May 8, 1956 C. J. WOESSNER 2,744,650

SELF-LOCKING BOX STRUCTURE

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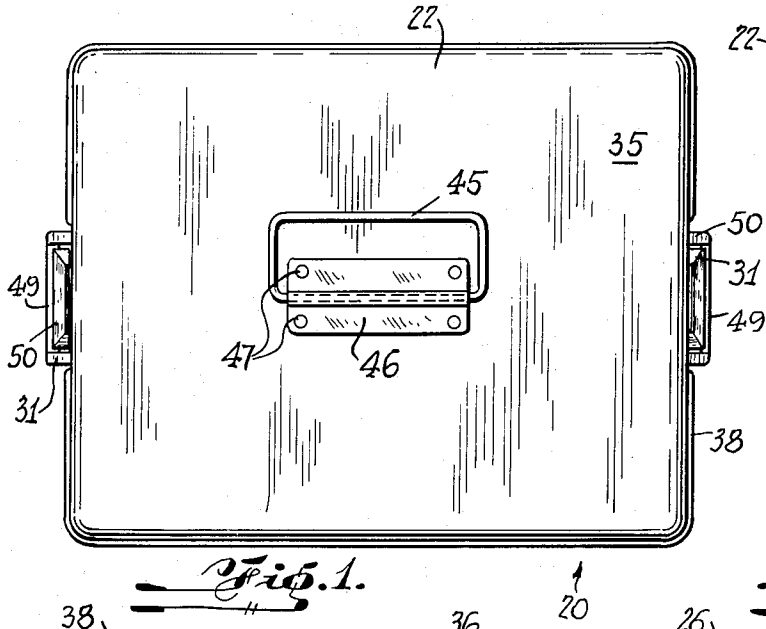


Fig. 1.

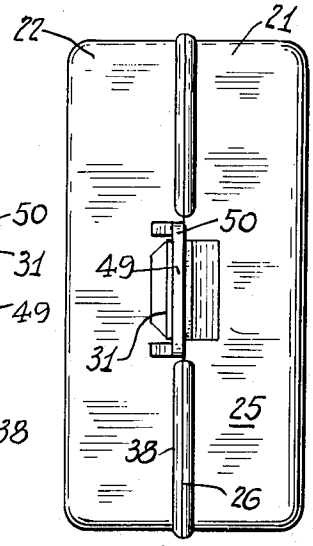


Fig. 2.

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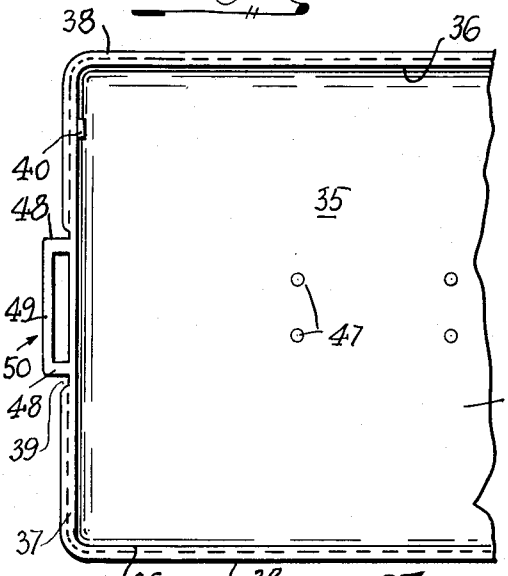


Fig. 3.

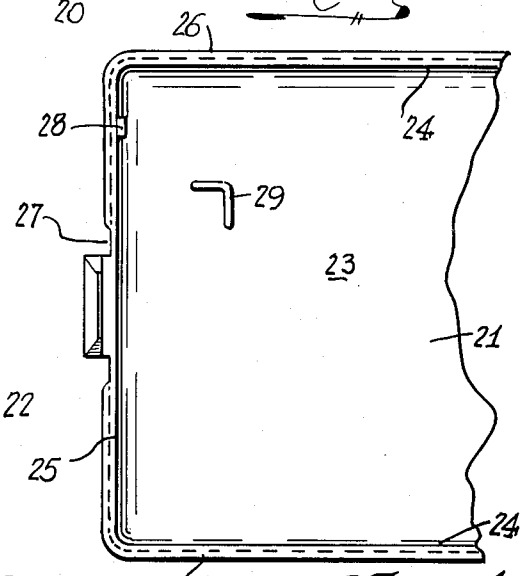


Fig. 4.

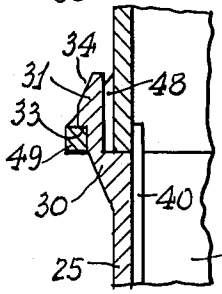


Fig. 5.

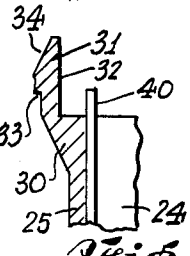


Fig. 6.

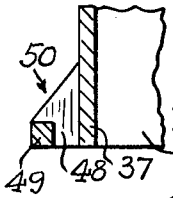


Fig. 7.

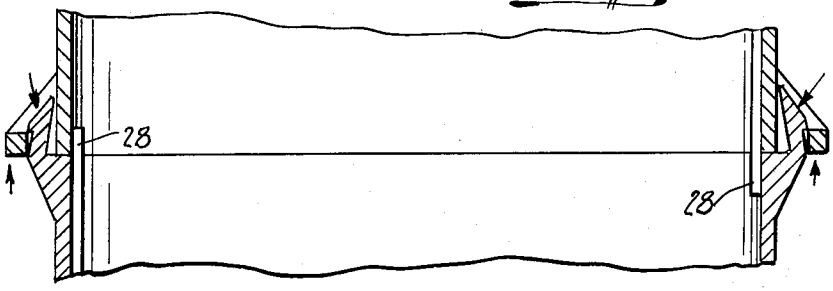
INVENTOR.
CARL J. WOESSNER.
BY Carey Freeman
ATTORNEY.

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Fig. 8.



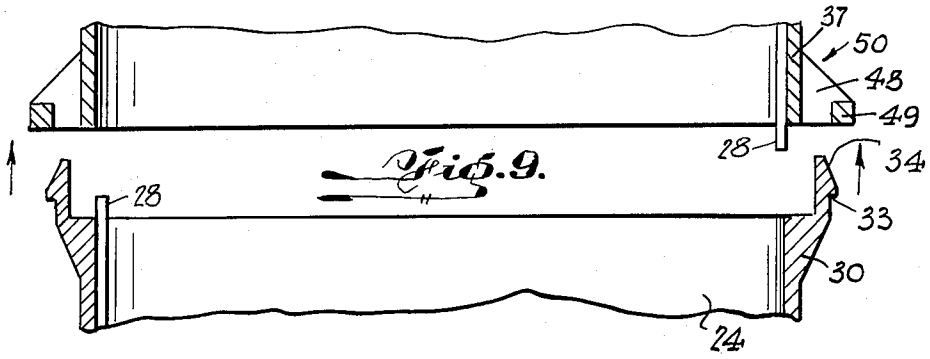


Fig. 9.

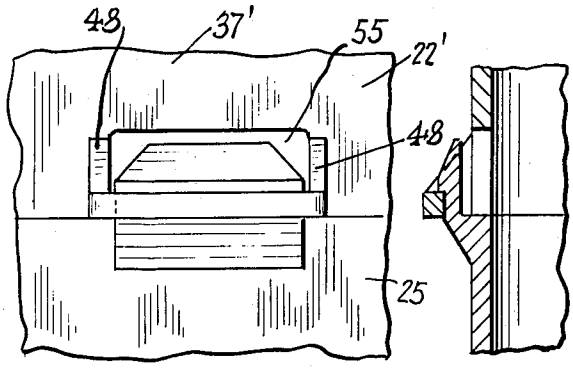


Fig. 10.

Fig. 11.

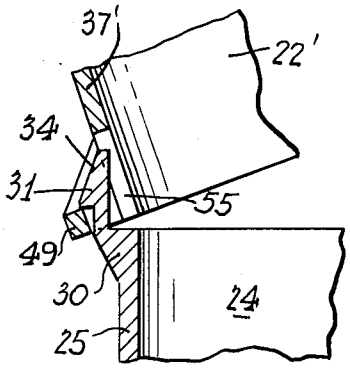


Fig. 12.

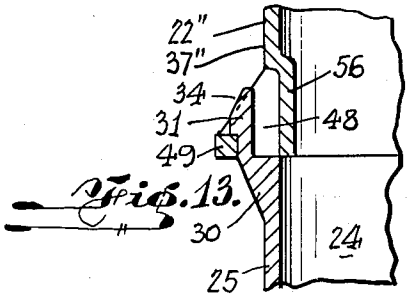


Fig. 13.

INVENTOR.
CARL J. WOESSNER.
BY Percy Freeman
ATTORNEY.

United States Patent Office

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SELF-LOCKING BOX STRUCTURE

Carl J. Woessner, East Orange, N. J., assignor to Gibraltar Manufacturing Co., Inc., Jersey City, N. J., a corporation of New Jersey

Application August 17, 1953, Serial No. 374,753

4 Claims. (Cl. 220—4)

This invention relates generally to containers or boxes, and is particularly directed to boxes or cases of the type adapted to be automatically self-locking, and permit of easy opening.

The particular embodiment of the present invention, which is illustrated in the drawings and which will be described hereinafter in greater detail, comprises generally, a pair of complementary sections, one of which includes loops and the other having lugs engageable in the loops when the sections are in closed relation. The construction is such that the lugs are releasably retained in the loops to hold the box in closed condition.

It is a principal object of the present invention to provide a box or case of the type described having simple and efficient means for automatically locking the box in closed condition, which means are manually actuable to effect unlocking and opening of the box in one continuous movement. That is, mere closing of the box will effect locking of the same while a single manual movement will simultaneously effect unlocking and opening of the box.

It is another object of the present invention to provide a box or case of the type described which is simple in construction and durable in operation, and which is particularly well adapted for mass production techniques, as by plastic molding or other desired method. Further, the complementary sections of the box or case of the present invention are adapted to be produced in the same mold with very slight modifications, to thereby effect substantial savings in mold costs.

It is still another object of the present invention to provide a box or case having the characteristics mentioned in the foregoing paragraphs, which completely eliminates the need for hinge and lock hardware, as the locking means may be molded integrally with the box sections.

It is a further object of the present invention to provide a novel box construction of the type described which is light in weight, extremely versatile in use, and which can be manufactured and sold at a reasonable cost.

Other objects of the present invention will become apparent upon reading the following specification and referring to the accompanying drawings, which form a material part of this disclosure.

The invention accordingly consists in the features of construction, combinations of elements, and arrangement of parts, which will be exemplified in the construction hereinafter described, and of which the scope will be indicated by the appended claims.

In the drawings:

Fig. 1 is a top plan view showing a box or case constructed in accordance with the present invention, the latter being in closed condition.

Fig. 2 is a side elevational view showing the device of Fig. 1.

Fig. 3 is a partial bottom plan view showing the inside of the box top section or cover.

Fig. 4 is a partial, top plan view showing the inside of the box bottom section.

Fig. 5 is a fragmentary, sectional view showing the locking means of the present invention.

Fig. 6 is a fragmentary, sectional view showing one element of the locking means of the present invention.

Fig. 7 is a fragmentary, sectional view showing another element of the locking means of the present invention.

Fig. 8 is a partial, sectional elevational view showing the box sections in closed position, just before opening.

Fig. 9 is a partial, sectional elevational view showing the box sections in open condition.

Fig. 10 is an enlarged, fragmentary side elevational view showing a slightly modified form of locking means.

Fig. 11 is a sectional elevational view showing the latch means of Fig. 10 in closed condition.

Fig. 12 is a view similar to Fig. 11 showing another operative position of the latch means.

Fig. 13 is a fragmentary, sectional elevational view showing still another slightly modified form of latch means comprehended within the present invention.

Referring now more particularly to the drawings, and specifically to Figs. 1–6, the embodiment of the invention illustrated therein comprises a case or container, generally designated **20**, having a bottom or lower section **21** and a top or upper section **22**, which is complementary to the bottom section. For purposes of illustration, complementary sections **21** and **22** are shown as rectangular in configuration. However, it is appreciated that shapes other than rectangular may be employed, as desired, in practising the present invention. The bottom section **21** includes a bottom wall **23**, upstanding side walls **24**, and end walls **25** on the bottom wall and extending between the side walls. Beads or lips **26** extend along the rim of the side and end walls **24** and **25**, being omitted centrally of the end walls, as at **27** for reasons which will become apparent hereinafter. Internally of the bottom section **21**, on the end walls **25** are formed ribs or tongues **28** which extend upwardly beyond the bead **26**. It is preferred to form a single rib or tongue on each of the end walls **25** adjacent to an opposite one of the side walls **24**, so that a pair of ribs **28** are disposed diagonally with respect to each other. A bracket **29** is shown formed on the bottom wall **23**. The bracket forms no part of the present invention but merely illustrates how the case **20** may be adapted for various uses.

Centrally of each side wall **25**, on the exterior face thereof, are formed thickened wall portions **30** centrally of the space **27** between the beads **26**. On each of the thickened portions **30**, offset laterally outwardly from the associated end wall **25**, is formed an upstanding projection or lug **31**. Each of the lugs **31** has a substantially vertical inner face **32** and its outer face is cut away to provide a downwardly facing shoulder **33**. Above the shoulder **33**, the outer side of each lug **30** is formed with an inwardly and upwardly inclined surface **34**, all for a purpose which will presently become fully apparent.

The upper case section **22** is similar to the lower case section and includes a top wall **35** having depending side walls **36** and depending end walls **37** extending between the side walls **36**. Along the edge or rim of the side and end walls **36** and **37** are formed external beads **38** similar to the beads **26** on the bottom section **21**. The beads **38** are omitted centrally of the side walls **37**, as at **39**. On the internal face of each end wall **37** is formed a rib **40** which extends downwardly beyond the edge of the associated end wall to provide a tongue. The ribs or tongues **40** are each disposed adjacent to one of the side walls **36**, so as to be in diagonal relation with respect to each other, as described hereinbefore in connection with the bottom section **21**.

On the exterior of the top wall **35**, a handle **45** and handle retaining plate **46** may be secured as by rivets **47**. Such a handle is preferably employed where portability is desired.

On the exterior surface of each side wall **37**, in the space **39** intermediate the beads **38**, are formed a pair of parallel spaced laterally outwardly extending webs or plates **48**. Extending between each pair of webs **48**, and spaced from the adjacent side wall portion, is a substantially rectangular member or bar **49**, which combines with the webs and adjacent side wall portion to provide a laterally outwardly extending loop, generally designated **50**.

When the complementary upper and lower sections **22** and **21** are in their closed condition, that is when the sections are in edge to edge facing relation, each of the lugs **31** will extend upwardly through one of the loops **50** and the downwardly facing lug shoulder **33** will engage over the upper surface of the bar **49** to retain the lugs in position with respect to the loops, and, consequently, to retain the box sections in closed condition. This relationship is clearly illustrated in Fig. 5, wherein it is seen that the shoulder **33** serves as a detent to lock the box sections in closed relation.

As it is preferred to fabricate both the upper and lower box sections **22** and **21** as an integral plastic unit, it will be apparent that the upstanding lugs **31** will be possessed of a certain degree of inherent resiliency. This resiliency permits inward deflection of lugs **31** as clearly shown in Fig. 8. There it will be seen that inward deflection of the lugs **31** in the direction of the angularly disposed arrows will shift the shoulders **33** clear of the cross members **49** so that the top section **22**, including loops **50**, may be raised upwardly in the direction of the vertical arrows. Conversely, when it is desired to close the box, the upper section is moved downwardly so that the inclined lug surfaces **34** engage with the cross members **49** and are deflected inwardly thereby. Upon continued downward movement of the upper section **22** and its loops **50**, the lugs **31** will snap outwardly and the shoulders **33** will engage over the cross members **49** to lock the upper and lower sections in closed condition.

Thus, upon closing movement of the box sections, the latter will be automatically locked together. Further, the simple manual action of depressing the lugs **31** inwardly and simultaneously raising the bars **49** will effect opening of the box and separation of the upper and lower sections.

It will be noted that the complementary sections are substantially identical except in the central side wall regions. Thus, it is apparent that a single mold may be employed in manufacturing the box sections, it being only necessary to slightly modify the mold for the upper and lower sections. Further, it will be seen that the tongues **28** and **40** of the lower and upper box sections will each be disposed adjacent to one corner of the box and provide means for centering the sections upon closing, as well as to rigidify and strengthen the closed box structure.

In Figs. 10, 11 and 12 are shown a slightly modified form of the present invention wherein the upper casing section **22'** has its end walls **37'** each formed with an opening or cut-out portion **55** extending inwardly from the side wall edge between the loop webs **48**. By this form of the invention, it will be seen from Figs. 11 and 12, that the loop **50** and lug **31** may serve as a hinge-like connection between the top and bottom casing sections. That is, it is possible to rotate the upper case section **22'** about the loop cross member **49** while the latter is retained in engagement below the shoulder **33**. This is so because the opening **55** will freely receive the lug **31** upon rotative movement of the upper case section **22'** about the loop member **49**, or, stated otherwise, the lug **31** may pass through the opening **55** upon rotative movement of the lower case section **21** about the cross member **49** of the loop **50**.

In Fig. 13 is shown another slightly modified form of the present invention wherein a limited degree of rotative movement is permitted between the upper case section **22''** and the lower case section **25**, and the openings **55** are eliminated. Thus, the heretofore described hinge-like action may be employed while the upper and lower case sections provide a substantially air-tight, completely closed container. To effect this end, the portion of the end wall **37''** intermediate the loop webs **48** is recessed or offset inwardly as at **56**. Thus, the upper case section **22''** may be rotated about the loop member **49** until the lug **31** contacts the recessed portion **56**, thereby providing a considerable degree of rotation. Further, the lugs **31** may be freely deflected inwardly by the thumb of the user, the recessed wall portion **56** providing increased operating space for the fingers.

From the foregoing, it is seen that the present invention fully accomplishes its intended objects, and provides a container or box which is well adapted to meet practical conditions of use.

Although the present invention has been described in some detail by way of illustration and example for purposes of clarity of understanding, it is understood that certain changes and modifications may be made within the spirit of the invention and the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. A container comprising a pair of complementary substantially similar sections, each section having a bottom wall and a peripheral wall extending substantially at right angles from said bottom wall and terminating in a free smooth edge, said sections being in edge-to-edge contact to constitute a closed container, diagonally opposed tongues extending beyond the free edge of each section from the inside surface of the respective peripheral wall of each section, said tongues of one section, when the sections are in closed relation, being disposed in opposed relation to the tongues on the mating section, the tongues of one section extending into the other section to relatively align the sections, at least two laterally extending loops on one of said sections, at least two upstanding resiliently deflectable lugs on the other of said sections and insertable through said loops when said sections are in closed relation, means on said lugs for automatically effecting lateral deflection of the latter when said sections are arranged in closed relation, and detent means on said lugs and releasably engageable with said loops for holding said lugs in said loops.

2. A container according to claim 1, said lateral deflection means comprising an oblique surface on each of said lugs adapted to slidably engage the associated one of said loops when said sections are being arranged in closed relation to effect deflection of said lugs.

3. A container according to claim 1, said detent means comprising a shoulder on each of said lugs and engageable over the associated loop when said lugs are deflected and inserted through said loops, said lugs being manually depressible for releasing said shoulder from engagement with said lugs.

4. A container comprising a pair of complementary substantially similar sections, at least two laterally outwardly extending loops on one of said sections, at least two upstanding resiliently deflectable lugs on the other of said sections and insertable through said loops when said sections are in closed relation, and a shoulder on each of said lugs and engageable with the associated one of said loops for releasably retaining said lugs in said loops, said one section being cut away adjacent at least one of said loops, to receive the adjacent lug and facilitate swinging opening and closing movement of said other section with said one loop in engagement with said adjacent lug.

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