CLAIMS

WE CLAIM:

1. An apparatus for suspending air bubbles in a fluid path of a fluid injector system, the apparatus comprising:

a housing;

an internal chamber having a curved interior wall defined within the housing;

an inlet fluid pathway in fluid communication with the internal chamber, the inlet fluid pathway extending into the chamber at a tangent to the curved interior wall; and

an outlet fluid pathway in fluid communication with the internal chamber, the outlet fluid pathway spaced from the inlet fluid pathway such that fluid flowing into the internal chamber via the inlet fluid pathway is directed away from the outlet fluid pathway,

wherein the internal chamber is configured to create an internal fluid vortex in an injection fluid entering the internal chamber from the inlet fluid pathway, and wherein the internal fluid vortex at least temporarily suspends one or more air bubbles in the fluid in the internal vortex and delays the passage of the one or more air bubbles to the outlet fluid pathway.

2. The apparatus according to claim 1, wherein the outlet fluid pathway extends from the internal chamber in a direction perpendicular to a flow path of fluid within the internal chamber.

3. The apparatus according to claim 1 or 2, wherein at least a portion of the outlet fluid pathway has a cross-sectional area greater than a cross-sectional area of the inlet fluid pathway to reduce fluid velocity in the outlet fluid pathway relative to fluid velocity in the inlet fluid pathway.

4. The apparatus according to any of claims 1-3, wherein the outlet fluid pathway extends substantially parallel to the inlet fluid pathway.

5. The apparatus according to any of claims 1-4, wherein the internal chamber is at least partly spherical or hemispherical.

6. The apparatus according to any of claims 1-5, further comprising a recess extending radially outward from the internal chamber.

7. The apparatus according to any of claims 1-6, further comprising a valve in fluid communication with the internal chamber for draining air accumulated in the internal chamber.

8. The apparatus according to any of claims 1-7, wherein the housing comprises:

a first housing section comprising the inlet fluid pathway and the outlet fluid pathway; and

a second housing section comprising at least a portion of the internal chamber,

wherein one of the first housing section and the second housing section comprises a flange for receiving the other of the first housing section and the second housing section.

9. The apparatus according to any of claims 1-8, wherein the housing comprises at least one strengthening rib extending radially outward from the outlet fluid pathway.

10. The apparatus according to any of claims 1-9, further comprising a screen disposed in the outlet fluid pathway such that fluid flowing out of the internal chamber passes through the screen.

11. The apparatus according to any of claims 1-10, wherein the housing comprises a light-transmissible material configured to illuminate air bubbles in the internal chamber.

12. The apparatus according to any of claims 1-11, wherein the housing comprises a connector arm configured for attachment to an injector housing of the fluid injector system.

13. The apparatus according to any of claims 1-12, further comprising an adjustable valve for changing a cross-sectional area of at least one of the inlet fluid pathway and the outlet fluid pathway.