

**Oct. 3, 1967**

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**3,344,971**

LINED BOX

Filed Dec. 6, 1965

2 Sheets-Sheet 1

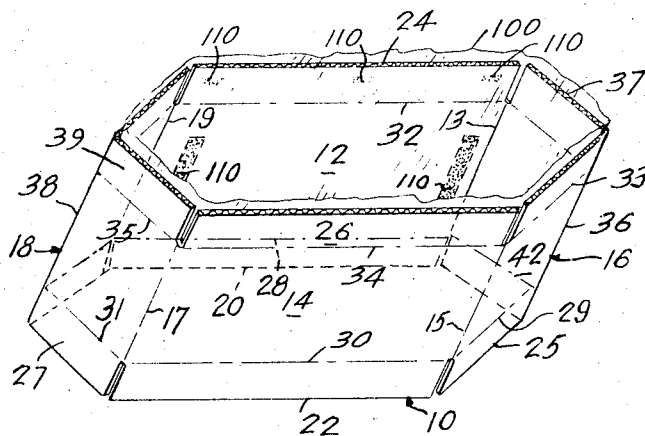


Fig-1

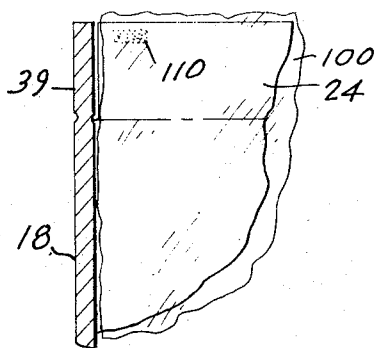


Fig. 2

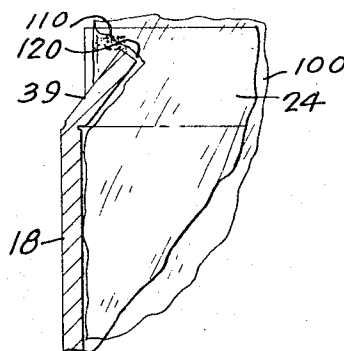


Fig 4

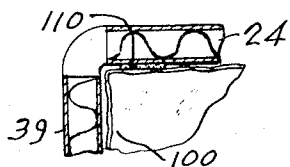


Fig. 3

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2 Sheets-Sheet 2

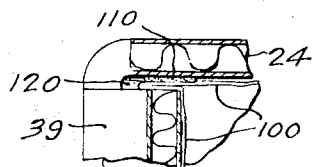


Fig. 5

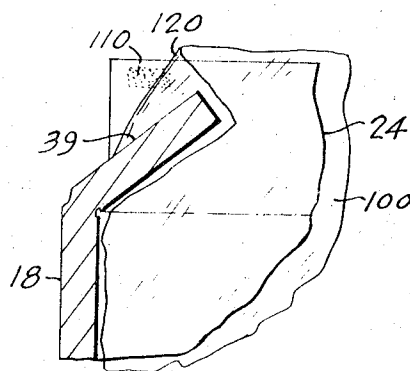


Fig. 6

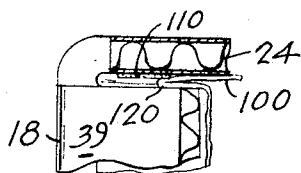


Fig. 7

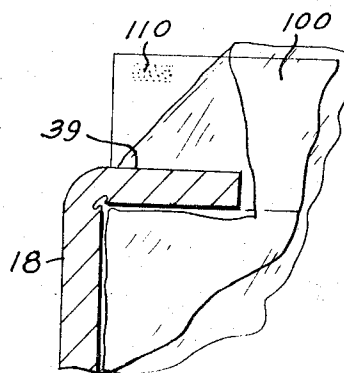


Fig. 8

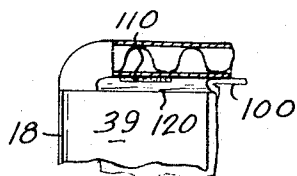


Fig. 9

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3,344,971

## LINED BOX

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### ABSTRACT OF THE DISCLOSURE

The present invention relates to a lined box structure having two pairs of opposite side walls, bottom and top closure flaps connected to opposite ends of these walls, axial fold lines bisecting one pair of opposite side walls and their respective closure flaps and permitting the box to be collapsed, a liner with a perimeter substantially equal to the inner perimeter of the box secured to a pair of opposed top closure flaps by releasable adhesive means so that the top of the liner is held open by the flaps but may be completely separated from the flaps for closing.

The present invention relates to lined boxes, particularly to boxes having bags or tube liners inserted therein in pre-assembled box and bag or box and tube combinations.

Bag and box combinations are not new in themselves but existing combinations have many disadvantages. Usually such arrangements of bags and boxes must be assembled by inserting the bag or liner into an erected box, immediately prior to filling. This means the convertor must provide facilities for inserting the bag or liner somewhere in his packaging line which requires extra space and extra equipment or labour and is generally not satisfactory.

Present pre-assembled box and bag combinations supplied to the convertor in knock-down condition require the use of oversize bags to permit erection of the box. As a result, extra material is required which is thus more costly and produces an unsightly ill-fitted package. This superfluous material also tends to trap the product within its folds. Usually a gusseted type bag or a bag of special construction is required for manufacturing bag in box combinations.

The present invention aids in overcoming the above difficulties and permits a better and closer fit between the bag and box which in turn reduces the cost of the bag. Applicant's bag need not be of any unique construction, nor need the bag extend excessively beyond the bottom of the box in knock-down position when the two are secured together.

In known lined box construction generally the bag insert must be held open for filling by some suitable extraneous means. This increases the complications in the packaging machine. One recent patent permanently adheres the bag or liner insert to the top flaps of the box whereby the mouth of the bag may be held open by its connection with the flaps. While the latter arrangement provides a simple means to hold the bag or liner open during filling, the sealing of the bag or liner becomes unduly complex, requiring the use of special insertable anvil means.

The present invention provides a simple system of holding the bag or liner open for filling which systems permits easy closing or sealing of the bag or liner in a plurality of conventional ways.

It is thus the main object of the present invention to provide an improved pre-assembled box and liner combination.

A further object of the present invention is to provide a bag and box combination wherein the bag is releasably

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secured to the inside of the box to hold the bag open during filling and permitting easy closing of the bag and box.

Broadly, the present invention relates to a box having a lining in the form of a tube or bag wherein the liner is releasably secured to at least one pair of opposed top flaps of the box so that the liner may be held open for filling but is readily detached from said flaps to permit closing and sealing.

Further features, objects and advantages will be apparent from the following detailed description taking in conjunction with the accompanying drawings in which:

FIG. 1 is a perspective view from the top of the box showing the box in semi collapsed condition;

FIGS. 2, 4, 6 and 8 are partial cross-sections illustrating folding of the top end flaps of the box to close off the box and bag combination;

FIGS. 3, 5, 7 and 9 are partial plan views of FIGS. 2, 4, 6 and 8 respectively;

Like numerals represent like parts throughout the various views.

The box 10 (FIG. 1) has side panels 12 and 14 and end panels 16 and 18 interconnected by fold lines 13, 15, 17 and 19, which form the corners of the box. One of these corners may conveniently include the manufacturers joints. A pair of bottom closure side flaps 20 and 22 and a pair of top closure side flaps 24 and 26 are hinged to the panels 12 and 14 by score lines 28, 30, 32 and 34 respectively.

End panels 16 and 18 have bottom closure flaps 25 and 27 and top closure flaps 37 and 39 connected thereto by crease lines 29, 31, 33 and 35 respectively. Each of these panels 16 and 18 together with their respective top and bottom closure flaps are bisected by top to bottom running crease lines 36 and 38. These crease lines permit half of each of the panels 16 and 18 and their respective closure flaps to be collapsed into face to face relationship with their opposite halves on the other side of crease lines 36 or 38.

As indicated a hexagonal box structure is formed. The box may be collapsed by folding along the lines 36 and 38 to bring the side walls 12 and 14 together or which may be erected by moving the fold lines 36 and 38 toward each other. This system of erecting or collapsing is important in maintaining the bag size at a minimum as will be explained hereinbelow.

The bag or tube liner 100 of the present invention may be of relatively simple construction. The periphery of the bag or tube liner need only be substantially the same size as the inner periphery of the box when a hexagonal box construction is used. If a bag liner is used no complex bottom or gusseted side wall structure is necessary. A tube formed in any suitable manner need only be sealed off at one end for example by a transverse heat seal or the like to provide the bag bottom.

With the hexagonal box construction as above described the bag 100 may be arranged and secured in the box 10 without the bottom of the bag projecting excessively below the bottom flaps of the box so there is very little likelihood of the bag being damaged when the box and bag combination is in collapsed or knock-down condition. The top rim of the bag 100 preferably extends slightly above the top edge of the top closure flaps of the box to facilitate sealing of the bag.

The bag or liner 100 is secured within the box 10 in any suitable manner but care must be taken to prevent permanent adherence of the bag to the top and bottom box closure flaps. Preferably the bag is secured to the side wall panels 12 and 14 of the box, adjacent the periphery and particularly at the corners of these panels. The bag may, if desired, be secured to the end wall panels 16 and 18 of the box. To facilitate handling, the bag is

detachably secured adjacent its top edge to the top closure side flaps 24 and 26, as will be described in detail hereinbelow. In the illustrated embodiment the bag 100 is shown held in position by means of adhesive patches at 110 which may be pieces of tape having adhesives on both sides. Alternatively and preferably, adhesive patterns that will be described hereinbelow may be used.

After the lined box has been erected and the flaps 20, 22, 25 and 27 folded to form the bottom of the box, the lined box is ready for filling. The temporary adherence of the liner 100 to the flaps 24 and 26 by adhesive patches 110 located on the outside corners of these flaps holds the liner in open position for easy filling.

After the bag has been filled it is a relatively simple matter to close the bag and box. Because the bag is not permanently secured to the top flaps 24 and 26 it may be easily separated therefrom which permits a simple heat seal to be run transversely of the bag to seal same. Alternatively, the bag may simply be wire tied or closed in any suitable manner after it has been separated from the top flaps.

Where a tight seal on the bag is not required the bag and box may be closed simultaneously. In this case, the bag is not torn from the top flaps, but is separated therefrom as the top flaps are folded. To close the box and bag simultaneously the end flaps 37 and 39 are folded first followed by folding of the flaps 24 and 26. Attention is directed to FIGS. 2 to 9 inclusive which illustrate the folding sequence of one corner of the box, the other corners fold in substantially the same manner and have not been illustrated. As flap 39 is folded to closed position the fold 120 which forms in the bag or liner 100 transverse the adhesive patch 110 and peels the bag 100 from the flap 24. When the flap 39 reaches the closed position a gusset type fold is formed in the bag 100, said fold extending from the corner of the box at an angle across the flap 24. After the flaps 37 and 39 have been folded the flaps 24 and 26 may be folded over and secured to the flaps 37 and 39 in any suitable manner.

Preferably the adhesive securing the bag or liner to the flaps possesses some after tack properties which permits the bag or liner to be re-secured should the bag or liner and box accidentally become separated.

Only the use of adhesive patches have been disclosed so far. However, it is preferred to use specific adhesive patterns depending on the end use of the carton. For example, if the liner is to be separated from the flaps 24 and 26 by folding of the flaps 36 and 37 inwardly as above described, it may be desirable to use an arcuate adhesive pattern, preferably a strip pattern extending from each outside corner of the flaps 24 and 26 toward the crease lines 32 and 34. The centre of such arcs of adhesive preferably are located approximately at the junction of the end edges of the flaps 24 and 26 with the crease lines 32 and 34 respectively. Such arcs of adhesive permit substantially uniform stress on the liner as the fold 120 travels along the arc.

In many cases it may be desirable to secure the liner or bag to the flaps 24 and 26 along substantially the full free edges of these flaps. Alternatively, a combination of the arcuate glue strips above described and a strip of adhesive extending along the other periphery of the flaps in the area covered by the liner 100 when the flaps 37 and 39 have been folded may be used or any suitable pattern of adhesive may be used as required.

It may be desirable to have the liner or bag secured to the end flaps 37 and 39. Generally if the liner is secured to these end flaps the adhesive pattern should be located

adjacent the crease lines 36 and 38. Should it be desirable to space the adhesive from the lines 36 or 38, it is preferred that the adhesive be applied on one side only of the lines 36 or 38, i.e. on one-half of each of the flaps 37 or 39 respectively, preferably on diagonally opposite sides of these flaps.

If the liner or bag 100 is adhered to the flaps 37 and 39 adjacent the crease lines 36 and 38, heat sealing of the bag or liner may be facilitated. Assuming that the liner or bag 100 is free of the flaps 24 and 26, folding of the flaps 37 and 39 outwardly with the bag attached along lines 36 and 38 will automatically close the bag or liner along the centre line of the box. Any liner or bag material extending outwardly from the point of attachment to the flaps 37 and 39 will tend to form a pair of upstanding edges that may be easily secured together to seal the bag or liner.

In some instances, it may also be desirable to secure the bottom ends of the bag 100 to the flaps 25 and 27 adjacent the fold lines 36 and 38 to more accurately control formation of the bag bottom during setting up and bottoming operations.

Modification may be made in the disclosed invention without departing from the spirit of the invention as defined in the appended claims. For example, if a tube liner rather than a bag is used the hexagonal box structure may be dispersed with and a knock-down box still produced having the periphery of the tube substantially equal to the periphery of the box. Also while the liner 100 has been illustrated as extending beyond the top closure flaps, this need not be the case depending on how the liner is to be sealed. Also the mode of attachment of the bag or liner to the top flaps may also be applied to the bottom flaps if the liner or bag opens toward the bottom of the box.

I claim:

A container comprising a box having opposed side and end walls, opposed pairs of side and end top closure flaps bendably connected to one end of said side and end wall, opposed pairs of side and end bottom closure flaps bendably connected to the opposite end of said side and end walls, a crease line bisecting each said end walls and its respective end closure flaps to provide a hexagonal box structure, a bag within said box, releasable adhesive means on said opposed pair of side top closure flaps, forming the sole connection between said bag and said pair of side top closure flaps and releasably holding said bag adjacent the mouth of said bag whereby said bag may be held in open position by said releasable adhesive means on said side top closure flaps and may be readily completely separated from said side top closure flaps to facilitate closing of said bag.

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