Claims

1. A method for processing a liquid sample (3) situated in a receptacle (2), wherein an attachment device having at least one fluid line (4) is placed on and attached to the receptacle (2) such that the least one fluid line (4) protrudes into the liquid sample (3) and a fluid is directly dispensed into the liquid sample (3) through the fluid line (4) and/or a portion of the liquid sample (3) is aspirated into the fluid line (4) characterized in that the dispensed fluid is a previously aspirated portion of the liquid sample (3) and/or in that the dispensed fluid is a gas previously aspirated from the liquid sample (3).

2. The method as claimed in claim 1, in that
   a. the aspiration and dispensing is carried out multiple times in succession in order to mix the liquid sample (3) and/or in that
   b. the aspiration and dispensing is carried out alternately in order to mix the liquid sample (3).

3. The method as claimed in claim 2, characterized in that the quantity of the aspirated liquid sample (3) is between 5% and 30% of the total quantity of the liquid sample (3) and the operation of aspiration and dispensing is repeated at least 3 times.

4. The method as claimed in any of claims 1 to 3, characterized in that
   a. a gas bubble (10) is generated, with a gas bubble diameter being increased and reduced in order to mix the liquid sample (3) and/or in that
   b. a gas content of the liquid sample (3) is adjusted by feeding of the gas into the liquid sample (3) and/or in that
   c. a gas content of the liquid sample (3) is adjusted by diffusion-based exchange between the liquid sample (3) and the gas and/or between, firstly, the gas situated in the fluid line and, secondly, the liquid sample (3) and/or in that
   d. a gas content of the liquid sample (3) is adjusted by diffusion-based exchange between, firstly, the gas situated in a section of the fluid line (4) and, secondly, the portion of the liquid sample (3) aspirated into the fluid line (4) and/or in that
   e. what is carried out as desired is a mixing of the liquid sample (3) or an aspiration of the liquid sample (3) into the fluid line (4) or a dispensing of fluid from the fluid line (4) into the liquid sample (3) and/or in that
   f. the mixing of the liquid sample (3) is interrupted and the portion of the liquid sample (3) is aspirated into the fluid line (4) after a predefined period of time has elapsed or the mixing of the liquid sample (3) is interrupted and the portion of the liquid sample (3) is aspirated into the fluid line (4) immediately after the interruption to the mixing.

5. The method as claimed in any of claims 1 to 4, characterized in that,
   a. after the portion of the liquid sample (3) has been aspirated, the fluid line (4) is pulled out of the liquid sample (3) and transported away from the receptacle (2) and/or in that
   b. the attachment device is fluidically connected to a pump and/or in that
   c. after the pump has been connected to the attachment device, the fluid line (4) is fluidically connected to the pump.

6. The method as claimed in any of claims 1 to 5, characterized in that, when analyzing the liquid sample (3), a number of detection agents are provided in the receptacle (2) the detection agents being intended for binding a chemical species of the liquid sample (3) and for altering its optical properties on the basis of the binding, and the optical property of the detection agent is ascertained and the ascertained optical property of the detection agent is used to determine a property of the liquid sample (3) as the ascertained result and/or the ascertained optical property of the detection agent is used to determine the presence and/or quantity of a species present in the liquid sample (3) as the ascertained result.

7. The method as claimed in any of claims 1 to 6, characterized in that

a. the attachment device comprises a further fluid line (40) which protrudes into the liquid sample (3) and through which a further fluid is dispensed into the liquid sample (3) and/or in that

b. the attachment device comprises another fluid line which protrudes into another liquid sample of another receptacle, the fluid line (4) and the other fluid line being fluidically connected, a portion of the liquid sample (3) and a portion of the other liquid sample being aspirated into the fluid line (4) and into the other fluid line, respectively, such that the aspirated liquid sample (3) is not mixed with the aspirated other liquid sample.

8. The attachment device, which is placeable on and attachable in a detachable manner to a receptacle (2) for the accommodation of a liquid sample (3), comprising at least one fluid line (4), the design and the intention of which are such that the fluid line (4) protrudes into the liquid sample (3) and that a fluid is directly dispensable into the liquid sample (3) through the fluid line (4) and/or a portion of the liquid sample (3) is aspiratable into the fluid line (4) characterized in that the attachment device comprises a control device which is designed such that what is brought about is that the dispensed fluid is a previously aspirated portion of the liquid sample and/or that the dispensed fluid is a gas previously aspirated from the liquid sample.

9. The attachment device as claimed in claim 8 or 9, characterized in that the dispensed fluid

a. is a previously aspirated gas or is a previously aspirated portion of the liquid sample (3) and/or in that

b. a filter (6) which is liquid-impermeable and gas-permeable is arranged in the fluid line (4) and/or in that

c. the attachment device comprises a control device which is designed to bring about the aspiration and dispensing multiple times in succession and alternately in order to mix the liquid sample (3).

10. The attachment device as claimed in any of claims 8 or 9, characterized in that the attachment device comprises an attachment (1), wherein

a. the fluid line (4) is fluidically connected to the attachment (1) and/or wherein

b. the fluid line (4) is connected to the attachment (1) in an integral manner or in a detachable manner and/or wherein

c. the attachment (1) covers the receptacle (2) and/or wherein

d. the attachment (1) is connectable to the receptacle (2) in a detachable manner.

11. The attachment device as claimed in any of claims 8 or 9, characterized in that the attachment device comprises a lid (5) which has a through-hole (8), through which the fluid line (4) extends.

12. The attachment device as claimed in claim 10 or 11, characterized in that the attachment (1) or the lid (5) are directly arrangeable on the receptacle (2).

13. The attachment device as claimed in any of claims 8 to 12, characterized in that

a. the fluid line (4) is pipette-shaped or in that the fluid line (4) has a constant cross section toward the receptacle (2) or in that the fluid line (4) has a tapering cross section toward the receptacle (2) or in that the outer surface of the fluid line (4) rests on an inner wall of the receptacle (2) and/or in that

b. a wall of the fluid line (4) has multiple projections (16) which are arranged spaced apart in the longitudinal direction of the fluid line (4) and extend transversely in relation to the longitudinal direction of the fluid line (4) and/or in that

c. multiple fingers (13) extend from a wall of the fluid line (4) in the longitudinal direction of the fluid line (4), the fingers (13) being arranged spaced apart in the circumferential direction of the fluid line (4), and/or in that

d. an external side of the fluid line (4) is hydrophobic.

14. The attachment device as claimed in any of claims 10 to 13, characterized in that the attachment (1) or the lid (5) comprises a seal for the sealing of the receptacle (2).

15. The attachment device as claimed in any of claims 8 to 14, characterized in that

a. the attachment device comprises a valve, by means of which the fluid line (4) is closable and/or in that

b. the attachment device comprises a further fluid line (40) which protrudes into the liquid sample (3) and through which a further fluid is dispensable into the receptacle (2) and/or in that

c. the attachment device comprises another fluid line which is introducible into another liquid sample of another receptacle, the fluid line (4) and the other fluid line being fluidically connected to one another.

16. A device comprising an attachment device as claimed in any of claims 8 to 15 and a receptacle (2), characterized in that the attachment device is attached to the receptacle (2) in a detachable manner.

17. The device as claimed in claim 16, characterized in that the attachment device is fluidically connected to a pump.

18. The device as claimed in claim 17, characterized by a control device which is connected to the pump and which controls the pump such that

a. the aspiration and dispensing is carried out multiple times in succession in order to mix the liquid sample (3) and/or in that

b. the aspiration and dispensing is carried out alternately in order to mix the liquid sample (3).

19. The device as claimed in any of claims 16 to 18, characterized in that

a. the fluid line (4) is fluidically connected to the pump by means of a fluid channel (7), the fluid channel (7) being arranged in the attachment (1) and/or in that

b. the device comprises a gas tank which is fluidically connected to the fluid line (4) and/or in that

c. the device comprises an optical capture device (18) for the capture of a property of the liquid sample (3) and/or in that

d. a sample carrier comprises multiple receptacles (2) and/or in that

e. the receptacles (2) are not fluidically connected to one another when the attachment is removed from the sample carrier and/or in that

f. the control device controls the pump such that a portion of the liquid sample (3) and a portion of the other liquid sample are aspirated into the fluid line (4) and into the other fluid line, respectively, such that the aspirated liquid sample (3) is not mixed with the aspirated other liquid sample and/or in that

g. the fluid channel (4) in the attachment (1) is designed and implemented such that only gas flows through the fluid channel (7).