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(54) **Hinged-lid pack**

(57) A hinged lid type pack for cigarettes or other consumable products is disclosed. The lid of the pack is provided with a locking mechanism comprising a locking tab connected by a tab hinge to a front wall of the pack, an engagement portion, located on an inner side of a front wall of the lid, for engaging with the locking tab, the locking tab has a base adjacent the tab hinge, a tip distal to the tab hinge, and sides extending between the base and the tip; the locking tab and the engagement portion are configured such that the sides of the locking tab are engageable with the engagement portion and prevent a section of the locking tab from being received in the engagement portion. The pack may be folded from a blank.

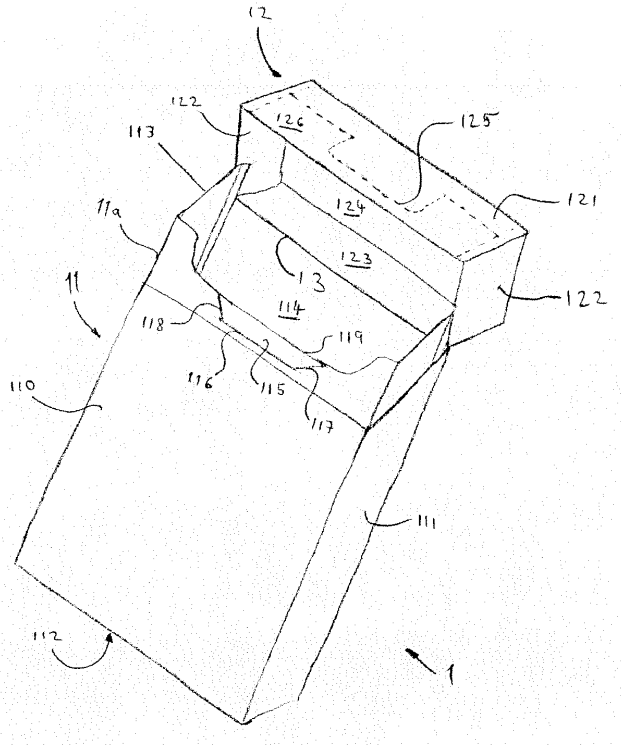

Fig 1

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Description

[0001] The present invention relates to a hinged-lid type pack. In particular, the invention relates to hinged lid pack for cigarettes or other consumable products and which may be folded from a blank made of card or another substantially planar semi -flexible material capable of being folded to form a boxed shaped container.

[0002] Boxed shaped containers having a hinged lid for containing cigarettes are well known in the art and numerous different examples have been proposed in the past. These are often folded from cardboard blanks to form a cardboard pack having a hinged lid which may be opened to allow access to the contents and closed again to protect the contents during transport, when in the pocket of a user's garment for example.

[0003] Such cardboard packs may suffer some deformation during use and due to this deformation and/or due to general disturbance of the pack in use, the lid may tend to at least partially open at times when the user wishes the lid to remain closed. This can result in damage to the contents of the pack and can result in the contents of the pack escaping from the pack in an undesirable manner. This phenomenon may be referred to as "smiling", where the hinged lid of the pack sits slightly open with respect to the body of the pack. When carried in a garment, in particular where the pack is a cigarette pack, loose tobacco contained in the pack can find its way into the user's pocket through the aperture created by this "smiling" effect. Different methods of attempting to overcome this "smiling" effect have been proposed in the prior art and it is desirable to improve the resistance of packs to this "smiling" effect. Further, it is desirable to provide a pack which gives a user a clear indication of when the lid is in a properly closed configuration and is therefore less likely to "smile" in the above-described manner.

[0004] Packs including a lid locking mechanism have been proposed in the past. One such pack has a tongue mounted to a front wall of the pack which is rotatable about a hinge at the base of the tongue. The tongue is configured to engage with an engaging part on the inner front wall of the lid of the pack, which has a gap, the gap being formed between the inner wall of the lid and a tab folded on to the inner wall. As the lid of the pack is rocked toward an open position, the tongue enters the gap and resists the opening of the pack. This prior configuration has some drawbacks, in that the forces required to disengage the tongue from the gap can create stresses in the hinge at the base of the tongue, as well as between the inner front wall of the lid and the tab creating the gap. Further, the prior locking mechanisms only engage once the lid is partially rocked toward the open position and so only hold the lid partially closed and do not completely resolve the "smiling" problem. Features of a prior art mechanism will be discussed in more detail later, in relation to Figure 6A.

[0005] Accordingly, there is a clear need for a container having an improved locking mechanism for maintaining the lid in a closed configuration.

[0006] In order to solve the problems posed by the prior art, the present invention provides a hinged lid pack comprising:

a body, having a plurality of side walls, a bottom end and a top end;
a lid for closing an opening of the body, comprising a lid front wall on a side of the lid substantially opposite a lid hinge connecting the lid to a rear side wall of the body;
a locking tab connected by a tab hinge to a front side wall of the pack, opposite the rear side wall of the pack;
an engagement portion, located on an inner side of the lid front wall, for engaging with the locking tab such that the locking tab can be rotated about the tab hinge when the lid is rocked over the body;
the locking tab having a base adjacent the tab hinge, a tip distal to the tab hinge, and sides extending between the base and the tip;
wherein the locking tab and the engagement portion are configured such that the sides of the locking tab are engageable with the engagement portion so as to prevent a section of the locking tab from being received in the engagement portion.

[0007] The hinged-lid pack of the present invention has a novel locking mechanism, which engages more quickly upon closure of the lid of the pack as compared to prior locking mechanisms and which maintains a positive engagement as well as providing a positive locking sound to confirm to the user that the locking mechanism has properly engaged. As compared to prior art locking mechanisms, the lid is consequently held more positively in a completely closed position. This is advantageous over prior art locking mechanisms which require the lid to be partially opened before they properly engage. Further, the locking mechanism of the present invention allows a locking tab of a greater length than was feasible in the prior art. The locking tab is able to engage with the lid of the pack at a point between its base and its tip. In use, when a user rocks the lid about the lid hinge, from a closed position to an open position, the tip pivots relative to the lid about the point of engagement between the sides of the locking tab and the engagement portion of the lid, which lies at a point between the base and the tip of the locking tab. The disengagement of the locking mechanism is therefore less susceptible to cause damage to the locking tab and/or the lid of the pack on disengagement, since the locking tab pivots about a point between its base and its tip. Further, less deformation is caused in the locking tab itself, in the walls of the pack and in the lid during disengagement of the mechanism and therefore the mechanism may be repeatedly operated, without causing excessive deformation, damage and weakening to the structure of the overall pack. This further contributes to avoidance of the phenomenon of "smiling" after

repeated opening and closing operations of the pack.

[0008] The locking tab and the engagement portion may be configured such that the sides of the locking tab engage with the engagement portion when the lid is in a closed configuration, which ensures a more immediate engagement and better resistance to the "smiling" effect than prior art closing mechanisms.

[0009] The locking tab may be located on an upper edge of the front side wall or inner frame of the pack and connected to it by a fold line, or may be created by a cut provided in the front side wall or inner frame of the pack.

[0010] The locking tab may be biased away from the front side wall, which assists in providing immediate engagement of the locking tab with the engagement portion on closing the lid.

[0011] The engagement portion may be arranged to enable access, for the locking tab, to a gap located between an engagement portion tab and the inner side of the lid front wall. Allowing the locking tab access to the gap may provide a more positive locking effect of the locking mechanism.

[0012] The locking tab may be configured such that at least a part of it may enter the gap when the lid is rocked from a closed position to a partially open position. This can increase the locking function of the locking mechanism as the lid is partially opened to prevent inadvertent opening of the lid.

[0013] The locking tab and engagement portion may be configured such that less than a quarter of the length of the locking tab may be received in the engagement portion. Allowing only a quarter of the length of the locking tab to be received in the engagement portion can reduce the drawbacks described in relation to the prior art.

[0014] The locking tab and engagement portion may be configured such that less than a half of the length of the locking tab may be received in the engagement portion. Allowing less than a half of the length of the locking tab to be received in the engagement portion can further reduce the drawbacks described in relation to the prior art.

[0015] The locking tab and engagement portion may be configured such that less than three quarters of the length of the locking tab may permitted to be received in the engagement portion by the configuration of the pack. Allowing less than three quarters of the length of the locking tab to be received in the engagement portion can further reduce the drawbacks described in relation to the prior art.

[0016] The locking tab and engagement portion may be configured such that a length of the locking tab at least equal to two times the thickness of the locking tab is unable to enter the gap. This configuration, as well as the above configurations, can allow the benefits of the locking tab being received in the gap to be realised, while reducing the drawbacks of the prior art.

[0017] The locking tab may have, when the lid is in a closed configuration, at least one side configured at an angle α relative to a longitudinal axis A of the pack extending substantially from the bottom end of the pack to the open top end of the pack;

the angle α being greater than an angle of orientation relative to axis A of sides of the engaging portion which are configured to engage with sides the locking tab. Providing an angle α greater than an angle of orientation relative to axis A of sides of the engaging portion which are configured to engage with sides the locking tab can allow the sides of the locking tab to more effectively and reliably engage with the engagement portion.

[0018] When the lid is in a closed position, the engagement portion may comprise at least one side extending substantially parallel to a longitudinal axis A of the pack, the axis A extending substantially from the bottom end of the pack to the open top end of the pack. This configuration can simplify the form of the pack blank, while providing the advantages of the present invention.

[0019] The engagement portion may have a maximum width at which it may engage with the locking tab, W_1. The width of the locking tab may vary between the base and the tip, such that the sides of the locking tab are engageable with the engagement portion at a point where the width of the locking tab equals W_1. In a preferred embodiment, the locking tab may have a width W_2 at its base and a width W_3 at its tip; the width W_2 may be greater than width W_1; and the width W_3 may be smaller than width W_1.

[0020] The provision of the above dimensions may provide a specific example of a configuration which provides the benefits of the present invention.

[0021] A blank or set of blanks for forming the pack of the present invention is provided, as is a method of forming the pack of the present invention by folding the blank or blanks provided.

[0022] Specific embodiments of the present invention will now be described with reference to the accompanying drawings in which:

Figure 1 is a perspective view of a hinged-lid pack in accordance with the present invention;

Figure 2 illustrates internal features of the locking mechanism of the pack;

Figure 3 illustrates an alternative arrangement of the inner features of the locking mechanism of the pack

Figures 4A, 4B and 4C illustrate exemplary alternative arrangements of an engagement portion of the present invention;

Figure 5 shoes a perspective view of the locking mechanism of the present invention in a partially opened state;

Figure 6A shows a locking an example of a locking mechanism having certain drawbacks;

Figures 6B shows the locking mechanism of the present invention in a closed configuration;

Figure 6C shows the locking mechanism of the present invention in a partially opened configuration; and

Figure 7 shows a two-part blank for forming a pack

according to the present invention.

[0023] Figure 1 shows a hinged lid pack 1 comprising a body 11 and a lid 12. Body 11 comprises a plurality of side walls 110, 111, 114, a bottom end wall 112 (not visible) and an open top end 113. Lid 12 is provided to close the open top end 113 of the body 11. Lid 12 comprises a lid front wall 121 on the side of the lid substantially opposite a lid hinge 13 connecting the lid to a rear side wall 114 of the body 11. The lid further comprises lid side walls 122. Lid rear wall 123 is not essential and the lid hinge 13 may optionally be formed directly between rear side wall 114 of the pack and top wall 124 of the lid. A number of intermediate side walls 111 may be disposed between the front wall 110 and the rear wall 113 of the pack, in any number, to form a pack of a desired shape. For example, as an alternative to the form illustrated in figure 1, where a single pair of opposing intermediate side walls 111 is provided to give the pack a regular box-shaped form, a plurality of intermediate side walls 111 may be provided in order to give the pack a substantially oval-shaped form when viewed from its bottom wall 112 or looking into the open top end 113 of the body 11. Other numbers of intermediate side walls 111 may be provided to provide other outer shapes to the box as appropriate. Front side wall 110 is substantially opposite rear side wall 114, but need not necessarily be precisely opposite and parallel to rear side wall 114.

[0024] A locking tab 115 is connected by a tab hinge 119 to a front side wall 110 of the pack. The front side wall 110 is located substantially opposite the rear side wall 114 of the pack. Front wall 110 is located such that locking tab 115 may engage with an engagement portion 125, located on an inner side of the lid front wall 121, for engaging with the locking tab 115. The locking tab has a base adjacent the tab hinge 119 and a tip 116 distal to the hinge. The locking tab 114 also has a first side 117 extending between the base and the tip and a second side 118 extending between the base adjacent the hinge and the tip 116. Engaging portion 125 is shown in dashed lines, to illustrate that it is formed on the inner side of lid front wall 121 and is therefore not directly visible from the outside of the lid shown in Figure 1.

[0025] The dimensions of the base and tip of the locking tab and the corresponding dimensions of the engagement portion 125 are configured to allow at least the tip 116 of the tab to be received in the engagement portion, but to prevent the base adjacent the hinge 119 from being received in the engagement portion, such that the engagement portion 125 may engage with sides 117 and 118 of the locking tab 115. The locking tab 115 is biased away from the front wall 110 of the pack, such that when the lid is closed, the locking tab is biased into the engagement portion 125.

[0026] Figure 2 illustrates inner features of the locking mechanism for the present invention. Figure 2 presents a view of a pack similar to that shown in Figure 1, with the lid in a closed configuration and viewed from the front side wall 110 of the pack 1. In the arrangement shown in Figures 1 and 2, the locking tab 115 is attached to an inner frame 11a. Inner frame 11a is optional and the locking tab 115 may be directly hingedly connected to front side wall 110 if desired. In Figure 2, the features of the inner frame 11a and its locking tab 115 are shown in dashed lines, to differentiate them from the features of the front side wall 110, a lid front wall 121 and the engagement portion 125, which are shown in solid lines. Circles 20 indicate attachment or gluing points, where the inner frame 11a may be attached to front side wall 110 and where the engagement portion tab 126 comprising the engagement portion 125 may be glued to the inner side of the lid front wall 121.

[0027] In the example shown in Figure 2, engagement portion 125 has a width W_1. The width W_1 is measured at the widest point of the engagement portion which may engage with locking tab 115. The engagement portion 125 may have numerous forms, as will be discussed in relation to later Figures 4A to 4C. In the particular example illustrated in Figure 2, the engagement portion has two parallel sides running substantially parallel to an axis A of the pack, extending substantially in a direction extending from bottom end wall 112 to the open top end 113. These parallel longitudinal sections of the engagement portion are connected by a substantially perpendicular bottom section at a bottom of the engagement portion, nearest to the bottom end wall of the pack 112. Further alternative arrangements of the engagement portion and related examples will be discussed in relation to Figures 4A, 4B and 4C.

[0028] In Figure 2 it can be seen that the width W_2 of the base of the locking tab 115 is greater than the width W_1 of the engagement portion 125. The tip 116 of the locking tab 115 has a width W_3, which is smaller than width W1 of the engagement portion. Accordingly, as can been seen in Figure 2, sides 117 and 118 of locking tab 115 can engage with engagement portion 125 where their edge profiles cross one-another in the figure. The side 117 of locking tab 115 is oriented at an angle α to longitudinal axis A of the pack 1 when the locking tab 115 lies in a plane substantially parallel to axis A. Similarly, opposite side 118 may be oriented at a same or similar angle to longitudinal axis A of the pack 1 when the locking tab 115 lies in a plane substantially parallel to axis A. While the base of the locking tab cannot be received in the engagement portion, the tip of the locking tab can be received in the engagement portion, such that the engagement portion may engage with sides 117 and 118 of locking tab 115.

[0029] Figure 3 shows a similar arrangement to that illustrated in Figure 2, with similar features similarly numbered. In Figure 3, the lid 12 of the pack is in a partially open configuration and tip 116 of locking tab 115 has partially entered into a gap created between the lid front wall 121 and the engagement portion tab 126 that forms the engagement portion 125. In this situation, it can be seen that sides 117 and 118 of the locking tab 115 may

engage with the radiused portion 43 of the engagement portion 125. This may only be necessary where the sides 117 and 118 have not sufficiently engaged with the intersecting points on the parallel side parts of the engagement portion 41 shown in Figure 2. In the situation shown in Figure 3, the locking tab is received in the above described gap created between the engagement portion and the lid front wall 121. As the lid as further opened from this configuration, the locking tab will rotate around its tab hinge 119 to release the lid into an open position.

[0030] Figures 4A, 4B and 4C illustrate some exemplary alternative arrangements of the engagement portion 125 suitable for use in the present invention. Figure 4A shows detailed features of the arrangement shown in Figures 2 and 3. The engagement portion 125 has two parallel sides 41, extending substantially in a direction parallel to the longitudinal axis of the pack A extending from the bottom end face to the open top end of the pack body 11 when the pack is closed. These engagement portion sides 41 are connected by a substantially perpendicular bottom edge 42, and radiused corners 43 are provided between sides 41 and the bottom edge 42. As shown in figures 2 and 3, the sides of the locking tab may engage with either the sides 41 and/or the raduised corners 43 of the engagement portion.

[0031] Figure 4B shows an alternative arrangement for an engagement portion of the present invention, where non-parallel sides 44 are provided, which extend outwardly from a bottom edge 45 connecting the two sides 44. Again, radiused corners 46 are provided connecting the bottom edge 45 to the sides 44. Width W_1 is measured at the widest point at which the engagement portion of Figure 4B may engage with the sides 17 and 18 of the locking tab 115. This may generally be the widest part of the engagement portion which is located along the length of the locking tab from its base to its tip when the lid is in a closed configuration. W_1 may alternatively or additionally be described as the greatest width of the engagement portion substantially perpendicular to the longitudinal axis of the pack body, or substantially parallel to the axis of the tab hinge 119 of the locking tab 115.

[0032] Figure 4C illustrates a further alternative arrangement for an engagement portion of the present invention. Here, the engagement portion is an opening 47 in a tab 126 which may be folded to form the engagement portion. In this example, the engagement portion has sides 48, connected by a bottom edge 49, again connected by radius corners 49a. The sides 48 may be connected at the top edge, opposite the bottom edge 49 to form an opening in the tab. However, in some arrangements, this top edge can damage the contents of the pack when the lid is closed and so it may not be desirable to include this edge.

[0033] In any of the arrangements of Figures 4A, 4B and 4C, the sides 41, 44 and 48 are arranged at a certain angle relative to the longitudinal axis A of the pack when the lid is in a closed configuration. Sides 41 in Figure 4A are parallel to this longitudinal axis A. Sides 44 in Figure 4B are at an angle β from longitudinal axis A. Sides 48 in Figure 4C are at an angle γ from longitudinal axis A. When these angles of orientation relative to longitudinal axis A (β and γ) are smaller than the angle of orientation α (shown in Figure 2) of the sides 117 and 118 of the locking tab 115, then the sides of the engagement portion may cross-over and intersect with the sides of the locking tab 115. The provision of the radiused corners 43, 46 and 49a may also cause these radiused portions to engage with sides 117 and 118 of locking tab 115. In any of these cases, sides of locking tab 115 can engage with the engagement portion 125 in a beneficial manner as is described herein.

[0034] Figure 5 illustrates a cut-away, perspective view, of the pack of the present invention in a partially opened state, where a user has partially rocked the lid 12 of the pack toward an open position and so bottom edge 126a of lid 12 is separated from the top edge 110a of the pack body 11. In the cut-away view, a portion of lid front wall 121 is removed to show how the engagement portion 125 and the locking tab 115 engage one another. It can be seen that the locking tab 115 has engaged with the engagement portion 125 at engagement points 51 and 52 along sides 117 and 118 of locking tab 115. The locking tab has a length L_1, and the engagement points 51 and 52, where the sides of the locking tab engage with the engagement portion 125, occur at a distance L_2 from the tab hinge 119 of the locking tab. It can be seen that a first portion of the locking tab 115 between its tip 116 and the engagement points 51 and 52 is received within the engagement portion 125. A second portion of the locking tab 115, between its base adjacent the tab hinge 119 and engagement points 51 and 52, is not received in the engagement portion 125 and is prevented from being so received by at least a part of its width being greater than that of the engagement portion 125. The geometrical characteristics of the 2 portions of the locking tab are not essential to the invention. The engagement of sides 117 and 118 of the locking tab with the engagement portion 125 at engagement points 51 and 52 results in the first portion being received within the engagement portion 125, and the second portion of the locking tab 115 being prevented from being received in the engagement portion 125. In this partially opened configuration, the locking tab is angled away from the front side wall 110 and the further the lid is opened, the more the locking tab rotates about its tab hinge 119. The locking tab acts to bias the lid back to a closed configuration when its angle is between around 1 degree to around 90 degrees from the front side wall 110.

[0035] Some benefits of the arrangement of the present invention will now be described with reference to Figures 6A, 6B and 6C. Figure 6A illustrates a prior art-type arrangement wherein a locking tab 115 is capable of being entirely received, from its tip down to is base adjacent its hinge, in a gap 62 formed between an engagement portion tab 126 and a lid front wall 121. It can be seen that the locking tab engages with the edge 61

of the engagement portion at a point at or very near to tab hinge 119 and the base of the locking tab. For the lid of the pack to completely open, it is necessary for the locking tab to be completely disengaged from the engagement portion and the gap 62 formed between an engagement portion tab 126 and a lid front wall 121. As a user rocks the lid of the example shown in Figure 6A towards an open position, the engagement portion 61 will tend to exert significant stresses on tab hinge 119, since it is difficult for locking tab 115 to rotate out of the gap 62 created between engagement portion tab 126 and lid front wall 121. The tip 116 of the locking tab has a tendency to follow the arc described by arrow 63, but the reaction force created by the lid front wall 121 obstructs this motion and this therefore exerts significant stresses on tab hinge 119. Accordingly, in the disengaging of the locking tab of Figure 6A from the engagement portion of Figure 6A, damage may be caused to tab hinge 119, to lid front wall 121, or to engagement portion 61 and engagement portion tab 126.

[0036] The drawbacks of the arrangement in Figure 6A may appear to be resolved by simply providing a shorter locking tab 115. However, this would result in a less effective locking mechanism, since inherent tolerances and play between the lid 12 and the pack body 11, created by the manufacturing tolerances and/or deformation of the pack during use by a user, may mean that the locking tab does not have sufficient length to properly hold the lid in a closed position.

[0037] The advantage of a longer tab 115 is described as follows. Where a locking tab has a length L, the lid of the pack must be opened approximately by a distance L before the locking tab is at a point substantially perpendicular to the pack front wall 110 or the inner frame 11 a to which it is attached. It is at this substantially perpendicular position that the locking tab no longer biases the lid to a closed position. Accordingly, the greater then length L of a locking tab, the further a pack lid 12 must be opened before the locking tab ceases to bias the lid to a closed position. However, as described above, in the arrangement shown in Figure 6A, a long locking tab brings with it the disadvantage that it is increasingly difficult to disengage the locking tab 115 from the gap 62 without causing damage to the tab hinge 119 or the lid front wall 121 or the engagement portion tab 126.

[0038] Figure 6B illustrates the arrangement of the present invention in a closed configuration. An advantage of the present invention is that in this closed configuration, the tip 116 of locking tab may enter into the engagement portion, as created by any of the forms shown in Figures 4A to 4C, as soon as the tip of the locking tab has passed the bottom edge of the engagement portion. The configuration of the present invention allows the locking tab to immediately engage with the engagement portion such that the sides of the locking tab can engage with the engagement portion even before the lid has been rocked toward an open configuration. It can therefore be seen that even before a user begins to open the lid, the locking tab of the present invention provides a locking function, holding the lid in a closed configuration. This is beneficial when compared to the arrangement shown in Figure 6A, where the lid must be rocked open to a sufficient degree to allow locking tab 115 to enter the gap 62 before the locking tab properly engages with the engagement portion.

[0039] Figure 6C illustrates the situation when a user begins to rock the lid 12 of the pack of the present invention towards an open position. As front wall 121 moves upward in the Figure and away from the front side wall 110 and/or the inner frame 11a of the pack body 11, the locking tab 115 rotates about tab hinge 119 at its base, and also rotates relative to the engagement portion about a point 64, at a length L_2 along its length, where the sides of the locking tab engage with the engagement portion. It will be apparent that the difference between this configuration and that of Figure 6A is that the relative point of rotation 64 of the locking tab is located at a point away from tab hinge 119. This results in a smaller amount of the tip 116 of the locking tab 115 being in the engagement portion during opening of the lid and therefore the additional stresses created in engagement portion 125, locking tab 115, tab hinge 119 and lid front wall 121 are reduced as compared to the configuration shown in Figure 6A. This can result in a locking mechanism which may be closed and re-opened a greater number of times without damage to these elements of the pack or its general structure.

[0040] Accordingly, the locking tab of the present invention, being configured to engage the engagement portion on its side, provides a locking tab with the advantages of a locking tab of greater length, while avoiding the disadvantages of a locking tab which is able to penetrate too far into a gap 62 created between the engagement portion tab 126 and the lid front wall 121 of the example shown in Figure 6A. A small amount of the locking tab may enter the engagement portion of the present invention without inducing the drawbacks described in relation to Figure 6A to too great a degree. For example allowing a length of the locking tab substantially equal to the thickness of the material from which it is produced to enter the engagement portion and/or the gap may be beneficial. Up to around a quarter of the length may be received in the engagement portion. Further up to around a half or up to three quarters of the length may be received in the engagement portion. Where more than a half of the length of the locking tab is received in the engagement portion, the drawbacks described in relation to Figure 6A may increase, since the force created by the lid front wall 121 on the tip 116 of the locking tab acts on a longer lever than the force acting on the tab hinge 119. Therefore, in this case, the force on the hinge is greater than the force on the lid front wall 121 and the hinge is more prone to damage. In spite of this, providing any additional distance between the tab hinge 119 and the point of relative rotation 64 of the locking tab 115 relative to the engagement portion 125, reduces the drawbacks

described in relation to Figure 6A. A distance L_2 as small as one or two times the thickness of the material from which the pack, and in particular the material from which the locking tab, is produced, can bring an associated benefit.

[0041] The arrangement of the present invention therefore allows the benefits of a longer locking tab 115 to be realised, whilst avoiding the drawbacks of the arrangement shown in Figure 6A. It can therefore be seen that it is beneficial to provide a locking tab having a base portion which cannot be received in the engagement portion and a tip which can be received in the engagement portion, such that at least one side of the locking tab engages with the engagement portion.

[0042] Figure 7 illustrates a two part blank which may be used to form the pack of the present invention. The blank comprises a first portion 71 for forming the body of the pack, a second portion 72 for forming the lid of the pack, and in this example comprises a further blank 73 for forming a inner frame for the pack. As described earlier, the inner frame is optional and if an inner frame is not desired, the features relating to the locking tab 115 may be reproduced directly on the front side wall 110 of the pack 1 by their reproduction on the upper edge 710a of front wall panel 710. The pack blank comprises a front side wall panel 710, having intermediate side wall panels 711 on each side, connected by fold lines to the front side wall panel. At its bottom edge, the front side wall panel 710 is connected by a fold line to a bottom wall panel 712. Bottom wall panel 712 is in turn connected to a rear wall panel 714 by a fold line. Rear wall panel 714 is connected on each side by fold lines to side wall tabs 713, which are connected to bottom wall tabs 712a by fold lines. To form the main body of the pack, the front side wall panel 710 and rear side wall panel 714 are folded about their respective fold lines connecting them with the bottom panel 712. Bottom wall tabs 712a are folded at their connecting fold lines through 90°. S ide wall tabs 713 are folded through 90° about their connecting fold lines with rear side wall panel 714 such that bottom wall tabs 712a rest on bottom wall panel 712 on the inside of the pack. Front wall panel 710 is then folded to form the front side wall of the pack and its connected side wall panels 711 are folded about their connecting fold lines through 90° on to the outside of side wall tabs 713. Side wall panel 711 can then be fixed to side wall tabs 713 to maintain the form of the pack body.

[0043] A second portion 72 of the blank forms the lid 12 of the pack 1. The lid section comprises a lid front wall panel 721, a pair of adjoining lid side wall panels 722, a lid rear wall panel 723 and a lid top wall panel 724. Lid rear wall panel 723 is connected by fold lines to lid side wall tabs 722a, which are in turn connected to lid top wall tabs 724a. To form the lid the lid top wall tabs are folded through 90° about their connecting fold line with lid side wall tabs 722a. In turn, lid side wall tabs 722a are folded through 90° about their connecting fold lines with lid rear wall panel 723. Lid top wall panel 724 can then be folded about its connecting fold line with lid rear wall panel 723 to form the top wall 124 of the pack 1 . The lid front wall panel 721 can then be folded about its connecting fold line with lid top wall panel 724 to form the front wall of the lid. Lid side wall panels 722 are then folded through 90° and may be fixed to lid side wall tabs 722a to form the lid structure. A tab 726 is provided, connected via a fold line to lid front wall panel 721 and is provided with a recess or cut out 725 in a form appropriate for creating the engagement means of the present invention, which may be in any of the forms illustrated in Figures 4A to C, or in any similar form suitable for providing the necessary engagement with the sides of the locking tab. Engagement portion tab 726, having recess or cut-out 725 can be folded through substantially 180° about its connecting fold line with the lid front wall panel 721 in order to create the necessary engagement portion on the inside of the lid front wall 121 of the pack 1.

[0044] Secondary blank 73 may be provided where an inner frame is required. The blank comprises an inner frame front wall panel 731 connected by fold lines to inner frame side wall panels 732. The inner frame side wall panel 732 may comprise fold lines 733. These fold lines allow a portion of the inner frame to be angled slightly towards the interior of the pack, which can help to grip the products within the pack. In particular, if the products are cigarettes, this can help to fold the cigarettes in a tight bundle within the pack. The locking tab 734 is provided on the inner frame, where the inner frame is required. As described above, if the inner frame is not necessary, locking tab 734 may be formed on the top edge 710a of front side wall panel 710.

[0045] The locking tab 734 may optionally be left unfolded when the pack is first made, such that it remains in the orientation illustrated in Figure 7. On a first opening of the pack by the user, the user may then fold the locking tab through substantially 180° on to the outside of either the front side wall 110 or inner frame 11a, depending upon which if these features has the tab attached to it, such that on a first re-closing of the pack, the locking tab engages with the engagement portion 125. Alternatively, the locking tab may be folded during the production process, such that the locking tab is engaged prior to its first opening by a user and operates the first time that the user opens the pack. The tab may also be provided by the provision of a substantially u-shaped cut in the front wall of the pack, as illustrated by dashed line 736, in an opposite longitudinal orientation to locking tab 734 shown in Figure 7. In this way, the locking tab is already oriented toward the bottom face of the pack before folding about its hinge at the fold-line created at its base. Folding the tab out from the interior of the pack along the connecting fold line at its base can then provide the same function as is described in relation to the above embodiments. Biasing the tab away from the inner frame or the front wall of the pack can improve the engagement of the locking tab with the engagement portion once the lid is closed. The greater the bias, the more immediately and effec-

tively the locking tab will engage with the engagement portion.

[0046] Dashed line 735 indicates the line on the inner frame which should correspond to the top edge 710a of the blank 71 once the pack is assembled. A degree of inaccuracy generally exists in packaging manufacturing processes, concerning exactly where the inner frame may be attached to main body blank 71. Accordingly, having a locking tab which can engage with an engagement portion regardless of the precise location of the inner frame on the outer pack blank is therefore advantageous. Since the locking tab of the present invention engages on its side with the engagement portion as soon as the pack is closed, the locking mechanism of the present invention is better suited to coping with the inherent inaccuracies present in standard packaging manufacturing processes. The tolerances of the relative placement of the inner frame to the outer pack can be in the region of + or - 0.5mm.

[0047] The greater length L_1 of the tab provides yet further advantages when its length can be extended as provided by the present invention. For example, if a tab is too short, card folded through 180° may begin to delaminate once folded and thus the efficiency of the functioning of the locking tab may be reduced. Accordingly, the pack of the present invention provides numerous advantages and benefits to the user.

Claims

1. A hinge-lid pack comprising:

a body, having a plurality of side walls, a bottom end and a top end;
a lid for closing an opening of the body, comprising a lid front wall on a side of the lid substantially opposite a lid hinge connecting the lid to a rear side wall of the body;
a locking tab connected by a tab hinge to a front side wall of the pack, opposite the rear side wall of the pack;
an engagement portion, located on an inner side of the lid front wall, for engaging with the locking tab such that the locking tab can be rotated about the tab hinge when the lid is rocked over the body;
the locking tab having a base adjacent the tab hinge, a tip distal to the tab hinge, and sides extending between the base and the tip;
wherein the locking tab and the engagement portion are configured such that the sides of the locking tab are engageable with the engagement portion so as to prevent a section of the locking tab from being received in the engagement portion.

2. A hinge-lid pack according to claim 1, wherein the engagement portion has a maximum width W_1 at which it may engage with the locking tab and the width of the locking tab varies between the base and the tip, such that the sides of the locking tab are engageable with the engagement portion at a point where the width of the locking tab equals W_1.

3. A hinge-lid pack according to claim 2, wherein:

the locking tab has a width W_2 at its base and a width W_3 at its tip;

width W_2 is greater than width W_1; and
width W_3 is smaller than width W_1.

4. A hinge-lid pack according to any one of the preceding claims, wherein the locking tab and the engagement portion are configured such that the sides of the locking tab engage with the engagement portion when the lid is in a closed configuration.

5. A hinge-lid pack according to any preceding claim, wherein the locking tab is located on an upper edge of the front side wall or inner frame of the pack and connected to it by a fold line, or is created by a cut provided in the front side wall or inner frame of the pack.

6. A hinge-lid pack according to any preceding claim, wherein the locking tab is biased away from the front side wall.

7. A hinge-lid pack according to any preceding claim, wherein the engagement portion is arranged to enable access to a gap located between an engagement portion tab and the inner side of the lid front wall.

8. A hinge-lid pack according to claim 7, wherein the locking tab is configured such that at least a part of it may enter the gap when the lid is rocked from a closed position to a partially open position.

9. A hinged-lid pack according to any preceding claim, wherein less than a quarter of the length of the locking tab may be received in the engagement portion.

10. A hinged-lid pack according to any preceding claim, wherein less than a half of the length of the locking tab may be received in the engagement portion.

11. A hinged-lid pack according to any preceding claim, wherein less than three quarters of the length of the locking tab may be received in the engagement portion.

12. A hinged-lid pack according to any preceding claim, wherein:

the locking tab has, when the lid is in a closed configuration, at least one side configured at an angle α relative to a longitudinal axis A of the pack extending substantially from the bottom end of the pack to the open top end of the pack; the angle α being greater than an angle of orientation relative to axis A of sides of the engaging portion which are configured to engage with sides the locking tab.

13. A hinged-lid pack according to any preceding claim, wherein when the lid is in a closed position, the engagement portion comprises at least one side extending substantially parallel to a longitudinal axis A of the pack, the axis A extending substantially from the bottom end of the pack to the open top end of the pack.

14. A blank or set of blanks for forming the pack of any one of claims 1 to 13.

15. A method of forming the pack of any one of claims 1 to 13 by folding the blank or blanks of claim 14.

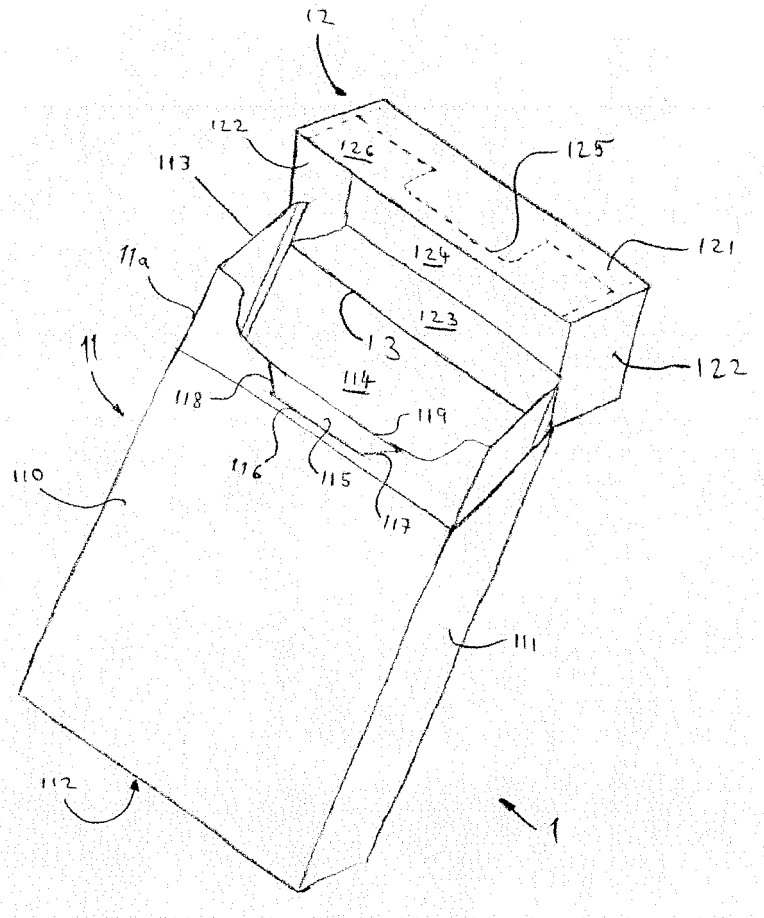
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Fig 1

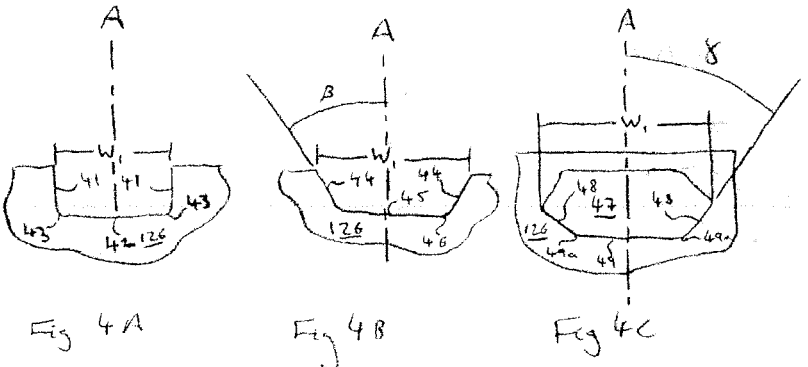

Fig 4A Fig 4B Fig 4C

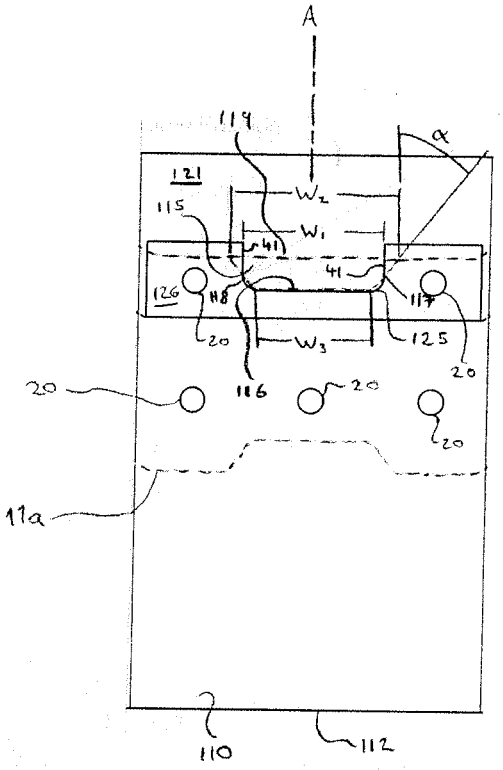

Fig 2

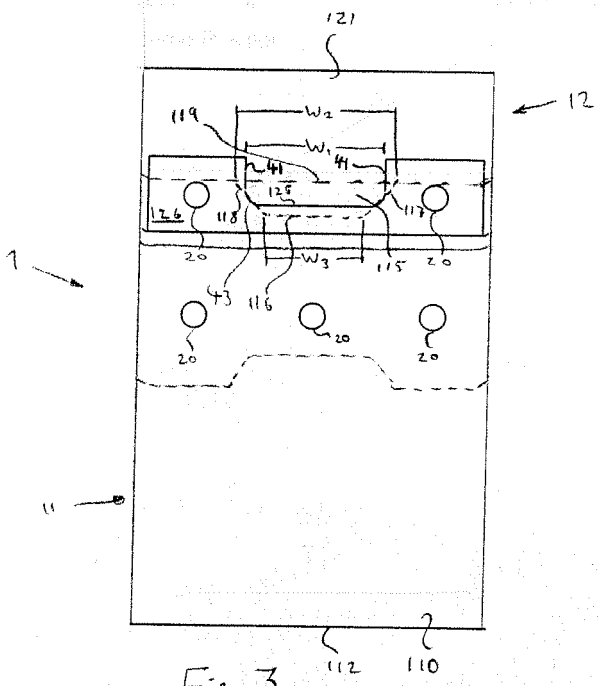
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Fig 3

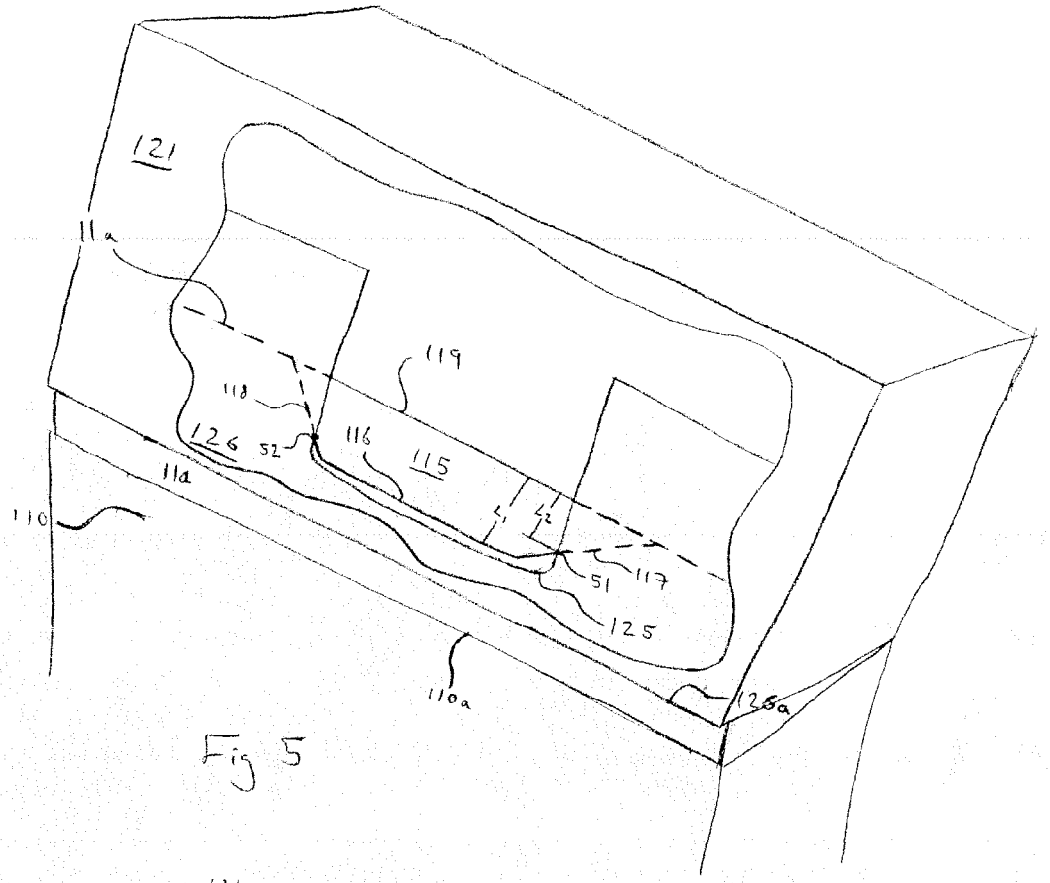

Fig 5

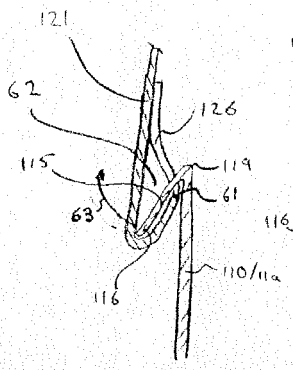

Fig 6A

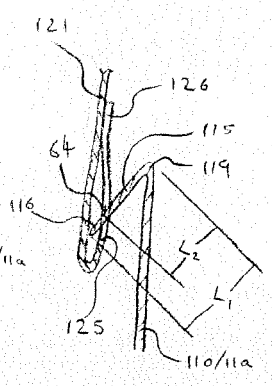

Fig 6C

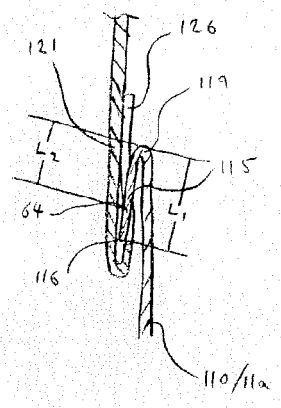

Fig 6B

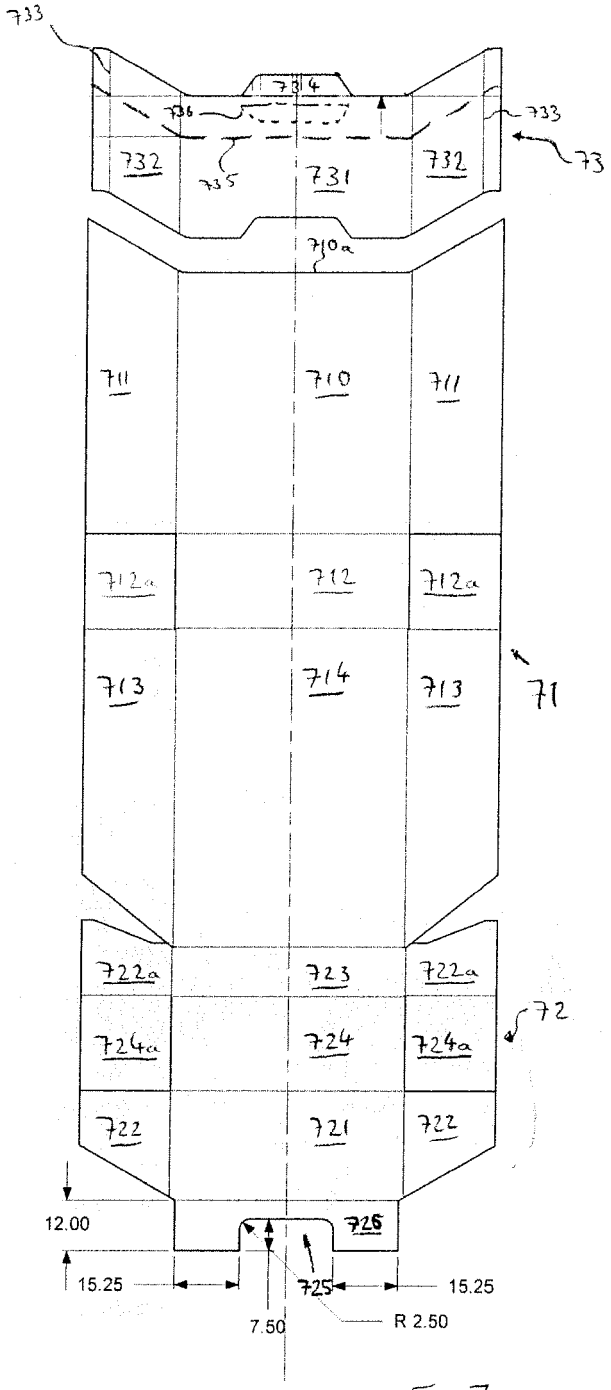
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Fig 7

Europäisches Patentamt
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EUROPEAN SEARCH REPORT

Application Number
EP 11 15 0519

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 0 894 737 A1 (JAPAN TOBACCO INC [JP]) 3 February 1999 (1999-02-03) * column 16, paragraph 0106; figures 22-23 *	1,4-15	INV. B65D5/66 B65D85/10
A	WO 2006/015688 A1 (UNILEVER PLC [GB]; UNILEVER NV [NL]; LEVER HINDUSTAN LTD [IN]; COLE AN) 16 February 2006 (2006-02-16) * page 8, line 3 - line 26; figures 1-4 *	1-15	

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B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	4 April 2011	Derrien, Yannick

CATEGORY OF CITED DOCUMENTS

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D : document cited in the application
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04-04-2011

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