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**Dell'Orfano**

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(54) **BATCH THERMOLYTIC DISTILLATION OF CARBONACEOUS MATERIAL**

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(\* ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 630 days.

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**C10B 1/00** (2006.01)

(52) **U.S. Cl.** ..... **202/219; 202/262; 202/117; 202/118; 202/119; 202/103; 202/108; 422/268; 422/269; 422/270; 422/271**

(58) **Field of Classification Search** ..... **202/219, 202/262, 117, 118, 119, 103, 108; 198/705, 198/706, 710, 712, 725, 804; 422/268-271, 422/301; 48/92; 201/10, 11**

See application file for complete search history.

(56) **References Cited**

**U.S. PATENT DOCUMENTS**

4,508,564 A *	4/1985	Kennedy	75/403
4,614,752 A *	9/1986	Fuchs et al.	521/44.5
4,925,532 A *	5/1990	Meuser et al.	202/219
5,449,438 A *	9/1995	Jagau et al.	201/10
5,852,062 A *	12/1998	Carpenter	521/41
6,051,110 A *	4/2000	Dell'Orfano et al.	202/219
6,346,221 B1 *	2/2002	Wagner	422/184.1

\* cited by examiner

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(57) **ABSTRACT**

A distillation system is provided for batch thermolytic distillation of lump carbonaceous material, such as lump wood and shredded rubber tires. The system preferably includes multiple distillation units mounted side-by-side. Each unit includes a reactor bath for holding molten tin at approximately 455° C., a two-compartment reservoir for storing molten tin, and a porous basket pivotally mounted within the reactor bath for tipping motion. A process for batch thermolytic distillation of lump carbonaceous material includes rotating the porous basket into a reactor bath by rotating the basket about an axis passing through the reactor bath; putting a charge of wood into the basket; closing a retractable lid onto the reactor bath; filling the reactor bath with molten material to produce gas and char by thermolytic conversion of the charge, draining the reactor bath of molten material while the lid is closed; quenching the char in the reactor bath with steam; opening the lid; and tipping the char from the basket.

**30 Claims, 8 Drawing Sheets**

