Claims

1. Effector unit for a robot having at least one supporting element (2) arranged at an end member (17) of the robot, having an effector (3) which can be fastened to the supporting element (2) by means of coupling elements (4,5) engaging into one another in a form-fit and/or force-fit manner, and having a locking mechanism (8; 15) which connects a coupling element (5) of the effector (3) to a coupling element (4) of the supporting element (2) in a detachable and loss-proof manner,
in which the supporting element (2) is movably arranged relative to the end member (17), and in which the coupling elements (4, 5) can be connected in a common axial alignment (AK) which is arranged transverse to the alignment (AT) of the supporting element (2);
characterized in that
the coupling elements (4,5) are arranged and configured such so as to be connected or decoupled by a rotational displacement movement of the robot around the axial alignment (AK) and/or by a translational displacement movement of the robot along the axial alignment (AK).

2. Effector unit according to claim 1, in which the locking mechanism (8,15) is arranged on the supporting element (2) in such a free accessible way that it can be actuated actively or passively by an external abutment (13,14).

3. Effector unit according to claim 2, in which the locking mechanism (8,15) is designed such that it can be actuated under contact with said abutment (13,14) by a displacement movement of the robot.

4. Effector unit according to claim 2 or 3, in which the locking mechanism (8,15) is designed such that it can be

actuated by a displacement movement of the robot under a releasable engagement with an abutment.

5. Effector unit according to one of claims 1 to 4, in which the coupling element of the supporting element (2) is formed as an opening (4) for receiving the coupling element (5) of the effector (3) with an opening width to be varied by the locking mechanism (8,15).

6. Effector unit according to claim 5, in which the opening (4) is at least partially enclosed by two legs (6) of the supporting element (2), which are moveable relative to each other.

7. Effector unit according to claim 6, in which the legs (6) are designed to exert a mutual spring action, the legs (6) being movable against the spring action by means of the locking mechanism (8,15).

8. Effector unit according to claim 7, in which the spring effect can be produced by recesses (7) in the supporting element (2).

9. Effector unit according to any one of claims 1 to 8, in which the coupling elements (4,5) have a complementary cylinder, wedge or cone shape at least in sections.

10. Effector unit according to any of claims 1 to 4, in which at least one detent mechanism is provided between the coupling elements (4,5).

11. Effector unit according to claim 10, in which the coupling elements (4,5) are formed as a bayonet locking mechanism.

12. Effector unit according to any of claims 1 to 4, in which the coupling elements (4,5) are formed as a screw connection.

13. Effector unit according to any of claims 2 to 12, in which the locking mechanism is formed as a lever (8,15) pivotably mounted on the supporting element (2).

14. Effector unit according to claim 13, in which the lever (8,15) has a contour which is configured such that said lever (8,15) can be moved continuously along said abutment (14).

15. Effector unit according to claim 13 or 14, in which the lever (15) has an engagement opening (16) for the actuating element.

16. Effector unit according to any of claims 1 to 15, in which at least one means (12) is provided between the supporting element (2) and the effector (3) for precisely positioning the effector (3) during the coupling process.

17. Robot comprising an effector unit according to any one of claims 1 to 16.

18. Working device with a robot comprising an effector unit (1), characterized in that the effector unit (1) is designed according to at least one of claims 1 to 16.

19. Working device according to claim 18, in which a holding device (9) for the effector (3) is provided, on which the effector (3) can be movably deposited.

20. Working device according to claim 19, in which a linear guide is formed between the holding device (9) and the effector (3).

21. Working device according to any of claims 18 to 20, in which an abutment (13,14) is provided which interacts with the effector unit (1) during a displacement movement of the robot.

22. Working device according to claim 21, in which the abutment (13,14) is formed at least partially complementary in shape to the locking mechanism (8,15) of the effector unit (1).

23. Working device according to claim 22, in which the abutment is constructed as at least one rolling element (14).

24. Method for changing an effector (3) on an end member (17) of a robot, wherein a supporting element (2) is provided on the end member (17) of the robot, with which the effector (3) can be fastened by means coupling elements (4,5) in a form-fit and/or force-fit manner, which are releasably and captively connectable by means of a locking mechanism (8,15), wherein the supporting element (2) is movable relative to the end member (17), and wherein the coupling elements (4, 5) are connectable in a common axial alignment (AK) which is arranged transverse to the alignment (AT) of the supporting element (2),
comprising the steps of:
- picking up the effector (3) from a holding device (9) by connecting the coupling element (4) of the supporting element (2) to the coupling element (5) of the effector (3) by means of a first sequence of robot movements to form an effector unit (1);

- transferring the effector unit (1) to an abutment (13, 14) by means of a second sequence of robot movements; and
- moving the locking mechanism (8,15) with respect to the abutment (13,14) while locking the supporting element (2) and the effector (3) of the effector unit (1) by means of a third sequence of robot movements.

25. Method according to claim 24, after completion of the activity intended for the effector (3), further comprising the steps:
- transferring the effector unit (1) to the or a further abutment by means of a fourth sequence of robot movements;
- moving the locking mechanism (8,15) with respect to the abutment by unlocking the supporting member (2) and the effector (3) of the effector unit (1) by means of a fifth sequence of robot movements; and
- placing the effector (3) on the holding device (9) by decoupling the coupling element (4) of the supporting element (2) from the coupling element (5) of the effector (3) by means of a sixth movement of robot movements.

26. Method according to claim 24 or 25, in which the steps of the individual sequences of the robot movements are sequentially repeatable using a plurality of different effectors (3).