CLAIMS

1. A system for analysing a plurality of liquid samples comprising particles, the system comprising:

a plurality of sample chambers, a detection chamber and a coupling mechanism operable to rotate the sample chambers to place a sample chamber of the plurality of sample chambers into a coupled configuration with the detection chamber such that, in the coupled configuration, there is an optical path between said sample chamber and the detection chamber:

wherein each sample chamber comprises:

a sample space for receiving a sample of the plurality of liquid samples;

a light input for input of light into the sample chamber for interaction with the sample; and

an exit aperture arranged for the light to pass from the sample chamber via the optical path to the detection chamber when said sample chamber is in the coupled configuration with the detection chamber;

and the detection chamber comprises:

an input aperture for receiving light from the optical path when the sample chamber is in the coupled configuration with the detection chamber.

and a detector for detecting, or a detector aperture for receiving, light to be detected;

wherein said sample chamber and the detection chamber comprise at least one light integrating volume, and wherein the sample chamber is configured such that in operation the liquid sample is present in the sample chamber and isolated from the detection chamber.

2. A system as claimed in claim 1, wherein the coupling mechanism is operable to sequentially place each sample chamber into the coupling configuration with the detection chamber.

3. A system as claimed in claims 1 or 2, wherein the coupling mechanism comprises a carousel mechanism.

4. A system as claimed in any of claims 1 to 3, further comprising a driving arrangement arranged to drive the coupling mechanism, optionally, wherein the driving arrangement comprises mechanical or electro-mechanical means.

5. A system as claimed in any preceding claim, wherein at least one of a) or b):

a) the sample chamber further comprises a light beam exit port aligned with the light input and optionally leading to a beam dump;

b) the light input comprises a light input aperture.

6. A system according to any preceding claim, wherein walls of the sample chamber are reflective.

7. A system according to any preceding claim, wherein the light input and the exit aperture are arranged such that, in operation, at least some, optionally substantially all, of the light from the light input is reflected and/or scattered at least once before passing through the exit aperture.

8. A system according to any preceding claim, wherein walls of the detection chamber are reflective such that in operation at least some, optionally substantially all, of the light entering via the optical path undergoes at least one reflection before detection by the detector.

9. A system according to any preceding claim, wherein the walls of the sample chamber and/or the detection chamber comprise at least one of:

(i) a reflective material, optionally titanium oxide, aluminium, or silver;

(ii) a diffusive coating configured to produce diffuse light.

10. A system according to any preceding claim, wherein the detector comprises a light receiving element.

11. A system according to claim 10, wherein the arrangement of the optical path and the detection chamber defines an optical axis from the input aperture to a point or region on a wall of the detection chamber opposing the input aperture, and the light receiving element of the detector is located in an off-axis position with respect to said optical axis.

12. A method of using a system according to Claim 1 to detect particles in a liquid sample, comprising:

inputting light into one of the plurality of sample chambers for interaction with a sample, wherein said one of the plurality of sample chambers is or comprises or forms part of an integrating volume that directs substantially all light scattered by the sample to the detection chamber; and

detecting light received in the detection chamber from the sample chamber to obtain a measurement representative of the presence and/or quantity of particles in the liquid sample,

the method further comprising rotating the sample chamber to place the sample chamber into a coupled configuration with the detection chamber such that, in the coupled configuration, there is an optical path between the sample chamber and the detection chamber.

13. A method according to claim 12, comprising performing repeating the inputting of light and obtaining of a measurement at a plurality of different times thereby to determine a variation in a property of particles in the sample as a function of time and/or as a function of treatment of the sample.

14. A method according to claim 12 or claim 13, wherein at least one of a) or b):

a) the particles comprise micro-organisms;

b) the sample comprises at least one of blood, blood plasma, urine, water, bacterial growth fluid, cerebrospinal fluid (CSF), pus, or joint aspirate.