My invention pertains to containers and particularly to protective containers for foods and other products.

A principal object of my invention is to provide a container fabricated of fibrous and viscous materials capable of keeping foods in prime condition until they reach the consumer, and affording a reasonable protection during the period of consumption.

A further object is the application of a new principle to the fabrication of a food container whereby a wide variety of fibrous board, lacquers, or other board-coating materials and wrappers, such as waxed glassines, coated papers, Cellophane, Pyralin and other protective materials, may be employed in combinations.

Another object is to provide in a container a novel three or four sided tray wherein its respective ends are self-locking, both when forming the container, and also when reclosing it by the consumer.

Another object is to provide a novel food container that can be fabricated by machinery and equipment now existing in operating plants, yet will be cheap and easy to produce and pack, and will stimulate consumer use.

Another object is to provide a package that is adapted for automatic filling, wrapping and closing, whether the merchandise be “dump” filled into the trays or stacked in tiers or rows.

Another object is to provide a container adapted to be filled through one side, which filling side may be wholly or partly open, the container after filling being sealed in a transparent wrapper and the whole may or may not be secured within an open-ended sleeve, an end of the container being self-locking when initially formed and upon reclosing.

The above and other objects and advantages are attained by my invention, an embodiment of which I have illustrated in the accompanying drawings to which reference is made.

Fig. 1 shows a container made from a blank from which the self-locking tray may be formed.

Fig. 2 shows one end of the tray formed from the blank of Fig. 1.

Fig. 3 is a section on line 3—3 of Fig. 2 showing the self-locking flaps and tongue.

Fig. 4 shows a fragment of a tray blank similar to Fig. 1, but with a modified form of lock.

Fig. 5 shows one end of a tray made from a blank of Fig. 4.

Fig. 6 illustrates the opening and closing of the end of a tray of Fig. 5.

Fig. 7 shows a tray made from a blank of Fig. 5, 1 or 4, filled, wrapped and sealed, ready to be inserted within a sleeve.

Fig. 8 shows a blank from which the sleeve may be formed.

Fig. 9 shows a sleeve and filled tray in process of assembly.

Fig. 10 shows the sleeve and tray fully assembled, ready for shipment.

Fig. 11 shows a modified form of sleeve and tray with one end of the tray partly opened or partly reclosed.

Fig. 12 shows the tray fully opened.

Fig. 13 shows a blank for forming a tray with an integral fourth side or closure.

Fig. 14 shows a completely wrapped package made from a tray of Fig. 13.

Fig. 15 shows the package of Fig. 14 with the wrapper removed from one end and the tray end opened by the consumer.

The blank of Fig. 1 may be made from any suitable card board and when used for packaging bakery products, the surface that is to form the inside of the tray may be coated with a suitable moisture vapor and grease resistant coating as in my co-pending application Ser. No. 508,706. Such an impervious coating is indicated by the diagonal shade lines on Fig. 1.

The blank is cut and scored to provide a panel that forms the bottom of the tray. At each side is a side panel 1, 2, 11, 12 and at each end an end panel 13, 14 for forming the sides and ends of the tray. At each end, each side panel has a flap 15, 16, 17, 18, each of which has a locking slit 19, 20, 21, 22. Each end panel has a lip 23, 24 and on each side has a tongue 25, 26, 27, 28, that is adapted to enter into one of the slits 19, 20, 21, 22. The several adjoining panels and flaps are separated by score lines 29, 30, 31, 32, 33, 34 along which the material is folded to form the tray.

The slits 19 to 22 are angular or have lateral extensions at each end so that a short resilient latch 29a, 20a, 21a, 22a is formed from the material at each slit.

At each locking tongue, short cuts 25a, 26a, 27a, 28a extend into the end panels a distance equal to or slightly greater than the thickness of the material, and the score lines 35, 36, 37, 38 are made wide enough to include the depth of these cuts, so that when the tongues are folded to stand at right angles to the end panels, their outer surfaces will lie substantially flush with or slightly within the adjacent edges of the end panels. The slits 19, 20, 21, 22 substantially coincide with the score lines along which the flaps are joined to the side panels or may be spaced therefrom a
distance not greater than the depth of the cuts 25a, 26a, 27a, 28a. To form a tray from the blank, the sides 11, 12 are turned up at right angles to the bottom 10. The flaps 15, 16, 17, 18 are then turned in so that they are perpendicular to the sides and over the score lines 26, 31. The tongues 25, 26, 27, 28 are then turned up, the heavy score lines 28, 31, 37, 38 arching slightly so as to form a slight locking groove or recess 33, Fig. 3, at the base of each tongue. The ends 13, 14 are then turned up and the tongues 25, 26, 27, 28 guided into the respective slits 15, 16, 20, 21, 22, the short latches yielding as shown in dotted lines in Fig. 3. When the tongues have fully entered the slits, the latches spring back so that their ends enter into the grooves 39 and automatically lock the tray in assembled position. The tray is then ready for filling, after which the lips 23, 24 are turned down over the contents. The tray is then wrapped as with a transparent wrapper 40 and sealed against one side, preferably the bottom, and the two ends, Fig. 7. Each end may be covered with a seal 41 of a suitable design. Closely adjacent one end of the tray, the wrapper 40 may be provided with a tear line 42, having a free end 43, by means of which the wrapper can be torn to give access to the end of the tray beneath the seal 41. This tear line may extend around the tray or along only three sides. A blank for forming a sleeve to receive the wrapped tray of Fig. 7 is shown in Fig. 8. The blank has a back or bottom panel 44, side panels 45, 46, a front panel 47 and a glue strip 48 separated by score lines 49, 50, 51, 52. Score or embossed lines 53, 54 may be provided for ornamentation and to stiffen the sleeve. A window 55 is provided in the front panel, which may be of the configuration shown with curved lips 56, 57, 58, 59, at the bases of which are embossed lines 60, 61, 62, 63 which both ornament the front end and cause the free edges of the lips to turn inward slightly. To form the sleeve, the blank is folded on the score lines 48, 50, 51, 52 and the strip 48 glued to the free edge of panel 44, preferably on the outside thereof, as shown in Fig. 9. The sleeve is made from cardboard or other relatively stiff material and preferably is shorter than the tray so that the latter projects at one end by an amount approximately equal to the width of the tear strip so as to give easy access to the loose end of the strip. The wrapped tray has a sliding fit within the sleeve so that the end of the sleeve may have a straight edge against which the tear strip may sever the wrapper. When the tray has been filled and wrapped as in Fig. 5, and the sleeve opened to form an open-ended rectangular shell, a strip of suitable adhesive 64 will be applied to the wrapper 40 over one of the lips 23, 24, and the tray slid into the sleeve or the sleeve slid over the tray as shown in Fig. 9. The arrow 65 shows the relative direction of movement of the sleeve with respect to the tray. The lips 23, 24 are held against the sides of its base 39 and with adhesive 64 outward against the inside of the sleeve so as to assure a good bond. Fig. 10 shows the completed package ready for shipment and sale to the consumer.

When the consumer desires to open the package, he pulls on the end 43 of the tear strip or rip cord which will sever the wrapper 40 at the edge of the sleeve. This releases the seal 41 and the folded end of the wrapper which are thrown away or may be left hinged along one side, when the tear strip extends along only three sides. The lid or end panel 14 (or 13, which ever is exposed) is then raised as shown in Fig. 11, the lock between the tongues 25, 26 and latches 28a yielding to permit withdrawal of the lip 24 and raising of the end panel. When the lid is fully raised, the flaps 15, 17 are opened so as to give full access to the contents, as shown in Fig. 12. When sufficient of the contents has been removed, the package will be reclosed by turning down the lid 14, reinserting the lip 24 inside of the sleeve and the tongues 25, 26 in the locking slits.

As shown in Figs. 10, 11, 12, the tray is longer than the sleeve by an amount equal to the width of the tear line 42. When the two are assembled, the tear line lies outside the sleeve so that the end 43 is exposed. The opposite ends of tray and sleeve are flush. When the tear line 42 has been removed, the end of the tray projects slightly beyond the sleeve which gives easy access to the edge of the end or lid 14 to open it. Usually the tear line 42 will be from ⅛ to ⅜ inch wide and the tray will project at one end by this amount. The bond 64 between the wrapper and sleeve is not broken and the only part of the wrapper that is opened is the flap 40 opposite the tear line 42.

Therefore, when reclosed, the package again is sealed substantially tight and will keep the contents against deterioration for a considerable period. This is particularly true when the inside of the tray is coated with a moisture and grease resistant coating.

With some products, as enrobed or iced biscuits and cakes, for example, it is desirable to give a fuller display. In such case, the display opening or window will be extended across the front panel 41 of the sleeve and part way across the side panels 45, 46, as indicated by the dot-dash lines 65 in Fig. 8. The sides 11 and 12 of the tray will be cut out as indicated by the dot-dash lines 67, 68, Fig. 1, so that the edges of these cut-outs will coincide with the edges of cut-out 66 in the finished package, as shown in Fig. 11. This affords a very attractive and effectual display of two sides and the front of the contents.

The packages of Figs. 10, 11, and 12 are identical except for the size and shape of the windows in Figs. 10 and 11 and the omission of the window in Fig. 12.

In Fig. 8, the arrow 65 indicates the run of the grain or fibre of the material as I prefer it so that the material will fold more accurately along the score lines 49, 50, 51, 52 which are perpendicular to the grain and prevent bowing of the sides.

In Figs. 4, 5, and 6, I have illustrated another form of self-locking end closure that may be used on the tray of either Fig. 1 or 13. The same reference numbers, with prime indices, are used to identify the parts corresponding to those in Fig. 1. Fig. 4 shows one of four identical corners of the blank. The flap 16' has a locking slit 20' that is cut out at 70' so as to provide a two part resilient latch 20'. The tongue 26' is joined to the edge of the wrapper 40' along a broad score line 36' and is cut away at both sides of its base 39' by a neck 71 to be received within the cut-out or notch 70. The outer edge 26' of the tongue 26' is the arc of a circle with its center at the common corner of the panels 10', 11' and 14' and of a radius substantially equal to the distance from the center to wrapper 40', forming a uniform curve on score line 36' and its curved free end entered
within the slit 20', as shown in Fig. 6. The same procedure is followed for the other tongue 27' at the same end of the tray and similar tongues at the other end of the tray (not shown). As the tongue 26' (and other like tongues) enters its respective slit 20, the resilient two part latch 20b springs inward, like the latch 20a Fig. 3, until the shoulder or neck 11 enters into the notch 76. The latch 20b then snaps back of the shoulders 12, 13 on the tongue and thus holds the end panel or lid 14 in closed position. The latch yields, however, to permit the lip 24' to be withdrawn and the lid 14' raised to open the container and also to reclose it after part of its contents has been consumed.

When the nature of the contents is such that they can be poured out, the lid 14' need not be fully opened, but may be opened only to the extent shown in Fig. 6 where the end of the tongue 26' remains within the slit 20.

The tray made according to Figs. 4, 5, and 6, is adapted to be filled, wrapped, and inserted in a sleeve as the tray of Figs. 1 to 3.

In Fig. 13 I illustrate a blank adapted to form a four-sided tray that will be filled through a display opening in the fourth side and may be opened and reclosed the same as the trays of Figs. 1 to 7.

This blank is cut and scored to provide a bottom panel 74, side panels 75, 76 and end panels 77, 78 for forming the bottom, sides and ends of the tray, the same as the panels 10, 11, 12, 13 and 14 of Fig. 1. Each end panel has a tuck or lip 79, 80 corresponding to the lips 23, 24. At the end of each side there is a flap 15', 16', 17', 18' corresponding in function to the flaps 15, 16, 17, 18 but shown formed like the flap 16' of Fig. 4. Each side of the end panel has a tongue 25', 26', 27', 28' cooperating with the respective flaps like the tongue 26' of Fig. 4. One set of the tongues and flaps are indicated on Fig. 13 by the same reference numbers that are used to designate the same parts in Fig. 4. The other three tongues and flaps are identical and need not be described in detail. The end closure of Fig. 4 is shown as a part of this blank, but the closure of Fig. 1 or other equivalent closure is equally adapted to use therewith.

A top panel on which side 81 is joined to the tray edge of panel 76 along a score line 82 and at its other edge has a glue strip 83 that is adapted to be secured to the edge of side 75 to form a four-sided tray. The top side 81 has an opening 94 which serves both as a filling opening and as a window for displaying the merchandise in the filled container. The opening 84 may have inwardly curved lips 85, 86, 87, 88 with embossed lines 89, 90, 91, 92 at their bases in the same manner as in Fig. 8. The material of this blank preferably is coated with a moisture vapor and grease resistant coating, the same as the blanks of Figs. 1 and 4.

To assemble the tray from the blank of Fig. 13, the blank is first folded on two alternate score lines, 82, 94, and the glue strip 83 is secured to the free edge of side panel 75. This leaves the tray closed. It is then erected into rectangular form by bending on the score lines 94, 86, 97, 99 when the two sides 75, 76, stand parallel and perpendicular to the top and bottom panels. The two ends are then closed as described in connection with Figs. 1 to 6 or like Fig. 1, if the closure is to be used. This provides a four-sided tray having a large opening 84 in its top side through which it is filled. This type or form of tray is especially adapted for filling with small crackers or biscuit and other materials which usually are "dump-filled" or poured into a package or carton. The glue flap 83 may be secured to the inside or outside face of panel 78. When it is secured to the inside, all four sides of the tray present uninterrupted smooth surfaces to the wrapper.

When the tray has been filled through its open side, it is wrapped in a wrapper 85, Fig. 14, which preferably is made from a transparent moisture vapor and grease resistant material such as cellophane, glassine coated with Parlon, resin or wax, and the like, the longitudinal and end seams being sealed in any suitable manner, as by heat. The wrapper may have a tear line 88, with a loose end 100, secured near one end for easy opening, similar to the tear line 42 of Figs. 7 and 10. Or the consumer may sever the wrapper at the end to be opened by a knife or other instrument. The sealed wrapper may be supported by stiff board so that it is easily severed.

The wrapper 85 may be secured to the tray by strips of adhesive 101, 102 so that the wrapper may not be removed in its entirety when it has been severed by the tear line. These strips of adhesive may be applied to the tray blank as shown in Fig. 13, in which case an adhesive is used that may be activated by heat and pressure.

The adhesive may be applied to the tray after filling and just before it is enclosed in the wrapper.

Fig. 14 shows the filled and wrapped tray ready for delivery to the consumer. The open face of the tray, which served as a filling opening, also serves as a window for effectively displaying the merchandise through the transparent wrapper. The sealed ends of the wrapper may be covered with a seal as in Figs. 7 and 8. To open the package, the consumer will grasp the end 100 of the tear line and pull it to sever the wrapper near the top as shown at 103, Fig. 15. The adhesive 101 holds the wrapper in place around the tray and the adhesive 102 retains the severed top portion on the cover 78. The cover 78 can now be opened to give access to the contents. As shown in Fig. 15, the cover need be opened only far enough to enable the consumer to reach or pour out the articles and usually will be opened only to such extent that the tips of the tongues 26', 27' remain within their respective slits. This enables the consumer to reclose and automatically relock the package simply by pressure on the end panel 78. It is not necessary to guide the tongues into their slits again, as would be the case if the cover were opened to its maximum.

In Figs. 10 and 14, I have shown tear strips 42, 99 as a convenient means for opening the container. However, the invention is not limited thereto. With a wrapped tray as in Fig. 14, the wrapper is supported at all edges of the tray. These edges afford a convenient means for securing the wrapper on three sides where the end 13, 14 or 77, 78 is to be opened, or the edges may serve as a guide for a suitable instrument, as a knife blade. In the package of Fig. 5, when the tear line is omitted the top edges of the sleeve form a shoulder or guide for a knife or other instrument for severing the top panel along the end where the tray projects beyond the sleeve and is to be opened.

My improved container in all forms and modifications shown can utilize a wide variety of materials in various combinations adapted to the
particular commodity to be packed without departing from a standard method of fabrication. For economy, it is desirable to use cheap material, such as cracker shell board, for packaging many foodstuffs, but such material being made largely from waste paper and scrap containing a fairly high percentage of moisture imparts an unappetizing odor to many products, especially baked goods. Also such material is brittle, has a very low tensile strength, and tends to crack or fracture along the fold lines. By means of the present invention, such materials are entirely satisfactory for packaging foodstuffs that have the most delicate aromas and flavors. When the coating is applied to the board, heat is applied to dry the coating and evaporate the solvent which also drives the moisture out of the board. The package is then filled and sealed within an impervious wrapper before it can reabsorb any appreciable amount of moisture. Also, the coating being on the inside of the trays when folded does not crack at the fold lines, but the impervious surface is retained intact over the entire inner surface. All joints or seams of the outer wrappers are heat-sealed against the smooth plane surfaces on the sides and ends of the trays so that hermetically tight joints are obtained throughout.

While I have illustrated my tray as having automatically locking tongues and slits and believe this to be a most advantageous construction, yet the invention is not limited thereto, but contemplates that the tray may be made in other forms. Thus the tongues 25, 26, 27, 28, 29, 30, 21, 22 may be omitted, in which case the ends or lids 13, 14, will be secured to the flaps 15, 16, 17, 18, as by spot gluing, so that the bond may be easily broken by the consumer after the end of the wrapper has been removed.

The locking tongues and flaps are not limited to use with an open sided tray, but are adapted for closing an end, top or lid of the usual type of carton. The term tray, therefore, will be considered to include a carton and not be limited to a tray adapted to be filled through one side except as the context may require.

It will also be understood that the terms, side, bottom, end, top, flap, tongue, lip, etc., by which I have designated parts of the package are used only in a relative or descriptive sense, and are not to be given a limited meaning.

The invention will suggest many other modifications and adaptations to those skilled in this art, all within its scope.

Having thus described my invention in what I now believe to be its best embodiment, what I claim is:

1. A package of the class described comprising a tray having a bottom, two sides and open top, an interrupted flap at one end of each side, each flap having a cut therein providing a latch, an end panel connected to the end of the bottom adjacent said flaps and forming an end of the tray, said end panel lying outside said flaps, a tongue extending from each side of the end panel, said tongues extending through the respective flap cuts and containing latches, said latches permitting the tongues to be withdrawn for opening the end of the tray and to be reinserted to reclose the end, a sealed wrapper enclosing the tray, a tear line associated with the wrapper adjacent the said end panel of the tray for inserting the wrapper, a sleeve within which the wrappered tray has a sliding fit, said tray being longer than the sleeve whereby the tear line will be outside the sleeve, and means for securing the wrapped tray within the sleeve.

2. A package of the class described comprising a tray having a bottom, two sides and open top, an interrupted flap at one end of each side, each flap having a cut therein providing a latch, an end panel secured to one end of the bottom adjacent said flaps and forming an end of the tray, said end panel lying outside of said flaps and having a tongue secured to each side along an offset score, said tongues extending through the respective flap cuts and the offset scores providing grooves for receiving the latches, said latches being resilient and permitting the withdrawal of said tongues and their reinsertion to open and reclose the end of the tray, a sealed wrapper enclosing the tray, a tear line for severing the wrapper adjacent the said end of the tray, a sleeve within which the wrapped tray is enclosed, said tray extending beyond the sleeve at one end to expose said tear line, and means for securing the wrapped tray within the sleeve.

3. A package of the class described comprising an open sided tray having one end adapted for opening and reclosing, a transparent wrapper enclosing the tray and sealed against the sides and the ends thereof, a tear line for severing the wrapper adjacent said resealable end, a sleeve within which the wrapped tray has a sliding fit, a window opening in the side of said sleeve over the open side of the tray whereby the contents of the tray are visible, said tray being longer than the sleeve whereby the tear line will be outside the sleeve, and means securing the wrapped tray within the sleeve.

4. A package of the class described comprising an open sided tray having one end adapted for opening and reclosing, a transparent wrapper enclosing the tray and sealed against one side and the ends thereof, a tear line for severing the wrapper adjacent said resealable end, a sleeve within which the wrapped tray has a sliding fit, a window opening in the side of said sleeve over the open side of the tray whereby the contents of the tray are visible, there being inwardly curved lips at the edges of the opening pressing inwardly on the wrapper, said tray being longer than the sleeve whereby the tear line will be outside the sleeve, and means securing the wrapped tray within the sleeve.

5. A package of the class described comprising a tray having a bottom and two side panels and a top open for filling, said tray having a closure at each end, one of said closures being adapted for opening and reclosing, said resealable end closure comprising an interrupted flap on each side of the tray, an end panel connected to the bottom of the tray and overlying said interrupted flaps, each flap having a slit therein providing a lock adjacent its adjoining side, the end panel having a tongue on each side adapted to enter the respective slits, each tongue being engageable by a lock to hold the end panel closed against said interrupted flaps, a wrapper enclosing said tray and sealed against one of said first mentioned panels and said two end closures, a tear line for severing the wrapper, said wrap at the end, a cardboard member surrounding said wrapper and having a straight edge spaced inwardly from the end of the tray adjacent the tear line, said member being secured to the wrapper.

6. A package of the class described comprising a tray having a bottom, two side panels, two end panels and an open top, one end panel being
hinged to the bottom and adapted for opening and reclosing, a wrapper enclosing said tray and sealed against the bottom and two end panels, a tear line associated with the wrapper adjacent said reclosable end panel for severing the wrapper, a sleeve of relatively stiff material within which the wrapped tray has a sliding fit, said sleeve being shorter than the tray with the reclosable end extending beyond one end of the sleeve and the other end being flush with the other end of the sleeve, the first mentioned end of the sleeve being located at the tear line whereby said end will provide an edge against which to sever the wrapper.

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