Claims

1. A screwing device comprising a screwdriver (45, 245) and a connection element (10, 210) for coupling the screwdriver (45) to a robot arm (11),
wherein the connection element (10, 210) comprises:
– a first, robot-side transmission element (20),
– a second, tool-side transmission element (22),
– a restoring element (25) arranged between the first and second transmission element (20, 22), and
– a distance measuring element (50),
wherein the two transmission elements (20, 22) can be moved towards each other against a restoring force of the restoring element (25) in an actuation direction (26) and the distance measuring element (50) is designed and arranged so as to be able to measure a distance which represents a spacing between the transmission elements (20, 22) in the actuation direction (26), and the first and the second transmission element (20, 22) of the connection element (10) are coupled by a guide (27) that is designed and arranged such that the two transmission elements (20, 22) can be displaced relative to one another only in the actuation direction (26).

2. The screwing device according to claim 1,
characterized in that
the restoring element (25) of the connection element (10) is designed as at least one spring (25).

3. The screwing device according to claim 2,
characterized in that
the spring (25) is designed as a helical spring (25) which is arranged around a fastening element (21) that connects the first and second transmission element (20, 22) and defines the possible spacing between the first and second transmission element (20, 22).

4. The screwing device according to any of claims 1 to 3,
characterized in that
a distance sensor (51) of the distance measuring element (50) of the connection element (10) is arranged so as to be fixed relative to the first transmission element (20), and the

distance measuring element (50) measures a spacing from the second transmission element (22) of the connection element (10).

5. The screwing device according to any of claims 1 to 4,
characterized in that
the distance measuring element (50) comprises an optical distance sensor (51).

6. The screwing device according to claim 5,
characterized in that
the guide (27) comprises at least one ball retainer (31) which is arranged between the two transmission elements (20, 22) and so as to be in parallel with the actuation direction (26).

7. The screwing device according to any of claims 1 to 6,
characterized in that
the connection element (10) comprises a damper (32).

8. The screwing device according to claim 7,
characterized in that
the damper (32) is arranged in the force flow between the screwdriver (45) and a connector element (15, 215) that makes connection to the robot arm (11) possible.

9. The screwing device according to claim 7,
characterized in that
the damper (32) comprises a guide (39) which is designed and arranged such that a deformation of the damper (32) transversely to the actuation direction (26) is impossible.

10. The screwing device according to either claim 7 or claim 8,
characterized in that
the damper (32) is arranged on a side opposing the first transmission element (20), relative to the second transmission element (22).

11. The screwing device according to any of claims 1 to 10,
characterized in that
the connection element (10, 210) comprises a quick-change connector (15, 215) that is

designed such that the connection element (10) can be coupled to a robot arm (11) using the quick-change connector (15), without manual intervention.

12. A method for screwing a screw (47) into a wall (49) using a screwing device (5, 205) according to any of claims 1 to11, which method is carried out by a robot arm (11), wherein

– the screwing device (5, 205) is guided towards the wall (49) at an actuating force in an actuation direction (26),

– a variable that is characteristic of the actuating force is sensed while the screwing device (5, 205) is guided towards the wall (49), and

– the screwing device (5, 205) is actuated such that the mentioned variable is within a specifiable range.

13. The method according to claim 12,
characterized in that
the mentioned variable is set to a constant value.