

### Claims

1. A molding press for encapsulating semiconductor dies on a substrate, the molding press comprising:
  - 5 a first mold chase with a first mold chase surface; and
  - a second mold chase with a second mold chase surface;
  - the first and second mold chases being operable to clamp a substrate, which is held against a substrate-facing surface relating to either the first or second mold chase surface, between the first and second mold chase surfaces to define at least one mold
  - 10 cavity with respect to the substrate;
  - wherein the molding press further comprises a rotational mounting device on which either the first or second mold chase is rotatable about at least one axis passing through the centre of the substrate-facing surface to adjust the relative arrangement of the first and second mold chase surfaces.
  - 15
2. The molding press according to claim 1, wherein the rotational mounting device is configured to allow rotation of either the first or second mold chase about two orthogonal axes passing through the centre of the substrate-facing surface to adjust the relative arrangement of the first and second mold chase surfaces.
- 20
3. The molding press according to claim 1, wherein the second mold chase is part of a platen, the platen comprising a drive mechanism configured to rotate the lower mold chase.
- 25
4. The molding press according to claim 3, wherein the platen comprises the rotational mounting device.
5. The molding press according to claim 1, wherein the rotational mounting device comprises roller bearings.
- 30
6. The molding press according to claim 4, wherein the platen comprises a top portion, a middle portion to which the top portion is mounted by a first rotational mounting, and a base portion to which the middle portion is mounted by a second rotational mounting; wherein the drive mechanism is configured to rotate the top portion relative to the middle portion about the first rotational mounting, and the middle portion relative to the base portion about the second rotational mounting.
- 35

7. The molding press according to claim 4, wherein the platen comprises a plurality of load cells positioned to measure clamping forces applied at opposed edges of a substrate during clamping; and wherein the drive mechanism is configured to rotate the top portion or the middle portion, or both, to balance said clamping forces.
8. The molding press according to claim 7, wherein the load cells are positioned between first and second parts of the top portion of the platen.
9. The molding press according to claim 7, wherein the load cells are positioned beneath the base portion.
10. The molding press according to claim 7, wherein the load cells are positioned in alignment with two orthogonal axes passing through the centre of the substrate-facing surface to adjust the relative arrangement of the first and second mold chase surfaces.
11. The molding press according to claim 6, wherein the second mold chase comprises a clamping plate coupled to the top portion by a plurality of springs, the clamping plate comprising a plurality of gauging sensors positioned to measure spring compression at different locations on the clamping plate; and wherein the drive mechanism is configured to rotate the top portion and/or the middle portion to minimize any differences in the measured spring compression at the different locations.
12. The molding press according to claim 11, wherein the gauging sensors are positioned in alignment with two orthogonal axes passing through the centre of the substrate-facing surface to adjust the relative arrangement of the first and second mold chase surfaces.
13. A platen for a molding press for encapsulating semiconductor dies on a substrate, the platen comprising:  
a first mold chase having a first mold chase surface;  
the platen being operable to cooperate with a further platen having a second mold chase with a second mold chase surface to clamp a substrate, which is held against a substrate-facing surface relating to either the first or second mold chase

surface, between the first and second mold chase surfaces to define at least one mold cavity with respect to the substrate;

wherein the platen further comprises a rotational mounting device on which either the first or second mold chase is rotatable about at least one axis passing through the centre of the substrate-facing surface to adjust the relative arrangement of the first and second mold chase surfaces.

14. The platen according to claim 13, wherein the rotational mounting device is configured to allow rotation of the either the first or second mold chase about two orthogonal axes passing through the centre of the substrate-facing surface to adjust the relative arrangement of the upper and lower mold chase surfaces.

15. The platen according to claim 13, further comprising a drive mechanism configured to rotate the first mold chase.

16. The platen according to claim 13, wherein the rotational mounting device comprises roller bearings.

17. The platen according to claim 13, comprising a top portion, a middle portion to which the top portion is mounted by a first rotational mounting, and a base portion to which the middle portion is mounted by a second rotational mounting; wherein the drive mechanism is configured to rotate the top portion relative to the middle portion about the first rotational mounting, and the middle portion relative to the base portion about the second rotational mounting.

18. The platen according to claim 17, further comprising a plurality of load cells positioned to measure clamping forces applied at opposed edges of a substrate during clamping; wherein the drive mechanism is configured to rotate the top portion and/or the middle portion to balance said clamping forces.

19. The platen according to claim 18, wherein the load cells are positioned between first and second parts of the top portion.

20. The platen according to claim 18, wherein the load cells are positioned beneath the base portion.

21. The platen according to claim 18, wherein the load cells are positioned in alignment with two orthogonal axes.

5 22. The platen according to claim 17, comprising a clamping plate coupled to the top portion by a plurality of springs, the clamping plate comprising a plurality of gauging sensors positioned to measure spring compression at different locations on the clamping plate; and wherein the drive mechanism is configured to rotate the top portion or the middle portion, or both, to minimize any differences in the measured spring compression at the different locations.

10 23. The platen according to claim 22, wherein the gauging sensors are positioned in alignment with two orthogonal axes passing through the centre of the substrate-facing surface to adjust the relative arrangement of the upper and lower mold chase surfaces.

15

**Claims**

1. A molding press for encapsulating semiconductor dies on a substrate, the molding press comprising:

- 5 a first mold chase with a first mold chase surface; and  
a second mold chase with a second mold chase surface; the first and second mold chases being operable to clamp a substrate, which is held against a substrate-facing surface relating to either the first or second mold chase surface, between the first and second mold chase surfaces to define at least one mold cavity with respect to the  
10 substrate;

wherein the molding press further comprises a rotational mounting device on which either the first or second mold chase is rotatable about an axis passing through a centre of the substrate-facing surface to adjust the relative arrangement of the first and second mold chase surfaces.

15

2. The molding press according to claim 1, wherein the rotational mounting device is configured to allow rotation of either the first or second mold chase about at least one of two orthogonal axes each passing through the centre of the substrate-facing surface to adjust the relative arrangement of the first and second mold chase surfaces.

20

3. The molding press according to claim 1 or claim 2, wherein the second mold chase is part of a platen, the platen comprising a drive mechanism configured to rotate the lower mold chase.

25

4. The molding press according to claim 3, wherein the platen comprises the rotational mounting device.

5. The molding press according to any one of the preceding claims, wherein the rotational mounting device comprises roller bearings.

30

6. The molding press according to claim 4 or claim 5, wherein the platen comprises a top portion, a middle portion to which the top portion is mounted by a first rotational mounting, and a base portion to which the middle portion is mounted by a second rotational mounting; wherein the drive mechanism is configured to rotate the top portion

relative to the middle portion about the first rotational mounting, and the middle portion relative to the base portion about the second rotational mounting.

7. The molding press according to any one of claims 4 to 6, wherein the platen  
5 comprises a plurality of load cells positioned to measure clamping forces applied at opposed edges of a substrate during clamping; and wherein the drive mechanism is configured to rotate the top portion or the middle portion, or both, to balance said clamping forces.

10 8. The molding press according to claim 7, wherein the load cells are positioned between first and second parts of the top portion of the platen.

9. The molding press according to claim 7 or claim 8, wherein the load cells are positioned beneath the base portion.

15

10. The molding press according to any one of claims 7 to 9, wherein the load cells are positioned in alignment with two orthogonal axes passing through the centre of the substrate-facing surface to adjust the relative arrangement of the first and second mold chase surfaces.

20

11. The molding press according to any one of claims 6 to 10, wherein the second mold chase comprises a clamping plate coupled to the top portion by a plurality of springs, the clamping plate comprising a plurality of gauging sensors positioned to measure spring compression at different locations on the clamping plate; and wherein  
25 the drive mechanism is configured to rotate the top portion and/or the middle portion to minimize any differences in the measured spring compression at the different locations.

12. The molding press according to claim 11, wherein the gauging sensors are positioned in alignment with two orthogonal axes passing through the centre of the  
30 substrate-facing surface to adjust the relative arrangement of the first and second mold chase surfaces.

13. A platen for a molding press for encapsulating semiconductor dies on a substrate, the platen comprising:

a first mold chase having a first mold chase surface;

the platen being operable to cooperate with a further platen having a second mold chase with a second mold chase surface to clamp a substrate, which is held against a substrate-facing surface relating to either the first or second mold chase surface, between the first and second mold chase surfaces to define at least one mold cavity with respect to the substrate;

wherein the platen further comprises a rotational mounting device on which either the first or second mold chase is rotatable about an axis passing through a centre of the substrate-facing surface to adjust the relative arrangement of the first and second mold chase surfaces.

14. The platen according to claim 13, wherein the rotational mounting device is configured to allow rotation of the either the first or second mold chase about at least one of two orthogonal axes each passing through the centre of the substrate-facing surface to adjust the relative arrangement of the upper and lower mold chase surfaces.

15. The platen according to claim 13 or 14, further comprising a drive mechanism configured to rotate the first mold chase.

16. The platen according to any one of claims 13 to 15, wherein the rotational mounting device comprises roller bearings.

17. The platen according to any one of claims 13 to 16, comprising a top portion, a middle portion to which the top portion is mounted by a first rotational mounting, and a base portion to which the middle portion is mounted by a second rotational mounting; wherein the drive mechanism is configured to rotate the top portion relative to the middle portion about the first rotational mounting, and the middle portion relative to the base portion about the second rotational mounting.

18. The platen according to claim 17, further comprising a plurality of load cells positioned to measure clamping forces applied at opposed edges of a substrate during clamping; wherein the drive mechanism is configured to rotate the top portion and/or the middle portion to balance said clamping forces.

19. The platen according to claim 18, wherein the load cells are positioned between first and second parts of the top portion.

20. The platen according to claim 18 or 19, wherein the load cells are positioned  
5 beneath the base portion.

21. The platen according to any one of claims 18 to 20, wherein the load cells are positioned in alignment with two orthogonal axes.

10 22. The platen according to any one of claims 17 to 21, comprising a clamping plate coupled to the top portion by a plurality of springs, the clamping plate comprising a plurality of gauging sensors positioned to measure spring compression at different locations on the clamping plate; and wherein the drive mechanism is configured to rotate the top portion or the middle portion, or both, to minimize any differences in the  
15 measured spring compression at the different locations.

23. The platen according to claim 22, wherein the gauging sensors are positioned in alignment with two orthogonal axes passing through the centre of the substrate-facing surface to adjust the relative arrangement of the upper and lower mold chase surfaces.  
20

24. A molding press for encapsulating semiconductor dies on a substrate, the molding press comprising:

a first mold chase with a first mold chase surface; and

a second mold chase with a second mold chase surface;

25 the first and second mold chases being operable to clamp a substrate, which is held against a substrate-facing surface relating to either the first or second mold chase surface, between the first and second mold chase surfaces to define at least one mold cavity with respect to the substrate;

wherein the molding press further comprises a top portion, a middle portion to  
30 which the top portion is mounted by a first rotational mounting, and a base portion to which the middle portion is mounted by a second rotational mounting; and

a drive mechanism configured to rotate the top portion relative to the middle portion about the first rotational mounting, and the middle portion relative to the base

portion about the second rotational mounting, to adjust the relative arrangement of the first and second mold chase surfaces.