Patent claims

1. A device for processing a liquid sample, comprising a carrier (1) that has at least one well (2) for receiving the liquid sample, a processing unit (3) for carrying out at least one processing step, and an actuating apparatus (4), which has an electrical control or regulating unit (5) for controlling or regulating the processing step carried out by means of the processing unit (3), wherein the actuating apparatus (4) is mounted on the processing unit (3), characterized in that the processing unit (3) is mounted on the carrier (1).

2. The device as claimed in claim 1, characterized in that the device comprises a housing (6),
   a. that is releasably reconnected to the carrier (1) and that closes off the carrier (1) and/or in that
   b. the actuating apparatus (4) is arranged between the housing (6) and the carrier (1) and/or in that
   c. the housing (6) is mounted on the actuating apparatus (4) and/or in that
   d. the device is configured such that the processing of the liquid sample takes place autonomously in the device and/or in that
   e. the housing (6) and/or the actuating apparatus (4) and/or the processing unit (3) are configured such that they can be handled by the same handling device as the carrier (1) and/or in that
   f. the actuating apparatus (4) is releasably reconnected to the processing unit (3) and/or in that
   g. the processing unit (3) is releasably reconnected to the carrier (1) and/or in that
   h. the housing (6) is releasably or firmly reconnected to the actuating apparatus (4).

3. The device as claimed in claim 1 or 2, characterized in that
   a. the housing (6) comprises an input device for inputting data into the electrical control or regulating unit (5) of the actuating apparatus (4) and/or in that
   b. the housing (6) is configured like a box, wherein the actuating apparatus (4) and/or the processing unit (3) and/or the carrier (1) is/are arranged in the cavity of the housing (6) and/or in that
   c. the actuating apparatus (4)comprises an electrical storage unit (14) that supplies the electrical control or regulating unit (5) with electrical energy and/or in that
   d. the actuating apparatus (4) comprises a communication means for sending and/or receiving data and/or in that
   e. the actuating apparatus (4) comprises at least one pump that is controllable by the electrical control or regulating unit (5) and/or in that
   f. the actuating apparatus (4) comprises at least one tank for storing a processing medium, which is fluidically connectable to a pump and/or the processing unit (3) and/or in that

g. the actuating apparatus (4) comprises a measuring unit which is electrically connected to the electrical control or regulating unit (5) and/or fluidically connected to the processing unit (3) and/or in that

h. the actuating apparatus (4) comprises a plate (25) on which the electrical control or regulating unit (5) and/or the electrical storage unit (14) and/or the communication means and/or the pump and/or the tank and/or the measuring unit are arranged.

4. The device as claimed in one of claims 1 to 3, characterized in that

a. on mounting of the actuating apparatus (4) on the processing unit (3) or on removal of the actuating apparatus (4) from the processing unit (3), the processing medium located in the processing unit (3) and/or the portion of the liquid sample located in the processing unit (3) do/does not come into contact with the actuating apparatus (4) and/or in that

b. the actuating apparatus (4) is connected tubelessly or wirelessly to the processing unit (3) and/or in that

c. the device comprises an intermediate element (7) that is arranged between the actuating apparatus (4) and the processing unit (3) and/or in that

d. the device comprises an intermediate element (7) is connected by means of the actuating apparatus (4) to the processing unit (3) and/or in that

e. the device comprises an intermediate element (7) that is arranged between the actuating apparatus (4) and the processing unit (3) and/or is connected by means of the actuating apparatus (4) to the processing unit (3) wherein the actuating apparatus (4) is integrally connected by means of the intermediate element (7) to the processing unit (3) and/or in that

f. the processing unit (3) comprises at least one further tank for storing a further processing medium.

5. The device as claimed in one of claims 1 to 4, characterized in that the processing unit (3) comprises at least one fluid line (19) that extends from an attachment (21) and protrudes into the liquid sample.

6. The device as claimed in claim 5, in that

a. at least one fluid line (19) is fluidically connected to a fluid channel (22) that is arranged in the attachment (21) and/or in that

b. at least one other fluid line is fluidically connected to one other fluid channel that is arranged in the attachment (21).

7. The device as claimed in claim 6, characterized in that

a. the fluid channel (22) is fluidically connected to the pump and/or in that

b. the fluid channel (22) is fluidically connected to the tank and/or the further tank and/or in that

c. the other fluid channel is fluidically connected to another pump and/or in that

d. the other fluid channel is fluidically connected to the tank and/or the further tank.

8. The device as claimed in one of claims 1 to 7, characterized in that

a. the processing unit (3) comprises at least one further valve that is connected to the electrical control or regulating unit (5) and/or in that

b. the processing unit (3) comprises a heating element and/or a cooling element (36) and/or in that

c. the processing unit (3) comprises a further fluid channel (34), in which a heating agent or a cooling agent is flowable and/or in that

d. the well (2) of the carrier (1) is arranged in a receptacle of a receiving element (37) and/or in that

e. the processing unit (3) comprises at least one analysis unit (27) for analysis of the liquid sample and/or in that

f. the processing unit (3) comprises at least one analysis unit (27) for analysis of the liquid sample wherein the analysis unit (27) comprises at least one sensor and a waste chamber (31) for receiving the portion of the liquid sample aspirated into the analysis unit (27), wherein the waste chamber is fluidically connected downstream of the sensor and/or in that

g. the processing unit (3) comprises at least one optical detection device for determining a property of the liquid sample and/or the sensor and/or in that

h. the processing unit (3) is configured as a disposable component.

9. The device as claimed in one of claims 1 to 8, characterized by a further processing unit (11) for carrying out at least one further processing step and a further actuating apparatus that are arranged on the side of the carrier (1) facing away from the processing unit (3).

10. The device as claimed in claim 9, characterized in that

a. the further processing unit (11) is arranged between the carrier (1) and the further actuating apparatus and/or in that

b. the further processing unit (11) comprises at least one further optical detection device for determining a property of the liquid sample and/or the sensor and/or in that

c. the carrier (1) is mounted on the further processing unit (11) and/or in that

d. the further processing unit (11) and/or the actuating apparatus (4) are arranged in a further cavity of a further housing, wherein the further housing is releasably reconnectable to the carrier (1) and/or in that

e. the further actuating apparatus and the actuating apparatus (4) communicate by data technology.

11. A method for processing a liquid sample using a device as claimed in one of claims 1 to 10.

12. The method for processing a liquid sample, characterized in that
    a. at least one well (2) of a carrier (1) is filled with at least one liquid sample and in that
    b. a processing unit (3) is mounted on the carrier (1) and in that
    c. an actuating apparatus (4) is mounted on the processing unit (3), wherein the actuating apparatus (4) comprises an electrical control or regulating unit (5) and in that
    d. a processing step carried out by the processing unit (3) is controlled or regulated by the electrical control or regulating unit (5).

13. The method as claimed in claim 11 or 12, characterized in that
    a. a housing, which closes off the carrier (1) and the actuating apparatus (4) and the processing unit (3), is releasably reconnected to the carrier (1) and/or in that
    b. prior to processing of the liquid sample, the electrical control or regulating unit (5) is programmed and/or a processing program is selected and started and/or in that
    c. the control of the processing step is carried out according to a predetermined control sequence and/or in that
    d. after the processing of the liquid sample is finished, the processing unit (3) is exchanged for another processing unit (11) for carrying out another processing step.

14. The method as claimed in one of claims 11 to 13, characterized in that
    a. the actuating apparatus (4) is transported to a filling station, in which a processing medium is supplied to a tank of the actuating apparatus (4) and/or in that
    b. the processing unit (3) is transported to a washing station (49), in which the processing unit (3) is washed and/or in that
    c. an assembly or disassembly of the device is carried out manually or automatically and/or
    d. an assembly or disassembly of the device respectively is carried out by a single handling device.

15. The method as claimed in one of claims 11 to 14, characterized in that in assembly of the device, a processing unit (3) is selected from a plurality of differently configured processing units and transported to an assembly station, in which the processing unit is mounted on the carrier, and then,

an actuating apparatus (4) belonging to the processing unit (3) is selected from a plurality of differently configured actuating apparatuses and transported to the assembly station, in which it is mounted on the processing unit (3).

16. The method as claimed in one of claims 11 to 15, characterized in that
    a. optionally, by means of the processing unit (3), mixing of the liquid sample located in a well (2) of the carrier (1) or aspiration of a portion of the liquid sample or dispensing of a fluid into the liquid sample is carried out, and/or in that

b. by means of the processing unit (3), at least one mixture is produced that comprises at least two processing media, wherein by means of the processing unit (3), a processing medium is supplied in a predetermined amount to the well (2), and subsequently, by means of the processing unit (3), another processing medium is supplied in a predetermined amount to the same well (2), and/or in that

c. by means of the processing unit (3), a liquid sample is transferred from a well (2) into another well.

17. The method as claimed in one of claims 11 to 16, characterized in that the well (2) is monitored, wherein in monitoring, a property of the liquid sample is optically detected and the electrical control or regulating unit (5) regulates the processing step carried out by the processing unit (3) depending on the detected property.

18. The method as claimed in claim 17, characterized in that monitoring is conducted to determine whether the liquid sample is contaminated with a foreign body.

19. The method as claimed in one of claims 11 to 18, characterized in that by means of the processing unit (3), the liquid sample is heated or cooled.

20. The method as claimed in one of claims 11 to 19, characterized in that the processing unit (3) analyzes the liquid sample.