# METHOD AND APPARATUS FOR MIXING

## ABSTRACT

An apparatus and method for mixing a liquid having particulate includes a vessel for containing the liquid and an axial impeller rotating about a substantially vertical axis. The impeller is adapted for submerging below the liquid surface by a distance approximately one- quarter to one-half of the height of the liquid. The impeller is oriented upwardly to produce (a) an inner, upward flow region located along the vertical axis of the vessel, (b) a transition flow region above the impeller in which liquid moves radially outwardly toward the vessel sidewall, and (c) an outer, downward flow region located along the sidewall. The impeller spins at a variable speed, such that the flow is capable of entraining solid particles having a settling velocity of up to approximately 1 foot per minute in the liquid, and the speed of the impeller is chosen to enable particles having a desired settling velocity to settle to the vessel bottom.

**FIGURE 1**