

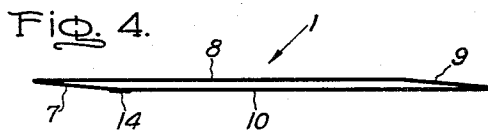
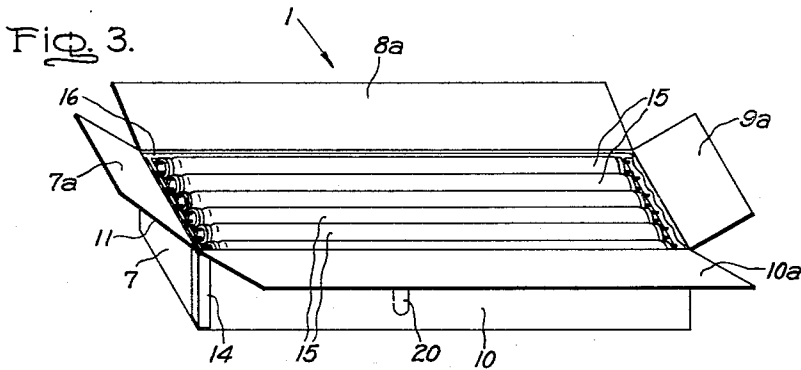
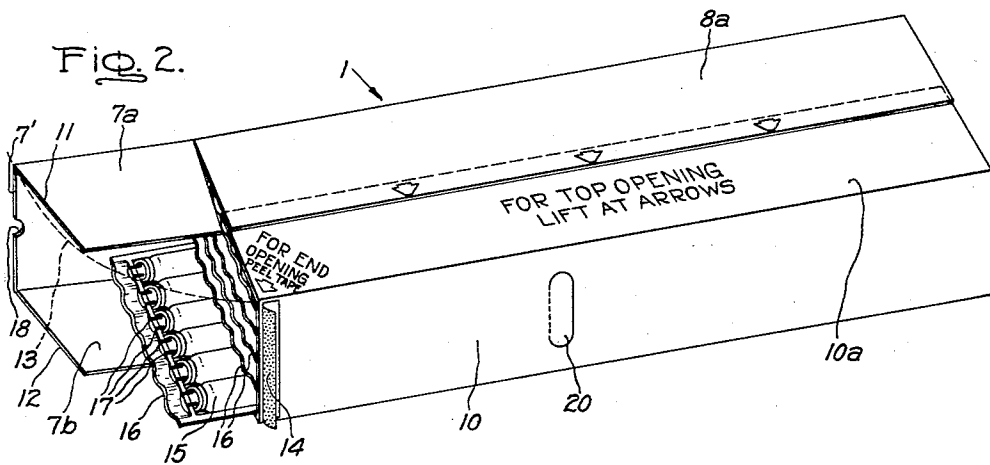
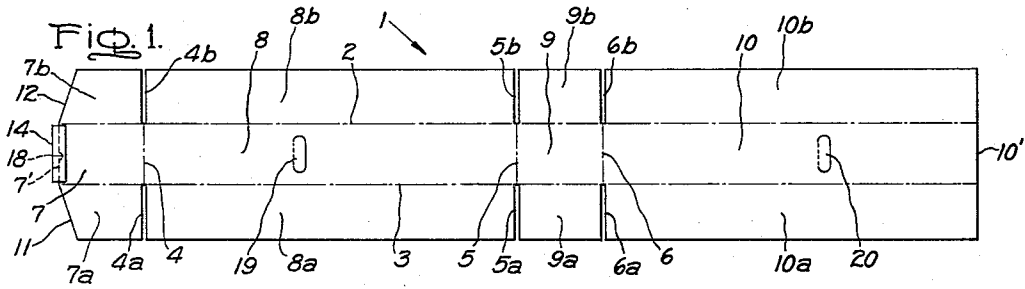
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FLUORESCENT LAMP CARTON

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## FLUORESCENT LAMP CARTON

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2 Claims. (Cl. 229—51)

This invention relates to a fiberboard box or carton for shipping and dispensing elongated tubular fluorescent lamps.

Fluorescent lamps intended for commercial or industrial sales are generally boxed rather than being individually sleeved or wrapped. One common size of box or carton used with 40 watt fluorescent lamps which are 4' in nominal length and 1½" in diameter, contains twenty-four lamps. The lamps are stacked in four layers, six to a layer; pulp paper trays are provided at the ends to separate the lamps and protect the bases or contact pins from damage.

The principal object of the invention is to provide a sturdy one-piece carton that is easily erected and set up for filling, and which lends itself to lengthwise (horizontal) insertion of the lamps through the open top but from which the lamps may thereafter be unloaded endwise through one end of the carton. The carton is to be of the slotted type and amenable to manufacture on a continuous in-line rotary cutting machine.

A feature of the invention is a lamp carton which can be easily opened at one end, while in either a horizontal or vertical position, by removing a peelable tape on one corner. The entire end panel can then be swung open for endwise removal of lamps; as new lamps are removed from the carton in the process of relamping an area, the carton may also be used as a container for the convenient disposal of old lamps. The hinged end can be reclosed at will for protection of the contents.

A fluorescent lamp carton embodying the invention may be produced from a single corrugated fiberboard blank consisting of four panels each with side flaps. The first and third panels form the end walls of the box. The second and fourth panels form the side walls of the box, and their flaps overlapped and glued together at the center form the top and bottom walls. The first panel is hinged at one end and its flaps are cut back at the free end to permit folding into or out of the box. The hinged panel is fastened down by means of a strip of gummed tape along the free edge, preferably a peelable tape. The carton is loaded with lamps while lying flat on a loading table with the top flaps open, after which they are glued shut; the feature of top loading is an advantage to the manufacturer. The principal advantage of the carton from the customer's point of view is the feature of endwise removal of the lamps by means of the hinged end closure. However the carton may also be unloaded in the conventional way by breaking open the glue joints in the overlapped flaps forming the top closure.

The cartons are purchased from the carton manufacturer in knocked down form. At this stage, the invention is embodied in the special arrangement of fold lines and slots in a corrugated fiberboard blank and including a manufacturer's joint therein, which blank is an efficient low cost instrumentality for forming the carton which has been described.

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For further objects and advantages and for a better understanding of the invention, attention is now directed to the following description of a preferred embodiment to be taken in conjunction with the accompanying drawing. The features of the invention believed to be novel will be more particularly pointed out in the appended claims.

In the drawing wherein like symbols refer to corresponding parts throughout the several views:

FIG. 1 is a top plan view of a blank from which the improved carton embodying the invention is produced.

FIG. 2 shows the carton erected, filled with lamps, and with the hinged end opened to allow endwise removal of lamps.

FIG. 3 shows the carton erected and filled with lamps but with the top open.

FIG. 4 is a side or edgewise view showing the carton in knocked down form as received from the box manufacturer.

Referring to the drawing and more particularly to FIG. 1, the carton is formed from a single substantially rectangular elongated paperboard or fiberboard sheet or blank 1. The blank is provided with two longitudinal fold lines 2 and 3 extending its full length, and with three transverse fold lines 4, 5 and 6 extending between the longitudinal fold lines. The fiberboard is preferably corrugated and the corrugations preferably extend in the transverse direction, that is, parallel to fold lines 4, 5 and 6. The blank is cut inwardly from the opposite longitudinal edges up to fold lines 2, 3 by slots 4a, 4b in alignment with transverse fold line 4, slots 5a, 5b in alignment with fold line 5, and slots 6a, 6b in alignment with fold line 6. The slots have appreciable width in order to compensate for the thickness of the material as the various panels are folded over in forming the carton; in practice, with corrugated fiberboard of the strength and thickness commonly used for packaging fluorescent lamps, the slots may be about a quarter of an inch in width.

The combination of fold lines and slots divides the blank into alternating short and long panels 7, 8 and 9, 10; each panel in turn has flaps designated respectively 7a, 7b for the first panel, 8a, 8b for the second panel, 9a, 9b for the third panel, and 10a, 10b for the fourth panel. In the erected carton, panels 7 and 9 form the end closures and extend the width of the carton; panels 8 and 10 form the long narrow side walls and extend the length of the carton; the transverse dimension of the panels is equal to the depth of carton. The length of the carton is greater than its width, and its width is greater than its depth. Panels 8a and 10a are exterior flaps which overlap when folded over; in the sealed carton, they are glued together along the overlap to form the top wall. Similarly exterior flaps 8b and 10b glued together along their overlap form the bottom wall. Flaps 9a and 9b are interior flaps which are merely folded under the exterior flaps and assist in making the box more rigid.

Panel 7 forms the hinged end of the carton which can be swung open for endwise removal of lamps. Fold line 4 serves as a hinge for the panel, and flaps 7a, 7b form wings which fold into the carton alongside the top and bottom walls respectively. The leading edges of the flaps

or wings 7a, 7b are cut away at 11 and 12 in order to permit them to be folded readily in and out of the box. The cuts 11, 12 as illustrated are simple diagonal cuts and these are the cheapest to make. However, the appearance may be enhanced somewhat by curving under the edges 11, 12 to a curvature corresponding to the path of the leading edge 7' when the panel is swung about fold line 4; such curvature is indicated by dotted line 13 in FIG. 2.

The cartons are purchased and received from the box manufacturer in knocked down form and folded flat as illustrated in FIG. 4. This is essential as otherwise shipping costs would be prohibitive. Panel 7 is folded under along fold line 4 and panel 10 is folded under along fold line 6. The edges 7' and 10' of the panels, which are joined together in what is known as a manufacturer's joint by a piece of gummed tape 14. This joint is severable to allow the end panel to become hinged on its opposite edge. Preferably there is used for gummed tape 14 a water-activated peelable paper tape such as that sold under the designation Peelac by Nashua Corporation. Such tape is applied by wetting it and pressing against the corrugated fiberboard in similar fashion to ordinary gummed paper tape. However it has the unusual property that it can be peeled back by hand by the simple expedient of lifting a corner with a fingernail and merely pulling on the tape. The glue or adhesive used in this tape has a cohesiveness which is less than its adhesiveness either to the tape itself or to the fiberboard to which it is applied. To open the hinged end of the carton, the tape is peeled back as per the printed instructions on the carton. A film of glue remains on the tape and another film remains on the fiberboard, but there is no rupture or delamination of the surface of the fiberboard.

The lamp packer erects the carton by opening it out to a rectangle along fold lines 4, 5, 6 and the manufacturer's joint, then folding under interior flaps 7b and 9b, and thereafter exterior flaps 8b and 10b. The carton is now erected into a rectangular box with its bottom wall closed and its top wall open. If hand sealing of the cartons is being practiced, glue should be applied to the overlapping edges of flaps 8b and 10b at this stage in order to form permanently the bottom wall of the box. The operator now packs the lamps into the box, loading them in horizontally. The lamps 15 are separated by pulp paper trays 16. The pulp paper trays are corrugated according to the spacing intended for the lamps in a row of six and serve both to separate the lamps within the row and the four rows from one another. The ends of the pulp paper trays are built up to accommodate the terminal pins 17 of the lamps and to take up the weight of the lamps when the box is resting on end rather than allowing the lamps to stand on the pins which might thereby be damaged.

When the box is filled, the operator folds in first the interior flaps 7a, 9a and then the exterior flaps 8a, 10a and glues the latter together along their overlapped margins in order to form the top closure and seal the box. In practice, in the mass production of fluorescent lamps, the boxes are not sealed nor glued shut by hand. Instead, a sealing pressing machine is used and, at the initial erection of the box, the packer simply folds the panels under without gluing them. After the box is loaded with lamps, the operator pushes the box into the machine which thereupon reopens the bottom panels while supporting the lamps, applies glue to both the long bottom panels 8b, 10b and the long top panels 8a, 10a. The glue is concentrated about the arrows in the top to facilitate reopening when desired. The machine then folds in all the panels, first the interior flaps and then the exterior flaps in the proper sequence and maintains pressure on the exterior flaps along the overlap until the glue is set.

For convenience in opening the hinged end panel of the box, a finger opening 18 is cut into the swinging edge

7'. Also, hand holes 19, 20 are provided in the narrow sides 8, 10 of the box, slightly above the center of gravity when the hinged end is uppermost. The hand holes are generally oval-shaped and are cut right through the fiberboard except for the top portion which is merely a fold line (shown dotted). When the cut portion of the hand hole is folded in, the fold line serves as a hinge and a double thickness of fiberboard is thereby provided to make the box easier to grasp. The hand holes 19, 20 also lend themselves to the use of hooks by which a carton may be hung on a rung of a ladder during the relamping operation.

Although the principal advantage of the carton which has been described, from the point of view of the purchaser, is the end opening feature whereby the lamps can be removed endwise, the purchaser may of course if he prefers open the top of the carton by breaking the glue joints at the arrows in the top, as per the printed instructions. The carton then opens in the fashion illustrated in FIG. 3 and the lamps may be removed by lifting them out horizontally in precisely the same fashion as they were loaded.

The carton according to the invention is extremely economical to produce because there is a minimum wastage of fiberboard from the blank. As seen in FIG. 1, the entire blank is used for the carton except for the slots and the diagonal cuts in the wings of the hinged end 7, the waste occasioned thereby being negligible. The cost is maintained low by the use of a single peelable sealing strip or tape 14 along a single edge of the carton, which edge is along the depth dimension, and therefore shortest. This is an important consideration because peelable tape, unlike conventional gummed tape, is relatively expensive and cannot be used indiscriminately. In larger cartons, such as cartons for 8' long fluorescent lamps, it may be more convenient to make the carton out of two fiberboard blanks joined together rather than a single sheet. In such case, two manufacturer's joints would be provided in the knocked down carton, but only one need be of peelable tape to provide the end opening feature.

The illustrated embodiment of the invention is intended as exemplary and not in order to limit the invention thereto. The scope of the invention is to be determined by the appended claims.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. A rectangular shipping and dispensing carton for elongated fluorescent lamps, said carton being formed of corrugated fiberboard and comprising two side panels and two end panels joined together with at least one manufacturer's joint between one end panel and a side panel, said manufacturer's joint being formed by a piece of gummed tape having greater adhesion than cohesion, said tape being peelable to allow said one end panel to become hinged upon its opposite edge, the side panels having exterior flaps which are overlapped at the center only and glued together to form top and bottom walls of the carton, the end panels having interior flaps which are folded under the top and bottom walls, the flaps of said one end panel being cut back along their edges next to the manufacturer's joint to allow said one end panel to be folded into or out of the carton.

2. A rectangular shipping and dispensing carton for elongated fluorescent lamps, said carton being of greater length than width and of greater width than depth and being formed of a single elongated sheet of corrugated fiberboard with the corrugations extending transversely, said carton comprising side panels extending the length by the depth thereof and end panels extending the width by the depth of said carton and being continuous except for a manufacturer's joint between one end panel and a side panel, said manufacturer's joint being formed along a depth edge of the carton by a piece of gummed tape having greater adhesion than cohesion, said tape

being peelable to allow said one panel to become hinged upon the opposite depth edge, the side panels having exterior flaps which are overlapped at the center only and glued together to form top and bottom walls extending the length by the width of the carton, the end panels having interior flaps which are folded under the top and bottom walls, the flaps of said one end panel being cut back along their edges next to the manufacturer's joint to allow said one end panel to be folded into the carton to seal it, or out of the carton to allow endwise withdrawal of lamps therefrom.

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