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# United States Patent [19]

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Carns et al.

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[54] RECOVERY OF AROMA GASES

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[\*] Notice: The portion of the term of this patent subsequent to Feb. 2, 2010 has been disclaimed.

### [57] ABSTRACT

[21] Appl. No.: **81,879**

Coffee aroma gases are conveyed to a cryogenic collector in which liquid nitrogen is sprayed directly into the aroma gas stream to rapidly condense the aroma gas and form finely divided particles of coffee aroma frost suspended in a stream of nitrogen gas, while minimizing contact of the cooled gas with the walls of the collector. The suspension of aroma frost particles in gaseous nitrogen is passed through a tubular porous filter to remove the aroma frost particles which collect on the outer surface of the tubular filter, with the nitrogen gas passing through the porous filter and being exhausted from the collector. The porous filter is periodically back pulsed to dislodge aroma frost particles collected on the outer surface of the tubular filter, with the particles being recovered for incorporation in soluble coffee products. Condensation of aroma components present in the aroma gas may be carried out in several stages to effect fractionation of the aroma gas.

[22] Filed: **Jun. 25, 1993**

### Related U.S. Application Data

[60] Continuation-in-part of Ser. No. 980,025, Nov. 23, 1992, Pat. No. 5,222,364, which is a division of Ser. No. 760,662, Sep. 16, 1991, Pat. No. 5,182,926.

[51] Int. Cl.<sup>5</sup> ..... **A23F 1/08**

[52] U.S. Cl. .... **62/352; 62/12; 426/478**

[58] Field of Search ..... **62/8, 12, 15, 352, 353, 62/354, 358, 359; 426/478, 486**

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8 Claims, 4 Drawing Sheets

