICATIONS

JP 58-183928, English Abstract, 1983.* JP 2001-162116, English translation, 2001.*

* cited by examiner

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(57) ABSTRACT

The present invention provides with a method of purifying air with significant content of ethylene gas. Bacteria, pathogens, molds, fungus and ethylene gas are removed by using ozone and air filtration technology. This process is useful for storages and production facilities where ethylene might be harmful for perishable products.

5 Claims, 1 Drawing Sheet



