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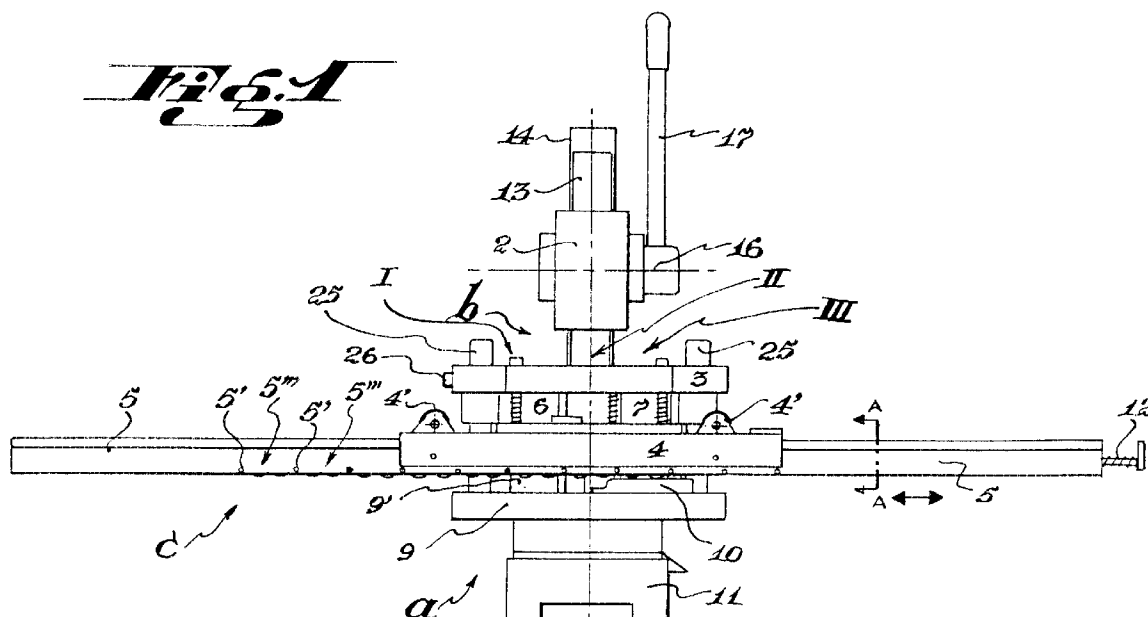
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**28006 Madrid (ES)**(54) **Device for the packaging of medicinal products in solid state**

(57) DEVICE FOR THE PACKAGING OF MEDICINAL PRODUCTS IN SOLID STATE of the type in which the product is outfitted in an alveolar single piece conformed in a plastic sheet (1); said sheet can be closed by a sheet that may be torn (1'); both sheets are part of a set of plates (e) that can be fractionable in multialveolar units [blister] (30); the present device wherein it includes a press (b) that works with a diehold (3), said diehold has a cutting matrix that includes a female (10) and a male (7) comprising a sheet press (8); on the other

hand, said diehold includes a set of thermosealing plate (6) and anchor plate (9'); said device also contains a guiding floating carriage (4) of a frame that carries sheets (c) which, as a sequential locator of each blister (30), interleaves between the mentioned cutting matrix (7,10) and the mentioned thermosealing set (6,9'); said frame carrying the sheets (e) embodying external guiding means (5'') in correspondence with the position of each blister; said guiding means (5'') directed in a sliding manner in corresponding descending-descending tracks (d).



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## Description

### I - BACKGROUND OF THE INVENTION

In general terms, the present invention consists in a device for the packaging of medicinal products in solid state. Its aim is to enable the packaging of small productions in multialveolar units ["blisters"].

In the elaboration of medicinal products under the form of small and thin tablets, or pills, the pharmaceutical industry uses different types of automatic machines.

On the other hand, the great invests that this industry must direct to the scientific research, as well as the necessary experimental and production equipment, have outlined a production based in the latest technology. Due to this, the development of automatic machines has had an increased dynamism. These machines have an increasing productive capacity, as they have been destined to massive production.

In this manner, together with the machines producing the medicinal product in solid state, machines to produce the packaging for said product have also been developed. These packaging machines are known as independent devices that are included in the same line of production together with the machines for the products. They are also included as devices included in a same machine that has two inlets and one outlet. The medicinal product enters through one of the inlets, while the materials composing the packaging enter through the other inlet. The packaging is made by the same machine. Finally, the finished product is obtained already packaged at the outlet of the machine.

Such is the case of the machines that pack the products in multialveolar units known as blisters. Usually, in order to achieve such packaging, two sheets are used, one made of plastic and the other of a material that may be torn. In the plastic sheet there is a plurality of alveolus, in which the product under the form of a tablet is put, one per alveoli. Afterwards, the same machine covers them with the sheet that may be torn. Then, it produces a thermosealing of the set of sheets and fractionates the set, thus obtaining the blisters.

Furthermore, together with the use of the latest medicines, there are those preparations called magistral. This type of medicines are sold according to a prescription or a specific formulation indicated by the physician. The consumption of such magistral medicines has grown in the last years. The same can be said about homeopathic preparations. Their composition varies according to each patient individually and to the medicine that is prescribed.

In these cases, they are small productions that vary their composition from one patient to another. Due to this, the big automatic machines are not apt for production, nor packaging of this type of medicines.

Devices for the realization of low production of these products are already known. The packaging of those productions in blisters in a fast and efficient way

has not been solved yet.

The device of the present invention solves in a convenient way such problem. To solve this problem, the invention has a frame. There is a press that works with a dieholder mounted on such frame. The dieholder has a cutting die with a female and male parts including a sheet press. Said dieholder has also a set of a thermosealing plate and anchor plate.

The press has a guiding floating carriage inside which a frame bearing the sheets slides. In the frame, there is a plastic sheet with alveolar cavities previously conformed, and there is also a sheet that can be torn, conforming a set of fractionable sheets. This frame that is the sequential locator of each blister, has external guiding means. Said means in correspondence with the position of each blister are led in a sliding manner in corresponding ascending-descending tracks.

In this way, through the simple activation of the corresponding lever, small productions of blisters may be completed in a short time. This is possible because the present device has three stations, (sealing, intermediate and cutting). Thus, in each activating movement, while in one station the sheets are sealed, in the other station the cutting that conforms the blister occurs.

### II - ILLUSTRATION

For a better clarity and understanding of the object of the invention, the same is illustrated with several figures in which it has been represented under one of its preferred embodiments, all of this as a simple example, not limiting the scope of the present invention.

Figure 1 is a front view of the device that allows the observation of its general conformation. Inside the press, the guiding floating carriage can be seen. Inside said carriage, the frame bearing the sheets is seen. The long longitudinal walls of the frame surpass the sides of the device.

Figure 2 is a side view in which the activating lever can be seen, as well as the press disposed between the inferior and top supports. In the back part of said press, next to the main guides, the body of the ascending-descending tracks are partially seen.

Figure 2A is a front detail of the descending-ascending tracks.

Figure 3 is a view in perspective of a section of the frame carrying the sheets outlined by two cross sections. Inside the same, the set of sheets can be seen. In the posterior part, the descending-ascending tracks may be observed.

Figure 4 is a schematic view of the descending-ascending tracks in which the frame carrying the sheets may be seen in the position in which two of its guiding bolts enter in the first and second descending tracks respectively. This descent of the guiding bolts provokes the displacement of the frame carrying the sheets within the guiding floating carriage.

Figure 5 is a view similar to the one just mentioned,

in which the guiding bolts meet in the respective grooves. The sheet press acts in this position. While in the first station the sealing is produced, in the last station the cutting conforming the blister is done.

Figure 6 is a view similar to Figures 4 and 5, in which it is shown how one of the guiding bolts is guided between the ascending track and its outlet guide. This provokes a new displacement of the frame that carries the sheet in the guiding floating carriage.

In the different figures, the same reference numbers indicate equal or corresponding parts, and the sets of various elements have been marked with letters.

#### List of main references:

- (I) sealing station
- (II) intermediate station
- (III) cutting station
- (a) frame
- (b) press
- (c) frame carrying the sheets
- (d) descending-ascending tracks
- (e) set of plates composing the blister
- (1) plastic sheet of (e)
- (1') plate of (e) that may be torn
- (2) superior bearing
- (3) dieholder
- (3') bolts of (3) with flexible means
- (4) guiding floating carriage
- (4') superior rotative sliders
- (4'') inferior rotative sliders
- (5) longitudinal walls of (c)
- (5') transversal bar
- (5'') guiding means (guide bolts)
- (5''') consecutive cells
- (6) thermosealing plate
- (7) cutting male matrix
- (8) sheet press
- (8') bolts of (8) with flexible means
- (9) inferior bearing of (b)
- (9') anchor plate
- (10) cutting female matrix
- (10') wedges of (5) in (10)
- (11) base of frame (a)
- (12) tensile means
- (13) guiding rod of press (b)
- (13') serrated border of (13)
- (14) main column
- (15) locking means of the rod (13)
- (16) activating axle
- (17) activating lever
- (18) body of tracks (d)
- (19) inlet guide
- (19') first descending track
- (20) outlet guide
- (20') ascending track
- (21) first wedge of (d)
- (22) initial stop

- (22') first peak of (d)
- (22'') second peak of (d)
- (23) second descent track
- (24) second wedge of (d)
- (25) main guides of (b)
- (26) electric switch of (6)
- (30) multialveolar unit (blister)

#### III - MAIN OBJECT

In order to comply with the specified aims, the device for the packaging of medicinal products in solid state is of the type in which the product is outfitted in an alveolar single piece conformed in a plastic sheet (1); said sheet can be closed by a sheet that may be torn (1'); both sheets (1) and (1') are part of a set of plates (e) that can be fractionable in multialveolar units [blister] (30); the present device wherein it includes a press (b) that works with a diehold (3), said diehold has a cutting matrix that includes a female (10) and a male (7) comprising a sheet press (8); on the other hand said diehold includes a set of thermosealing plate (6) and anchor plate (9'); said device also contains a guiding floating carriage (4) of a frame that carries sheets (c) which, as a sequential locator of each blister (30), interleaves between the mentioned cutting matrix (7)(10) and the mentioned thermosealing set (6)(9'); said frame carrying the sheets (c) embodying external guiding means (5'') in correspondence with the position of each blister (30); said guiding means (5'') directed in a sliding manner in corresponding descending-descending tracks (d).

#### IV - DESCRIPTION OF THE INVENTION

The aim of the present invention is directed to the packaging of medicinal products in solid state. This device is of the type in which the medicinal product is conditioned in a single position accommodated in a plastic sheet (1) that can be closed by a sheet that can be torn (1'). Both sheets (1) and (1') make up a set of plates (e). Said set can be fractionable in multialveolar units called blisters.

The present device embodies a frame (a) provided with a base (11) on which a main columns (14) is built. The latter (14) provides a mounting to a superior bearing (2) in its most elevated part.

Between the base (11) of the frame (a) and the superior bearing (2) a press (b) is found, together with a guiding floating carriage (4). Inside said carriage (4) moves a frame carrying sheets (c) in which an arranged set of plates (e) to be applied can be found.

Most particularly, inside the superior bearing (2) there is a gear system [such as a serrated wheel, not in the figures] that connects to an activating axle (16) with a guiding rod (13) of press (b). On the activating axle (16) there is an activating lever (17), finished as a commanding handle. On the other hand, the guiding rod (13), provided with a serrated border (13') for its con-

nection with the gear system, ends in a dieholder body (3). Said dieholder body (3) is wedged in a sliding manner in the main guides (25) that are built as from the inferior bearing (9).

A thermosealing plate (6) and a male cutting matrix (7) are mounted on said dieholder body (3) through sliding bolts (3') provided with flexible means. Also, a sheet press (8) with its respective bolts (8') provided with flexible means and a guiding floating carriage (4) are found mounted on the dieholder (3).

The sheet press (8) is left arranged on top of the means located in the inferior bearing (9). At the same time, said sheet press (8) encompasses the thermosealing plate (6) and the cutting male matrix (7) in a similar manner as a fence. Furthermore, the guiding means (4) interposed between the dieholder (3) and the inferior bearing (9) is provided of superior (4') and inferior (4'') rotative tracks, among which its wedge guided in a sliding manner is found guiding the frame carrying the sheets (c).

There is an anchor plate (9') underneath the guiding floating carriage (4) on the inferior bearing. This anchor plate (9') is placed opposite to the thermosealing plate (6). On the other hand, there is a female cutting matrix (10) that is placed opposite to the male cutting matrix (7).

The frame carrying the sheets (c) is a bearing, longitudinally extended. Its longitudinal walls (5) have a plurality of transversal rods (5'). These rods (5') conform respective cells (5''), arranged in a consecutive manner. Each of said cells (5'') outlines the surface of a blister (30) on the sheets (1) and (1') of the set of plates (e). The frame (c) also has tensile and retentive means (12) of sheets (1) and (1').

Furthermore, guiding means (5'') extend from one of the longitudinal walls (5) of the frame that carries the sheets (c). These guiding means project in correspondence with the position of each cell (5''). In the present way of embodiment, the guiding means (5'') are guiding bolts (5''). Said bolts (5'') include extensions of said transversal rods (5') that go through one of the longitudinal walls (5). These guiding bolts (5'') can be directed in a sliding manner in corresponding descending-ascending tracks (d).

More particularly, said descending-ascending tracks (d) posses a body (18). Said body (18) is mounted on the inferior bearing (9) of press (b) and it has its superior border in the shape of a serrated chevron. In this way, the body (18) has a first tuft (22') from which a first descending track (19') starts. This first descending track (19') is provided with an inlet guide (19) and it ends in a first wedge (21). In the outlet of the first wedge (21) there is an ascending track (20'). Said ascending track (20') is surrounded along the edge with an outlet guide (20) and it ends in a second tuft (22''). As from this second tuft (22''), a second descending track (23) starts. Said descending track (23) leads to a second wedge (24).

The device that is being described has three stations (I)(II)(III) that are run through by the frame carrying

the sheets (c). Firstly, there is a sealing station (I) located in the area in which the thermosealing plate (6) and the anchor plate (9') confront. Then there is an intermediate station (II) that coincides with the area that separates the thermosealing plate (6) and the cutting matrix (7). Finally, there is a cutting station (III) for the set of plates (e) that coincides with the position of the male (7) and female (10) cutting matrix.

#### 10 The set works as follows:

The switch (26) of the electric circuit that supplies the thermosealing plate must be activated. The frame carrying the sheets (c) must have a plastic sheet (1) with a medicinal product in its alveolus and a sheet that can be torn (1') covering said product. In these conditions, the device is ready to be activated.

The frame that carries the sheets (c) can be displaced within the guiding floating carriage (4) until its first guiding bolt (5'') reaches the initial stop (22) of the descending-ascending tracks (d). With such arrangement, the lever can be activated. This is done liberating the corresponding locking means (15).

When said lever (17) is lowered, the dieholder (3) of press (b) descends. Simultaneously, the frame that carries the sheets (c) moves within the floating carriage (4). This is because the guiding bolt (5'') surpasses the first tuft (22'), and, directed by the inlet guide (19), it moves by the first descending track (19') until it reaches the first wedge (21). In the sealing station (I), the set of sheets (e) is immobilized by the sheet press (8). Meanwhile, the thermosealing plate (6) seals against the anchor plate (9') the part of both sheets (1)(1') outlined by a cell (5'').

When the activating lever is raised, the guiding bolt (5'') which was in the first wedge (21) goes up by the ascending track (20'), directed by the outlet guide (20). When the lever (17) is lowered again, said guiding bolt (5'') surpasses the second tuft (22'') and runs along the second descending track (23).

By means of these movements, the cell (5'') of the frame (c) that contains the part of the set of sheets (e) which is already sealed passes to the intermediate station (II). At the same time, the cell (5'') coming behind enters the sealing station (I).

By repeating both movements of the lever (17), the first cell (5'') enter the cutting station (III) with the sealed set of sheets (e). There, both matrixes (7)(10) produce the cutting conforming a multialveolar unit or blister (30). At the same time, in the first station (I), another cell (5'') subjects its sheet portion to the action of the thermosealing plate (6).

It cannot be doubted that when the present invention is put into practice, modifications may be introduced concerning certain details in construction and shape, without this implying drawing apart from the fundamental principles that are clearly substantiated in the clauses of the following claims:

**Claims**

1. DEVICE FOR THE PACKAGING OF MEDICINAL PRODUCTS IN SOLID STATE of the type in which the product is outfitted in an alveolar single piece conformed in a plastic sheet; said sheet can be closed by a sheet that may be torn; both sheets are part of a set of plates that can be fractionable in multialveolar units [blister]; the present device wherein it includes a press that works with a diehold, said diehold has a cutting matrix that includes a female and a male comprising a sheet press; on the other hand, said diehold includes a set of thermosealing plate and anchor plate; said device also contains a guiding floating carriage of a frame that carries sheets which, as a sequential locator of each blister, interleaves between the mentioned cutting matrix and the mentioned thermosealing set; said frame carrying the sheets embodying external guiding means in correspondence with the position of each blister; said guiding means directed in a sliding manner in corresponding descending-ascending tracks.
 

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2. DEVICE FOR THE PACKAGING OF MEDICINAL PRODUCTS IN SOLID STATE in accordance with claim 1 wherein the frame that carries the sheets goes through three stations: one sealing station level with the thermosealing plate, an intermediate station, and another cutting station coinciding with the position of the cutting matrix.
 

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3. DEVICE FOR THE PACKAGING OF MEDICINAL PRODUCTS IN SOLID STATE in accordance with claim 1 wherein the sealing station, the thermosealing plate and anchor plate are arranged, while in the cutting station the male and female cutters are found.
 

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4. DEVICE FOR THE PACKAGING OF MEDICINAL PRODUCTS IN SOLID STATE in accordance with claim 1 wherein the frame that carries the sheets is a bearing longitudinally extended conforming a plurality of cells arranged in a consecutive manner; each of which outlines the surface of a blister on the sheet, including respective external guides corresponding with the position of each cell.
 

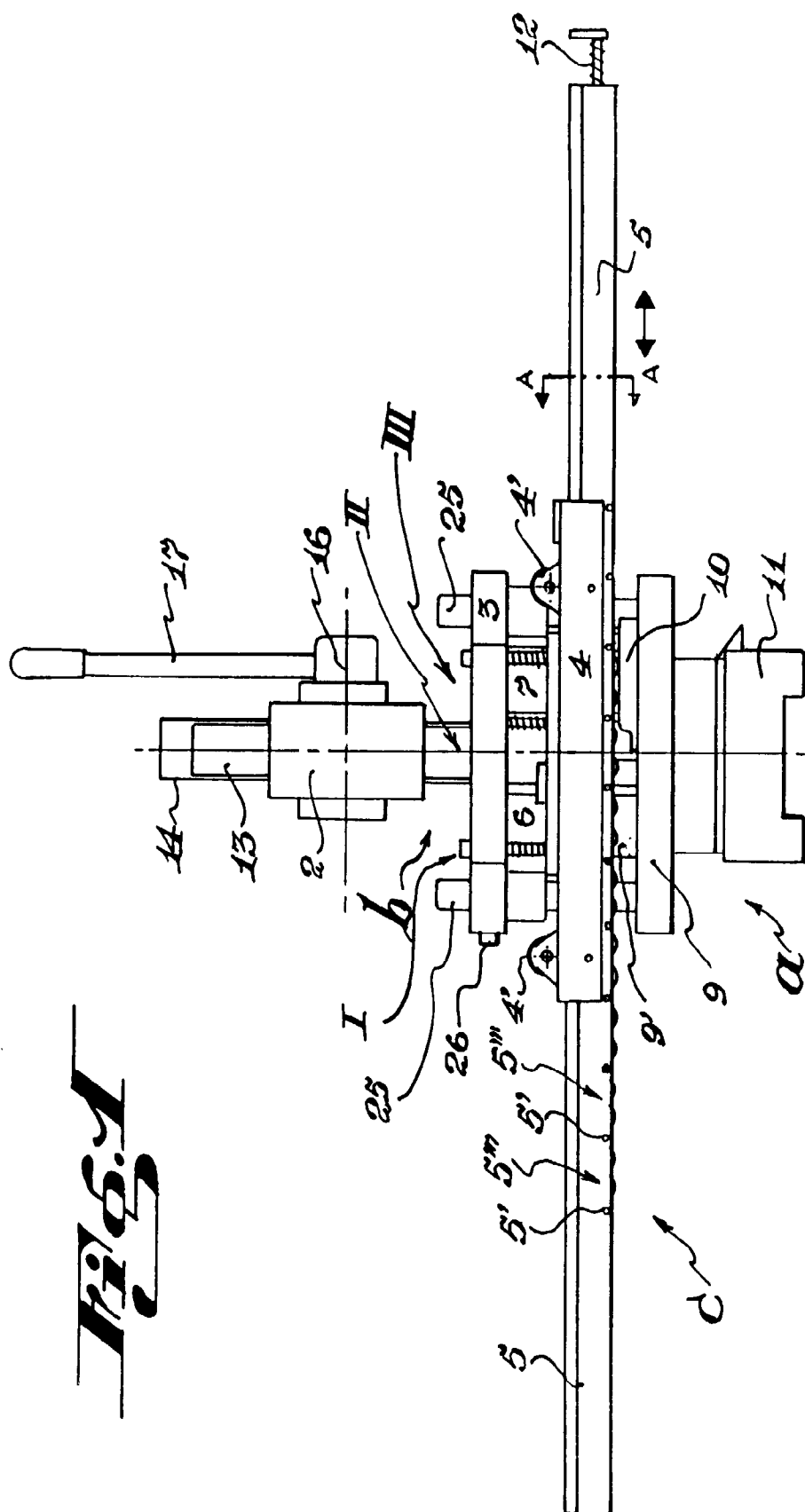
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5. DEVICE FOR THE PACKAGING OF MEDICINAL PRODUCTS IN SOLID STATE in accordance with claim 1 wherein the press includes a sheet press that is located above the anchor plate and the female cutting; said sheet press surround in the manner of a fence the thermosealing plate and the male cutting.
 

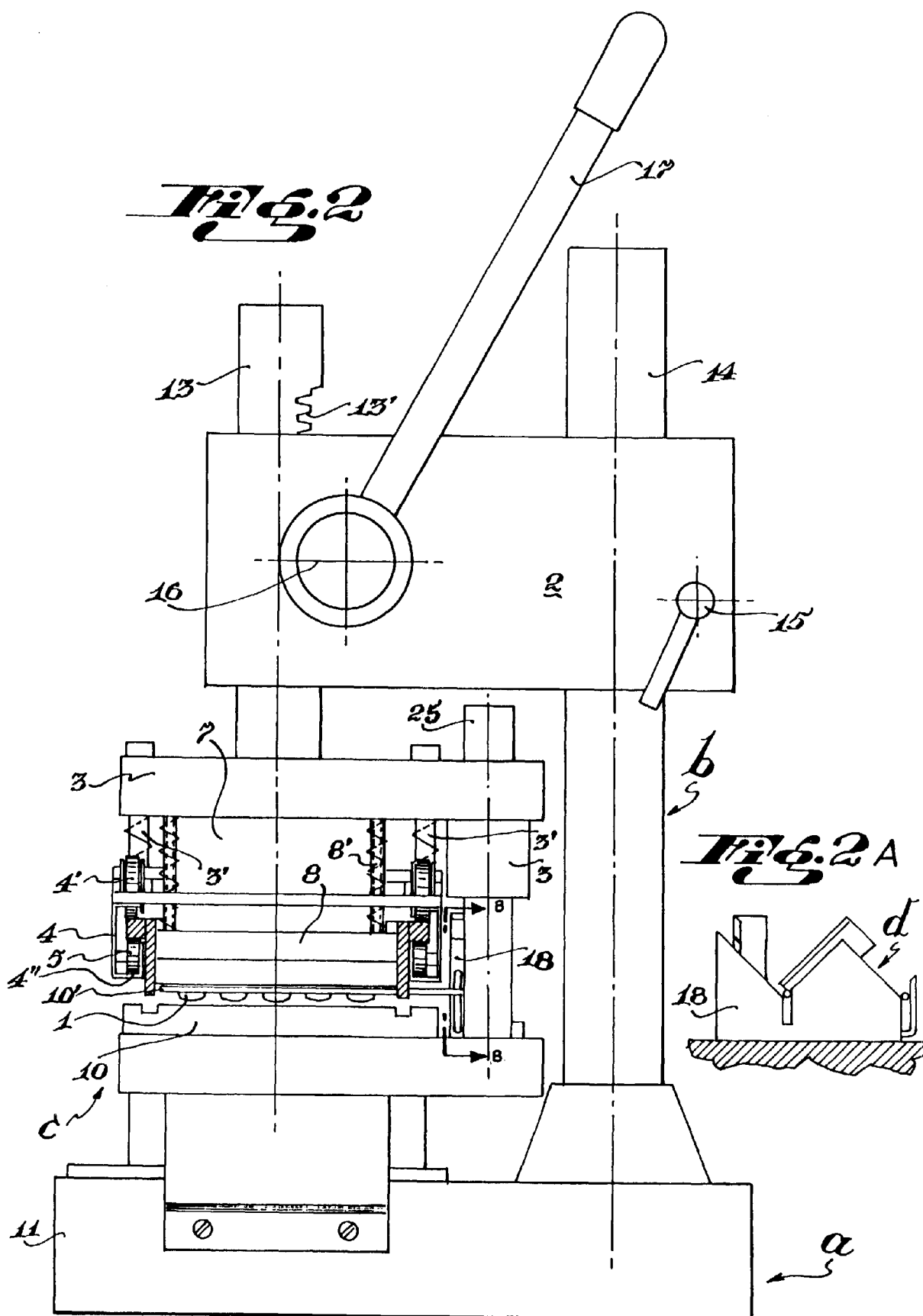
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6. DEVICE FOR THE PACKAGING OF MEDICINAL PRODUCTS IN SOLID STATE in accordance with claim 1 wherein the press can be activated by means of a lever that ends in a handle.
 

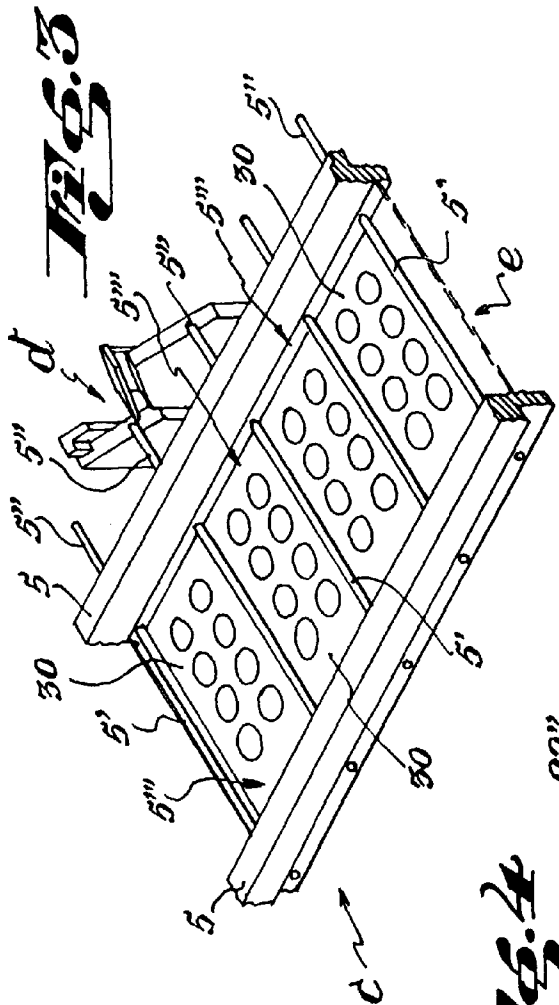
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7. DEVICE FOR THE PACKAGING OF MEDICINAL PRODUCTS IN SOLID STATE in accordance with claim 1 wherein the thermosealing plate is connected to an electric circuit that includes an activating switch.
 

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8. DEVICE FOR THE PACKAGING OF MEDICINAL PRODUCTS IN SOLID STATE in accordance with claim 1 wherein it includes a frame that conforms a base with an inferior bearing and a main column with a superior bearing; between said inferior and superior bearings a press is arranged; said press can be activated by means of a lever that includes, on one hand, an electric thermosealing plate confronted to an anchor plate; and, on the other hand, it includes a male cutting matrix confronted to a female cutting matrix; interleaved within the press there is a guiding floating carriage in which a frame that carries the sheets is wedged in a sliding way, said frame provided with guiding bolts wedged in descending-ascending posterior tracks.
 

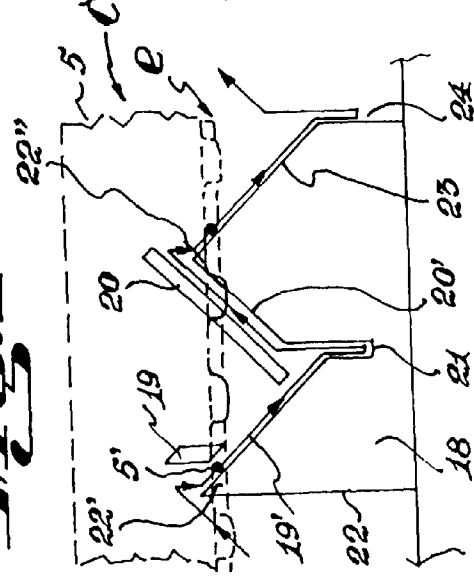
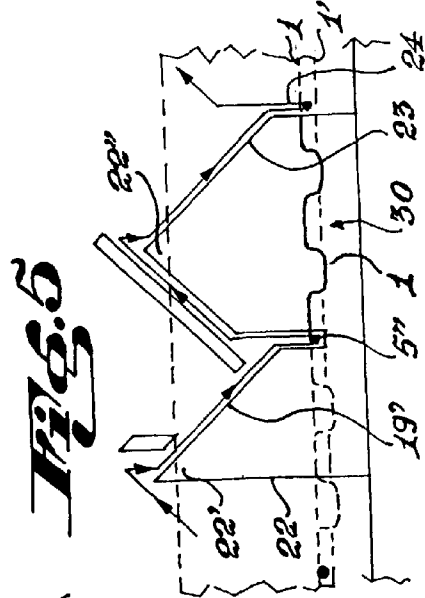
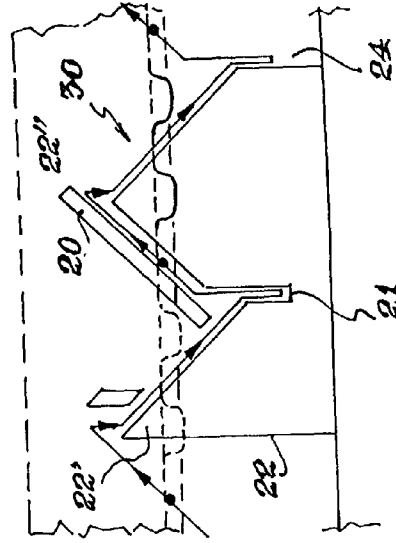
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**Fig. 6**







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# EUROPEAN SEARCH REPORT

Application Number  
EP 97 50 0149

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	US 2 363 014 A (CH. NICOLLE) * page 4, column 2, line 27 - page 5, column 1, line 46; figures 11,12 * ---	1-3,5-7	B65B11/50 B65B51/14
A	GB 643 472 A (CH. NICOLLE) * page 4, line 77 - page 5, line 49; figures * ---	1-3	
A	FR 1 001 640 A (CH. NICOLLE) * page 2, column 1, line 14 - page 3, column 1, line 8; figures * -----	1,6	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			B65B
The present search report has been drawn up for all claims			
Place of search: <b>THE HAGUE</b>		Date of completion of the search: <b>8 December 1997</b>	Examiner: <b>Jagusiak, A</b>
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