lower chamber 4.

The device preferably uses a film 6 made of plastic material, which is unwound from an adapted roll 7 which is associated in an upper region and at one side of the upper chamber 3 and then guided on adapted pairs of guiding elements 8a, 8b which are present proximate to the lateral edges 5a, 5b of the upper chamber 3 and of the lower chamber 4.

The film 6 is then rewound onto a winder which is operated by an adapted first motor 10 which is arranged laterally to the upper chamber 3.

Heat-sealing and/or cutting and/or die-cutting means are provided inside each one of the upper chamber 3 and of the lower chamber 4 and are arranged concentrically within the chambers so as to define internally and centrally a free space 11 onto which the tray 2 is to be made to act.

The heat-sealing and/or cutting and/or die-cutting means are composed of a series of upper pressers 12a, 12b, 12c, which are inserted in each other, are arranged mutually coaxially within the upper chamber 3 and are provided with heat-sealing and/or cutting and/or die-cutting systems.

In the particular embodiment, the upper pressers are three in number, but their number might vary according to specific requirements.

The heat-sealing and/or cutting and/or die-cutting means also comprise a series of lower pressers 13a, 13b, 13c, which are arranged so as to be inserted in each other coaxially within the lower chamber 4 and are arranged, with respect to the upper pressers 12a, 12b, 12c, so as to correspond respectively to the upper pressers.

The upper pressers 12a, 12b, 12c and the lower pressers 13a, 13b, 13c can thus move vertically because they are actuated by adapted actuators 14 such as pneumatic cylinders which are arranged preferably above the upper chamber 3 and below the lower chamber 4.

As an alternative, only the upper pressers 12a, 12b, 12c or only the lower pressers 13a, 13b, 13c can be movable.

In the particular embodiment shown, the upper pressers 12a, 12b, 12c

CLAIMS

1. A packaging device (1), particularly for packaging trays containing food products or technical materials in a controlled atmosphere and by means of a film of plastic material (6), characterized in that it comprises an upper chamber (3) and a lower chamber (4), adapted to define a chamber for accommodating a tray (2), which can be fastened by mutually superimposing them and are each provided internally with a plurality of heat-sealing and/or cutting and/or die-cutting means arranged concentrically (12a, 12b, 12c, 13a, 13b, 13c), said lower chamber (4) being provided centrally with supporting means for said tray (2).

2. The device according to claim 1, characterized in that said film is a single-folded film (6), said upper chamber (3) and said lower chamber (4) being constituted by a container which can be fastened onto the other container hermetically by superimposition, bands or gaskets for airtightness being provided perimetrically to the lateral edge (5a, 5b) of said upper chamber (3) and of said lower chamber (4).

3. The device according to claims 1 and 2, characterized in that said film (6) of plastic material is unwound from an adapted roll (7), which is associated in an upper region and at one side of said upper chamber (3) and then guided on pairs of guides (8a, 8b) which are present proximate to said lateral edges (5a, 5b) of said upper chamber (3) and of said lower chamber (4), said film (6) being then rewound on a winder (9) which is controlled by a first motor (10) arranged laterally to said upper chamber (3).

4. The device according to claims 1 and 3, characterized in that heat-sealing and/or cutting and/or die-cutting means are arranged inside each one of said upper chamber (3) and said lower chamber (4) and are arranged concentrically within said chambers so as to define internally and centrally a free space (11) on which said tray (2) is to be made to act.

5. The device according to claims 1 and 4, characterized in that said heat-sealing and/or cutting and/or die-cutting means are composed of a

series of upper pressers (12a, 12b, 12c), which are inserted in each other and arranged mutually coaxially within said upper chamber (3) and are provided with heat-sealing and/or cutting and/or die-cutting systems.

6. The device according to claims 1 and 5, characterized in that said upper pressers are three in number.

7. The device according to claims 1 and 5, characterized in that said heat-sealing and/or cutting and/or die-cutting means comprise a series of lower pressers (13a, 13b, 13c), which are inserted in each other and coaxially within the lower chamber (4) and are arranged, with respect to said upper pressers (12a, 12b, 12c), so as to correspond respectively to said upper pressers.

8. The device according to claims 1, 6 or 7, characterized in that said upper pressers (12a, 12b, 12c) and said lower pressers (13a, 13b, 13c) are, individually or together or alternately, movable vertically and controlled by actuators (14), such as pneumatic cylinders, which are arranged preferably above said upper chamber (3) and below said lower chamber (4).

9. The device according to one or more of claims 1 to 7, characterized in that said upper pressers (12a, 12b, 12c) of said upper chamber (3) are fixed.

10. The device according to one or more of the preceding claims, characterized in that said upper pressers (12a, 12b, 12c) are box-shaped, with a height that corresponds to a particular tray (2) to be heat-sealed, said lower pressers (13a, 13b, 13c) being constituted by concentric rings of equal height, whose function is to abut against the perimetric edges (15) of the corresponding and overlying upper pressers (12a, 12b, 12c), said lower pressers (13a, 13b, 13c) being provided, at the lateral edges that are adjacent to the end that faces said upper pressers (12a, 12b, 12c), with blades (19) which are adapted to allow the cutting of said film (6) during the work cycle.

11. The device according to one or more of the preceding claims,

characterized in that at said free space (11) a plane (16) is provided, which can move vertically with respect to said lower chamber (4) by means of an adapted shaft (17), which can slide with respect to the footing (18) of said lower chamber (4), the support for said tray (2) being of the spring-loaded type.

12. The device according to claim 1, characterized in that said film (6) is of the flat sheet type.

13. A packaging method, particularly for packaging trays (2) containing food products or technical materials in a controlled atmosphere and by means of a film (6) of plastic material, using a device according to one or more of the preceding claims, characterized in that it comprises the steps that consist in:

– positioning, by centering it, a tray at a support which is arranged at said lower chamber, in a position below said upper chamber;

– moving for closure said lower chamber toward said upper chamber or vice versa, actuating said upper and/or lower presser means selected to correspond to the dimensions of said tray.

14. The method according to claim 13, characterized in that it comprises the step that consists in determining automatically the size of said tray prior to the actuation of said presser means.

lower chamber 4.

The device preferably uses a film 6 made of plastic material, which is unwound from an adapted roll 7 which is associated in an upper region and at one side of the upper chamber 3 and then guided on adapted pairs of guiding elements 8a, 8b which are present proximate to the lateral edges 5a, 5b of the upper chamber 3 and of the lower chamber 4.

The film 6 is then rewound onto a winder 9 which is operated by an adapted first motor 10 which is arranged laterally to the upper chamber 3.

Heat-sealing and/or cutting and/or die-cutting means are provided inside each one of the upper chamber 3 and of the lower chamber 4 and are arranged concentrically within the chambers so as to define internally and centrally a free space 11 onto which the tray 2 is to be made to act.

The heat-sealing and/or cutting and/or die-cutting means are composed of a series of upper pressers 12a, 12b, 12c, which are inserted in each other, are arranged mutually coaxially within the upper chamber 3 and are provided with heat-sealing and/or cutting and/or die-cutting systems.

In the particular embodiment, the upper pressers are three in number, but their number might vary according to specific requirements.

The heat-sealing and/or cutting and/or die-cutting means also comprise a series of lower pressers 13a, 13b, 13c, which are arranged so as to be inserted in each other coaxially within the lower chamber 4 and are arranged, with respect to the upper pressers 12a, 12b, 12c, so as to correspond respectively to the upper pressers.

The upper pressers 12a, 12b, 12c and the lower pressers 13a, 13b, 13c can thus move vertically because they are actuated by adapted actuators 14 such as pneumatic cylinders which are arranged preferably above the upper chamber 3 and below the lower chamber 4.

As an alternative, only the upper pressers 12a, 12b, 12c or only the lower pressers 13a, 13b, 13c can be movable.

In the particular embodiment shown, the upper pressers 12a, 12b, 12c

CLAIMS

1. A packaging device (1), particularly for packaging trays containing food products or technical materials in a controlled atmosphere and by means of a film of plastic material (6), said packaging device (1) comprising an upper chamber (3) and a lower chamber (4), adapted to define a chamber for accommodating a tray (2), which can be fastened by mutually superimposing them, said lower chamber (4) being provided centrally with supporting means for said tray (2);

said packaging device (1) being characterized in that:

said upper chamber (3) and said lower chamber (4) are each provided internally with a plurality of heat-sealing and/or cutting and/or die-cutting means (12a, 12b, 12c, 13a, 13b, 13c) arranged concentrically and coaxially within the respective chamber and;

said plurality of heat-sealing and/or cutting and/or die-cutting means (13a, 13b, 13c) arranged in said lower chamber (4) corresponds respectively to said plurality of heat-sealing and/or cutting and/or die-cutting means (12a, 12b, 12c) arranged in said upper chamber (3).

2. The device according to claim 1, characterized in that said film is a single-folded film (6), said upper chamber (3) and said lower chamber (4) being constituted by a container which can be fastened onto the other container hermetically by superimposition, bands or gaskets for airtightness being provided perimetrically to the lateral edge (5a, 5b) of said upper chamber (3) and of said lower chamber (4).

3. The device according to claims 1 and 2, characterized in that said film (6) of plastic material is unwound from an adapted roll (7), which is associated in an upper region and at one side of said upper chamber (3) and then guided on pairs of guides (8a, 8b) which are present proximate to said lateral edges (5a, 5b) of said upper chamber (3) and of said lower chamber (4), said film (6) being then rewound on a winder (9) which is controlled by

a first motor (10) arranged laterally to said upper chamber (3).

4. The device according to claims 1 and 3, characterized in that heat-sealing and/or cutting and/or die-cutting means are arranged inside each one of said upper chamber (3) and said lower chamber (4) and are arranged concentrically within said chambers so as to define internally and centrally a free space (11) on which said tray (2) is to be made to act.

5. The device according to claims 1 and 4, characterized in that said heat-sealing and/or cutting and/or die-cutting means are composed of a series of upper pressers (12a, 12b, 12c), which are inserted in each other and arranged mutually coaxially within said upper chamber (3) and are provided with heat-sealing and/or cutting and/or die-cutting systems.

6. The device according to claims 1 and 5, characterized in that said upper pressers are three in number.

7. The device according to claims 1 and 5, characterized in that said heat-sealing and/or cutting and/or die-cutting means comprise a series of lower pressers (13a, 13b, 13c), which are inserted in each other and coaxially within the lower chamber (4) and are arranged, with respect to said upper pressers (12a, 12b, 12c), so as to correspond respectively to said upper pressers.

8. The device according to claims 1, 6 or 7, characterized in that said upper pressers (12a, 12b, 12c) and said lower pressers (13a, 13b, 13c) are, individually or together or alternately, movable vertically and controlled by actuators (14), such as pneumatic cylinders, which are arranged preferably above said upper chamber (3) and below said lower chamber (4).

9. The device according to one or more of claims 1 to 7, characterized in that said upper pressers (12a, 12b, 12c) of said upper chamber (3) are fixed.

10. The device according to one or more of the preceding claims, characterized in that said upper pressers (12a, 12b, 12c) are box-shaped, with

a height that corresponds to a particular tray (2) to be heat-sealed, said lower pressers (13a, 13b, 13c) being constituted by concentric rings of equal height, whose function is to abut against the perimetric edges (15) of the corresponding and overlying upper pressers (12a, 12b, 12c), said lower pressers (13a, 13b, 13c) being provided, at the lateral edges that are adjacent to the end that faces said upper pressers (12a, 12b, 12c), with blades (19) which are adapted to allow the cutting of said film (6) during the work cycle.

11. The device according to one or more of the preceding claims, characterized in that at said free space (11) a plane (16) is provided, which can move vertically with respect to said lower chamber (4) by means of an adapted shaft (17), which can slide with respect to the footing (18) of said lower chamber (4), the support for said tray (2) being of the spring-loaded type.

12. The device according to claim 1, characterized in that said film (6) is of the flat sheet type.

13. A packaging method, particularly for packaging trays (2) containing food products or technical materials in a controlled atmosphere and by means of a film (6) of plastic material, using a device according to one or more of the preceding claims, characterized in that it comprises the steps that consist in:

– positioning, by centering it, a tray at a support which is arranged at said lower chamber, in a position below said upper chamber;

– moving for closure said lower chamber toward said upper chamber or vice versa, actuating said upper and/or lower presser means selected to correspond to the dimensions of said tray.

14. The method according to claim 13, characterized in that it comprises the step that consists in determining automatically the size of said tray prior to the actuation of said presser means.