CLAIMS

1. ~~1.~~ A method for separating particles according to their sizes via a cambered hydrofoil, wherein said hydrofoil is asymmetric about a chord line connecting a leading edge (le) and a trailing edge (te) of the hydrofoil,

~~-~~characterized in that it comprises the steps of~~,~~

forwarding particles to the cambered hydrofoil~~,~~ on a streamline

(i) coincident with a~~the~~ main axis (4) parallel to a~~passing through the leading edge (le) having an attack angle of a with the chordline.~~

~~2. A method according to claim 1 where said cambered hydrofoil is asymmetric about the chord line connecting the leading edge and the trailing edge of the hydrofoil making non zero attack angle with the main axis which is the axis parallel to the~~ stream and passing through the leading edge (le) of the hydrofoil; ~~,~~

(ii) said leading edge having an attack angle of α with the chord line.

2. ~~3.~~ A method for enhancing the separation of two particle-carrying parallel streamlines where one streamline is above the main axis of the cambered hydrofoil and the other streamline being below the main axis of cambered hydrofoil and there is a distance (a) between the streamlines at the upstream of the cambered hydrofoil, which is less than the projected height (h) of the cambered hydrofoil,

characterized in that

forwarding two particle-carrying parallel streamlines to meet the cambered hydrofoil, then since the particles past the cambered hydrofoil cannot drift into the vortex region (8) formed at the downstream of the flow separation point (7) on the cambered hydrofoil, distance between streamlines (d) at the close proximity at the downstream of the vortex region will be greater than distance (a).

4. ~~3.~~ A method for increasing the ~~resolution of~~ separation extent (R) ~~according to below formula~~

~~$$R = 1.18 \frac{d_{p2} - d_{p1}}{w_{0.5\delta 1} - w_{0.5\delta 2}}$$~~

of two distributions of two different sized particles coinciding at the main axis according to below formula

$$R = 1.18 \frac{d_{p,2} - d_{p,1}}{w_{0.5h,1} - w_{0.5h,2}}$$

where, $d_{p,2}$ is the location of the peak of smaller or larger particles along the channel width, $d_{p,1}$ is the location of the peak of larger or smaller particles along the channel width, $w_{0.5h,1}$ is the width of the distribution of larger or smaller particles at half height of its distribution peak, and $w_{0.5h,2}$ is the width of the distribution of smaller or larger particles at half height of its distribution peak, where one distribution peak is above the main axis of the cambered hydrofoil and the other distribution peak is below the main axis of cambered hydrofoil,

characterized in that it comprises the steps of

forwarding a flow having ~~said~~ two particle distributions to a ~~cambered hydrofoil then since the particles in the distributions past the~~ cambered hydrofoil, forming larger velocity ~~cannot drift into the vortex-region (8) formed at the downstream of the flow separation point (7)~~ on one side of the asymmetric hydrofoil, and smaller velocity on the other side of the asymmetric ~~the cambered~~ hydrofoil,

the particles on the streamlines above the main axis follow a path through the upper side of the cambered hydrofoil, and the particles on the streamlines below the main axis follow a path through the lower side of the cambered hydrofoil, wherein the particles are free from drift into a vortex-region (8) formed downstream of a flow separation point (7) on the cambered hydrofoil, ~~hydrofoil,~~

wherein the ~~the particles on the streamlines below the main axis follow a path through the lower side of the hydrofoil, and~~

particles on the streamline coincident with the main axis follow a path such that larger particles on the streamline tend to flow through a side of the cambered hydrofoil with smaller average velocity and smaller particles flow through the side of the cambered hydrofoil with larger average velocity.

4. ~~5.~~ A method for preventing mixing of different sized particles, resolution of which is ~~are~~ already ~~separated or enhanced or resolution is~~ increased according to Claim 2 ~~claims 1 or 3 or 4~~, by the ~~cambered~~ a hydrofoil,

characterized in that it comprises the steps of forming ~~via~~ a separation wall (13), ~~)~~ which divides the stream into two distinct streams, and is located downstream of the asymmetric

hydrofoil behind a vortex region, formed behind the flow separation point of the cambered hydrofoil, wherein the separation wall (13) tip (T) is located at the downstream end of the vortex region (8), and

forwarding the streamlines comprising larger particles and the streamlines comprising smaller particles to the separation wall, which divides them into two distinct streams.

~~characterized in that, the separation wall (13) tip (T) is located right at the downstream end of vortex region (8) formed at the downstream of the flow separation point (7) on a cambered hydrofoil~~

5. ~~6.~~ A device for preventing mixing of separated different sized particles for implementing the~~using~~ method according to Claim 3,~~5~~ comprising

an~~one~~ upstream channel for situating therein ~~, two downstream channels, separation wall (13) between these two downstream channels, and the separation wall tip (T) is located right at the downstream end of the vortex region formed at the downstream of the flow separation point on a cambered hydrofoil,~~

~~wherein~~ streamlines carrying different sized particles ~~at the upstream channel~~ with distance (a) in between, such that one streamline is above and the other is below the main axis, ~~are separated at the hydrofoil and directed to the downstream channels such that different sized particles can be collected separately.~~

a cambered hydrofoil located in the upstream channel,

two downstream channels located behind the asymmetric hydrofoil, and

a separation wall (13) between these two downstream channels,

wherein said separation wall (13) has a separation wall tip (T) located at the downstream end of the vortex region. ~~7. The device of Claim 6 further comprising one inlet (20) operative to receive fluid containing particles and two outlets (22) operative to deliver fluid containing particles, wherein the upstream channel is in form of a spiral (21).~~