CLAIMS

1. A set (7) for maintaining and transporting at least one cell culture flask (1, 11), configured within an orbital incubator shaker chamber, in which the set (7) comprises:

a flask holder (2, 12), configured to receive the at least one cell culture flask (1, 11) having a circular footprint and suitable for suspension cell culture;

an orbital incubator shaker tray (3) configured to be mounted on the inside of the orbital incubator shaker chamber, that comprises at least one guiding element (3.5) arranged for maintaining each cell culture flask holder (2, 12), in which the orbital incubator shaker tray (3) is arranged for receiving the flask holders (2, 12) and transferring an orbital movement to the flask holders (2, 12);

a 3-axis motorized stage (4) configured to be mounted on the inner side of a top wall of the orbital incubator shaker chamber, that comprises X-axis (4.1), Y-axis (4.2) and Z-axis (4.3) and three linear motors for driving the three axis (4.4, 4.5, 4.6) and means (4.7) for gripping the cell culture flask holder (2, 12);

a sliding door (5) configured to be mounted within a side wall of the orbital incubator shaker chamber, that comprises a door panel (5.2) and at least one motor for driving the door movement (5.4); and

a transfer shuttle (6) configured to be mounted on the outer side of a side wall of the orbital incubator shaker chamber, that comprises a sliding frame (6.1), rails (6.2), at least two belts arranged on the sliding frame (6.11), a cell culture flask holder plate (6.5) and a motor (6.3) for driving sliding movement of the plate on the rails (6.2), and in which the transfer shuttle (6) is configured to allow a movement of the cell culture flask holder plate (6.5) through the sliding door tunnel (5.3) created when the sliding door panel (5.2) is open.

2. A set (7) for maintaining and transporting at least one cell culture flask (1, 11) according to Claim 1, in which the cell culture flask (1, 11) is a 125ml Erlenmeyer flask (1) or a bioreactor tube (11).

3. A set (7) according to Claim 1 or 2, in which the means for gripping (4.7) the cell culture flask holder (2, 12) are attached to Z-axis (4.3) of the 3-axis motorized stage and

comprise one parallel gripper (4.7) with an adjustable prehension force, equipped with jaws (4.8) and fingers (4.9) for detachable connection to the flask holder (2, 12).

4. A set (7) according to Claim 1, 2 or 3, in which the motor for driving the door movement of the sliding door (5), comprises a stepper motor (5.4) for driving a sliding movement and a stepper motor (5.5) for driving a press movement of the door panel (5.2).

5. A set (7) according to any preceding claim, in which the sliding door (5) further comprises a precision sensor (5.6) for detecting a sliding movement of the door panel (5.2) and a precision sensor (5.7) for detecting press movement of the door panel (5.2).

6. A set (7) according to any of Claims 1 to 4, in which the sliding door (5) further comprises a temperature probe (5.8), a heating pad (5.9), a heating ribbon (5.10), and a controller, and in which the temperature probe (5.8) is controlling the heating pad (5.9) and the heating ribbon (5.10) through the controller.

7. A set (7) according to any preceding claim, in which the sliding door (5) further comprises a silicone o-ring (5.10) fitted between a door frame (5.1) and the door panel (5.2).

8. A set (7) according to any preceding claim, in which the transfer shuttle (6) further comprises an amplified precision sensor (6.7) for detecting a transfer shuttle home position, a sensor (6.8) for detecting of loading position of the cell culture flask holder (2, 12), and a sensor (6.9) for detecting of unloading position of the cell culture flask holder (2, 12).

9. A set (7) according to any preceding claim, in which the cell culture flask holder (2, 12) comprises a bottom heat conductor (2.3) at the base of the holder (2.1), one side of the heat conductor (2.3) being configured to be in contact with the orbital incubator shaker tray (3) and the other side of the heat conductor (2.3) being designed to be in contact with the at least one cell culture flask (1, 11).

10. A set (7) according to Claim 9, in which the bottom heat conductor (2.3) comprises four lateral heat conductors (10.8), at the four corners of the basket, these lateral heat conductors providing heat to the lateral side of the at least one cell culture flask (1, 11).

11. A set (7) according to any preceding claim, that further comprises a cell culture flask holder (2, 12), and in which the cell culture flask holder (2, 12) comprises a base (2.1), two handles (2.2) arranged perpendicular to the base (2.1) and opposite of each other, locking

means (2.4, 2.5, 2.6, 2.7, 10.1, 10.2, 10.3, 10.4, 10.5, 10.6, 10.7) for maintaining the cell culture flask (1, 11) and a heat conductive pad (2.3) arranged on the base (2.1) of the cell culture flask holder (2, 12).

12. A set (7) according to Claim 11, in which the cell culture flask holder (2, 12) further comprises at least two magnets (2.6) arranged on the outer side of the cell culture flask holder base (2.1) that provide attachment means to the orbital incubator shaker (8) comprising permanent electro-magnets (3.4).

13. A set (7) according to Claim 11, in which the cell culture flask holder's locking means (2.4, 2.5, 2.6, 2.7) comprises a clamping means (2.4), and a safety latch (2.5) arranged on the cell culture flask holder base (2.1).

14. A set (7) according to Claim 11, in which the cell culture flask holder's locking means (10.1, 10.2, 10.3, 10.4, 10.5, 10.6, 10.7) comprises four guillotines (10.1) each holding a toothed jaw (10.2) and arranged on the cell culture flask holder base (2.1).

15. An orbital incubator shaker comprising a set (7) according to any preceding claim.

16. An automated cell passaging platform comprising a liquid handling system (9), at least one robotized arm, at least one automated hotel, an automated refrigerated incubator, an automated microplate centrifuge with automated loader, a cell counting device and at least one orbital incubator shaker (8), characterised in that the at least one orbital incubator shaker (8) is configured to be arranged with the set (7) for maintaining and transporting at least one cell culture flask (1, 11) according to any of Claims 1 to 14.