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**Bowers et al.**

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(54) **METHOD FOR REMOVING PHOSPHORUS FROM WASTE LAGOON EFFLUENT**

(75) Inventors: **Keith E. Bowers**, Seattle, WA (US);  
**Philip W. Westerman**, Raleigh, NC (US)

(73) Assignee: **North Carolina State University**, Raleigh, NC (US)

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(52) **U.S. Cl.** ..... **210/715**; 210/717; 210/724; 210/906

(58) **Field of Classification Search** ..... 210/715  
See application file for complete search history.

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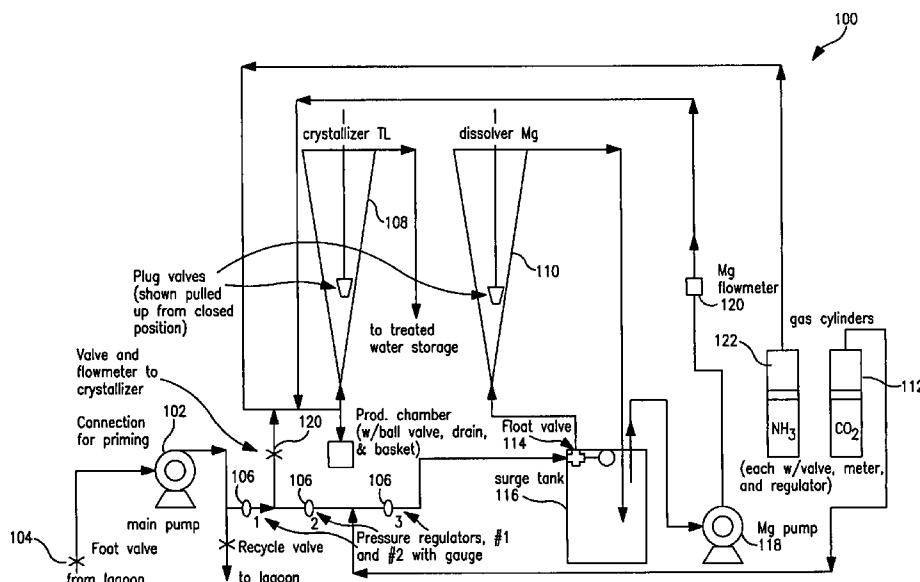
*Primary Examiner*—Peter A. Hruskoci

(74) *Attorney, Agent, or Firm*—Jenkins, Wilson & Taylor, P.A.

(57) **ABSTRACT**

An apparatus and method for removing phosphorus from a wastewater effluent stream from a hog waste lagoon. The wastewater effluent is introduced to the bottom of an inverted cone-shaped continuous crystallizer including a fluidized bed of struvite therein. An effective amount of ammonia is introduced to the wastewater effluent at the bottom of the crystallizer to elevate the pH of wastewater effluent a predetermined amount. An effective amount of magnesium is also introduced to the wastewater effluent at the bottom of the crystallizer. The composition adjusted wastewater effluent is then continuously passed upwardly through the fluidized bed of struvite to reduce the total phosphorus content of the wastewater effluent a predetermined amount of up to about 80% or more. The treated wastewater effluent stream is removed from the top of the crystallizer, and struvite crystals that grow large enough to sink from the bottom of the crystallizer are periodically removed from a collection chamber therebeneath.

**8 Claims, 27 Drawing Sheets**



Schematic Representation of Field-Scale Crystallizer, Showing Principal Components