

ABSTRACT

FLUIDIC DEVICE AND METHOD FOR SEPARATION OF NEUTRALLY BUOYANT PARTICLES

A technique using a curved channel of a spiral device to introduce a centrifugal force upon neutrally buoyant particles flowing in a fluid, e.g. water, to facilitate improved separation of such particles from the fluid is provided. As these neutrally buoyant particles flow through the channel, a tubular pinch effect causes the particles to flow in a tubular band. The introduced centrifugal force perturbs the tubular band (e.g. forces the tubular band to flow in a manner offset from a center of the channel), resulting in an asymmetric inertial migration of the band toward the inner wall of the channel. This allows for focusing and compaction of suspended particulates into a narrow band for extraction. The separation principle contemplated herein implements a balance of the centrifugal and fluidic forces to achieve asymmetric inertial equilibrium near the inner sidewall.

Figure 1