Oct. 31, 1961 C. H. KEITH 3,006,523

SHIPPING CASE

Filed Dec. 31, 1958 3 Sheets-Sheet 1

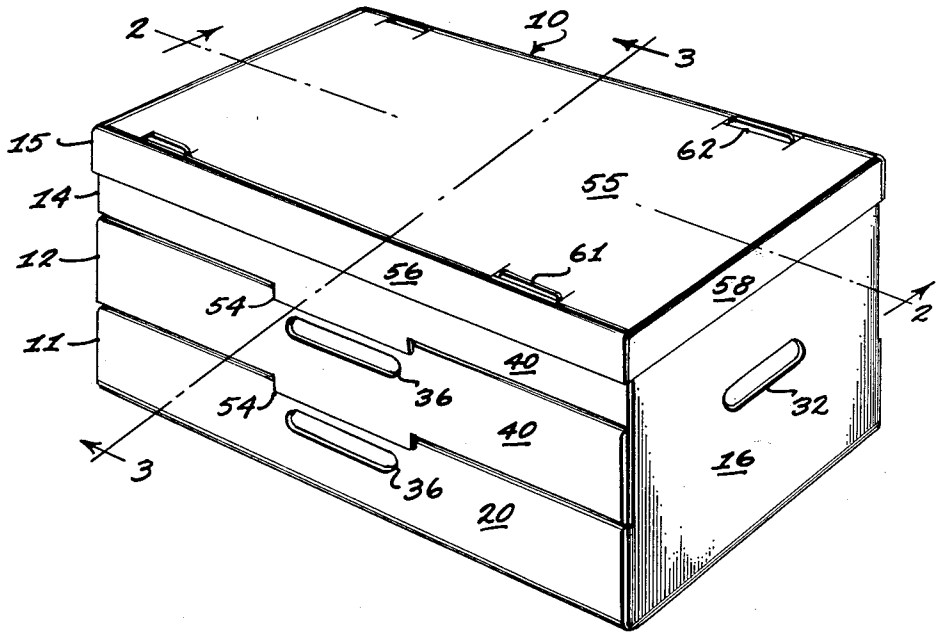


Fig. 1

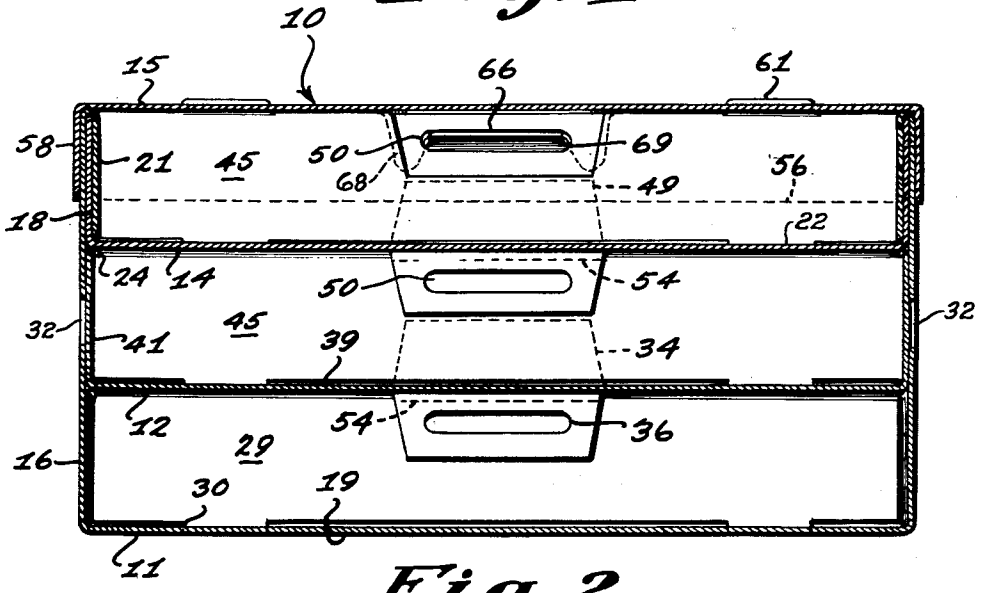


Fig. 2

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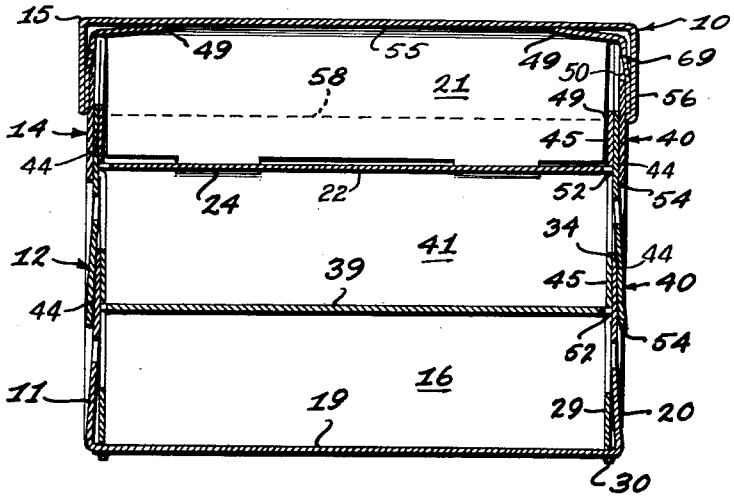


Fig. 3

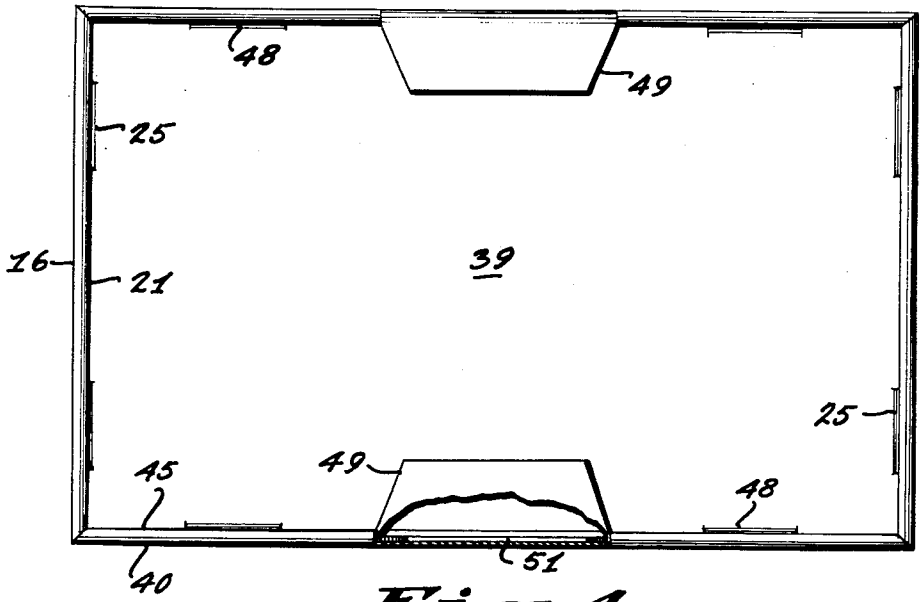


Fig. 4

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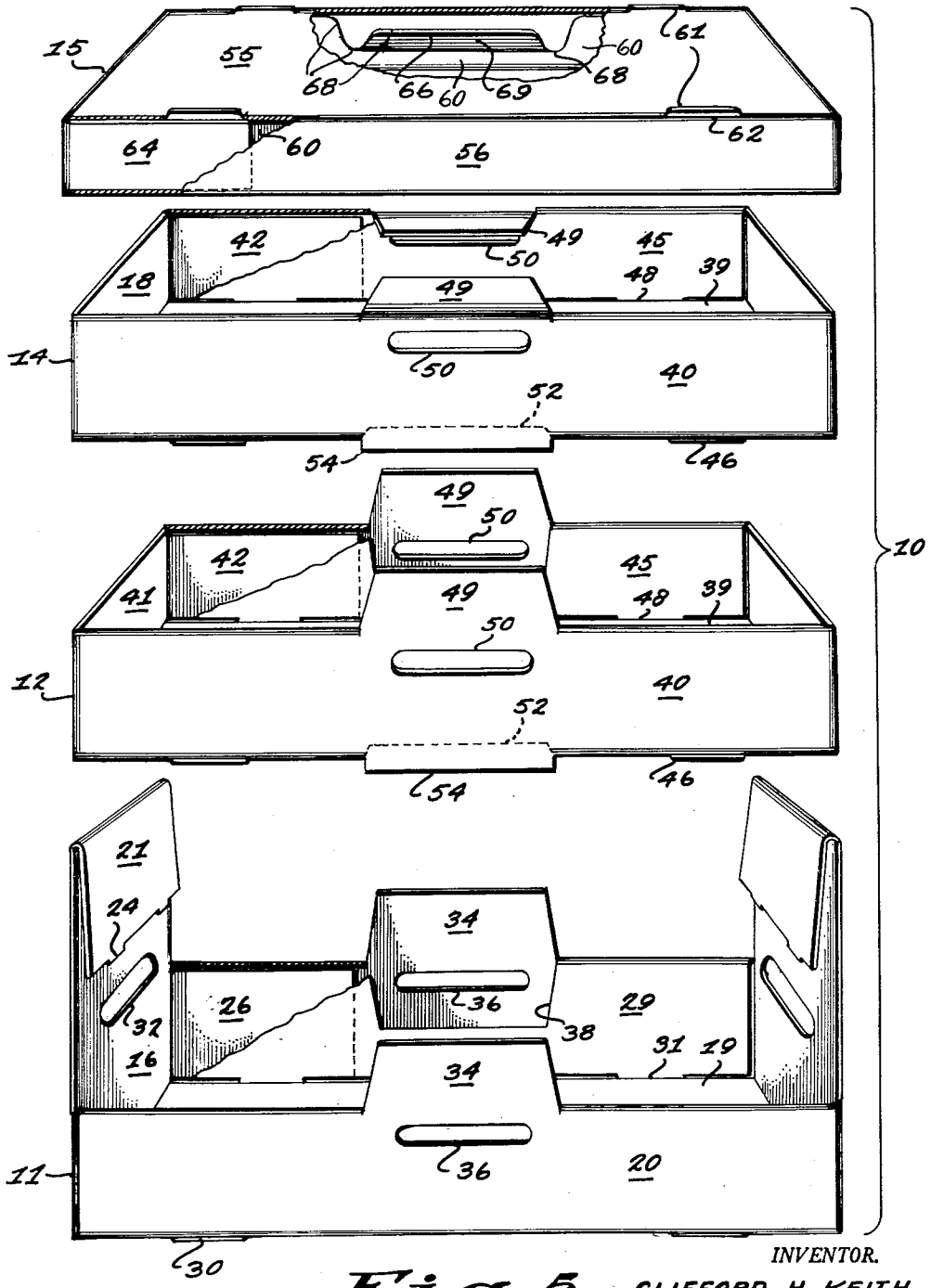


Fig. 5

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3,006,523

SHIPPING CASE

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13 Claims. (Cl. 229—15)

This invention relates to a shipping case and more particularly to a shipping case formed from a plurality of individual trays which are vertically nested and secured together to form an integral multi-tray case.

The mass packaging and shipping of fragile objects has been a difficult problem to those who handle objects too delicate to be packed one upon another in a conventional shipping case. Shallow cases have been used to reduce the number of layers of objects packaged, but these thin cases are of much smaller capacity than the conventional cases and thus many more are required in order to handle an equal quantity of objects. Attempts have been made to devise cases in which a number of individual trays are combined and secured together to approximate more nearly the shape and capacity of conventional shipping cases, but these multi-tray cases require either an outside container surrounding the trays or additional interlocking elements such as straps, wires or staples. In any of these cases the additional cost of material and the expense of complicated construction tend to minimize the saving in handling.

An example of the use of multi-tray cases is in the produce industry where items such as tomatoes, berries and many other vegetables and fruits would be damaged if packed in deep containers. These items require shallow packing and, in order to facilitate handling, it is desirable to combine a plurality of shallow containers, such as trays, into an integral case,.

The present invention provides a mult-tray shipping case which overcomes the disadvantages set out above. No outside container is required other than the trays themselves, as one of the trays is utilized to secure all the trays together to form an integral case. No additional interlocking elements are required as the trays themselves are designed to nest with each other in a rigid and structurally strong manner. Also, a cover is provided with integral means for locking the cover on the case. Further, each of the elements can be formed from single pieces of stock and assembled without gluing or stitching.

These and other features of the present invention are described in further detail below in connection with the accompanying drawings, in which:

FIG. 1 is a perspective view of a shipping case embodying the present invention;

FIG. 2 is a vertical sectional view taken along line 2—2 of FIG. 1;

FIG. 3 is a vertical sectional view taken along line 3—3 of FIG. 1;

FIG. 4 is a top plan view, partially in section of the shipping case of FIG. 1 with the cover removed; and

FIG. 5 is an exploded perspective view, partially in section, of the shipping case of FIG. 1.

Referring to the drawings, a shipping case is indicated generally as **10**, and consists of a bottom tray **11**, an intermediate tray **12**, a top tray **14** and a cover **15**. The trays are vertically nestable and the end walls **16** of the bottom tray **11** extend over the end walls **18** of the top tray **14** to secure the trays together, as will be described below. The cover **15** extends across the top of the case **10** and is removably locked thereon by locking means formed integrally with the cover and case. The case, when assembled for shipping, has somewhat the same outer appearance as conventional cases except for the exposed

walls of the individual trays, thus the bottom tray **11** provides the bottom and end walls of the case, the side walls of the individual trays **11**, **12** and **14** combine to form the sides of the case and the cover **15** serves its conventional purpose.

In the embodiment illustrated, the shipping case **10** is formed from corrugated paper board which is scored and folded to the desired configuration. However, it is to be understood that the present invention may be practiced by utilizing many other materials, and, although scoring and folding are shown here, the scope of the invention is not so limited, as any other convenient method of forming may be used.

The bottom tray **11** will first be described as it is the base upon which the other trays are nested and includes the means for securing the trays together into an integral case. In the embodiment illustrated, the bottom tray **11** consists of a rectangular bottom **19**, end walls **16** and side walls **20**. The end walls **16** extend vertically upwardly from the bottom **19** along the outside of the other trays to the top of the end walls **18** of the top tray **14** and have foldable portions **21** which are folded inwardly over the top tray walls **18**. These foldable portions **21** are of approximately the same height as the top tray end walls **18**, so that when they are folded over along the inside of the top tray walls they will extend down into contact with the top tray bottom as explained further below. A pair of latching feet **24** extend from the outer end of each foldable portion **21** and are engageable in latching slots **25** formed in the top tray bottom **22** adjacent the top tray end walls **18**. The latching feet **24** and slots **25** interlock to retain the foldable portions **21** in their folded positions and thus secure the trays **11**, **12** and **14** together to form an integral multi-tray case **10**. This construction is illustrated in FIGS. 2 and 5.

The side walls **20** of the bottom tray **11** have inner wall sections **29** extending from the tops thereof downwardly to the bottom **19** of the bottom tray **11**, thus increasing the strength and rigidity of the load bearing side walls **20**. The inner wall sections **29** are latched in place by feet **30** extending therefrom into slots **31** in the bottom **19** adjacent the side walls **20**. The end walls **18** and side walls **20** are interlocked by lateral arms **26** which extend from the end walls **18** between the side walls **20** and the inner wall sections **29**.

Intermediate the ends of the side walls **20** of bottom tray **11** are upwardly extendable keying flaps **34**. These flaps **34** are tapered upwardly for convenient engagement with the intermediate tray **12** to nest the intermediate tray **12** on the bottom tray **11**. Directly below the keying flaps **34** are ventilation openings **36** which permit the entry of air into the interior of the tray to ventilate produce or other perishable goods. These openings **36** can also be used to grasp the tray for easy handling.

When the bottom tray **11** is formed from corrugated paper board, as in the embodiment illustrated, it may be cut, scored and folded from a single blank of flat stock. The blank is cut to the shape of the rectangular bottom **19** with wall forming flanges extending from each edge. These flanges are scored at their juncture with the bottom so as to be foldable into vertical positions to form the end walls **16** and side walls **20**. The end wall forming flanges are cut with the lateral arms **26** extending therefrom, which are scored at their juncture with the end walls **16** so as to be folded inside the side walls **20**. The flanges that form the side walls **20** are double scored laterally to divide the flanges so as to form the inner sections **29** foldably thereon. Similarly the flanges forming the end walls **16** are double scored laterally near their outer ends to form the foldable portions **21** which are foldable over the top tray end walls **18**. During the cutting of the blank the latching feet **24** and **30** are

formed at the ends of the folded portions 21 and inner wall sections 29, respectively, and the latching slots 31 are cut in the bottom 19 adjacent the scored juncture with the side walls 20 in line with latching feet 30. The keying flaps 34 are cut from the inner wall sections 29 so that when the inner wall sections are folded back along the outer wall sections the flaps will remain as vertical continuations of the side walls 20. The ventilation openings 36 are cut from the side walls 20 in alignment with the openings 38 of the inner wall sections 29 formed by the removal of the keying flaps 34. Hand openings 32 are cut in the end walls 16 at an intermediate point to facilitate handling of the completed case or of the bottom tray individually.

To assemble the bottom tray, the end wall forming flanges are first folded along the scoring to vertical positions and the lateral arms 26 folded inwardly to positions along the side edges of the bottom portion 19. The side walls 20 are then folded vertically and the inner wall sections 29 folded inwardly over the lateral arms 26, the keying flaps 34 remaining upright. Finally, the latching feet 30 are engaged in the latching slots 31 to latch the side walls 20, and the end walls 16, in assembled positions. The bottom tray 11 is thus assembled to receive the other trays. From the above description it is apparent that the bottom tray of this invention may be simply and inexpensively formed and can be assembled simply and rapidly without gluing or stitching.

Referring now to the intermediate tray 12 and the top tray 14, it is apparent that they are of identical construction so that either tray can be utilized as the top tray or as the intermediate tray. Also, it should be noted that although the drawings illustrate a case with only one intermediate tray it is clearly within the scope of the present invention to construct a case with several intermediate trays or with no intermediate tray. The number of intermediate trays to be used in each case is determined by the height of the bottom tray end walls 16.

The intermediate tray 12 of the embodiment illustrated comprises a rectangular base portion 39, from which side walls 40 and end walls 41 extend vertically upward. The base portion 39 has approximately the same dimensions as the bottom 19 of the bottom tray 11 and the end walls 41 of the intermediate tray are in line with the bottom tray end walls 16 so that when inserted between the bottom tray end walls the intermediate tray will be firmly nested in place with its end walls 41 adjacent and inside of the end walls 16 of the bottom tray 11.

Lateral arms 42, similar to the lateral arms 26 of the bottom tray end walls 16, extend from the intermediate tray end walls 41 for interlocking engagement in the side walls 40, which are similar in construction to the bottom tray side walls 20. Thus the side walls 40 are formed with inner sections 45 extending downwardly to the base portion 39 with latching feet 46 thereon for engagement in latching slots 48 formed in the base portion 39 adjacent the side walls 40 in the same manner as the above described latching slots 31 in the bottom 19 of the bottom tray 11. Also, keying flaps 49 and ventilation openings 50 are formed at the side walls 40 similar to the flaps 34 and openings 36 of the bottom tray 11. In addition, latching slots 25 are formed in the base portion 39 adjacent the end walls to engage the latching feet 24 of the folded bottom end wall portions 21 when the tray structure is used as a top tray 14.

When the inner wall sections 45 of the side walls 40 are folded back over the lateral arms 42 of the end walls 41, they are parallel to the side walls 40 and spaced therefrom by the lateral arms 42. As seen in FIG. 5, the lateral arms 42 do not extend across the area which is in vertical alignment with the keying flaps 49. Thus, cavities 51 are formed between the side walls 40 and the inner wall section 45 below the keying flaps 49. These cavities 51 are provided to receive the keying flaps 49 of a subjacent tray or the keying flaps 34 of the bottom tray. In order that the cavities 51 can receive the keying flaps, flap receiving slots 52 are cut in the base portion 39 adjacent the side walls 40 and vertically aligned with the cavities 51 so that the keying flaps 49 of the subjacent tray may pass therethrough into the cavities. To further facilitate the receipt of the flaps 49, guide tabs 54 are formed as downward extensions of the outer wall sections 40. These guide tabs 54 engage the flaps 49 and guide their entry into the slots 52 and cavities 51. The guide tabs may conveniently be formed from the portion cut out to provide the flap receiving slots 52. Thus, the cut forming the slot can be made before folding the outer end walls into the vertical positions and the material cut out will fold with the outer wall sections to become guide tabs.

When constructing the trays from corrugated paper board, the intermediate and top trays 12 and 14 are formed from single blanks in a manner similar to the formation of the bottom tray 11. Thus, a rectangular base portion 39 is formed with wall forming flanges extending from each edge. The flanges are scored at their junctures with the base portion for folding into vertical positions to become side walls 40 and end walls 41. The end walls 41 are cut with lateral arms 42 extending therefrom a distance substantially equal to the distance between the end walls 41 and the adjacent keying flaps 49 of the side walls 40. The flanges which form the side walls are laterally double scored to form the inner wall sections 45 thereon, and the keying flaps 49 are cut from the inner wall sections 45 so that when the inner wall sections are folded along the double scoring the flaps will remain as vertical extensions of the side walls.

The inner wall sections 45 are cut with the latching feet 46 extending therefrom and the latching slots 48 and 25 are cut from the base portion 39 adjacent the side wall flanges and end wall flanges in line with the latching feet 46 and 24, respectively. The flap receiving slots 52 are cut from the base portion 39 adjacent the side wall flanges in line with the keying flaps 49, but the sides of the slots adjacent the side wall flanges are not cut so that the cut out material will fold with the side walls 40 to form depending continuations on the outside of the slots. These continuations become the guide tabs 54 described above.

The ventilation openings 50 are cut in the outer wall sections 44 adjacent the portion of the inner wall sections 45 which were cut away to form the keying flaps 49, thus air may pass through the ventilation openings 50 into the interior of the trays. These ventilation openings 50 also serve as hand holds for easy grasping and handling of the trays.

The cut and score blank, as described above, is folded to form an intermediate or top tray by first upwardly folding the end wall flanges into vertical positions with the lateral arms 42 folded to extend along the juncture of the side wall flanges and the base portion 39. The side wall flanges are similarly upwardly folded to vertical positions with the guide tabs 54 folded downwardly into guiding positions and simultaneously forming the flap receiving slots 52. The inner wall sections 45 are then folded along the double scoring over the lateral arms 42 to positions parallel to and spaced inwardly from the side walls 40 forming the flap receiving cavities 51 in the spaces between the ends of the lateral arms 42 vertically adjacent the flap receiving slots 52. When the inner wall sections 45 are folded along the double scoring as described, the keying flaps 49, which were cut from the inner wall sections 45, remain upright as extensions of the side walls 40. Finally, the latching feet 46 (FIG. 5) are inserted in the slots 48 to latch the side walls in place.

When the tray described above is being used as a top tray 14 instead of an intermediate tray 12, the ventilation openings 50 become part of the cover locking means and the keying flaps 49 are bent inwardly by the cover 15, reacting against the cover to urge it upwardly in a locked

position, as will be described. Also, the slots **25** in the top tray bottom, which were superfluous with the intermediate tray, are now used to receive the feet **24** of the folded portions **21** of the bottom tray end walls **16**.

The cover **15** of the shipping case **10** fits over the top tray **14** and consists of a rectangular cover portion **55**, side walls **56** and end walls **58**. The cover portion **55** has approximately the same dimensions as the top tray **14** so that the side and end walls **56** and **58**, which depend from the edges of the cover portion, overlay the side and end walls **40** and **18** of the top tray **14**. The side walls **56** have inner sections **60** thereon extending upwardly and inwardly with latching feet **61** engaged in latching slots **62** formed in the cover portion **55**. The side and end walls **56** and **58** of the cover **15** are interlocked in the same manner as the side and end walls of the trays, thus the end walls **58** are provided with lateral arms **64** extending between the side walls **56** and inner sections **60**.

As seen in FIG. 5, the inner sections **60** of the side walls **56** extend into contact with the cover portion **55** to add strength and rigidity to the cover **15**. However, there are formed on the upper central portions of the inner sections **60**, a pair of upwardly and slightly inwardly extending locking tabs **69** (FIGS. 2 and 5) the upper edges **66** of which automatically engage in or through the ventilation openings **50** when the cover **15** is placed over the upper tray **14**. These tabs **69** are formed by cutting wide W-shaped slots **68** in said inner wall sections **60** and by removing the W-shaped wall portions lying within and above the W-shaped slot. When the cover **15** is placed on the case **10** and the side walls **56** are sprung outwardly, the locking tab **69** will swing downwardly and inwardly so as to engage into the ventilation openings **50**. Upon release of the side walls **56**, the tabs will tend to return to vertical positions, further engaging in the openings to lock the cover on the case. To unlock, the sides **56** must once again be deformed until the tabs **69** have been withdrawn from the openings.

As was mentioned previously, the keying flaps **49** of the top tray **14** are bent inwardly by the cover **15** when the cover is forced down on the case. These flaps **49** react against the cover to urge it upwardly and facilitate the locking action of the locking tabs **69** in the openings **50**. This is illustrated in FIG. 3.

The cover **15** of the embodiment illustrated is formed from corrugated paper board, as were the trays, and the cover can similarly be formed from a single piece of stock. Thus a single blank is cut and scored to form the rectangular cover portion **55** with flanges extending from each edge. The flanges are scored at their juncture with the cover portion for folding downwardly to form depending walls. The end walls **58** are cut with the lateral arms **64** extending therefrom and scored for folding the arms into engagement with the side walls **56**. The side walls are double scored laterally to form the inner sections **60** thereon, and the inner sections are cut with the latching feet **61** and the U-shaped slots **65** to form the locking tabs **69**. Also, the cover portion **55** is cut to form the latching slots **62** adjacent the inner wall sections in line with the latching feet **61**.

The cover **15** is simply assembled from the cut and scored blank by folding the end walls **58** downwardly, the lateral arms **64** inwardly, the side walls **56** downwardly and the inner side wall sections **60** over the lateral arms **64** until the latching feet **61** are engaged in the latching slots **62**.

Since all of the trays and the cover of the present embodiment can be formed from flat blanks, a tremendous saving in space is possible when shipping or storing the empty cases. They can be shipped or stored in knock-down form and assembled prior to use. As the assembly procedures are simple and rapid, the unskilled user can quickly assemble the trays and covers at the point of packaging and needs no glue or staples.

When the trays and cover have been assembled and the trays packed with objects, the intermediate tray **12** is simply lowered between the end walls **16** of the bottom tray **11**, which guide the nesting of the trays so that the cavities **51** of the intermediate tray **12** will be aligned with the keying flaps **34** of the bottom tray. The intermediate tray is supported by the side walls **20** of the bottom tray and since the flaps **34** are locked in vertical positions between the inner and outer wall sections **45** and **44**, the trays are locked in alignment. The top tray **14** is similarly nested between the end walls **16** of the bottom tray **11** and keyed on top of the intermediate tray **12**. The trays are secured as an integral multi-tray case by folding the folded portions **21** of the end walls **16** over the top tray end walls **18** and latching the feet **24** in the slots **25**. Finally, the cover **15** is placed over the case **10** and locked thereon by insertion of the locking tabs **69** in the ventilation openings **50** of the top tray **14**.

The multi-tray construction of this invention is adaptable to other uses than for fragile objects only. Thus it readily lends itself to shipping a selection of different objects, such as oranges in one tray, grapefruit in another tray, and tangerines in another.

From the above description it is obvious that the present invention provides a multi-tray shipping case which requires no additional material except the extended bottom tray end walls; which has interchangeable top and intermediate trays; and which has nesting means, tray securing means and cover locking means all integral with the trays and covers so as to eliminate any additional elements. Further, the trays and covers can each be formed from single blanks such as by die cutting and there is no gluing or stitching required to assemble the trays and cover from the cut blanks.

While this invention is susceptible of embodiments in many different forms, there is shown in the drawings and is herein described in detail one specific embodiment, with the understanding that the present disclosure is to be considered as an exemplification of the principles of the invention and is not intended to limit the invention to the embodiment illustrated, the scope of the invention being defined in the appended claims.

I claim:

1. A multi-tray shipping case, comprising bottom, top and intermediate trays vertically nestable to form a multi-tray case, the bottom tray having walls extending upwardly into engagement with the top tray; and latching means for detachably latching said walls to said top tray to form an integral case.

2. A multi-tray shipping case, comprising bottom, top and intermediate trays vertically nestable to form a multi-tray case, the bottom tray having walls extending upwardly into engagement with the top tray; latching means for detachably latching said walls to said top tray to form an integral case; a removable cover mountable over the top tray; and locking means for detachably locking said cover on the case.

3. A multi-tray shipping case, comprising a plurality of trays vertically nestable to form a multi-tray case, the top tray having upstanding walls, the bottom tray having walls aligned with the walls of said top tray, the bottom tray walls extending upwardly to the top of the top tray walls and having a portion foldable over said top tray walls; and latching means for detachably latching said foldable portion to the top tray thereby forming an integral case.

4. A multi-tray shipping case, comprising a plurality of trays vertically nestable to form a multi-tray case, the top tray having upstanding walls, the bottom tray having walls aligned with the walls of said top tray, the bottom tray walls extending upwardly to the top of the top tray walls and having a portion foldable over said top tray walls, said foldable portion having latching feet extending therefrom and said top tray having latching slots shaped to receive said feet to removably latch said bot-

tom tray walls to the top tray, thereby forming an integral case.

5. A multi-tray shipping case, comprising a plurality of trays vertically nestable to form a multi-tray case, the top tray having upstanding walls, the bottom tray having walls aligned with the walls of said top tray, the bottom tray walls extending upwardly to the top of the top tray walls and having portions foldable over said top tray walls, said foldable portions being of substantially the same height as the top tray walls and having latching feet extending therefrom, said top tray having latching slots formed in its bottom adjacent said top tray walls shaped to receive said feet to removably latch said bottom tray walls to the top tray walls, thereby forming an integral case.

6. A multi-tray shipping case, comprising bottom, top and intermediate trays vertically nestable to form a multi-tray case, the bottom tray having walls extending upwardly into engagement with the top tray; latching means for detachably latching said walls to said top tray to form an integral case; and a removable cover mountable over the top tray and having a locking tab, said top tray having a locking slot for receiving said locking tab to lock the top on the case.

7. A multi-tray shipping case, comprising a plurality of trays vertically nestable to form a multi-tray case, the bottom tray having walls extending upwardly into engagement with the top tray; latching means for detachably latching said walls to said top tray to form an integral case; a removable cover mountable over the top tray and having a locking tab, said top tray having a locking slot for receiving said locking tab to lock the cover on the case and a flap on said top tray adjacent said locking slot and normally extending upwardly, the flap being forced from its normal position into a less upwardly extending position by the cover and thereby reacting against the cover to urge the cover upwardly and lock the locking tabs in the locking slots.

8. A shipping case, comprising a plurality of vertically nested trays with the top tray having upstanding walls, said walls having locking slots formed therein; a removable cover mountable over the top tray and having depending walls overlaying the walls of the top tray and extending beyond said locking slots; and locking tabs extending from the walls of the cover and engageable in the locking slots when the cover is mounted on the case, thereby locking the cover on the case.

9. A shipping case, comprising a body portion having upstanding walls, said walls having locking slots formed therein; a removable cover mountable over said body portion and having depending walls overlaying the walls of the body portion and extending beyond said locking slots; and flaps normally extending upwardly from the upstanding walls of the body portion adjacent said locking slots, the flaps being forced by the cover to less upwardly extending positions and thereby reacting against the cover to urge the cover upwardly and lock the locking tabs in the locking slots.

10. A shipping case, comprising a body portion having upstanding walls, said walls having horizontal locking slots formed therein adjacent the top of the walls; a removable cover mountable over said body portion and having depending walls overlaying the walls of the body

portion and extending beyond said locking slots, said walls of the cover having end portions folded back along the walls adjacent the body portion, each said folded back end portion having a horizontal tab forming slot adjacent one of said horizontal locking slots and vertical slots extending downwardly from the ends of said tab forming slots forming a tab which is engageable in the locking slot to lock the cover on the body portion.

11. A blank foldable to form a cover for a shipping case or the like and including tabs engageable in horizontal locking slots of the case to lock the cover on the case, the blank, comprising a cover portion; wall forming flanges extending from said cover portion and scored at their juncture with the cover portion so as to be foldable to form walls; foldback end portions extending from said wall forming flanges and being double scored at the juncture with the flanges, each said end portion having a generally wide W-shaped slot formed adjacent its outer end with the base of the wide W-shaped slot parallel with the double crease to form a tab shaped so that when the blank is folded along the creases the tab extends upwardly adjacent the locking slot of the case and is engageable therein to lock the cover on the case.

12. A tray vertically nestable with similar trays to form a multi-tray case, the tray comprising a base portion; outer wall sections extending from said base portion and folded into vertical positions; inner wall sections extending from said outer wall sections and folded inwardly to vertical positions parallel to and spaced from the outer wall sections forming cavities therebetween; keying flaps formed from said inner wall sections before folding, said flaps being vertical extensions of said outer wall sections, guide tabs formed from said base portion adjacent said outer wall sections and folded with the outer wall sections to form vertical continuations of the outer walls sections, the guide tabs being vertically aligned with the keying tabs, the folding of the guide tabs with the outer wall sections provides slots in the base portion vertically aligned with the keying tabs, the guide tabs, slots and cavities being shaped to engage the keying flaps of a vertically adjacent tray.

13. A tray vertically nestable with similar trays to form a multi-tray case, the tray comprising a base portion; walls extending vertically from said base portion; a keying flap extending from one of said walls, said base portion having a flap receiving slot adjacent one wall and vertically aligned with said flap, said one wall having a flap receiving cavity vertically aligned with said slot, said slot and cavity being shaped to receive the keying flap of a vertically adjacent tray; and a guide tab on the wall extending outwardly adjacent the slot of the base portion and extending vertically beyond the base portion to guide the receipt of the keying flap of the vertically adjacent tray.

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