July 1, 1941. J. W. CHALMERS 2,247,870

BOX MADE OF CARDBOARD OR SIMILAR MATERIAL

Filed July 29, 1939 2 Sheets-Sheet 1

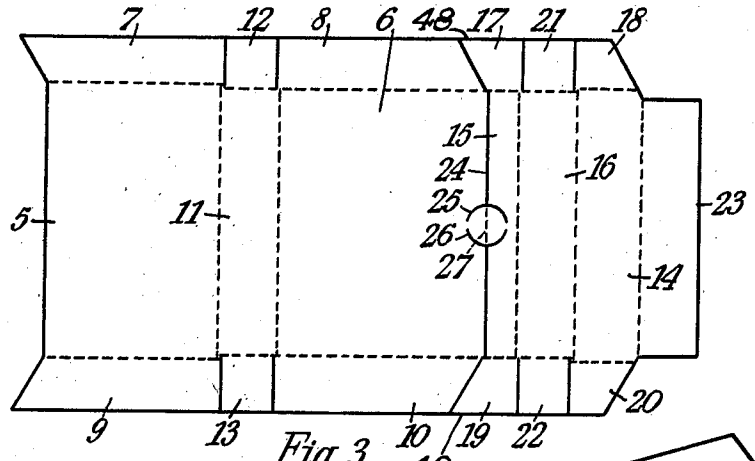

Fig. 3

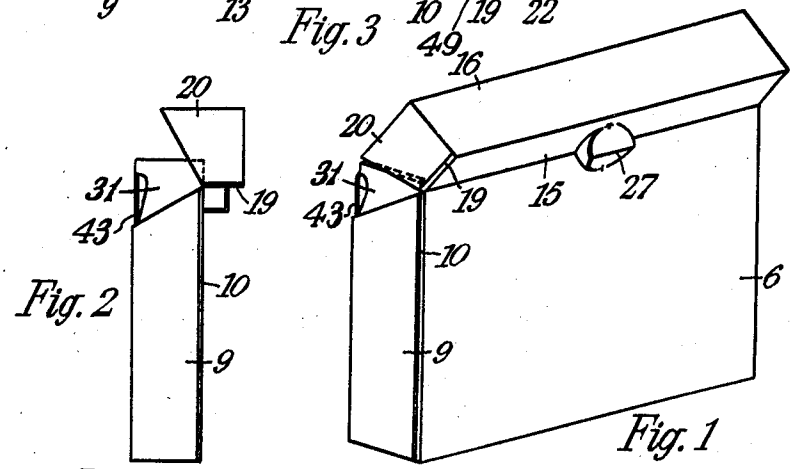

Fig. 2

Fig. 1

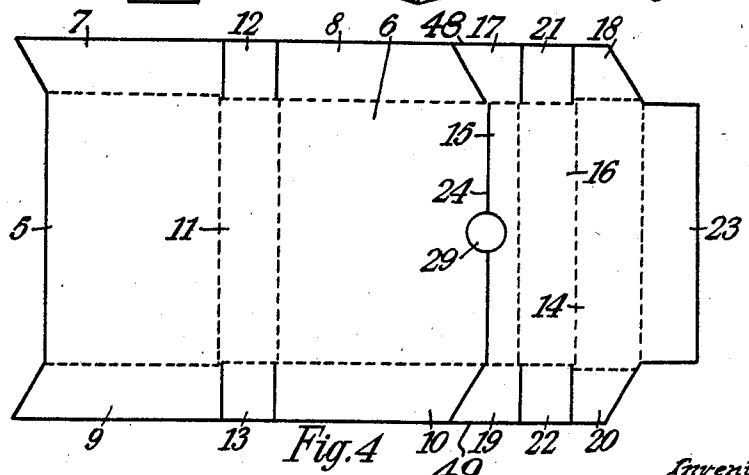

Fig. 4

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BOX MADE OF CARDBOARD OR SIMILAR MATERIAL

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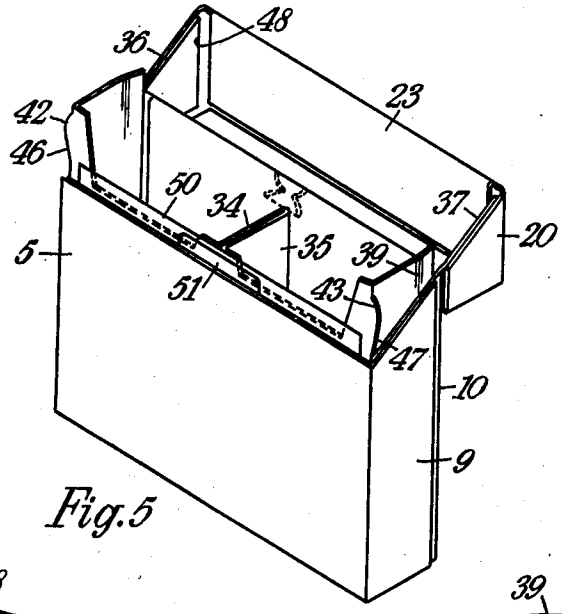

Fig. 5

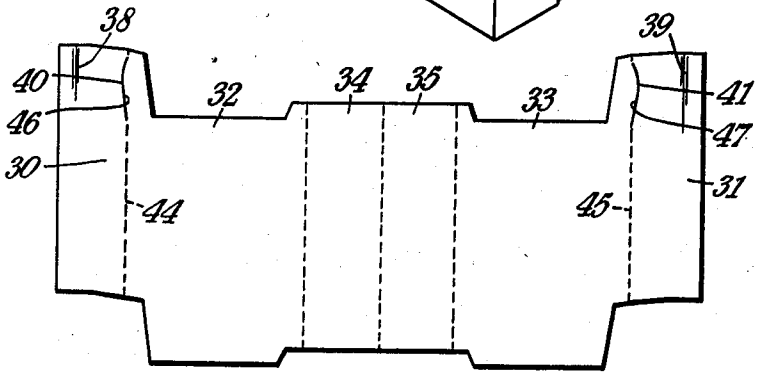

Fig. 6

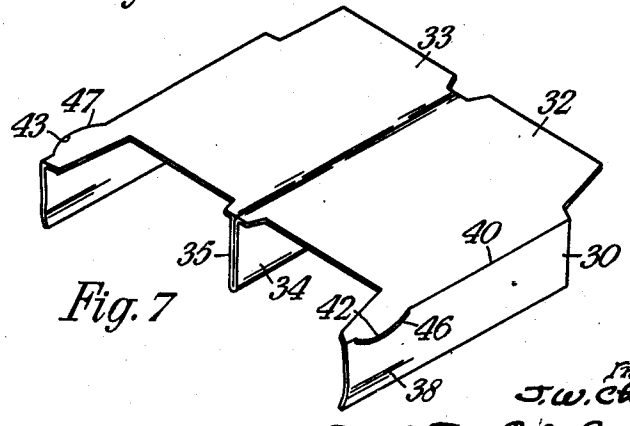

Fig. 7

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Patented July 1, 1941 2,247,870

UNITED STATES PATENT OFFICE

2,247,870

BOX MADE OF CARDBOARD OR SIMILAR MATERIAL

John Walker Chalmers, Deptford, London, England, assignor to Molins Machine Company Limited, Deptford, London, England

Application July 29, 1939, Serial No. 287,395
In Great Britain August 11, 1938

13 Claims. (Cl. 229—44)

This invention is for improvements in or relating to boxes made of cardboard or similar material, for examples, boxes adapted to contain cigarettes or other rod-shaped articles such as crayons.

The invention is concerned with boxes of the kind having a body portion and a box-like lid hingedly connected with a side of the body portion. When such boxes are in use it is sometimes found that there is, during the opening of the box, a tendency for the lid to be partly torn from the body portion if the user of the box grips the box from opposite sides with a grip which is sufficiently strong to cause the opposite sides to be pressed towards each other so that the side of the box containing the hinge is caused to bulge outwardly. Thus when attempting to open the lid of the box the user is endeavouring to bend the material from which the box is formed, with the result that the box tends to tear along the hinge connection by which the lid is hinged to the body portion of the box. A box which is so gripped during the opening of the box is found to be difficult to open and it is an object of the invention to avoid or reduce the tendency above referred to.

A further object of the invention is to provide means to resist the opening of the lid of a box when the latter is closed.

According to the invention there is provided a box made of cardboard or similar material and comprising a single blank from which there is formed a receptacle and a box-like lid hingedly connected by a crease formed in the blank, the hinge and the sides of the receptacle and the lid which are connected thereby being interrupted in a direction transverse to the hinge so as to enable the parts to move towards one another under lateral compression applied to the box for the purpose of reducing a tendency for the box to be broken or torn along the hinge during opening of the box. The interruption may be effected by a pair of slits spaced apart from each other in a direction transverse to the hinge, whereby when the lid is opened those portions of the receptacle and the lid which are located between the slits tend to move out of the planes of those sides of the receptacle and the lid from which they are formed. The slits may be of arcuate form and the ends thereof directed towards each other. The interruption may be effected by an aperture (e. g., a circular aperture). Those portions of the receptacle and the lid which are located between the slits may be connected by a crease which is substantially in alignment with the hinge and which is formed in the opposite side of the box blank from that in which the hinge is formed.

Further, according to the invention there is provided a box having a body portion and a lid hingedly connected therewith, the side walls of the lid being adapted, during closing of the lid, to pass over the sides of the body portion, wherein a lateral projection, formed by a slit extending lengthwise of the box and made in a side wall of the body portion thereof at a position adjacent the junction of said side wall and the front wall of the body portion and extending to the line of intersection of the front and side walls is arranged to engage a side wall of the lid when the latter is closed to resist opening of the lid. The body portion of the box may comprise a receptacle and an inner member disposed within the receptacle and having side panels adapted to extend beyond the side walls of the receptacle and to form with the side walls of the body portion, the slit being formed in a side panel of the inner member.

Further, according to the invention there is provided a box having a body portion and a lid hingedly connected therewith, the side walls of the lid being adapted, during closing of the lid, to pass over the sides of the body portion, wherein a lateral projection, formed by a slit extending lengthwise of the box and made in a side wall of the body portion thereof at a position adjacent the junction of said side wall and the front wall of the body portion and extending to the line of intersection of the front and side walls is arranged to engage a side wall of the lid when the latter is closed to resist opening of the lid, that portion of the projection which is remote from the top of the box being arranged gradually to slope to the line of intersection of the front and side walls of the body portion of the box for the purpose described.

The invention will be described by way of example with reference to the accompanying drawings, in which—

Figure 1 is a perspective view of a partly opened box having a hingedly connected box-like lid, the box having the invention applied thereto.

Figure 2 is an end view of the box shown in Figure 1, with the lid more fully open than is the case in Figure 1.

Figure 3 is a blank from which the receptacle and the lid of the box shown in Figure 1 are formed.

Figure 4 shows a modified form of blank from

which a box having the invention applied thereto can be made.

Figure 5 is a perspective view of the box shown in Figure 1 as seen from a different angle and shows more clearly the inner member employed in the box.

Figure 6 is a plan of the blank from which the inner member is formed.

Figure 7 is a perspective view of the inner member formed from the blank shown in Figure 6.

Like reference numerals refer to like parts throughout the specification and drawings.

In the example shown in the drawings the box is made from two blanks the first of which is shown in Figure 3. The blank shown in Figure 3, when folded, comprises the lid of the box and a receptacle, while the blank shown in Figure 6 comprises an inner member which is inserted into the receptacle and constitutes together with the receptacle, the body portion of the box. The receptacle into which the inner member is inserted is formed by a front panel **5**, a back panel **6**, side panels **7** and **8** which are folded into overlapping engagement and secured together to form one side wall of the body portion, side panels **9** and **10** which are folded and secured to form the opposite side of the body portion and a bottom panel **11**. Reinforcing tabs **12** and **13** are secured to the bottom panel of the body portion to reinforce the bottom of the box. The lid comprises a front panel **14**, a back panel **15**, a top panel **16**, side panels **17** and **18** which are secured together to form one side wall of the lid, and side panels **19** and **20** which are secured together to form the opposite side wall of the lid. Reinforcing panels **21** and **22** are secured to the inner side of the top panel **16** to reinforce the latter, and a further reinforcing panel **23** is secured to the inner front side **14** of the lid. The back panel **6** of the body portion and the back panel **15** of the lid are hingedly connected by a crease, a score line or a line of perforations **24** formed in the blank.

The term "crease" is used herein to denote generally the hinge connection between the body portion and the lid and which is formed in the blank and the term "crease" where used is to include a score line or a line of perforations.

The box, as can be seen from Figures 1 and 5 is of substantially oblong, four sided rectilinear shape in cross-section with the longer sides of the oblong forming the back and front walls of the box.

The hinge **24** and the back panels **6** and **15** are interrupted in a direction transverse to the hinge by a pair of arcuate slits **25** and **26** which are spaced apart from each other in a direction transverse to the hinge, and, as can be seen from Figure 3, the ends of the arcuate slits are directed towards each other. Those portions of the back panels **6** and **15** which are located between the arcuate slits are connected by a further crease **27**, which crease is substantially in alignment with the hinge **24**, but is formed on the opposite side of the blank from the side in which the hinge **24** is formed. The crease which forms the hinge **24** is formed on that side of the blank which is to form the inner side of the box, and the crease **27** is formed on that side of the blank which is to form the outer side of the box.

When the blank is being folded the portions of the blank which are located between the slits **25** and **26** are pressed outwardly out of the plane of the back of the box so that when the box is completed and the lid thereof is opened the portions between the slits move out of the plane of the back wall of the lid and the body portion respectively, as shown in Figures 1 and 2 so as to enable the parts to move towards one another under lateral compression applied to the box, thereby reducing the tendency for the box to be broken or torn along the hinge **24** during the opening of the lid.

As stated above, the body portion of the box, shown in Figures 1 and 5, includes the blank shown in Figure **6**, which latter blank comprises three parts. The two outer parts which comprise side panels **30** and **31** are connected by a middle part which, as shown in Figure **6**, comprises four panels **32**, **33**, **34** and **35**. The panels **34** and **35** are folded as shown in Figure 7 to provide, when the inner member is inserted into the receptacle as shown in Figures 1 and 5, a partition between the front and back walls of the box. The panels **32** and **33** together extend from side to side of the receptacle. The side panels **30** and **31** extend beyond the side walls of the receptacle, which latter walls are formed by the side panels **7** and **8**, and **9** and **10** respectively, and form together with the side walls of the receptacle the side walls of the body portion of the box. The middle part of the inner member as constituted by the panels **32** and **33** together with the front panel **5** of the receptacle comprises the front wall of the body portion. From Figure 5 it will be seen that the junctions between the side panels **30**, **31** and the panels **32**, **33** comprise corner portions at the top of the body portion of the box. The overall length of the inner member is equal to the overall length of the body portion of the box so that the corner portions extend for a substantial distance above the hinge axis and a part of the top edge of the middle part of the inner member is arranged at level which is lower than the remainder of the top edge of the inner member, so that when the latter is inserted into the receptacle to complete the body portion of the box access may be obtained to the contents of the box when open from opposite sides of the box. By this arrangement the corner portions engage the inner surfaces of the front corners of the lid when closed and resist the opening of the lid. The front corners of the lid extend downwardly to provide a lead over the corner portions during the closing of the lid.

In forming the lid to provide the lead above referred to the front lid panel **14** is so dimensioned that during closing of the lid the free edge of the front panel **14** passes clear of the tops of the corner portions and of the front wall of the body portion and the tops of the side walls of the latter, together with the contents of the box, are arranged within the surfaces swept out by the leading edges **36**, **37** (Figure 5) of the side walls of the lid. In arranging that the corner portions shall extend for a substantial distance above the hinge axis **24** the latter is disposed between the top and the bottom of the box and the distance between the hinge axis **24** and the inside free edge of the front panel **14** of the lid is greater than the distance between the hinge axis and the front of the tops of the corner portions and the latter distance is in turn greater than the shortest distance between the hinge axis **24** and the inner surface of the front panel **14** of the lid. By so dimensioning the lid with respect to the corner portions the tops of the front edges of the corner portions are caused to engage with a slight pressure upon the front panel

14 of the lid over a portion of the closing movement of the lid, so that a snap action is imparted thereto during the closing of the lid and the opening of the lid, after closure, is resisted.

In order to ensure that the leading edges 36, 37 of the sides of the lid pass freely over the tops of the side panels 30, 31 the latter are creased as indicated by the reference numerals 38, 39 (Figure 6) and the free top portions of the side panels 30, 31 are slightly bent inwardly as shown in Figure 5.

It will be appreciated that if it is not desired to provide a partition in the box the middle part of the inner member may comprise one panel which connects the side panels 30 and 31.

The side panels 30 and 31 are provided with slits 40 and 41 which extend lengthwise of the inner member and which, when the blank is folded, provide projections 42 and 43 (see Figure 5) which project laterally from the front wall of the body portion of the box and which engage the side walls of the lid when closed for the purpose of resisting the opening of the box. As can be seen the slits extend to the dotted lines 44 and 45 about which the side panels 30 and 31 are folded, said lines 44 and 45 together with the front corners of the receptacle forming the lines of intersection of the front and side walls of the body portion.

As can be seen from Figure 6, the slits 40 and 41 are so formed that those portions of the projections formed thereby and which are remote from the top of the box, when the inner member is placed in the receptacle, are arranged gradually to slope towards the lines 44 and 45 as indicated by the reference numerals 46 and 47 (see Figure 6). The purpose of the gradual slope is to facilitate the opening of the lid should the projection become or tend to become wedged between the edges of the side lid panels 17 or 19 and the top panel 16 as might occur if there should happen to be a space left between such parts during the forming of the box.

The side panels 30, 31 of the inner member are dimensioned so as to be tightly held between the front and back walls of the receptacle so that the inner member is retained in position therein in order to obtain the best advantage of the lateral projections.

Although in the example described corner portions and lateral projections are both provided, it will be appreciated that lateral projections could be used alone for resisting opening of the box.

Referring to Figure 4, the blank shown therein is identical with the blank shown in Figure 3, except that the slits 25 and 26 are omitted and an aperture, shown in Figure 4 as a circular aperture 29, is formed in the blank, this aperture, as can be seen from Figure 4, being arranged to interrupt the hinge and the back walls of the body portion and the lid respectively in a direction transverse to the hinge. When a box is formed from the blank shown in Figure 4, the aperture 29 serves the same purpose as the slits 25 and 26 in the example previously described and enables the parts to move towards one another under lateral compression applied to the box. The aperture thus reduces the tendency for the box to be broken or torn along the hinge during the opening of the box.

By interrupting the hinge as well as the sides of the body portion and the lid which are connected thereby in a direction transverse to the hinge so as to enable the parts to move towards one another under lateral compression applied to the box, the tendency for the box to be broken or torn along the hinge during opening of the box is reduced. In a box not embodying the present invention this tendency to tear becomes greater if the box is gripped at the sides so as to cause a compression along the plane of the back wall of the box. Such a compression causes the back to bulge and if the lid is opened at that time the lid and body will tend to become torn apart. When, however, the hinge and the walls connected thereby are interrupted according to the invention, the application of a compressive force such as mentioned above, causes the portions of the walls to move towards one another and even if there is some bulging of the walls as a whole there will be little, if any, bulging of the interterrupted hinge, and the parts, since they are interrupted and do not form a continuous arch will, if displaced, tend rather to be pushed back to their normal plane as the lid is opened than to remain displaced so as to cause tearing. It will be obvious of course that if the compressive force is considerable, tearing may take place along the hinge, even when the box is made in accordance with the present invention, the advantage of which is obtained when the box is reasonably handled.

If desired, a liner 50 of metal foil or other wrapping material may be provided in a box and further, if desired, a picture or coupon 51 may be included.

What I claim as my invention and desire to secure by Letters Patent is:

1. A box made of cardboard or similar material, comprising a body portion which includes a back panel and adjoining side panels to provide rigid corners for the body portion, a box-like lid which includes a back lid panel and adjoining side lid panels to provide rigid corners for the lid, said body portion and lid each being formed from the same blank, and a hinge formed by a crease in said blank and connecting said back panels, the said back panels being cut across the hinge in such a manner and at such a position between said corners as to permit those parts of the back panels which are disposed on opposite sides of the portion cut, to move towards each other under lateral compression applied to the box during the opening thereof.

2. A box made of cardboard or similar material, comprising a body portion which includes a back panel and adjoining side panels to provide rigid corners for the body portion, a box-like lid which includes a back lid panel and adjoining side lid panels to provide rigid corners for the lid, said body portion and lid each being formed from the same blank, and a hinge formed by a crease in said blank and connecting said back panels, the said back panels being at a position between said corners, cut across the hinge by a pair of spaced apart slits to permit those portions of the back panels which are located between the slits to move out of the planes of the back panels and to permit those portions of the back panels which are disposed between said corners and the slits to move towards each other under lateral compression applied to the box during the opening thereof.

3. A box made of cardboard or similar mateiral, comprising a body portion which includes a back panel and adjoining side panels to provide rigid corners for the body portion, a box-like lid which includes a back lid panel and adjoin-

ing side lid panels to provide rigid corners for the lid, said body portion and lid each being formed from the same blank, and a hinge formed by a crease in said blank and connecting said back panels, the said back panels being, at a position between said corners, cut across the hinge by a pair of spaced apart arcuate slits having their opposite ends directed towards each other and permitting those portions of the back panels which are located between the slits to move out of the planes of the back panels and permitting those portions of the back panels which are disposed between said corners and the slits to move towards each other under lateral compression applied to the box during the opening thereof.

4. A box as claimed in claim 2, wherein a second crease substantially in alignment with said hinge connects those portions of the back panels which are located between said slits, said second crease being located on the opposite side of the blank from that in which the hinge is formed.

5. A box as claimed in claim 3, wherein a second crease substantially in alignment with said hinge connects those portions of the back panels which are located between said slits, said second crease being located on the opposite side of the blank from that in which the hinge is formed.

6. A box made of cardboard or similar material, comprising a body portion which includes a back panel and adjoining side panels to provide rigid corners for the body portion, a box-like lid which includes a back lid panel and adjoining side lid panels to provide rigid corners for the lid, said body portion and lid each being formed from the same blank and a hinge formed by a crease in said blank and connecting said back panels, the said back panels being, at a position between said corners, provided with an aperture common to both said back panels and extending across the hinge to permit those portions of the back panels which are disposed between said corners and the aperture to move towards each other under lateral compression applied to the box during the opening thereof.

7. A box as claimed in claim 6, wherein the aperture common to said back panels comprises a circular aperture.

8. A box, made of cardboard or similar material, comprising a body portion, a lid hingedly connected with the body portion, the side walls of the lid being adapted, during closing of the lid, to pass over the sides of the body portion, and a lateral projection extending from the body portion to engage a side wall of the lid when the latter is closed to resist opening of the lid, said projection being formed by a slit extending lengthwise of the box and made in a side wall of the body portion at a position adjacent the junction of said side wall and the front wall of the body portion, both ends of said slit extending to the line of intersection of the front and side walls, that portion of the projection which is remote from the top of the box being arranged gradually to slope to said line of intersection.

9. A box, made of cardboard or similar material, comprising a body portion which includes a receptacle and an inner member disposed within the receptacle, and a lid hingedly connected with the receptacle, the side walls of the lid being adapted, during the closing of the lid, to pass over the sides of the body portion, said inner member having side panels connected by a middle panel and adapted to extend beyond the side walls of the receptacle, and a lateral projection extending from the inner member to engage a side wall of the lid when the latter is closed to resist opening of the lid, said projection being formed by a slit formed in a side panel at a position adjacent the junction of the side panel and said middle part, the ends of said slit extending to the line of intersection of said side panel and middle panel, that portion of the projection which is remote from the top of the box being arranged gradually to slope to said line of intersection.

10. A box made of cardboard or similar material, comprising a body portion which includes a front panel, a back panel and adjoining side panels to provide rigid corners for the body portion, a box-like lid which includes a back lid panel and adjoining side lid panels to provide rigid corners for the lid, said side lid panels being adapted, during closing of the lid, to pass over the side panels of the body portion, said body portion and lid each being formed from the same blank, a hinge formed by a crease in said blank and connecting said back panels, the said back panels being cut across the hinge in such a manner and at such a position between said corners as to permit those parts of the back panels which are disposed on opposite sides of the portion cut to move towards each other under lateral compression applied to the box during the opening thereof, and a lateral projection extending from the body portion to engage a side panel of the lid when the latter is closed to resist opening of the lid, said projection being formed by a slit extending lengthwise of the box and made in a side panel of the body portion at a position adjacent the line of intersection of said side panel and the front panel of the body portion, both ends of said slit extending to said line of intersection.

11. A box made of cardboard or similar material, comprising a body portion which includes a front panel, a back panel and adjoining side panels to provide rigid corners for the body portion, a box-like lid which includes a back lid panel and adjoining side lid panels to provide rigid corners for the lid, said side lid panels being adapted, during closing of the lid, to pass over the side panels of the body portion, said body portion and lid each being formed from the same blank, a hinge formed by a crease in said blank and connecting said back panels, the said back panels being cut across the hinge in such a manner and at such a position between said corners as to permit those parts of the back panels which are disposed on opposite sides of the portion cut to move towards each other under lateral compression applied to the box during the opening thereof, and a lateral projection extending from the body portion to engage a side panel of the lid when the latter is closed to resist opening of the lid, said projection being formed by a slit extending lengthwise of the box and made in a side panel of the body portion at a position adjacent the line of intersection of said side panel and the front panel of the body portion, both ends of said slit extending to said line of intersection, that portion of the projection which is remote from the top of the box being arranged gradually to slope to said line of intersection.

12. A box made of cardboard or similar material, comprising a body portion which includes

a front panel, a back panel and adjoining side panels to provide rigid corners for the body portion, a box-like lid which includes a back lid panel and adjoining side lid panels to provide rigid corners for the lid, said body portion and lid each being formed from the same blank, a hinge formed by a crease in said blank and connecting said back panels, the said back panels being, at a position between said corners, cut across the hinge by a pair of arcuate slits having their opposite ends directed towards each other and permitting those portions of the back panels which are located between the slits to move out of the planes of the back panels and permitting those portions of the back panels which are disposed between said corners and the slits to move towards each other under lateral compression applied to the box during the opening thereof, and a lateral projection extending from the body portion to engage a side lid panel when the lid is closed to resist opening of the lid, said projection being formed by a slit extending lengthwise of the box and made in a side panel of the body portion at a position adjacent the line of intersection of said side panel and the front panel of the body portion, both ends of said slit extending to said line of intersection.

13. A box made of cardboard or similar material, comprising a body portion which includes a front panel, a back panel and adjoining side panels to provide rigid corners for the body portion, a box-like lid which includes a back lid panel and adjoining side lid panels to provide rigid corners for the lid, said body portion and lid each being formed from the same blank, a hinge formed by a crease in said blank and connecting said back panels, the said back panels being, at a position between said corners, cut cross the hinge by a pair of arcuate slits having their opposite ends directed towards each other and permitting those portions of the back panels which are located between the slits to move out of the planes of the back panels and permitting those portions of the back panels which are disposed between said corners and the slits to move towards each other under lateral compression applied to the box during the opening thereof, and a lateral projection extending from the body portion to engage a side lid panel when the lid is closed to resist opening of the lid, said projection being formed by a slit extending lengthwise of the box and made in a side panel of the body portion at a position adjacent the line of intersection of said side panel and the front panel of the body portion, both ends of said slit extending to said line of intersection, that portion of the projection which is remote from the top of the box being arranged gradually to slope to said line of intersection.

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