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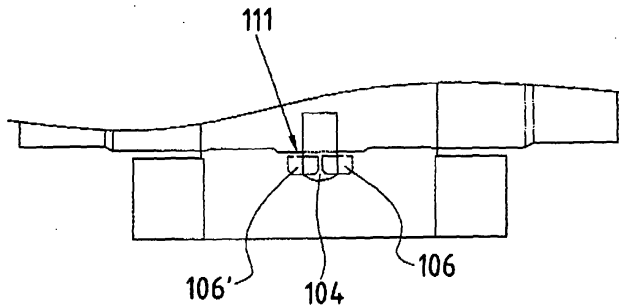
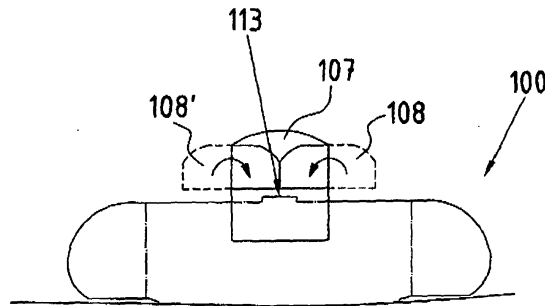
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**(54) Tamper-evident closure for a box with alarm sensor**

(57) The present invention provides a tamper-evident closure of a box (300) with alarm sensor providing a latch (107,104) with at least one side flap (108,106) and an opening (111,113) wherein the width of the opening, is smaller than the width of the latch and the expand-

able at least one side flap; wherein the at least one side flap is foldable prior insertion into the opening; wherein the at least one side flap is expandable after insertion into the opening; and wherein the latch and/or at least one side flap are provided with at least one layer of an electrical conducting material.



**Fig.2**

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**Description****Description**

**[0001]** A tamper-evident closure of a box with alarm sensor providing a latch with at least one side flap, and an opening.

**[0002]** According to the prior art, folding boxes are known which comprise a tamper-evident closure, wherein the closure must be glued during the final assembly of the folding box. Alternatively, folding boxes are provided with an adhesive label or sealed by thermoplastic adhesive gluing. In the case that boxes are individually packed due to customer requests, additional steps for gluing the closure prolong the final assembly process and make the shipment more expensive. Hence, there is a need for a box provided with a tamper-evident closure without adhesive.

**[0003]** The objective of the invention is to provide a tamper-evident closure for a box which only can be opened by mechanically damaging the packing material and provides an alarm after damaging.

**[0004]** According to the invention this objective is achieved by a tamper-evident closure of a box with alarm sensor providing a latch with at least one side flap and an opening

- wherein the width of the opening is smaller than the width of the latch and the expandable at least one side flap;
- wherein the at least one side flap is foldable prior insertion into the opening;
- wherein the at least one side flap is expandable after insertion into the opening; and
- wherein the latch and/or at least one side flap are provided with at least one layer of an electrical conducting material.

**[0005]** The embodiments of the present invention provide a box with at least one tamper-evident closure with alarm sensor including a first latch and a second latch and at least one opening, wherein the closure of the box can be mechanically closed without the need for gluing, and the closure can be opened only by destroying the original tamper-evident closure, wherein the box comprises

- a first latch with at least one side flap;
- a first opening of the box for inserting the first latch;
- wherein the at least one side flap of the first latch is foldable; and
- wherein the at least one side flap is expandable after inserting the side flap through the first opening into the inside of the box due to the intrinsic elasticity of the material; and
- wherein the first latch and/or at least one side flap are provided with at least one layer of an electrical conducting material.

**[0006]** The idea of the present invention is to provide a box with a tamper-evident closure. The closing mechanism provides an irreversible process of expansion of some side flaps of insertion latches once on closure inserted into the folding box. Due to irreversibility of the tamper-evident closure, the reopening of the box can merely occur by visibly damaging the packing material. Further, the combination of several latches also provides a high stiffness of the paperboard material at the closure. Thus, a tool i.e. knives or scissors are needed to open the latches. As a result unauthorised opening e.g. during the periods of transport or storing, will become difficult and will be apparent. If the break line of a first and/or second latch and the respective side providing an electrical conducting layer are broken or torn off, the change of electrical properties is sensed and an alarm is annunciated. Nevertheless, the tamper-evident closure may be closed with just manual folding of the side flaps of the latches during insertion of the latches into provided openings of the folding box. Thus, the originality of transported and packed goods, e.g. in case of providing a special quality or service to the customer can be guaranteed, if the box is evidently undamaged.

**[0007]** In an advantageous implementation the latch is made of a piece of material with an intrinsic elasticity comprising paperboard, rubber, metal or a plastic material.

**[0008]** Advantageously the elasticity of the material allows the expanding of the side flaps of the latches inside the box. A combination of several elastic materials or inelastic and elastic materials may be chosen. The choice of the elasticity of the materials and the shape of the side flaps for supporting the particular property of elasticity depends on the properties of expandability, favourable for achieving the irreversibility of the tamper-evident closure.

**[0009]** In an advantageous implementation the layer of an electrical conducting may be colour, ink and/or film. Advantageously the layer may be colour and/or ink, which is merely painted onto the latch and the at least one side flap. Several manners of painting or printing of the electrical conduction layer on material e.g. blank is well known.

**[0010]** In an advantageous implementation the layer is connectable to an actuator. Advantageously the actuator is an electrical circuit like a sensor device for sensing the change of electrical properties of the electrical layer. Also further devices like an alarm annunciation device or a combination of sensing device and alarm annunciation device may be comprised as an actuator.

**[0011]** In an advantageous implementation the layer and/or actuator is a RFID transponder and / or an alarm annunciation device. Advantageously the actuator is an electrical circuit which sensing changes in the electrical properties of the electrical conduction layer, storing changes or provides an alarm at a sensor device which triggers an alarm annunciation device, e.g. a horn, a loudspeaker, a flashlight or even a signal to a transponder or

transmitter, e.g. the RFID transponder or any other device that serves for announcing an alarm.

**[0012]** In an advantageous implementation the at least one side flap of the first latch provides a break line along a folding line, for allowing that the first time the box is opened, the side flap cooperates with the box side walls and is torn off at the predetermined break line when the side flap is moved beyond the tearing edge. Advantageously the side flap may be thorn off, once the box is opened. In some applications of tamper-evident closures the mere fact that the closure has once been opened is crucial, but the opening should be easy to handle, the break lines may support the opening, by pulling the latch and coincidentally provide information of the originality of the closure.

**[0013]** In an advantageous implementation the at least one side flap is provided with a rounded corner in the area of the folding line and that a latch is provided with at least a rounded edge in the area of the folding line in order to allow a smooth insertion when the side flaps are foldable adjacent towards the centre of the particular first or second latch.

**[0014]** In an advantageous implementation at least part of the side flap and particular latch are made of an electric conducting material crossing the break line in order to allow triggering an alarm when at least one side flap is being torn off the particular latch, while breaking the tamper-evident closure. Advantageously an alarming may be connected to the closure, for allowing, that and when the closure of the box has been broken.

**[0015]** In an advantageous implementation the opening provides a height dimension which is at least as high as the material thickness of the latch and the foldable side flap.

**[0016]** In an advantageous implementation the width of the opening is at least the width of the latch main body and at least smaller than the overall width of the at least one side flap and the latch main body.

**[0017]** In an advantageous implementation the opening provides a height dimension which is at least as high as the material thickness of the latch and the foldable side flap.

**[0018]** In an advantageous implementation the box is provided with

- a second latch with at least one side flap;
- a second opening in the first latch for inserting the second latch;
- wherein the at least one side flap of the first latch is foldable and
- wherein the at least one side flap is expandable after inserting the flap through the first opening into the inside of the box due to the intrinsic elasticity of the material.

**[0019]** In an advantageous implementation a blank for folding the box is designed as a single piece of material, comprising all of the flaps and latches cited.

**[0020]** In an advantageous implementation the at least one side flap of the second latch is securing the first latch of the tamper-evident closure by interlocking. Advantageously, the interlocking provides an additional security against unauthorised opening of the box. Also it provides more mechanical stiffness of the closure of the box.

**[0021]** In an advantageous implementation the dimensions of the second latch is at least smaller than the dimensions of the first latch.

**[0022]** Additional advantages, special features and practical refinements of the invention can be gleaned from the subordinate claims and from the presentation below of preferred embodiments making reference to the figures.

**[0023]** The figures show the following:

Figure 1 a schematic view of the paperboard blank;

Figure 2 a schematic view on the first and second latch providing side flaps;

Figure 3 a perspective view of the folded box folding the first latch;

Figure 4 a perspective view on the folded box folding the second latch with side flaps into the first latch;

Figure 5 a perspective view of the inside of the folded box on the interlocking first and second latch with expanded side flaps;

Figure 6 a perspective view of the inside of the box with the first latch provided with a RFID transponder; and

Figure 7 a perspective view of the inside of the box with the first latch provided with a layer of electrical conductive material, and a sensor device with wires in communication to the electrical conducting layer.

**[0024]** The box 100 according to the present invention provides a package sealed with a tamper-evident closure for transporting of physical mail object in particular for goods of high value or quality.

**[0025]** Figure 1 shows a box 300 in form of a paperboard blank 100 according to the present invention.

**[0026]** The box 300 provides several insertion tabs, latches and flaps, which are folded together in a kind of self-explanatory way for easily forming a universal transport box e.g. for the transportation of physical mailing goods or other physical objects. Similar boxes are known to the person of skill in the art.

**[0027]** This embodiment of the present invention provides a first latch 107 and a second latch 104 each provided with side flaps 108, 108' in the case of the first latch 107, and side flaps 106, 106' in the case of the second

latch 104. The latches 107, 104 and the side flaps 108, 108', 106, 106' are provided with a layer of electrical conducting material. The material may be colour or ink, which are painted or printed on the material. The layer may also be a film or a foil of an electrical conducting material.

**[0028]** The first latch 107 is made of one piece of paperboard, which is cut out as one piece of the paperboard blank 100. The first latch 107 provides an opening adjacent to the folding line of the first latch 107 which is in particular one third of the latch gauge in the area of the folding line 117. However the second opening 113 is at least as broad as the gauge of the second latch 104, in order to receive the second latch 104 with folded side flaps 106, 106' inside the box after entering through the first opening 111.

**[0029]** The second latch 104 is made of one piece of paperboard, which is at least partly cut out as one piece of the paperboard blank 100. The second latch 104 provides two openings adjacent to the folding line 127 on either side of the latch. When the box 300 is being assembled the cut out of the second latch 104 together with the adjacent parts of the first opening 111 form one first opening 111, which is in particular at least as broad as the width of the first latch 107, in order to receive the first latch 107 with side flaps 108, 108' in folded state inside the box 300 after entering through the first opening 111.

**[0030]** The first and second latch 107, 104 are provided with both an interior side and an exterior side. The exterior side is equally the exterior side of the folded paper box 300 and the opposite side to the exterior side is defined as the interior side.

**[0031]** Figure 3 shows a partly folded box 300 with a hinged lid 305, about to be closed by inserting the first latch 107 into the first opening 111 at the front face of the box 300. Prior insertion of the first latch 107 of the paperboard material has to be folded at the folding line 117 in a rectangular manner at the middle of the first latch 107, adjacent to the second opening 113, providing second latch 104 in form of a preferably round capped head type part to be inserted and a latch main body. The term latch main body indicates the body of the latch without the additional side flaps. The first latch 107 is provided two side flaps 108, 108' which are folded towards the centre of the interior side of the first latch 107 as implied by the curved arrows 301, 301' into a folded position as indicated in dashed lines. Then the box 300 is closed by folding the hinged lid 305 and inserting the first latch 107 into the first opening 111 in step 303.

**[0032]** Once inserted into the first opening 111 the side flaps 108, 108' of the first latch 107 will expand inside the box 300, because of the intrinsic elasticity forces of the paperboard material. In order to allow an expanding, a cavity or some space will be provided inside the box 300 to allow the expanding of the side flaps 108, 108' of the first latch 107.

**[0033]** Figure 4 shows the way to fold the side flaps 106, 106' of the second latch 104 toward the interior side of the second latch 104. Further the second latch 104 is

folded at the folding line 127 in preferably the middle of the second latch 104.

**[0034]** The second latch 104 is now inserted into the second opening 113, which is now adjacent to the first opening 111 and the folding line 127 of the hinged lid 305 of the box 300. After insertion the second latch 104 provides a smooth and flat surface of the box 300. The side flaps 106, 106' once entering the inside of the box 300, will expand due to the intrinsic elasticity of the material. Some space in the environment of the side flaps of the first and second latch 107, 104 has to be reserved for expanding the side flaps 108, 108', 106, 106' inside the box 300.

**[0035]** Once first latch 107 with its side flaps 108, 108' is inserted into the box 300 by means of the expansion of the side latches 108, 108' the first latch 107 is providing an interlock with the box 300 material surrounding the first opening 111.

**[0036]** Once the first latch 107 has been inserted, the expansion of the side flaps 108, 108' is irreversible, because the user cannot act on reversing the expansion of the side flaps 108, 108' in the interior of the box 300. Hence, the first latch 107 cannot be extracted of its position. Thus, the box 300 cannot be reopened by simply extracting the first latch 107 through the first opening 111. The side flaps 108, 108' will provide a mechanical shear force on the side walls of the box 300 when pulling back the first latch 107. If the user will try to reopen the box 300 by simply extracting the first latch 107, he will either tear off the side flaps 108, 108' of the first latch 107, or he will damage the sidewalls of the folding box 300. Also by means of some tools like a pair of scissors or a knife, it would be not possible to reverse the expansion the side flaps 108, 108' of the first latch 107. The only way to be open the box 300 is to either damage either the sidewalls or the latches of the box 300 in order to open up the first opening 111, thus that the side flaps 108, 108' of the first latch 107 with the possible to pass the opening, all by clearing of the side flaps 108, 108' or by damaging the first latch 107.

**[0037]** In any of the aforementioned cases, the tamper-evident closure will be destroyed or some damage will be made to the outside of the box 300, which is recognizable and easily visible from a distance.

**[0038]** Figure 5 shows the expanded side flaps 108, 108' of the first latch 107 and the side flaps 106, 108' of the second latch 104 expanded inside the box 300. As well the interlocking of the first latch 107 and the second latch 104 is schematically shown. As described before concerning the first latch 107, the second latch 104, with its side flaps 106, 108' is interlocking the first latch 107. As mentioned above in case that the user will try to reopen the box 300 by simply extracting the second latch 104, either the side flaps 106, 106' of the second latch 104 will be torn off, or the first latch 107 and the sidewalls of the box 300 will be damaged.

**[0039]** By means of the interlocking between the first latch 107 which is rectangular to the second latch 104,

and the latter, the mechanical forces to pull one of the latches in order to open the box 300 need to be rather high. Further the material of the latches reinforces the paperboard material in the closure area, hence, the forces to be injected by reopening need to be rather high.

**[0040]** Thus, it is not possible to reopen the box 300 by just pulling one of the two latches. The use of a tool e.g. a knife or a pair of scissors for damaging the sidewalls of the box 300 or cutting the latches is necessary. The damaged on the box 300 are visible, obvious to recognize even from a distance.

**[0041]** In one embodiment both the latches 107, 104 and the side flaps 108, 108', 106, 106' are provided with rounded caps in order to achieve a more easy insertion of the respective first latch 107 or second latch 104 into the respective opening on the folding box 300 .

**[0042]** The material for providing such an intrinsic elasticity may not only be limited to paperboard or corrugated board. There is a choice of materials coming into the mind of the person of skill in the art which provides an intrinsic elasticity which can be used to design latches with suitable elastic expansion side flaps. A choice of these materials may be any kind of plastic material, metal, rubber, etc.

**[0043]** Figure 6 shows an embodiment of the present invention with a RFID transponder 610 provided across the first latch 107 and the side flaps 108, 108'. In this embodiment the RFID transponder 610 is disposed across the folding line of the first latch 107 and the side flaps 108, 108'. The break lines 125, 125' if the first latch 107 is pulled out of the box 300 and the side flaps 108, 108' will be mechanically torn off when the first latch 108 crosses the tearing edge of the first opening 111. In this embodiment the RFID transponder 610 will be damaged, thereby of the electrical properties of the RFID transponder 610 are being changed. In this particular case, the damage of the RFID transponder 610 leads to alteration of the resonance frequency. Hence, the RFID transponder 610 cannot be received any more from outside on its particular duty frequency. A transponder system situated outside of the box 300 may recognize the failing of the response of the RFID transponder 610 at the original resonance frequency due to the damaging of the first latch 107 and the side flaps 108, 108', and thus will send out an alarm for example to a dispatcher, a mobile communication device, an alarm annunciation device or any other alarming centre.

**[0044]** Figure 7 shows an embodiment of the latch 107 and the two side flaps 108, 108' which are provided with an electrical conducting layer on the interior of the side flaps 108, 108', and the first latch 107, wherein the electrical conducting layer is crossing the break lines 125, 125'. In this embodiment the electrical conducting layer is contacted with two physical wires 720, 720', which may also be disposed on the paperboard blank 100 as printed wires or layer of electrical conducting material. The wires are connected to the sensor device 710 which detects electrical properties of an electrical conducting layer dis-

posed on the side flaps 108, 108' and first latch 107. For example if the second latch 107 will be pulled out of its position the side flaps 108, 108' will be torn off the first latch 107 when being pulled beyond a tearing edge, the electrical circuit between the wires 720, 720' and the electric conducting layer will be interrupted, thus the sensor device 710 will detect the interruption of the electrical circuit and actuate an annunciation device which then give an alarm in form of visible, audible or a RF signals, which could be registered from the outside of the box 300.

**[0045]** Therefore, the sensor device 710 may be connected to any kind of annunciation device providing audible, visible or any other kind of alarm. Further the alarm may be an alarm transmitted per high frequency fields. The annunciator may also be a HF transmitter transmitting an alarm actively or a RFID transponder 610 which transmissions enclose status information, providing an alarming status, which can be received from the outside, transmitting a requesting signal to the RFID transponder 610.

**[0046]** Further the layer of electrical conduction material may be a RFID transponder 610 which is provided as an electrical conduction layer on the latches 107, 104 and the side flaps 108, 108', 106, 106', and which is damaged when the latches are removed when the latches and/or the side flaps 108, 108', 106, 106' are cut or damaged. The changing properties of the electrical conductor are influencing the radio frequency properties of the RFID transponder 610. The RFID transponder 610 with different electrical or operational properties can easily be determined.

**[0047]** Also the combination of the above materials without the material for example by providing an inflexible material for that match and a highly flexible material like rather for the sites that may come into the mind of the person skilled in the art.

**[0048]** Further the side flaps 108, 108', 106, 106' may in particular be formed in order to have a break line 115, 115', 125, 125' which will be very easy to be torn-off, by pulling the respective latch out of the respective opening 111, 113 of the box 300. The torn-off side flaps 108, 108', 106, 106' of the respective latch 107, 104 will then be left over in the inside of the box 300. The break lines 115, 115', 125, 125' can be realised by grooves in the material, with perforation or by cutting the material along the folding line adjacent to the respective latch 107, 104. Further the material of the side flaps 108, 108', 106, 106' may be especially shaped for example with notches or cuts, in order fail under excess mechanical stress.

#### List of reference numerals:

100	Foldable paperboard blank
104	Second latch
106, 106'	Side flap of second latch
107	First latch
108, 108'	Side flap of first latch
111	First opening

(continued)

**List of reference numerals:**

113	Second opening
115, 115'	Break line at first latch
117	Folding line
125, 125'	Break line at second latch
127	Folding line
210	First latch and first opening
220	Second latch and second opening
300	Box
301, 301'	Folding the latches
303	Insertion of the first latch
305	Hinged lid
500	Inside view of the folding box
610	RFID transponder
710	Sensor device
720, 720'	Printed or physical wires

**Claims**

1. A tamper-evident closure of a box (300) with alarm sensor providing a latch (107, 104) with at least one side flap (108, 108', 106, 106') and an opening (111, 113)
  - wherein the width of the opening (111, 113), is smaller than the width of the latch (107, 104) and the expandable at least one side flap (108, 108', 106, 106');
  - wherein the at least one side flap (108, 108', 106, 106') is foldable prior insertion into the opening (111, 113);
  - wherein the at least one side flap (108, 108', 106, 106') is expandable after insertion into the opening (111, 113); and
  - wherein latch (107, 104) and/or at least one side flap (108, 108', 106, 106') are provided with at least one layer of an electrical conducting material.
2. The tamper-evident closure of claim 1, wherein the latch (107, 104) is made of a piece of material with an intrinsic elasticity comprising paperboard, rubber, metal or a plastic material.
3. The tamper-evident closure of claim 1, wherein the layer of an electrical conducting may be colour, ink and/or film.
4. The tamper-evident closure of claim 1 to 3, wherein the layer is connectable to an actuator.
5. The tamper-evident closure of claim 1 to 4, wherein the layer and/or actuator is a RFID transponder 610
6. The tamper-evident closure of claim 1 to 5, wherein the at least one side flap (108, 108', 106, 106') of the first latch (107) provides a break line (115, 115') along a folding line, for allowing that the first time the box 300 is opened, the side flap (108, 108', 106, 106') cooperates with the box 300 side walls and is torn off at the predetermined break line (115, 115') when the side flap (108, 108', 106, 106') is moved beyond the tearing edge.
7. The tamper-evident closure of claim 1 to 6, wherein the at least one side flap is provided with a rounded corner in the area of the folding line and that a latch (107, 104) is provided with at least a rounded edge in the area of the folding line in order to allow a smooth insertion when the side flaps (108, 108', 106, 106') are foldable adjacent towards the centre of the particular first or second latch (107, 104).
8. The tamper-evident closure of claim 1 to 7, wherein at least part of the side flap (108, 108', 106, 106') and particular latch (107, 104) are made of an electric conducting material crossing the break line in order to allow triggering an alarm when at least one side flap (108, 108', 106, 106') is being torn off the particular latch (107, 104), while breaking the tamper-evident closure.
9. The tamper-evident closure of claim 1 to 8, wherein the opening provides a height dimension which is at least as high as the material thickness of the latch (107, 104) and the foldable side flap (108, 108', 105, 106').
10. A box (300) with at least one tamper-evident closure with alarm sensor including a first latch (107) and a second latch (104) and at least one opening according to claim 1, wherein the closure of the box (300) can be mechanically closed without the need for gluing, and the closure can be opened only by destroying the original tamper-evident closure, wherein the box (300) comprises
  - a first latch (107) with at least one side flap (108, 108');
  - a first opening (111) of the box (300) for inserting the first latch (107);
  - wherein the at least one side flap (108, 108') of the first latch (107) is foldable;
  - wherein the at least one side flap (108, 108') is expandable after inserting the side flap (108, 108') through the first opening (111) in the inside of the box (300) due to the intrinsic elasticity of the material; and
  - wherein the first latch (107, 104) and/or at least one side flap (108, 108', 106, 106') are provided

with at least one layer of an electrical conducting material.

11. The box (300) of claim 10, wherein the box (300) is provided with 5
- a second latch (104) with at least one side flap (106, 106'); 10
  - a second opening (113) in the first latch (107) for inserting the second latch (104); 10
  - wherein the at least one side flap (108, 108') of the first latch (107) is foldable and 15
  - wherein the at least one side flap (106, 106') is expandable after inserting the flap through the first opening (111) in the inside of the box (300) due to the intrinsic elasticity of the material; and 15
  - wherein second latch (107, 104) and/or at least one side flap (108, 108', 106, 106') are provided with at least one layer of an electrical conducting material. 20
12. The box (300) of claim 11, wherein a blank (100) for the box (300) is designed as a single piece of material, comprising all of the flaps and latches cited. 25
13. The box (300) of claim 11 to 12, wherein the at least one side flap of the second latch (104) is securing the first latch (107) of the tamper-evident closure by interlocking. 30
14. The box (300) of claim 11 to 13, wherein the dimensions of the second latch (104) is at least smaller than the dimensions of the first latch (107), 35

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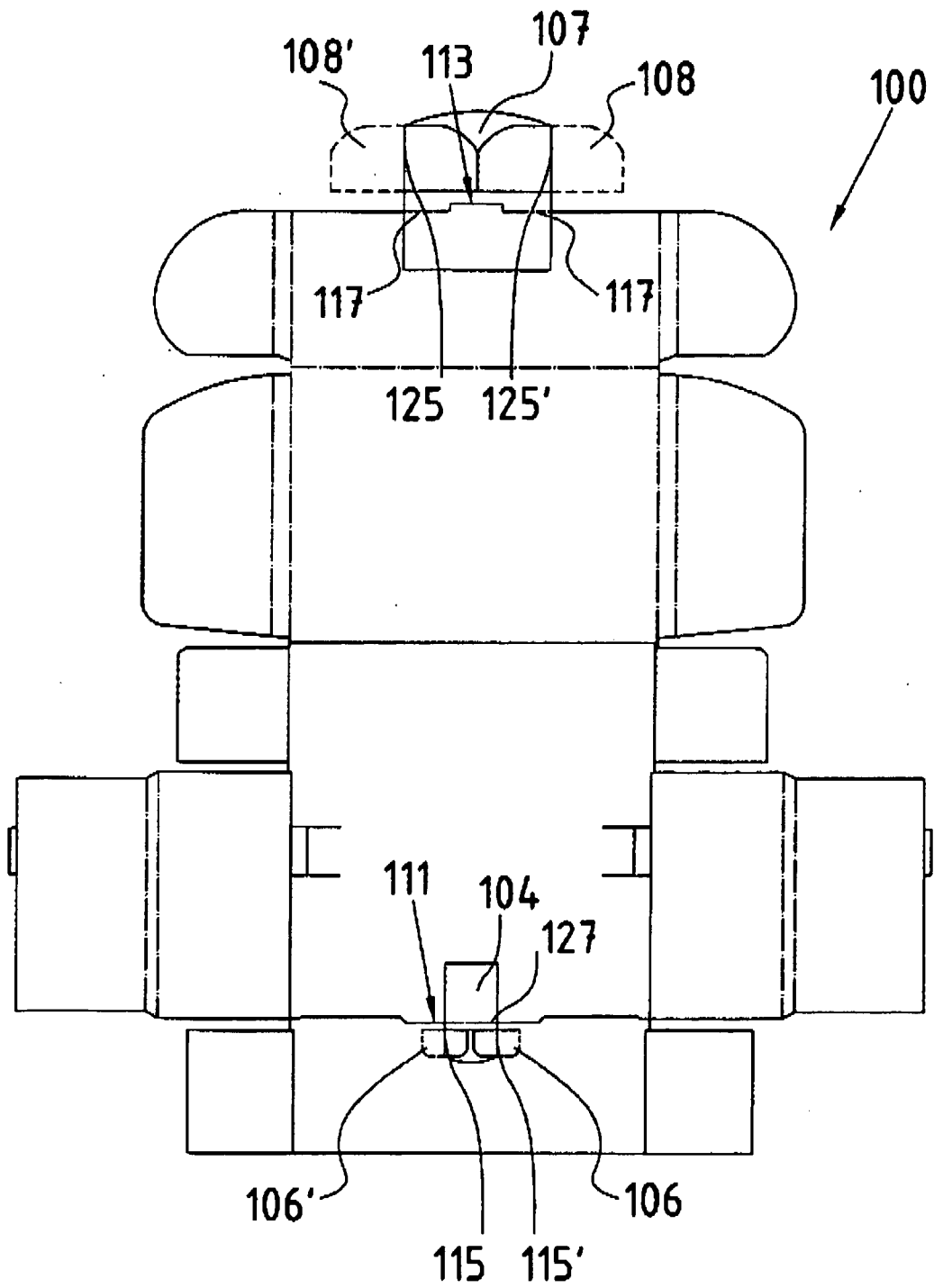


Fig.1



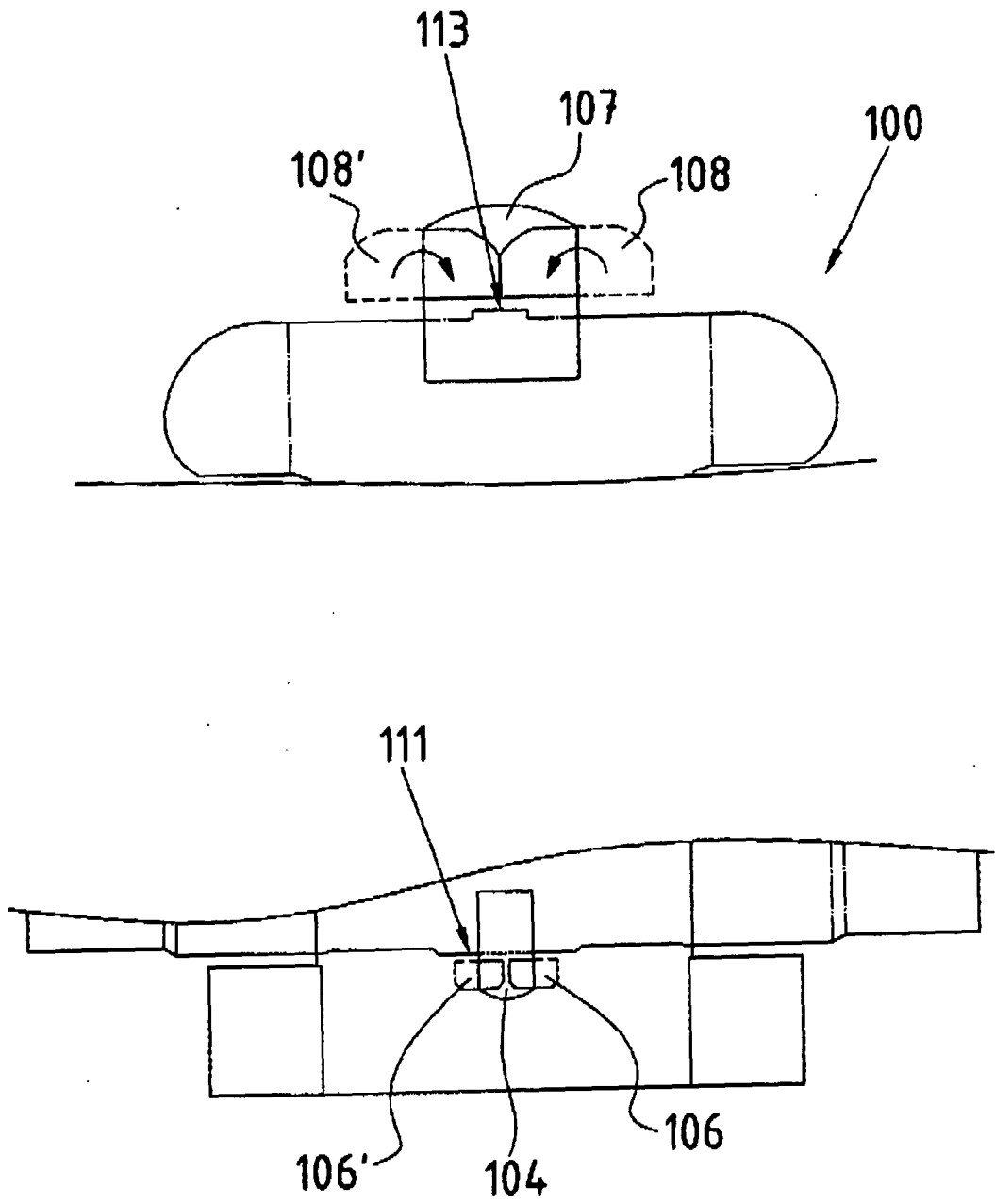


Fig.2

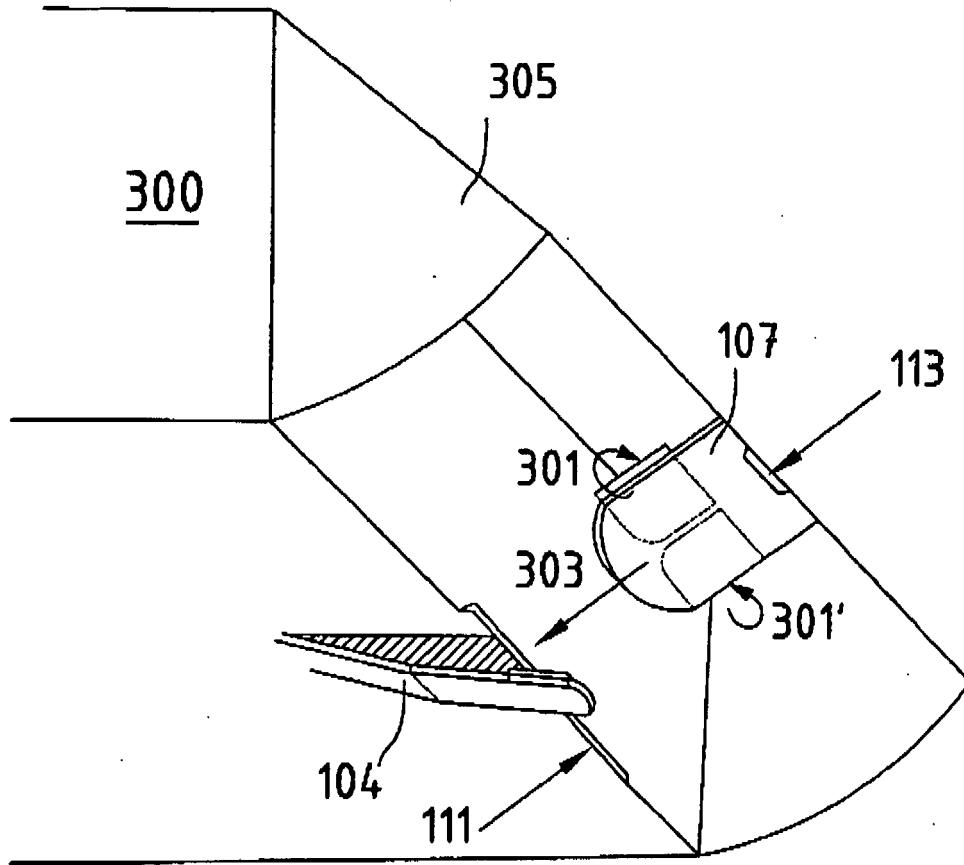


Fig.3

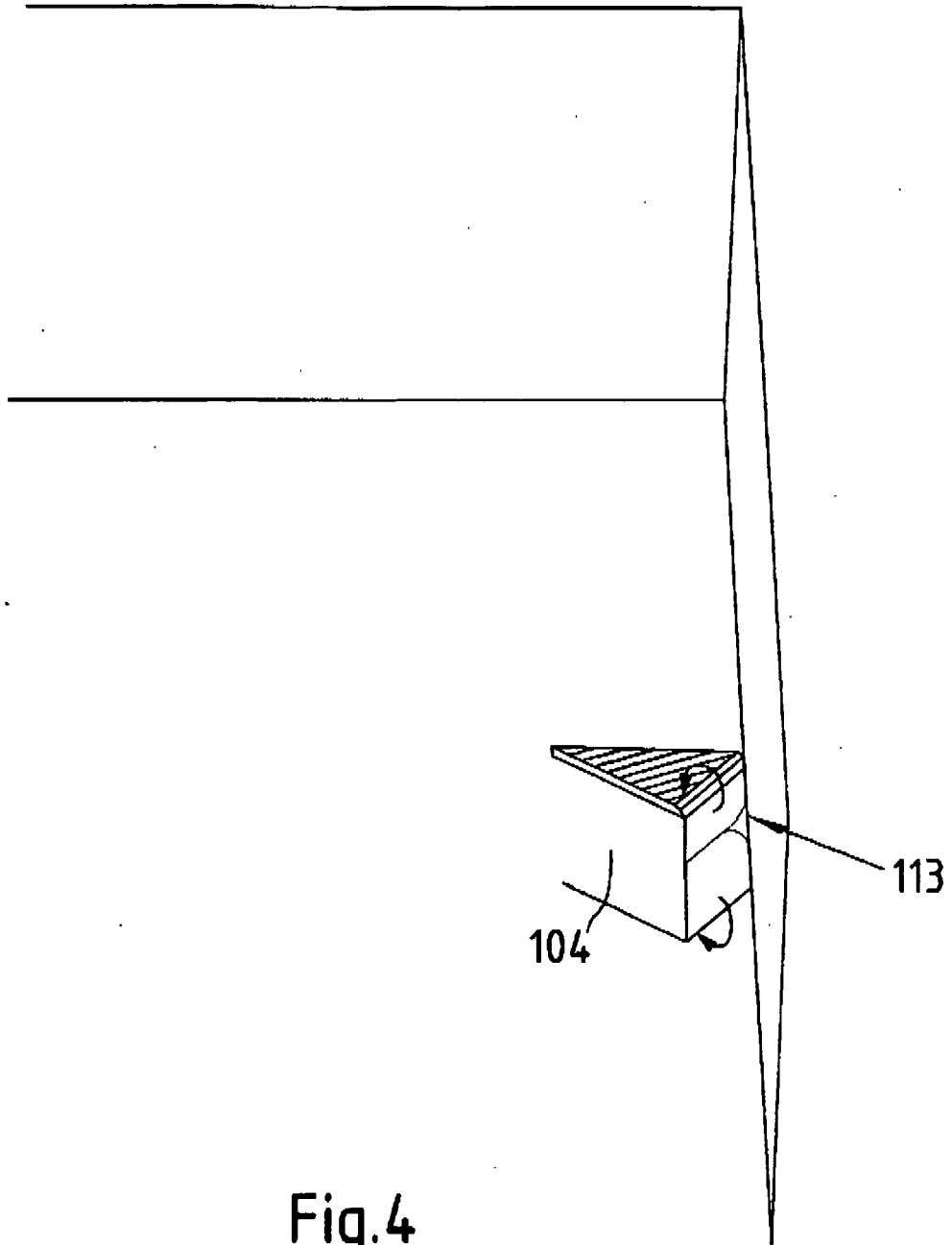


Fig.4

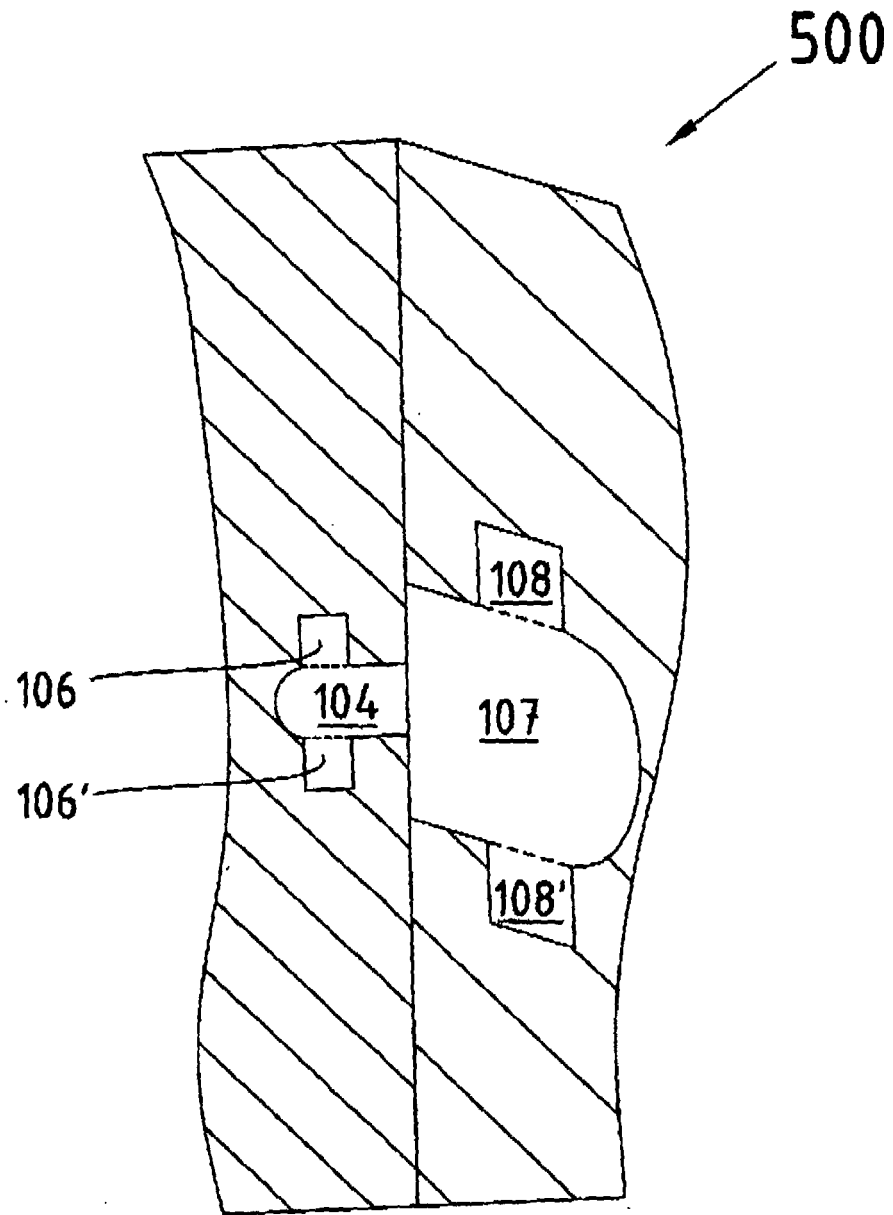


Fig.5

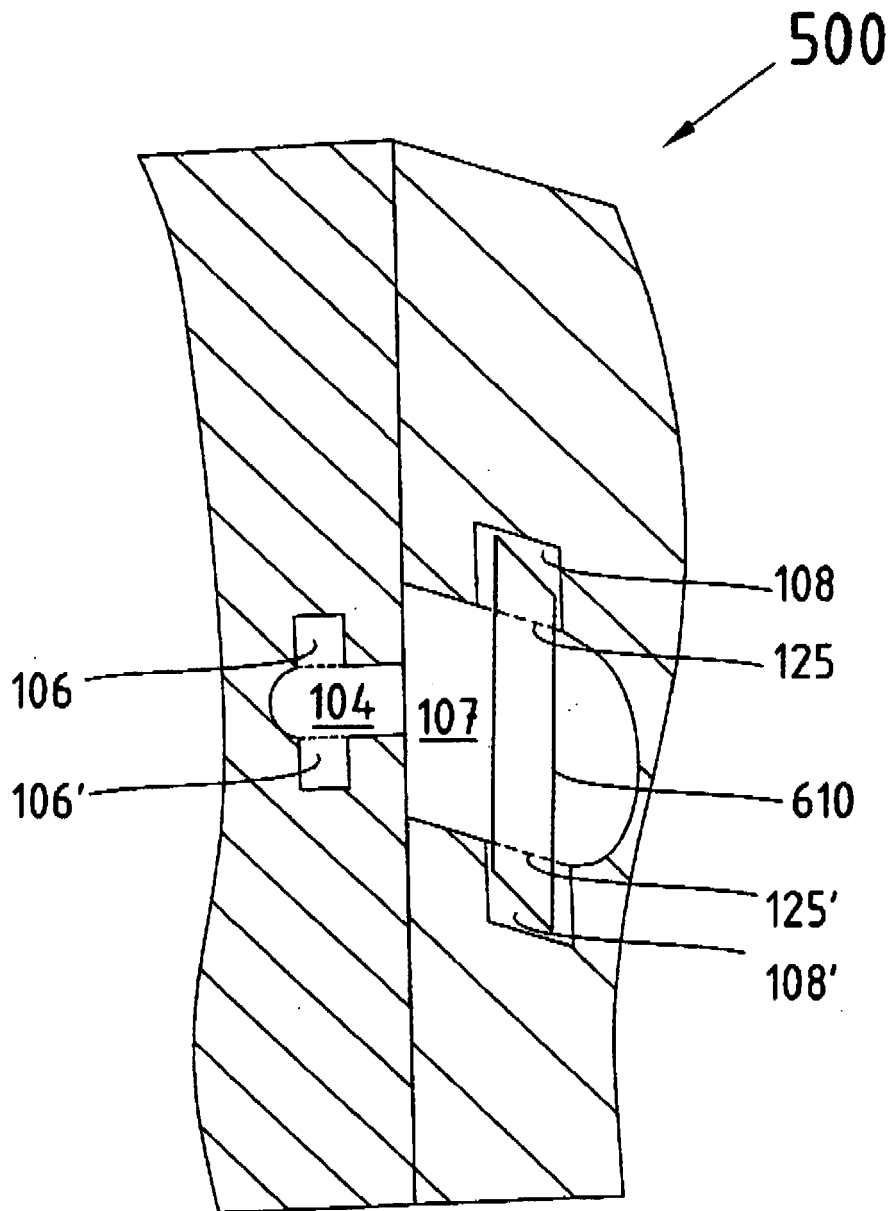


Fig.6

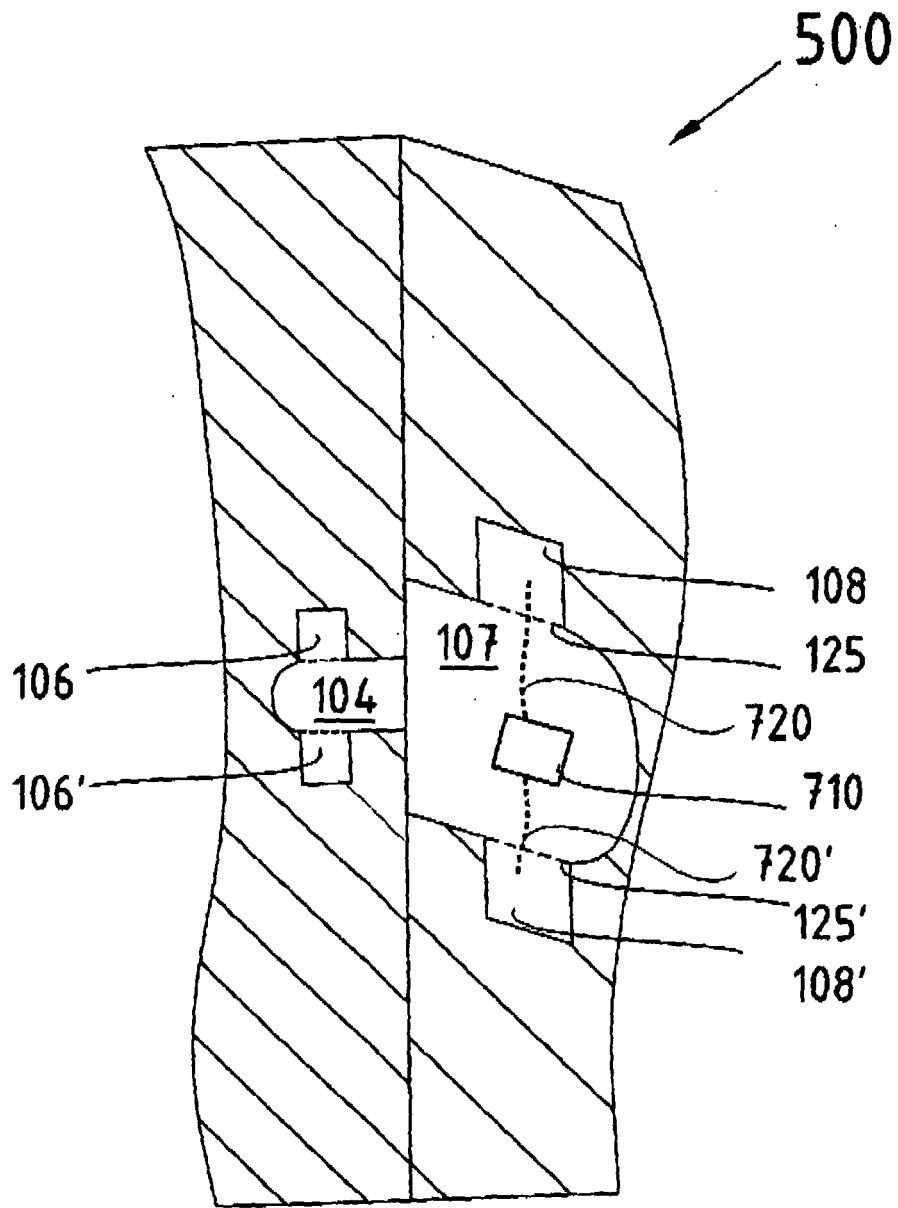


Fig. 7



EUROPEAN SEARCH REPORT

Application Number  
EP 09 01 3286

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X A	US 2 028 678 A (LUPTON ELMER H) 21 January 1936 (1936-01-21) * the whole document *	1-5,7-9 10-14	INV. B65D5/66
A	US 4 813 564 A (COOPER MARTIN H [US] ET AL) 21 March 1989 (1989-03-21) * column 1, line 34 - line 52; figures 4-8 * * column 3, line 32 - column 4, line 31 *	1-5,7-14	
X	WO 2006/064523 A1 (GI BI EFFE SRL [IT]; FULCO GIUSEPPE [IT]; LEUTI GIOVANNI [IT]; LO DUCA) 22 June 2006 (2006-06-22) * page 7, line 19 - line 27; figures 1-3 *	1-5	
A	US 1 108 464 A (MOREY FRED W.) 25 August 1914 (1914-08-25) * the whole document *	1-5	
A	US 2005/218202 A1 (BRAUDAKIS GEORGE [AU]) 6 October 2005 (2005-10-06) * figure 2b *	7	
X	US 2 331 754 A (WOHLERS FRIEDRICH H N) 12 October 1943 (1943-10-12) * the whole document *	10-14	
A	US 2005/184871 A1 (COSTE FRANCOIS [FR]) 25 August 2005 (2005-08-25) * paragraph [0009] - paragraph [0013]; figure 4 * * paragraph [0028] - paragraph [0039] *	1	TECHNICAL FIELDS SEARCHED (IPC) B65D
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 26 April 2010	Examiner Dick, Birgit
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

4

EPO FORM 1503 03.02 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.

EP 09 01 3286

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on  
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

26-04-2010

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 2028678	A	21-01-1936	NONE	
US 4813564	A	21-03-1989	EP 0329960 A2 JP 1254568 A	30-08-1989 11-10-1989
WO 2006064523	A1	22-06-2006	NONE	
US 1108464	A		NONE	
US 2005218202	A1	06-10-2005	WO 03089315 A1 AU 2003221619 A1 AU 2004101031 A4 AU 2004101044 A4 AU 2008255242 A1 CA 2522651 A1 EP 1534596 A1 NZ 536394 A	30-10-2003 03-11-2003 10-03-2005 10-03-2005 15-01-2009 30-10-2003 01-06-2005 26-10-2007
US 2331754	A	12-10-1943	NONE	
US 2005184871	A1	25-08-2005	CA 2494401 A1 DE 602005001159 T2 EP 1559653 A1 FR 2865720 A1	30-07-2005 17-01-2008 03-08-2005 05-08-2005

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82