Patent Claims

1. Device for transferring electronic components from a first carrier (68) to a second, strip-shaped carrier (74), having:
- at least one slide (12, 12a, 12b), which is connected to at least one slide-actuator (18);
- a cap (10) which comprises a support (22), a slide channel (14) for receiving the at least one slide (12, 12a, 12b), and a gripping device (20) for the first carrier (68);
- a first receiver (60), which is configured to position the first carrier (68) on the support (22), the electronic components (70, 70a) being provided on a side of the first carrier (68) that is remote from the support (22);
- a second receiver (72) which is configured to position the second carrier (74);
wherein the first receiver (60) and the second receiver (72) are so arranged relative to one another that a gap separates the first carrier (68) from the second carrier (74);
- the cap (10) and/or the second receiver (72) is configured to be moved from a first position into a second position so that the gap between the first carrier (68) and the second carrier (74) becomes smaller;
- the at least one slide (12, 12a, 12b) is configured to be extended by the at least one slide-actuator (18) relative to the support (22), to lift the first carrier (68), which is resting against the support (22), off the support (22), and to move an electronic component (70a) provided on the first carrier (68) in the direction towards the second carrier (74); and
- the gripping device (20) is configured to convey the first carrier (68) to the support (22) in order to separate the electronic component (70a) from the first carrier (68).

2. Device according to claim 1 having a control unit (56) which is configured to terminate the extension movement of the at least one slide (12, 12a, 12b) as soon as the control unit (56) detects that the electronic component (70a) is in contact with the second carrier (74) or with an adhesive applied to the second carrier.

3. Device according to claim 2 having at least one sensor element connected to the control unit (56), which sensor element is configured to detect a power consumed by the at least one slide-actuator (18) and/or a distance covered by the at least one slide (12, 12a, 12b).

4. Device according to any one of claims 1 to 3, wherein the gripping device (20) is connected to a vacuum source.

5. Device according to any one of the preceding claims, wherein an illuminating device (40) and a camera device (42) are fastened to a positioning device (11).

6. Device according to any one of the preceding claims, wherein a heating element is provided in a central region of the support (22) or on a positioning device (11).

7. Method for transferring an electronic component (70a) from a first carrier (68) to a second, strip-shaped carrier (74), comprising the steps:
- positioning a cap (10), a first carrier (68) and a second carrier (74) relative to one another so that at least one slide (12, 12a, 12b) provided in a slide channel (14) of the cap (10), an electronic component (70a) provided on the first carrier (68), and a contact face provided on the second carrier (74) are oriented along a common axis;
- moving the cap (10) and/or the second carrier (74) from a first position into a second position in order to make a gap between the first carrier (68) and the second carrier (74) smaller;
- extending the at least one slide (12, 12a, 12b) relative to a support (22) of the cap and in the direction towards the second carrier (74) so that the first carrier (68), which is resting against the support (22), is lifted off the support (22);
- separating the electronic component (70a) from the first carrier (68), which is effected by a gripping device (20) provided in the cap (10) conveying the first carrier (68) to the support (22).

8. Method according to claim 7, wherein the at least one slide (12, 12a, 12b) is extended relative to the support (22) and in the direction towards the second carrier (74) until the electronic component (70a) provided on the first carrier (68) is in contact with the second carrier (74) or with an adhesive applied to the second carrier (74).

9. Method according to either claim 7 or claim 8, wherein, after the electronic component (70a) has been separated from the first carrier (68), the cap (10) is moved from the second position into the first position.

10. Method according to claim 9, wherein, during the movement of the cap (10) into the first position, the at least one slide (12, 12a, 12b) is in contact with the electronic component transferred to the second carrier (74).

11. Method according to claim 9 or 10, wherein the at least one slide (12, 12a, 12b) is retracted once the cap (10) has reached the first position.

12. Method according to any one of claims 7 to 11, wherein the gripping device (20) conveys the first carrier (68) to the support (22) by means of a vacuum.

13. Method according to claim 12, wherein the first carrier (68) is first drawn in at the outside edge of the support (22).

14. Method according to any one of claims 7 to 13, wherein, in order to control the movement of the at least one slide (12, 12a, 12b), the power consumed by a slide-actuator (18) is detected and/or a distance covered by the at least one slide (12, 12a, 12b) is detected.

15. Method according to claim 14, wherein the extension of the at least one slide (12, 12a, 12b) is terminated when the power consumed by the slide-actuator (18) and/or the distance covered by the at least one slide (12, 12a, 12b) exceeds a threshold value.

CLAIMS

1. Device for transferring electronic components from a first carrier (68) to a second, strip-shaped carrier (74), having:
- at least one slide (12, 12a, 12b), which is connected to at least one slide-actuator (18);
- a cap (10) which comprises a support (22), a slide channel (14) for receiving the at least one slide (12, 12a, 12b), and a gripping device (20) for the first carrier (68);
- a first receiver (60), which is configured to position the first carrier (68) on the support (22), the electronic components (70, 70a) being provided on a side of the first carrier (68) that is remote from the support (22);
- a receiver-positioning actuator (62) and/or a receiver-displacing actuator (66) for horizontal movement of the first receiver (60) relative to the cap (10);
- a second receiver (72) which is configured to position the second carrier (74);
wherein the first receiver (60) and the second receiver (72) are so arranged relative to one another that a gap separates the first carrier (68) from the second carrier (74);
- the cap (10) is configured to be moved from a first position into a second position so that the gap between the first carrier (68) and the second carrier (74) becomes smaller;
- a positioning device (11) for positioning the cap (10) and the at least one slider (12, 12a, 12b) relative to the first receiver (60) and second receiver (72), wherein the positioning device (11) comprises a cap-positioning actuator (44) which can displace the positioning device (11) and cap (10) in the vertical direction, and by means of vertical displacement the distance between the cap (10) and the first carrier (68) changes;
- the at least one slide (12, 12a, 12b) is configured to be extended by the at least one slide-actuator (18) relative to the support (22), to lift the first carrier (68), which is resting against the support (22), off the support (22), and to move an electronic component (70a) provided on the first carrier (68) in the direction towards the second carrier (74); and
- the gripping device (20) is configured to convey the first carrier (68) to the support (22) in order to separate the electronic component (70a) from the first carrier (68).

2. Device according to claim 1 having a control unit (56) which is configured to terminate the extension movement of the at least one slide (12, 12a, 12b) as soon as the control unit (56) detects that the electronic component (70a) is in contact with the second carrier (74) or with an adhesive applied to the second carrier.

3. Device according to claim 2 having at least one sensor element connected to the control unit (56), which sensor element is configured to detect a power consumed by the at least one slide-actuator (18) and/or a distance covered by the at least one slide (12, 12a, 12b).

4. Device according to any one of claims 1 to 3, wherein the gripping device (20) is connected to a vacuum source.

5. Device according to any one of the preceding claims, wherein an illuminating device (40) and a camera device (42) are fastened to a positioning device (11).

6. Device according to any one of the preceding claims, wherein a heating element is provided in a central region of the support (22) or on a positioning device (11).

7. Method for transferring an electronic component (70a) from a first carrier (68) to a second, strip-shaped carrier (74), comprising the steps:
- positioning a cap (10), a first carrier (68) and a second carrier (74) relative to one another so that at least one slide (12, 12a, 12b) provided in a slide channel (14) of the cap (10), an electronic component (70a) provided on the first carrier (68), and a contact face provided on the second carrier (74) are oriented along a common axis;
- moving the cap (10) from a first position into a second position in order to make a gap between the first carrier (68) and the second carrier (74) smaller;
- extending the at least one slide (12, 12a, 12b) relative to a support (22) of the cap and in the direction towards the second carrier (74) so that the first carrier (68), which is resting against the support (22), is lifted off the support (22), and so that the electronic component (70a) is moved until one side of the electronic componenet (70a) comes into contact with the second carrier (74);
- separating the electronic component (70a) from the first carrier (68), which is effected by a gripping device (20) provided in the cap (10) conveying the first carrier (68) to the support (22).

8. Method according to claim 7, wherein the at least one slide (12, 12a, 12b) is extended relative to the support (22) and in the direction towards the second carrier (74) until the electronic component (70a) provided on the first carrier (68) is in contact with the second carrier (74) or with an adhesive applied to the second carrier (74).

9. Method according to either claim 7 or claim 8, wherein, after the electronic component (70a) has been separated from the first carrier (68), the cap (10) is moved from the second position into the first position.

10. Method according to claim 9, wherein, during the movement of the cap (10) into the first position, the at least one slide (12, 12a, 12b) is in contact with the electronic component transferred to the second carrier (74).

11. Method according to claim 9 or 10, wherein the at least one slide (12, 12a, 12b) is retracted once the cap (10) has reached the first position.

12. Method according to any one of claims 7 to 11, wherein the gripping device (20) conveys the first carrier (68) to the support (22) by means of a vacuum.

13. Method according to claim 12, wherein the first carrier (68) is first drawn in at the outside edge of the support (22).

14. Method according to any one of claims 7 to 13, wherein, in order to control the movement of the at least one slide (12, 12a, 12b), the power consumed by a slide-actuator (18) is detected and/or a distance covered by the at least one slide (12, 12a, 12b) is detected.

15. Method according to claim 14, wherein the extension of the at least one slide (12, 12a, 12b) is terminated when the power consumed by the slide-actuator (18) and/or the distance covered by the at least one slide (12, 12a, 12b) exceeds a threshold value.