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(54) Title: METHOD AND APPARATUS FOR WASTEWATER TREATMENT USING EXTERNAL SELECTION

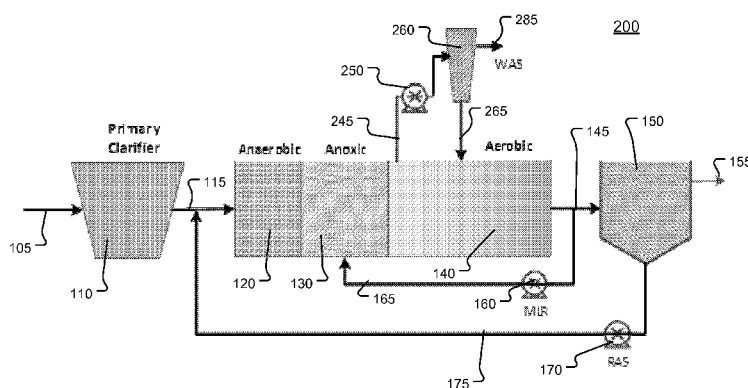


FIG. 2

(57) Abstract: A method and an apparatus for biological wastewater treatment that includes a biological selector and a physical selector. The apparatus comprises an internal biological reactor where wastewater and recycled biomass are combined to provide a high substrate and high electron acceptor gradient for generating morphological biomass features that favor granule formation over floc and filament formation, and an external gravimetric or external screen selector operating on the biomass waste stream for collecting and retaining densified biomass aggregates including dense granule selection and for wasting lighter filaments and flocs. In the method and apparatus, particles may be added to provide cores to promote the formation of aggregates encapsulating the seeded particles. The particles may be added as various materials, for example, in the bioreactor, to initiate or seed the formation of a granule, that could then be separated by or integrated with either the external gravimetric or external screen selector. Further, organisms may be selected for biological phosphorus removal, denitrifying methane oxidizers, biological sulfur or sulfide oxidation, methanogenesis.



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