Claims

1. A device for manufacturing container products made of plastic materials, in particular by carrying out a molding, filling and sealing process, said device having a molding device (13), which can be supplied with a molding tube (15) of plasticized plastic material, and which has a movable molding surface (17) that adapts to the predefined container geometry, on which said molding tube (15) can be placed for a molding, filling and/or sealing procedure, characterized in that a guide and retaining device (25) is provided, which has movable guide and retaining parts (77, 81; 79, 83), which parts can be controlled in such a way that, in at least one of the possible functional positions outside of the molding region of the molding device (13), said parts engage with the molding tube (15) itself and/or with the respective plastic material that surrounds at least one manufactured container product and/or the contents thereof.

2. The device according to Claim 1, characterized in that the movable guide and retaining parts (77, 81) at the end of a respective molding, filling and sealing process for the container product can be brought into a functional position, in which said parts supportively abut the molding tube (15) in the section adjacent to the inlet to the molding device (13), on opposite sides of the tube (15).

3. The device according to Claim 1 or 2, characterized in that the molding device (13) has jaws (47, 49; 51, 53) that form the mold surfaces (17), which jaws can be moved by means of a clamping unit (23) in a direction of movement that is perpendicular to the vertical direction of movement of the molding tube (15) between a position in which the mold is closed, and a position that opens the mold, and in that a sliding device (39)

is provided, by means of which the clamping unit (23) can be moved vertically downward from a starting position during the molding, filling and sealing process, together with the movement of the molding tube (15), and can be moved upward into the starting position during the molding, filling and sealing process at the end of the molding.

4. The device according to one of the preceding Claims, characterized in that the molding device (13) includes the main molds (47, 49) that mold the main part of the container as well as the head molds (51, 53), which can be moved independently of the main molds (47, 49) by means of the clamping unit (23) for a filling and subsequent sealing process in order to seal the head of the container.

5. The device according to one of the preceding Claims, characterized in that the guide and retaining device (25) can be displaced by means of a second sliding device (41) between an upper position, which corresponds to the operative position of the guide and retaining parts (77, 79, 81, 83), and lowered positions.

6. The device according to one of the preceding Claims, characterized in that the guide and retaining device (25) has an actuation unit (73, 75) for each guide and retaining part (77, 79, 81, 83), which can be displaced in a direction that extends perpendicular the vertical direction between a position in which these parts are in proximity to one another, which corresponds to the operative position of the guide and retaining parts (77, 79, 81, 83), and a position in which these parts are moved apart from one another.

7. The device according to one of the preceding Claims, characterized in that the actuation units (73, 75) for the associated guide and retaining parts (77, 81) have a swivel drive, by means of which these guide and retaining parts (77, 81) can be pivoted back and forth between a

between a pivoting position taken while in the operative position, in which these parts are located in a pivoting position that is aligned with the molding tube (15), and positions, in which these parts are located outside of the region of the molding device (13).

8. The device according to one of the preceding Claims, characterized in that the guide and retaining parts are provided in the form of support rails (77, 81), which extend across the entire length of the die parting plane (85) of the molding device (13) in the case of the pivoting position that corresponds to the operative position, and which are mounted on pivot shafts (87, 89) of the associated actuation unit (73, 75) for pivoting movements that extend in a horizontal plane, which shafts extend vertically and parallel to one another beside the die parting plane (85).

9. The device according to one of the preceding Claims, characterized in that, as a component of the guide and retaining device (23), the actuation units (73, 75) have additional guide and retaining parts (79, 83) that can be moved towards one another in the direction of a closed position, and moved away from one another in the direction of at least one opened position such that, in at least one of the closed positions, said parts engage, at least in part, with the respective plastic material that surrounds at least one manufactured container product and/or the contents thereof.

10. The device according to one of the preceding Claims, characterized in that when viewed in a vertical plane, the dimensions of the axial spacing between the respective actuation unit (73, 75) and the associated support rail (77, 81) is such that a container product that is still warm from the molding device (13) is received prior to transfer to the additional guide and retaining parts (79, 83)

of the actuation units (73, 75) in order that a kind of cooling segment is formed.

11. The device according to one of the preceding Claims, characterized in that the support rails (77, 81) which rest against the molding tube (15) have conically converging bearing surfaces (97).

12. The device according to one of the preceding Claims, characterized in that the clamping unit (23) of the molding device (13) has a primary support (43), on which the main molds (47, 49) and head molds (51, 5 3) are movably guided independently of one another in a horizontal direction, and which primary support is adjustably mounted on a vertical guide (31) of the device frame (1).

13. The device according to one of the preceding Claims, characterized in that main molds (47, 49) and head molds (51, 53) are each connected to an allocated, individual drive mechanism for the closing and opening movements, each of which has a lever mechanism (57) that can be actuated by means of an actuator (62, 63).

14. The device according to one of the preceding Claims, characterized in that the actuation units (73; 75) are also guided on the vertical guide (31) of the device frame (1) such that they can be vertically displaced by means of a second sliding device (41).

15. The device according to one of the preceding Claims, characterized in that each of the two sliding devices has a separate motor-driven ball screw (39, 41) in order to produce the respective vertical movements.

16. The device according to one of the preceding Claims, characterized in that the sliding device (41) of the actuation units (73, 75) has a transverse guide (71) that extends vertically between the associated vertical guides (31) of the device frame, along which transverse guide the actuation units (73, 75) with the additional guide and retaining parts (79, 83) are guided for the horizontal movement thereof and can be moved by means of at least one actuator (91), and in that there is a coupling device (93) between the actuation units (73, 75) in order to synchronize the horizontal movements of said units.

The invention claimed is:

1. A device for manufacturing container products made of plastic material in a molding, filling and sealing process, comprising:

a plasticized plastic material tube producer emitting a molding tube;

a mold positioned to be supplied with said molding tube from said tube producer via an inlet of said mold, said mold having movable molding surfaces defining a predetermined container geometry and on which said molding tube is placeable for molding, filling and sealing a container; and

a guide and retaining device having guide and retaining parts moveable into functional positions outside of a molding region of said mold, said guide and retaining parts engage at least one of said molding tube or respective plastic material surrounding the container or contents of the container in a first functional position of said functional positions of said guide and retaining parts, said guide and retaining parts supportively abut opposite sides said molding tube in a section thereof adjacent to said inlet of said mold after molding, filling and sealing of the container.

2. A device according to claim 1 wherein

said mold comprises mold jaws that form said mold surfaces;

a clamping unit is coupled to said mold jaws and moving said mold jaws in a movement direction perpendicular to vertical movement of said molding tube between a position in which said mold is closed and a position in which said mold in open; and

a first sliding device is coupled to said clamping unit and moving said clamping unit vertically downward from a starting position during the molding, filling and sealing of the container together with said molding tube and vertically upward back into the starting position at an end of the molding.

3. A device according to claim **2** wherein
said mold comprises main molds molding a main part of the container and comprises head molds movable independently of said main molds by said clamping unit for filling the container and for sealing a head of the container.

4. A device according to claim **1** wherein
a second sliding device is coupled said guide and retaining device and moves said guide and retaining device between an upper and operative position of said guide and retaining parts and lower positions thereof.

5. A device according to claim **1** wherein
said guide and retaining device comprises an actuation unit for each said guide and retaining part displacing the respective guide and retaining part in a direction perpendicular to a vertical direction between an operative position in which said guide and retaining parts are proximate to one another and an inoperative position in which said guide and retaining parts are spaced from one another.

6. A device according to claim **5** wherein
said actuation units comprises a swivel drive pivoting said guide and retaining parts between a pivoting position in the operative position in which said guide and retaining parts are aligned with said molding tube and positions in which said guide and retaining parts are outside of a region of said mold.

7. A device according to claim **6** wherein
said guide and retaining parts comprises support rails extending an entire length of a die parting plan of said mold in the pivoting position in the operative position in which said guide and retaining parts are aligned with said molding tube, said support rails being mounted on pivot shafts of said actuation units allowing pivoting movements in a horizontal plane, said pivot shafts extending vertically and parallel to one another.

8. A device according to claim 7 wherein
said guide and retaining device comprises additional guide and retaining parts coupled to said actuation units, said additional guide and retaining parts being movable toward one another to a closed position thereof in which said additional guide and retaining parts engage at least in part plastic material surrounding the container and movable away from one another to an opened position thereof.

9. A device according to claim 8 wherein
each said actuation unit is vertically and axially spaced from the respective support rail such that the container produced in said mold and still warm from the mold is received prior to transfer to said additional guide and retaining parts forming a cooling segment.

10. A device according to claim 7 wherein
said support rails have conically converging bearing surfaces resting against said molding tube.

11. A device according to claim 3 wherein
said clamping unit comprises a primary support, said main mold and said head molds being movably guided independently of one another in a horizontal direction on said primary support, said primary support being adjustably mounted on a vertical guide of a device frame.

12. A device according to claim 3 wherein
said main molds and said head molds are connected to main drives and head drives, respectively, for movement between open and closed positions thereof independently, each of said drives having a lever mechanism actuated by an actuator.

13. A device according to claim 5 wherein
said actuation units are guided on a vertical guide of a device frame and vertically displaced by a second sliding device.

14. A device according to claim 13 wherein
said second sliding devices comprises a motor-driven ball screw producing vertical movements of said actuation units.

15. A device according to claim 2 wherein
said first sliding device comprises a motor-driven ball screw producing vertical movements of aid clamping unit.

16. A device according to claim 8 wherein

said actuation units are guided on a vertical guide of a device frame and vertically displaced by a second sliding device;

said second sliding device comprises a transverse guide extending vertically between vertical guides of a device frame, said actuation units and said additional guide and retaining parts being guided for horizontal movements along said transverse guide and being movable by an actuator; and

a coupling is between said actuation units and synchronizes the horizontal movements of said actuation units.

17. A device for manufacturing container products made of plastic material in a molding, filling and sealing process, comprising:

a plasticized plastic material tube producer emitting a molding tube;

a mold positioned to be supplied with said molding tube from said tube producer via an inlet of said mold, said mold having movable molding surfaces defining a predetermined container geometry and on which said molding tube is placeable for molding, filling and sealing a container, said mold including mold jaws that form said mold surfaces;

a guide and retaining device having guide and retaining parts moveable into functional positions outside of a molding region of said mold, said guide and retaining parts at least one of engage said molding tube or respective plastic material surrounding the container or contents of the container in a first functional position of said functional positions of said guide and retaining parts;

a clamping unit coupled to said mold jaws and moving said mold jaws in a movement direction perpendicular to vertical movement of said molding tube between a position in which said mold is closed and a position in which said mold in open; and

a first sliding device coupled to said clamping unit and moving said clamping unit vertically downward from a starting position during the molding, filling and sealing of the container together with said molding tube and vertically upward back into the starting position at an end of the molding.

18. A device for manufacturing container products made of plastic material in a molding, filling and sealing process, comprising:

a plasticized plastic material tube producer emitting a molding tube;

a mold positioned to be supplied with said molding tube from said tube producer via an inlet of said mold, said mold having movable molding surfaces defining a predetermined container geometry and on which said molding tube is placeable for molding, filling and sealing a container; and

a guide and retaining device having guide and retaining parts moveable into functional positions outside of a molding region of said mold, said guide and retaining parts engage at least one of said molding tube or respective plastic material surrounding the container or contents of the container in a first functional position of said functional positions of said guide and retaining parts, said guide and retaining device including an actuation unit for each said guide and retaining part displacing the respective guide and retaining part in a direction perpendicular to a vertical direction between an operative position in which said guide and retaining parts are proximate to one another and an inoperative position in which said guide and retaining parts are spaced from one another, said actuation units including a swivel drive pivoting said guide and retaining parts between a pivoting position in the operative position in which said guide and retaining parts are aligned with said molding tube and positions in which said guide and retaining parts are outside of a region of said mold, said guide and retaining parts having support rails extending an entire length of a die parting plan of said mold in the pivoting position in the operative position in which said guide and retaining parts are aligned with said molding tube, said support rails being mounted on pivot shafts of said actuation units allowing pivoting movements in a horizontal plane, said pivot shafts extending vertically and parallel to one another, said support rails having conically converging bearing surfaces resting against said molding tube.

19. A device for manufacturing container products made of plastic material in a molding, filling and sealing process, comprising:

a plasticized plastic material tube producer emitting a molding tube;

a mold positioned to be supplied with said molding tube from said tube producer via an inlet of said mold, said mold having movable molding surfaces defining a predetermined container geometry and on which said molding tube is placeable for molding, filling and sealing a container, said mold including main molds molding a main part of the container and including head molds movable independently of said main molds by said clamping unit for filling the container and for sealing a head of the container;

a guide and retaining device having guide and retaining parts moveable into functional positions outside of a molding region of said mold, said guide and retaining parts engage at least one of said molding tube or respective plastic material surrounding the container or contents of the container in a first functional position of said functional positions of said guide and retaining parts; and

a clamping unit coupled to said mold jaws and moving said mold jaws in a movement direction perpendicular to vertical movement of said molding tube between a position in which said mold is closed and a position in which said mold in open, said clamping unit including a primary support, said main mold and said head molds being movably guided independently of one another in a horizontal direction on said primary support, said primary support being adjustably mounted on a vertical guide of a device frame.

20. A device for manufacturing container products made of plastic material in a molding, filling and sealing process, comprising:

a plasticized plastic material tube producer emitting a molding tube;

a mold positioned to be supplied with said molding tube from said tube producer via an inlet of said mold, said mold having movable molding surfaces defining a predetermined container geometry and on which said molding tube is placeable for molding, filling and sealing a container; and

a guide and retaining device having guide and retaining parts moveable into functional positions outside of a molding region of said mold, said guide and retaining parts engage at least one of said molding tube or respective plastic material surrounding the container or contents of the container in a first functional position of said functional positions of said guide and retaining parts, said guide and retaining device including an actuation unit for each said guide and retaining part displacing the respective guide and retaining part in a direction perpendicular to a vertical direction between an operative position in which said guide and retaining parts are proximate to one another and an inoperative position in which said guide and retaining parts are spaced from one another, said actuation units being guided on a vertical guide of a device frame and vertically displaced by a second sliding device.

21. A device according to claim **20** wherein

said second sliding devices comprises a motor-driven ball screw producing vertical movements of said actuation units.

22. A device according to claim **17** wherein

said first sliding device comprises a motor-driven ball screw producing vertical movements of aid clamping unit.

23. A device for manufacturing container products made of plastic material in a molding, filling and sealing process, comprising:

a plasticized plastic material tube producer emitting a molding tube;

a mold positioned to be supplied with said molding tube from said tube producer via an inlet of said mold, said mold having movable molding surfaces defining a predetermined container geometry and on which said molding tube is placeable for molding, filling and sealing a container;

a guide and retaining device having guide and retaining parts moveable into functional positions outside of a molding region of said mold, said guide and retaining parts engage at least one of said molding tube or respective plastic material surrounding the container or contents of the container in a first functional position of said functional positions of said guide and retaining parts, said guide and retaining device including an actuation unit for each said guide and retaining part displacing the respective guide and retaining part in a direction perpendicular to a vertical direction between an operative position in which said guide and retaining parts are proximate to one another and an inoperative position in which said guide and retaining parts are spaced from one another, said actuation units including a swivel drive pivoting said guide and retaining parts between a pivoting position in the operative position in which said guide and retaining parts are aligned with said molding tube and positions in which said guide and retaining parts are outside of a region of said mold, said guide and retaining parts having support rails extending an entire length of a die parting plan of said mold in the pivoting position in the operative position in which said guide and retaining parts are aligned with said molding tube, said support rails being mounted on pivot shafts of said actuation units allowing pivoting movements in a horizontal plane, said pivot shafts extending vertically and parallel to one another, said guide and retaining device including additional guide and retaining parts coupled to said

actuation units, said additional guide and retaining parts being movable toward one another to a closed position thereof in which said additional guide and retaining parts engage at least in part plastic material surrounding the container and movable away from one another to an opened position thereof, said actuation units being guided on a vertical guide of a device frame and vertically displaced by a second sliding device, said second sliding device including a transverse guide extending vertically between vertical guides of a device frame, said actuation units and said additional guide and retaining parts being guided for horizontal movements along said transverse guide and being movable by an actuator; and

a coupling between said actuation units and synchronizes the horizontal movements of said actuation units.