May 24, 1966 R. V. JOHNSON 3,252,648

RELOCKABLE TRAY

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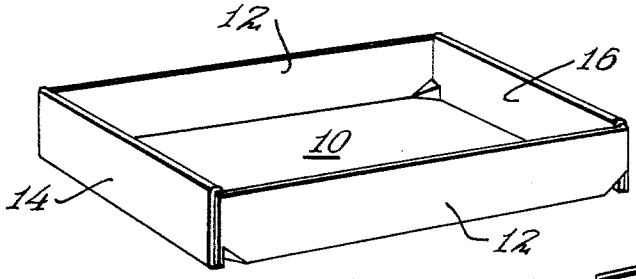


FIG. 1

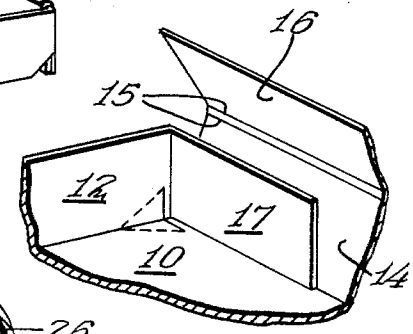


FIG. 2

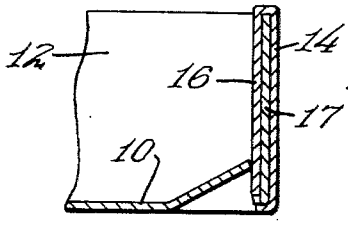


FIG. 3

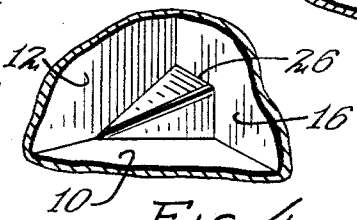


FIG. 4

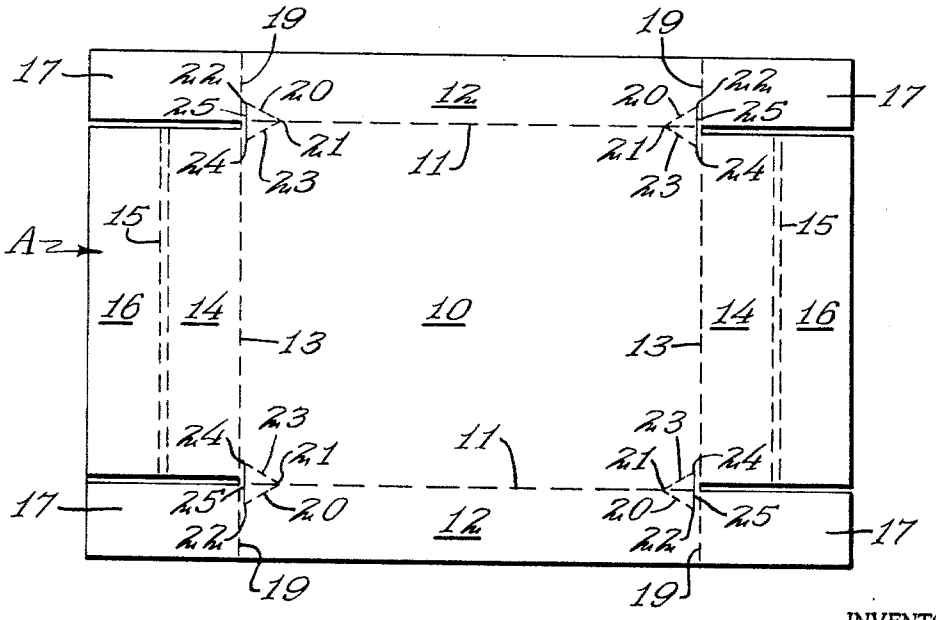


FIG. 5

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RELOCKABLE TRAY

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This invention relates to an improvement in relockable tray and deals particularly with a tray structure which may be set up and collapsed into flat form when desired.

Trays are used in packaging and handling of a wide variety of products. For example, bread, buns, and other bakery items are oftentimes delivered from the bakery to a store in such trays. Canned goods are oftentimes handled in trays and also oftentimes displayed in trays. Suits and other clothing are often packed in telescoped containers comprising two trays in telescoped relation. Trays of this type are often provided in flat form and are set up for use. It is quite important that trays of this type be set up in a minimum amount of time.

Trays used for bakery products are often reused. After the products have been delivered, the trays are oftentimes disassembled by disconnecting the corner flaps or by other means and refolded into flat form. With many types of corner locks, difficulty is experienced in unlocking the trays and the locks oftentimes become bent or damaged in attempting to unfold the tray by unlocking the locks. It is an object of the present invention to provide a tray which may be locked quickly and easily, and which may be unlocked just as quickly and easily when it is desired to do so.

One type of tray which has been commonly produced lies in a construction in which side and end walls are hingedly connected to a bottom panel, and corner flaps are hingedly connected to the ends of both side walls. The corner flaps are folded inwardly of the end walls in erecting the tray, and an end wall lining panel, hinged to the upper edge of each end wall, is folded inwardly of the corner flaps to hold these flaps in place. Suitable means are then employed for holding the end wall lining panels in position. Usually, a flange is hinged to the lower edge of each end wall lining panel, and a lock is provided on the bottom panel to engage and hold the lining panels in place. The main difficulty with such construction lies in the fact that the locks are not particularly positive, and do not always serve their intended purpose. Furthermore, if the locks are made more positive, the trays are more difficult to set up and more difficult to disassemble without injury to the locks.

A feature of the present invention resides in the provision of a tray of this same general type in which the end walls are provided with end wall lining panels which are folded down inwardly for corner flaps to hold the tray erect. However, to hold the lining panels in place, a pair of generally triangular areas is provided at the juncture between the ends of the side walls and the ends of the bottom panel. One side of the triangular areas is defined by a cut line extending generally along the fold lines connecting the end walls to the bottom panel and connecting the corner flaps to the side walls. Accordingly, by applying a slight inward pressure to these triangular areas, they may be folded inwardly to form abutments which act to positively lock the end wall lining panels in position. By applying an outward pressure to the same areas, the triangular areas may be folded back into the plane of the panels in which they are formed, thus removing the abutment and allowing the end wall liner panels to be unfolded.

These and other objects and novel features of the present invention will be more clearly and fully set forth in the following specification and claims.

In the drawings forming a part of the specification:

FIGURE 1 is a perspective view of the tray in erected form.

FIGURE 2 is a perspective view of a corner of the tray in partially erected form.

FIGURE 3 is a vertical sectional view through a portion of one end of the tray.

FIGURE 4 is a perspective detail on an enlarged scale showing one of the locking abutments in locking position.

FIGURE 5 is a diagrammatic plan view of the blank from which the tray is formed.

With reference to FIGURE 5 of the drawings, the tray A includes a rectangular bottom panel **10** which is hingedly connected along parallel fold lines **11** to side walls **12**. The bottom panel **10** is also connected along fold lines **13**, which intersect the fold lines **11** at right angles, to end walls **14**. The end walls **14** are foldably connected along wide scores or double fold lines **15** to end wall liner panels **16**.

Corner flaps **17** are foldably connected to the ends of the side walls **12** along fold lines **19** which are substantially aligned with the fold lines **13**. The various walls are so proportioned that the corner flaps **17** may be folded inwardly of the end walls **14**, and the end wall liner panels **16** may fold inwardly of the corner flaps to hold the side walls erect. FIGURE 2 of the drawings is illustrative of the manner in which the panels **14** and **16** may be folded to enclose the corner flaps **17**.

A diagonal fold line **20** extends from a point **21** near each end of each fold line **11** spaced a short distance from the ends **13** of the bottom panel **10** to a point **22** on each adjoining fold line **19**, a predetermined distance from the fold line **11**. A second diagonal score line **23** extends across each corner of the bottom panel **10** from the point **21** to a point **24** on the fold line **13** spaced from the fold line **11**. A cut line **25** extends between the points **22** and **24**. If desired, each cut line **25** may be spaced inwardly of the aligned fold lines **13** and **19** to allow for the thickness of the paperboard.

FIGURE 2 of the drawings illustrates the tray in a partially set up condition, and it is understood that the end wall liner panel **16** will be folded down inwardly of the corner flaps **17**. When the liner flap **16** is in place, inward pressure is applied to the triangular areas near the center of the cut line **25**. This causes the two similar triangular areas to flex inwardly into the position indicated in FIGURE 4, the edges of the triangular areas along the cut line **25** forming an abutment **26** which securely locks the end wall liner panel in place.

It is recognized that the construction described produces a tray in which the corners of the bottom panels are flexed inwardly, and that the tray is deformed to some extent at these points. However, for many purposes, this deformation is not any disadvantage, and the slight disadvantage in appearance is more than compensated for by the ease with which the tray is set up.

When it is desired to fold the tray back into flat form, it is only necessary to apply pressure along the portion of the fold line **11** separating the two triangular areas to fold these triangular areas back into the plane of the sidewall and bottom panel as indicated in FIGURE 2. When these corner areas have been snapped back in this position, the liner panels **16** are free to unfold and the tray may be folded back into flat form.

In accordance with the patent statutes, I have described the principles of construction and operation of my relockable tray; and while I have endeavored to set forth the best embodiment thereof, I desire to have it understood that obvious changes may be made within the scope of the following claims without departing from the spirit of my invention.

I claim:

1. A relockable tray including a sheet of paper-board cut and creased to provide:
a substantially rectangular bottom panel,
side wall panels hinged to opposite side edges of said bottom panel,
end wall panels hinged to opposite ends of said bottom panel,
corner flaps connected to the ends of said side wall panels and adapted to fold against the inner surfaces of said end wall panels,
end wall liner panels hinged to the upper edges of said end walls and adapted to fold inwardly of said corner flaps,
diagonally extending fold lines extending from a first point spaced from each corner of said bottom panel and on the lines of fold connecting said bottom panel to said side wall panels to a second point adjacent to the fold lines connecting said bottom panel to said end wall panels,
diagonally extending fold lines extending upwardly in said side wall panels from said first points to third points adjoining the fold lines connecting said corner flaps to said side walls, and
a cut line connecting the said second points and the adjacent third points,
whereby said diagonal fold lines and said fold lines connecting said botom panel to said side wall panels define triangular areas which may be forced inwardly to provide abutments for locking said end wall liner panels in place.

2. A relockable tray including a sheet of paper-board cut and creased to provide:
a substantially rectangular bottom panel,
side wall panels hinged to opposite side edges of said bottom panel,
end wall panels hinged to opposite ends of said bottom panel,
corner flaps connected to the ends of said side wall panels and adapted to fold against the inner surfaces of said end wall panels,
end wall liner panels hinged to the upper edges of said end walls and adapted to fold inwardly of said corner flaps,
an abutment formed adjacent to each corner of said bottom panel and having an edge engageable with the sides of said end wall liner panels to hold said liner panels against said corner flaps,
each said abutment including a pair of triangular areas on opposite sides of the lines of fold connecting said bottom panel to said side wall panels and extending from a common apex on said last mentioned lines of fold to a triangle base defined by a cut line intersecting said last named lines of fold,
said triangular areas being foldable into angular relation with the panels in which they are formed to provide the abutments.

3. The structure of claim 2 and in which said triangular areas are substantially equal in area.

4. A relockable tray including a sheet of paper-board cut and creased to provide:
a substantially rectangular bottom panel,
side wall panels hinged to opposite side edges of said bottom panel,
end wall panels hinged to opposite ends of said bottom panel,
corner flaps connected to the end of said side wall panels and adapted to fold against the inner surfaces of said end wall panels,
end wall liner panels hinged to the upper edges of said end walls and adapted to fold inwardly of said corner flaps,
an abutment formed adjacent to each corner of said bottom panel and engageable with said end wall liner panels to hold the same against said corner flaps,
each said abutment including a pair of right triangular areas on oposite sides of the lines of fold connecting said bottom panel to said side wall panels,
the triangular areas having a common apex and being defined by an end portion of one of said last mentioned lines of fold, a cut line intersecting said last mentioned line of fold, and a diagonal fold line extending from said apex to an end of one of said cut lines.

5. The structure of claim 4 and in which said triangular areas are of equal size.

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