This invention relates to a recessed end container comprising a rectangular tubular sleeve having a pair of parallel main panels marginally connected by a pair of side walls. Flap structures are hingedly connected to the ends of the main panels. Each flap structure includes a number of rectangular flanges connected by a pair of fold lines which are parallel to the fold lines connecting the flap structures to the main panels. The flanges comprise, in series, a first spacer flange hinged to the main panel, a partition panel, and a second spacer flange. The thin flanges are at right angles to the spacer panel with the spacer flanges diverging from the edges of the partition flange. The partition flange of the inner flap structure is provided with opposed vertically projecting ears which extend substantially their full height into the interior of the container to hold the partition flanges centered between the main panels. The container side walls are notched to accommodate the ends of the channel-shaped flap structures.

This invention relates to an improvement in recessed end containers and deals particularly with a tubular container having recessed ends designed to hold the product enclosed in spaced relation to the ends of the container to prevent injury to the product in the event the container is dropped or otherwise mishandled. In the past, it has been common practice to contain rectangular objects which are subject to damage when shipped in corrugated containers somewhat larger than the object contained, and including interior packing designed to hold the object in spaced relation to the end walls of the container. More recently, the use of recessed end containers has increased. Containers of this type comprise a tubular sleeve having integral closure flaps which extend into the ends of the sleeve to engage the product and to hold it from sliding within the sleeve. The present invention relates to a container of this general type in which the closure flaps serve to hold the interior product in spaced relation to the container ends.

In my previous Patent 3,302,852, issued Feb. 7, 1967 for Recessed End Containers, I disclose a book container including a flap structure in which the two main panels are each provided with a closure flap structure including a spacer panel and a partition panel. The spacer panels are folded through 180° to lie inwardly of the main panels to which they are hinged, while the partition panels are hinged to the spacer panels to form end closures. Recessed end containers of this type have been used in considerable volume and have proven very effective for their intended purpose. This is particularly true when the closure flaps are closed mechanically by plungers capable of forcing the flap structures in place. As will be understood, the equipment for closing the ends of containers of this type is quite expensive and usually requires intermittent movement of the container between a series of stations so that plungers may enter the ends of the container to fold the flap structure into position, and this may be more easily accomplished while the containers are stationary. It is a purpose of the present invention to provide a recessed end container in which the flap structures may be folded and secured together by an apparatus which is relatively simple, and yet which accomplishes the same general end result.

An object of the present invention resides in the provision of a tubular container having at one or both ends thereof, a flap structure on each of the main panels of the container which includes three panels or flanges hingedly connected together by a pair of parallel fold lines. These three flanges are foldable into generally channel-shaped form with the two end flanges of the series folded into converging relation, and the intermediate flange of the series being folded into right angular relation to the tubular walls of the container to form end panels engageable with the object being packaged. Thus, the two closure flap structures are folded into superposed relationship to form a trough-shaped or channel-shaped end. By providing notches in the ends of the remaining walls of the tube between the main panels, the two flap structures may be folded into V-shaped or trough-shaped form and held in this position by guide belts or rollers while adhesive between the flap structures dries, thus permitting the end closures to be sealed by simple mechanism while the containers move continuously through the closing machine.

A further feature of the present invention resides in the provision of a container of the type described in which the inner of the two flap structures may be provided with spacing ears projecting from opposite sides of the intermediate flange of the series to provide portions of the intermediate flange which are full depth of the tubular container. As a result, portions of the intermediate flange extend the full depth of the container end, thus centering the intermediate flange with respect to the main panels of the tubular container.

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 container in closed position.

FIGURE 2 is a sectional view through the container, the position of the section being indicated by the line 2--2 of FIGURE 1.

FIGURE 3 is a diagrammatic view of the blank from which the container is formed.

FIGURE 4 is a diagrammatic view of one end of the blank after it has been glued in tubular form.

While containers of the type illustrated in my previous patent above referred to have been widely used to contain books, that structure as well as the present structure, is also designed to contain other rectangular objects such as attached cases and other such generally rectangular objects during shipment and storage. The container is indicated in general by the letter A, while the object contained is indicated in broken lines in FIGURE 2 by the letter B.

The container A includes a top panel 10, a first side wall panel 11, a bottom panel 12 and a second side wall panel 13 connected along parallel lines of fold 14, 15 and 16. As will be understood terms such as "top panel" and "bottom panel" are used merely for the purpose of reference in the present description. A glue flap 17 is hingely connected to the second side wall panel 13 along a fold line 19 which is parallel to the previously described lines of fold.

The top panel 10 is hingedly connected along parallel fold lines 20 to flap structures which are indicated in general by the numeral 21. Each flap structure 21 is divided by a pair of fold lines 22 and 23 which are parallel to the fold lines 20 to form a first spacer panel 24, a partition
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panel 25, and a second spacer panel 26. The spacer panels 24 and 26 are usually of substantially equal width, and may be wider than the partition panels 25, if a deeply recessed end is desired. The depth to which the ends of the container are recessed depends upon the relative dimensions of the panels 24, 25, and 26, as will be understood; in any even, the combined widths of the flanges 24, 25 and 26 is greater than the height of the side walls 11 and 13.

The bottom panel 12 is foldably connected along parallel fold lines 27, which are generally aligned with the fold lines 20, to flap structures which are indicated in general by the numeral 29. Each flap structure 29 is divided by a pair of fold lines 30 and 31 which are parallel to the fold lines 27 to provide a first spacer panel 32, a partition panel 33, and a second partition panel 34. The spacer panels 32 and 34 are preferably of the same width, and in the arrangement illustrated are somewhat wider than the partition panel 33. However, as previously stated, the relative widths of the panels 32, 33 and 34 determines the degree of recess of the recessed container ends.

The spacer panel 32 includes a pair of generally U-shaped cut lines 35, the ends of which terminate at the fold line 30. The spacer panels 34 are provided with opposed U-shaped cut lines 36 which terminate at the fold line 31. The cut lines 35 and 36 define ears 37 and 39 which are connected to the partition panel 33 and remain in the plane of the flange 33. The base portions of the cut lines 35 and 36 are spaced apart a distance substantially equal to the width of the side walls 11 and 13, so that the ears 37 and 39 engage against the bottom panel 12 and top panel 10 respectively when the closure is in its closed position. In other words, the ears 37 and 39 form portions which are preferably the full height of the interior of the container so as to hold the partition panels 33 centered with respect to the main panels 10 and 12.

The ends of the side walls 11 and 13 are provided with generally U-shaped or V-shaped notches 40 and 41, these notches being designed to accommodate the flap structures 21 and 29 when these flap structures are folded into face contact. These notches permit the ends of the channel-shaped end closures to be open so that pressure wheels or belts may engage the end closures to hold them in face contact when the ends are glued shut.

In forming the container A from the blank illustrated in FIGURE 3 of the drawings, the blank is folded along the fold line 16 to fold the side wall 13 and glue flap 17 in overlapping relation to the main panel 12. The blank is then folded along the fold line 14 to bring the main panel 10 into contact with the glue flap 17. Adhesive is applied between the glue flap 17 and the panel 10 to adhere the blank into tubular form, as indicated in FIGURE 4 of the drawings.

When the container is used, the flat folded blank is squared up into tubular form, and the contents are inserted into the tubular container and centered therein. The flap structures 29 are next folded upwardly across the open ends of the container and are pressed inwardly into channel-shaped form, the partition flanges 33 being against the contents B and the ears 37 and 39 holding the flanges 33 centered between the main panels 10 and 12. Adhesive is applied to the under surface of the flap structure 21, and these flap structures are folded downwardly and inwardly into channel-shaped form until the flanges 24, 25 and 26 are in face contact with the first folded flanges 34, 33 and 32. The folding is preferably accomplished by rollers or belts. As an example of the structure employed, rollers C are shown in broken outline in FIGURE 2 of the drawings engaging opposite ends of the container. The container A may then pass between a pair of such rollers C, the container remaining in contact with such rollers until the adhesive connecting the flap structures 21 and 29 sets.

It has been found that most of the damage to rectangular objects such as books, attaché cases and the like is to the corners of such objects. In other words, when the containers are dropped, they usually land on one corner of the container and as a result, the container corner is dented inwardly damaging the object contained. With the present construction, the ends of the container extend well beyond the ends of the object contained, so that the force of the fall may damage the corner of the container without causing damage to the object contained.

In accordance with the patent statutes, I have described the principles of construction and operation of my container; 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 following claims without departing from the spirit of my invention.

I claim:

1. A recessed end container including:
a pair of generally rectangular main panels having opposed parallel edges integrally connected by one-piece side walls to provide a tubular body of predetermined cross sectional area,
a first closure structure hinged to one end of one of said main panels, said first closure flap structure being divided by a pair of fold lines parallel to the line of fold connecting said first flap structure to said main panel, to provide, in series, a first space flange, a partition flange, and a second space flange,
said partition flange being at right angular relation to said main panel, and said spacer flanges diverging from the edges of said partition panel to the ends of the main panels to provide a channel-shaped end, a second closure flap structure hinged to the adjacent ends of the other main panel, and means securing said second closure flap structure in overlying relation at least said second spacer flange of said first closure flap structure.

2. The structure of claim 1 and in which said second flap structure is divided by a pair of spaced fold lines to provide a first spacer flap, a partition flap, and a second spacer flap in contact, respectively, with the second spacer flap, the partition flap, and the first spacer flap of said first closure flap structure.

3. A recessed end container including:
a pair of generally rectangular main panels having opposed parallel edges connected by side walls to provide a tubular body, a first closure flap structure hinged to an end of one of said main panels, said closure flap structure being divided by a pair of fold lines parallel to the line of fold connecting said flap structure to said main panel to provide, in series, a first spacer flange, a partition flange, and a second spacer flange,
said partition flange being in right angular relation to said main panel, and said spacer flanges diverging from the edges of said partition panel to the ends of said main panels to provide a channel-shaped end, a second closure flap structure hinged to the adjacent end of the other main panel, and means securing said second closure flap structure in overlying relation to said first closure flap structure, said partition flange includes coplanar vertically spaced ears thereon, second partition flange with said ears thereon, extending substantially the full height of said tubular body.

4. A recessed end container including:
a pair of generally rectangular main panels having opposed parallel edges connected by side walls to provide a tubular body, a first closure flap structure hinged to an end of one of said main panels, said closure flap structure being divided by a pair of fold lines parallel to the line of fold connecting said flap structure to said main panel to provide, in
series, a first spacer flange, a partition flange, and a second spacer flange,
said partition flange being in right angular relation to said main panel, and said spacer flanges diverging
from the edges of said partition panel to the ends
of said main panels to provide a channel-shaped end,
a second closure flap structure hinged to the adjacent
end of the other main panel,
means securing said second closure flap structure in
overlying relation to said first closure flap structure,
the ends of said side walls including notches to accom-
modate said channel shaped end found by said first
closure flap structure.
5. A recessed end container including:
a tubular body including a pair of substantially rec-
tangular main panels marginally connected along
opposite edges by a pair of one piece side walls, said
main panels and side walls forming a tubular body
of predetermined rectangular cross section,
a first closure flap structure hinged to one main panel
at each end of said body,
said first closure flap structure being divided by a pair
of fold lines parallel to the hinge line connecting
said flap structure to the main panel to form a first
spacer flange, an inner partition flange and a second
spacer flange,
said first closure flap structure being in channel-shaped
form with the spacer flanges diverging outwardly
toward the ends of said main panels and the parti-
tion panel extending at substantially right angular
relation to said main panels,
a second closure flap structure hinged to the other
main panel and secured in face contact with said
first closure flap structure.
6. The structure of claim 5 and in which said partition
panel includes ears projecting in opposite directions
therefrom and coplanar therewith, said ears engaging the
inner surfaces of said main panels to hold said partition
panel substantially centered between said main panels.
7. The structure of claim 5 and in which said second
closure flap structure is divided by a pair of fold lines
to provide a first spacer flange, a partition flange, and a
second spacer flange, said last named flanges being in
channel-shaped form with the flanges thereof in face
contact with the flanges of said first closure flap structure.
8. The structure of claim 5 and in which the end walls
of said side walls are notched to accommodate said
closure flap structures.
9. The structure of claim 6 and in which said side
walls are notched to accommodate said closure flap
structures.

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DAVID M. BOCKENEK, Primary Examiner
U.S. Cl. X.R.

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