

# United States Patent

## Sellors

[15] **3,656,612**

[45] **Apr. 18, 1972**

[54] **CARTON**  
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 [22] Filed: **Apr. 9, 1970**  
 [21] Appl. No.: **26,916**

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[52] U.S. Cl.....**206/45.14, 206/45.31, 206/52 F, 206/DIG. 36, 229/27, 229/37 R**  
 [51] Int. Cl.....**B65d 5/50**  
 [58] Field of Search.....**206/44 R, 45.14, 45.19, 45.31, 206/45.34, 46 FR, 52 R, 52 F; 229/27, 37 R, 28 R**

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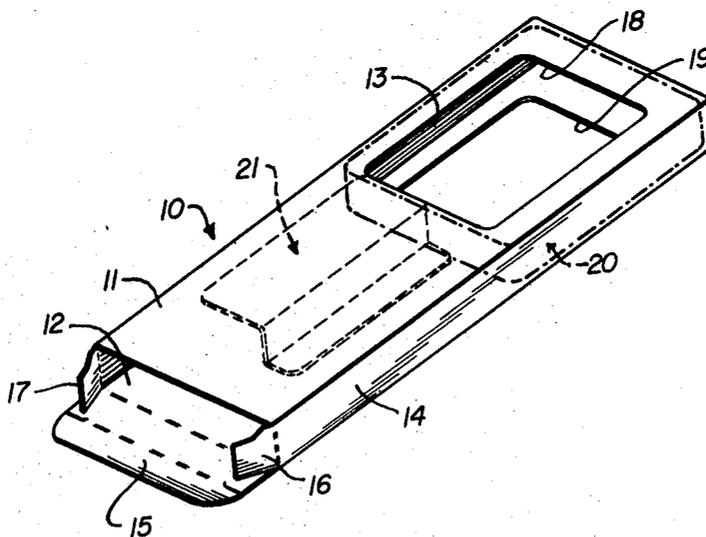
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### [57] ABSTRACT

A pilferproof carton which is particularly suitable for packaging Cassette tape cartridges.

**3 Claims, 16 Drawing Figures**



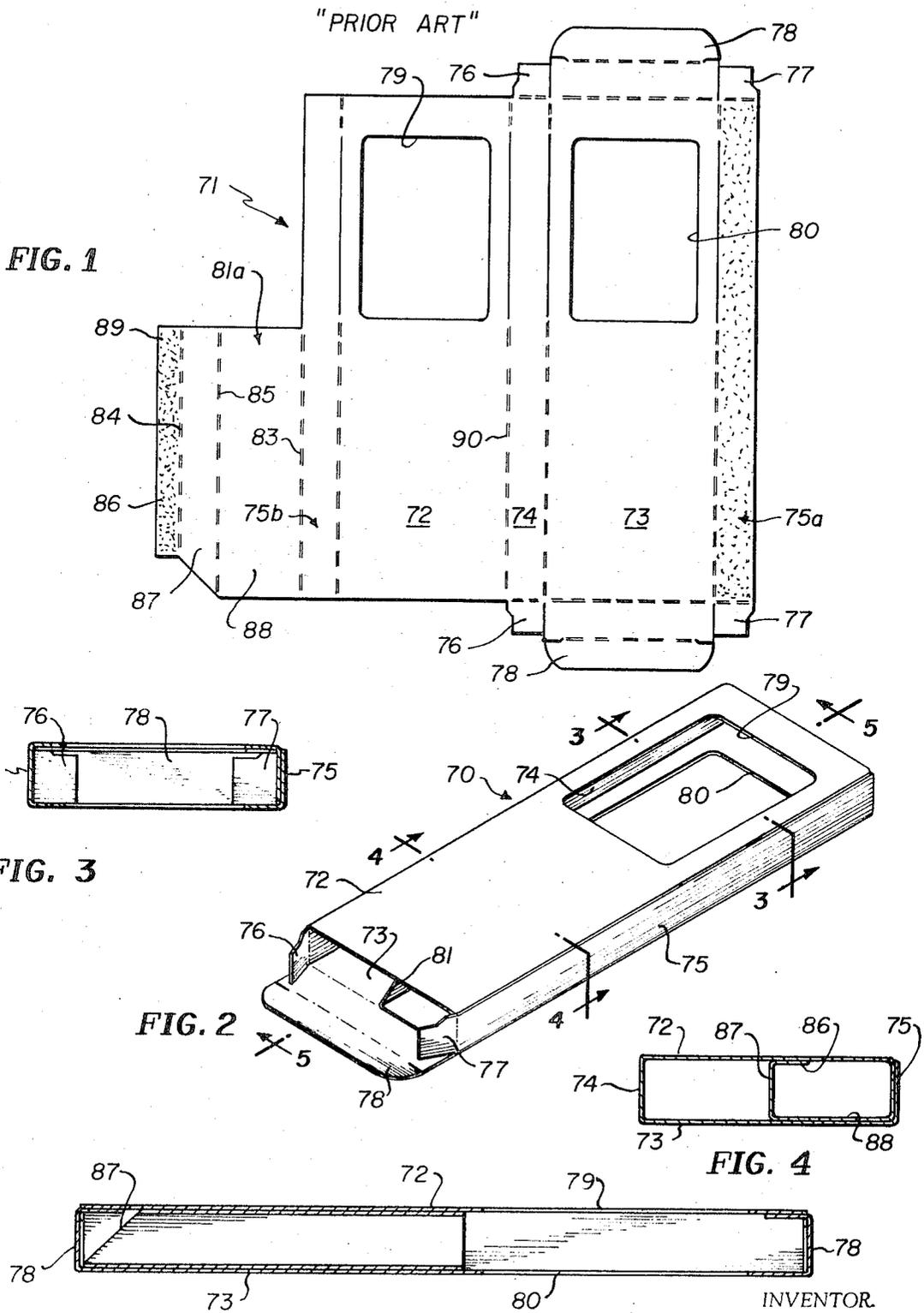


FIG. 1

FIG. 3

FIG. 2

FIG. 4

FIG. 5

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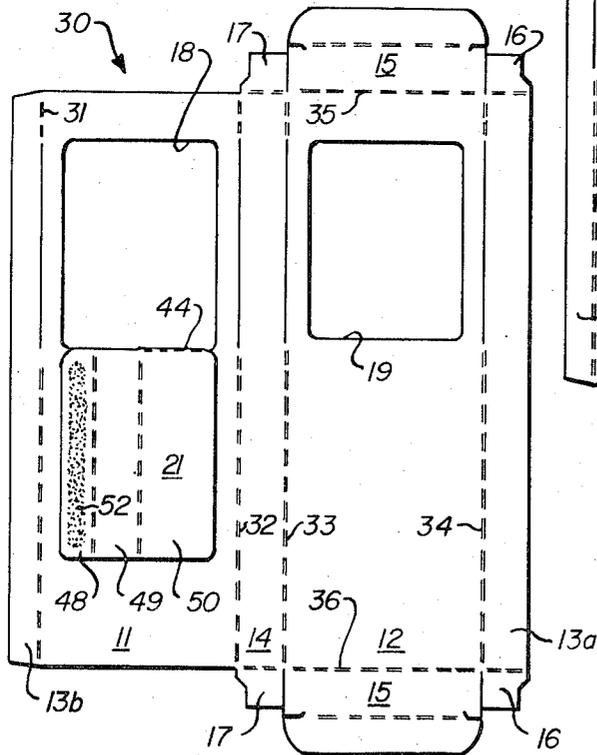
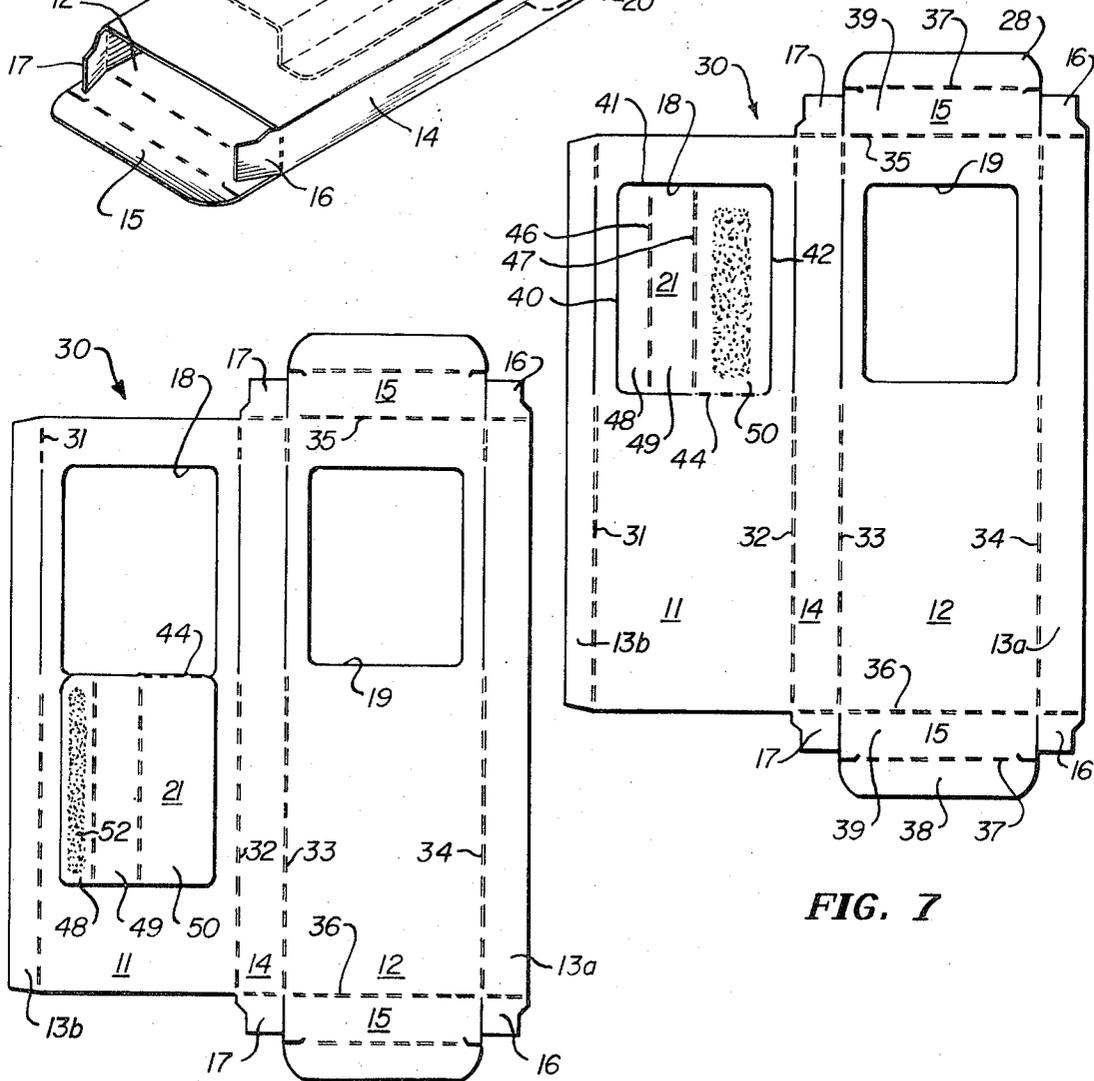
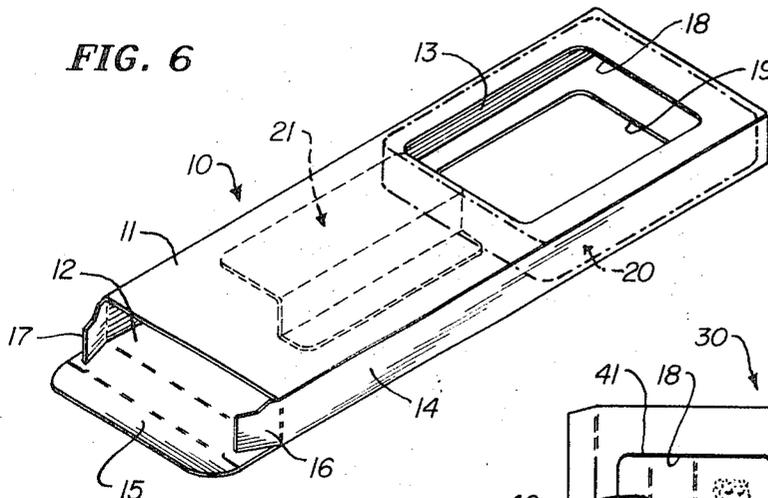


FIG. 8

FIG. 7

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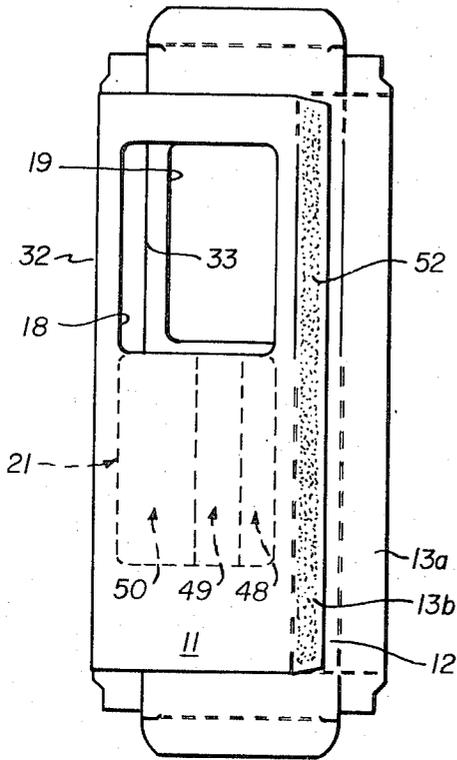


FIG. 9

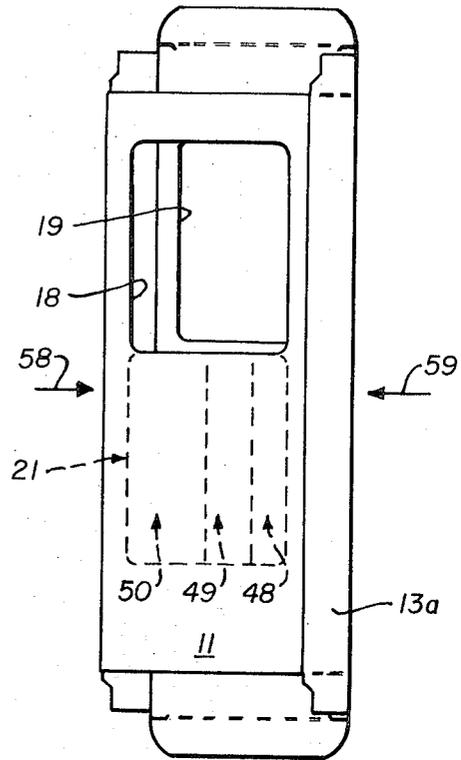


FIG. 10

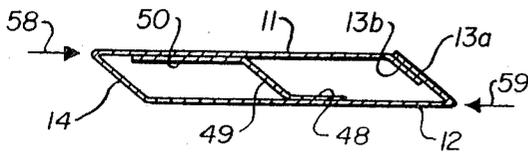


FIG. 11

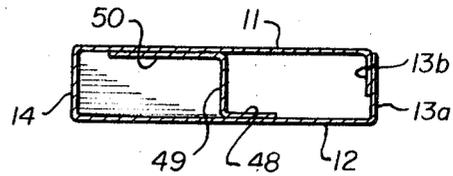


FIG. 12

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FIG. 13

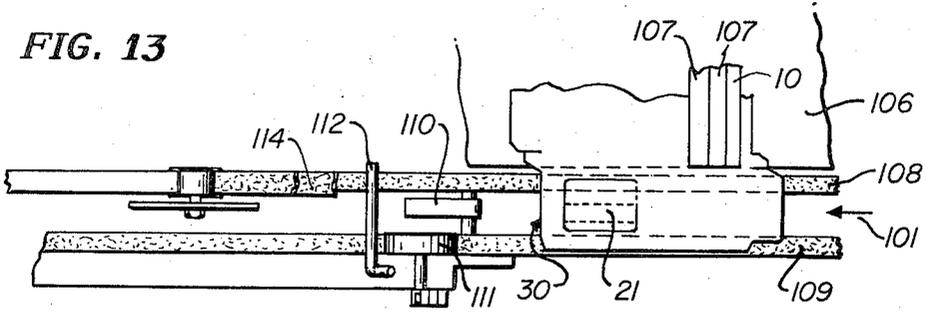


FIG. 14

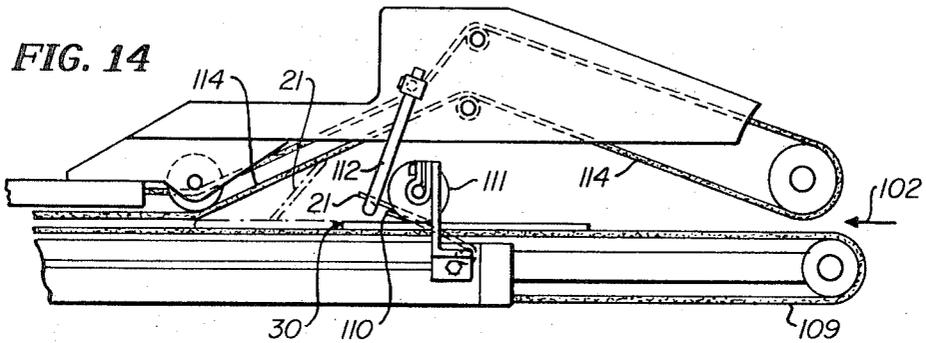


FIG. 15

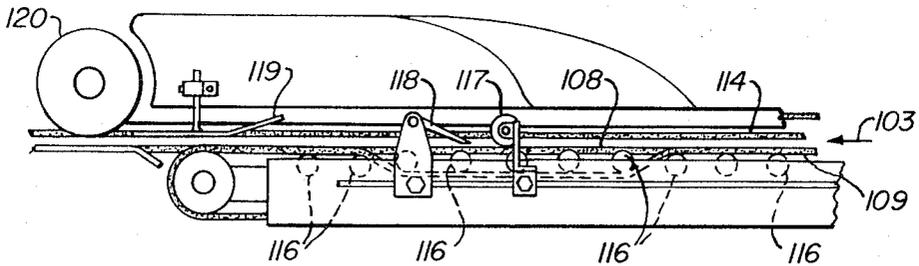
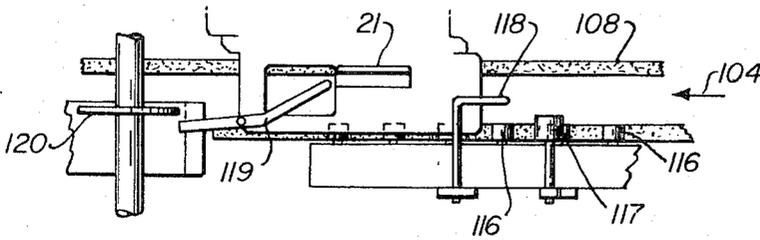


FIG. 16



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## CARTON

This invention relates to an improved carton and to the method and apparatus for forming said cartons in knocked-down, flat folded condition such that said cartons can be easily and quickly erected.

The improved carton is specially adapted for packaging tape cartridges, particularly Cassette tape cartridges, in a fashion such that the cartridges are readily visible to a purchaser. The carton furthermore is of an elongated construction which effectively reduces pilferage.

Tape cartridges such as Cassette tape cartridges are quite expensive, and are presently generally packaged in a carton substantially corresponding in size to the cartridge itself. These cartons function to both protectively enclose the cartridge so that the tapes are not subjected to damage prior to the purchase thereof and to display the cartridge to potential purchasers. The cartons are generally satisfactory, however, the small size thereof permits it to be easily slipped into a coat pocket. Stores, therefore, have experienced considerable pilferage and, as a result, desire a different type of packaging which provides the same advantages as these small size cartons, but which is of a construction or size to discourage this type of pilferage.

It is a relatively simple task to merely enlarge the cartons so that they cannot be easily slipped into a coat pocket. However, the tape cartridge must somehow be visibly displayed to the purchaser and it also must be supported so that it does not merely slide around in the larger carton. Several larger cartons have been proposed and/or used, however, they have generally been rejected because they are too expensive, too difficult to package the cartridge therein, and too difficult to assemble.

The carton of the present invention overcomes all of these objectionable features and is, to a great degree, pilferproof because of its elongated length. Accordingly, the carton is particularly suitable for packaging Cassette tape cartridges, as well as other similar types of articles.

It is therefore an object of the present invention to provide an improved carton which is particularly adapted to package tape cartridges or other similar types of articles so that they are visible to a purchaser and which is of a construction to deter pilferage thereof.

Still another object is to provide an improved carton of the above-described type which can be fabricated from a single blank of sheet material, with substantially no wasting of material.

A still further object is to provide an improved carton of the above-described type which can be fabricated from a single blank of sheet material, with substantially no wasting of material.

A still further object is to provide an improved carton of the above-described type which can be cut, scored, glued and folded, all automatically, the same being in a knocked-down configuration which can be compactly stored and/or shipped and which can be easily and quickly automatically or manually erected for filling.

A still further object is to provide a method and apparatus for folding and glueing the carton blanks to form a carton in a knocked-down configuration which can be compactly stored and/or shipped and which can be easily and quickly automatically or manually erected for filling.

Other objects of the invention will in part be obvious and will in part appear hereinafter.

The invention accordingly comprises an article of manufacture possessing the features, properties, and the relation of elements which will be exemplified in the article hereinafter described, and the scope of the invention will be indicated in the claims.

For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description taken in connection with the accompanying drawings, in which:

FIG. 1 is a plan view of a carton blank used to form a carton exemplary of the prior art;

FIG. 2 is a perspective view of the prior art carton fabricated from the carton blank of FIG. 1;

FIG. 3 is a sectional view taken along lines 3—3 of FIG. 2; FIG. 4 is a sectional view taken along lines 4—4 of FIG. 2;

FIG. 5 is a sectional view taken along lines 5—5 of FIG. 1;

FIG. 6 is a perspective view of a carton exemplary of the invention;

FIGS. 7—12 are plan views of the carton blank from which the carton of FIG. 6 is formed, generally illustrating the manner in which the carton blank is folded and erected to form the carton; and

FIGS. 13—16 are partial views of various sections of the apparatus for forming and glueing the carton blanks to form the cartons.

Similar reference characters refer to similar parts throughout the several views of the drawings.

Referring now to the drawings, in FIGS. 1—5 there is illustrated a carton 70 which is formed from the carton blank 71 shown in FIG. 1. The carton 70 has a top wall 72, a bottom wall 73, side walls 74 and 75, and end closure flaps 76—78 at each of its opposite ends. The top and bottom walls 72 and 73 have windows 79 and 80 formed in them, respectively, for permitting an article such as a Cassette tape cartridge packaged therein to be seen by a purchaser.

The carton 70 is of an elongated length, being approximately two times the length of the article packaged in it. The article is positionally retained with respect to the windows 79 and 80, by means of a spacer flap 81 disposed within the interior of the carton.

This spacer flap 81 is provided in the carton 70, by means of the laterally extending extension 81a (FIG. 1) which is integrally affixed along a score line 83 to the side panel flap 75b forming a part of the side wall 75. The extension 81a has score lines 84 and 85 formed on it, dividing the same into a glue flap 86, a spacer panel 87 and positioning panel 88.

During the forming of the carton 70, the spacer flap 81, or extension 81a, is first folded over along the score line 85, so that the glue flap 86 lies flat atop the spacer panel 87. Adhesive then is applied to the glue flap 86 as generally illustrated by the dotted adhesive area 89 thereon, and then the spacer flap 81 is folded over along the score line 83 so that it lies atop the top wall 72. When folded in this manner, the glue flap 86 is adhesively affixed to the top wall 72.

Next, the carton blank 71 is folded over along the score line 90 so that the top wall 72 with the spacer flap 81 adhesively affixed to it lies atop the bottom wall 73. Adhesive then is applied to the glue flap 75a, and the latter is folded over along the score line 91 atop the side wall panel 75b and adhesively affixed to it.

The carton 70 is erected by applying opposing forces to the side edges of the flat folded carton, and is closed by folding the end closure flaps 76—78 on each of the opposite ends of the carton so that they overlap one another, in the generally well-known manner.

The carton 70 is generally satisfactory in that it discourages pilferage because of its elongated length and it also allows the packaged article to be seen through the windows 79 and 80. However, the fact the spacer flap 81, or extension 81a, requires the use of additional paperboard material substantially increases the cost of the carton 70. In fact, the cost of this additional material increases the overall cost of the carton to the point that the carton cannot be economically used to package articles such as the Cassette tape cartridges.

In FIG. 6 there is illustrated a carton 10 exemplary of the invention which has all of the advantages of the carton 70 and, in addition, is formed in a fashion such that the spacer flap 81 of the carton 70 can be provided, without the use of additional paperboard material, in the manner fully described below. The carton 10 has a top wall 11, a bottom wall 12, side walls 13 and 14, and end closure flaps 15, 16 and 17 on each of its opposite ends. The top and bottom walls 11 and 12 have windows 18 and 19 in them, respectively, which are aligned with one another so that an article such as the Cassette tape cartridge 20 can be viewed from either side of the carton. The

carton 10 also has a spacer flap 21 within its interior which functions to space the cartridge 20 within the carton 10, in the same fashion as the spacer flap 81 of the carton 70.

The carton 10 is of substantially the same width as the Cassette tape cartridge 20, but it is elongated in length so that it is approximately twice the length of the cartridge. This additional length, as explained above, functions to deter pilferage of the cartridges.

The carton 10 is formed from the carton blank 30 illustrated in FIG. 7, which carton blank is cut from a single or continuous blank of sheet material such as paper board, with a minimum waste of material. The carton blank 30 has spaced-apart, vertically disposed score lines 31-34 formed on it which score lines define the top wall 11, bottom wall 12, and the side walls 13 and 14, and spaced-apart, horizontally disposed score lines 35 and 36 which define the end closure flaps 15-17 on each of the opposite ends of the carton 10. It may be noted that the side wall 13 is formed by a glue flap 13b integrally affixed to the top wall 11 along the score line 31 and a sealing flap 13a integrally affixed to the bottom wall 12 along the score line 34, when the carton blank 30 is folded in the manner described below. The end closure flaps 15 each have a horizontally disposed score line 37 formed on them, dividing the same so as to provide a tuck flap 38 and an end closure panel 39 for closing the ends of the carton 10.

The window 19 which is generally rectangular-shaped and approximates the size of the article packaged in the carton 10, in this case, a Cassette tape cartridge, is cut in the bottom wall 12. This window 19 is positioned substantially centrally of the upper (as shown) one-half of the bottom wall 12, and the article is positionally retained and supported in the carton 10 in a manner fully described below, so as to be viewable through this window 19 and the window 18 in the top wall 11.

The window 18 is cut in the top wall 11 so that it is substantially aligned with the window 19, when the carton 10 is erected. In cutting the window 18, the top wall 11 is completely severed along the edges 40-42 of the window, but is only severed along substantially one-half of the length of the lower edge 43 thereof. The remaining portion of this edge 43 is defined by a score line 44.

The carton material which normally would be cut from the carton blank 30 to form the window 18, in the construction of the carton 10, is not wasted but is instead utilized to form the spacer flap 21. Using this material in this fashion results in a substantial savings of material, so that the cost of the cartons 10 is substantially reduced, particularly in comparison to the cost of the carton 70.

To form this spacer flap 21, the material defining the window 18 is provided with spaced-apart, vertically disposed score lines 46 and 47 which define thereon a glue flap 48, a spacer panel 49 and a supporting flap 50. The spacer flap 21, during the forming of the carton 10, is folded upwardly (as illustrated) along the score line 44, so that it lies atop the top wall 11, as illustrated in FIG. 8. Prior to folding the spacer flap 21 in this fashion, an adhesive can be applied to the supporting flap 50 if desired, however, it has been found that this normally necessary glueing operation can be eliminated. The spacer flap 21 still will automatically be erected, hence substantial savings are provided by eliminating the glueing operation.

After the spacer flap 21 is folded in the described manner, adhesive is applied in the glue flap 48 generally as illustrated by the dotted glue area 52 illustrated in FIG. 8. Then, the carton blank 30 is folded over along the score line 32, so that the top wall 11 and the glue flap 13b lies atop the side wall 14 and the bottom wall 12, as illustrated in FIG. 9. When folded in this fashion, the glue flap 48 is adhesively affixed to the bottom wall 12.

Next, adhesive is applied to the glue flap 13b in the manner generally illustrated by the dotted glue area 52 in FIG. 9, and the carton blank 30 is folded over along the score line 34 so that the sealing flap 13a lies atop and is adhesively affixed to the glue flap 13b, as illustrated in FIG. 10. The carton 10 is

now completely formed and can be easily and quickly erected simply by applying opposing forces to the opposite edges of the carton 10, as indicated by the arrows 58 and 59 in FIGS. 10 and 11. Accordingly, the cartons 10 can be compactly stored and/or shipped in the illustrated knocked-down configuration, and thereafter easily erected for filling.

When opposing forces are applied to the carton 10 in the direction of the arrows 58 and 59, the spacer flap 21 is automatically erected in the interior of the carton, in the manner illustrated in FIGS. 11 and 12. It can be seen that the glue flap 48 is adhesively affixed to the bottom wall 12 and the supporting flap 50 is affixed to the top wall 11 along the score line 44 so that the spacer panel 49 is automatically vertically positioned, as illustrated in FIG. 12, as the carton 10 is erected. The spacer panel 49 is of the same width as the side walls 13 and 14 and therefore functions to prevent this portion of the carton which is empty from collapsing. In addition, the article when inserted in the carton abuts against the edge of the spacer panel 49 aligned with the edge of the window 18 and is thereby positioned and supported so that it is visible through the windows 18 and 19.

The carton 10 is closed by folding the end closure flaps 16 and 17 inwardly towards one another along the score lines 35 and 36 at the respective ends of the carton, and by then folding the end closure flaps 15 along the score lines 35, 36 and 37 so that the end panels 39 overlie and conceal the end flaps 16 and 17 and the tuck flaps 38 can be inserted in the carton to complete the end closure operation.

In FIGS. 13-16, there is generally illustrated a carton forming apparatus for folding and glueing the carton blanks 30, to form the cartons 10 in a flat folded, knocked-down configuration, generally as shown in FIG. 10. It will be appreciated that the carton forming apparatus is of a continuous length, the same being broken down into sections in FIGS. 13-16, respectively, to simplify its description and operation. In other words, the carton blanks enter the carton forming apparatus at the point indicated by the arrow 101 in FIG. 13, and continue through it in the direction of the arrows 102, 103 and 104 in FIGS. 14, 15 and 16, respectively.

The carton forming apparatus includes a feeder (not shown) which can be of standard construction, for feeding individual ones of the carton blanks 30 onto a generally flat bed along which the carton blanks are progressively advanced. The carton blanks 30 are substantially covered by a belt 106 which is disposed and held atop the carton blanks 30 by means of a number of rollers 107 (only three are illustrated) which extend along the length of the carton forming apparatus. The belt 106 functions to convey the carton blanks 30 along the length of the carton forming apparatus, and further positionally supports them so that the spacer flap 21 can be folded and glued, in the manner described below.

The one edge of the belt 106 lies substantially parallel with the score line 32 on the carton blanks 30, and that portion of the carton blank having the window therein providing the material for forming the spacer flap 21 is generally exposed and lies atop a pair of spaced-apart belts 108 and 109. The movement of these belts 108 and 109 are synchronized with the movement of the belt 106.

As the carton blanks 30 are progressively advanced along the length of the carton forming apparatus, they first encounter a spring finger 110 which, as can be best seen in FIGS. 13 and 14, is disposed so as to extend upwardly substantially centrally between the belts 108 and 109. As the carton blanks 30 pass over this spring finger 110, its one edge is held substantially flat atop the belt 108 by the belt 106, and its other edge is held substantially flat atop the belt 109 by a wheel 111. The peripheral surface of the wheel 111 rides on the belt 109, and the wheel is rotated by the belt 109. With the carton blank 30 confined in this manner, the spring finger 110 engages and forcibly urges the spacer flap 21 pivotally upwardly along the score line 44.

While being held in this position, the spacer flap 21 is engaged by an arm 112 which is disposed to extend across the

two belts 108 and 109, as the carton blank 30 is advanced. The arm 112 causes the spacer flap 21 to be further folded over along the score line 44, to a position as generally illustrated in FIG. 14. While in this position, the spacer flap 21 is engaged by and conveyed beneath a belt 114 which is moving at a speed coordinated with the advancing speed of the carton blank 30. This belt 114 functions to fold the spacer flap 21 flat atop the carton blank 30, to the position illustrated in FIG. 8.

In FIG. 15, it may be noted that the belt 109 is caused to turn down and to run beneath a number of its guide rollers 116, so that the edge of the carton blank 30 is no longer supported by the belt 109. Substantially centrally of this recessed portion of the belt 109, there is positioned a roller 117 which engages the now free floating edge of the carton blank 30 and bends this edge angularly downwardly so that the edge of the spacer flap 21 adjacent the roller 117 is caused to project upwardly sufficiently to be engaged by a finger 118. This finger 118 is disposed to engage beneath the spacer flap 21, so that the spacer flap 21 is forcibly urged upwardly to pre-break the score line 47, as the carton blank 30 advances.

Another finger 119 (FIG. 16) is disposed to engage the upwardly folded spacer flap 21 and to again flat fold and hold it atop the carton blank 30, until it is engaged and held by a glue wheel 120. As the carton blank 30 advances beneath the glue wheel 120, adhesive is applied to the glue flap 48 in a straight line fashion.

Thereafter, the carton blank 30 is advanced through the carton forming apparatus, and is folded and glued in the manner illustrated in FIGS. 9 and 10, in the manner employed in most carton forming apparatus.

It can be from the above description that all of the glue areas (only two of them) extend in a straight-line fashion, and in the same direction, so that glueing is simplified and easily accomplished. Furthermore, all of the described folding operations are accomplished automatically.

It will thus be seen that the objects set forth above, among

those made apparent from the preceding description, are efficiently attained and certain changes may be made in the above article. Accordingly, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

Now that the invention has been described, what is claimed as new and desired to be secured by Letters Patent is:

1. A carton having a window in one wall thereof, an article being packaged therein, said carton being formed from a single blank of sheet material which is cut, scored and folded to provide a top wall, a bottom wall, a pair of side walls, and end closure flaps closing the opposite ends of said carton, said carton being substantially longer in length than said article so as to discourage pilferage, a spacer flap being cut from one of said top and bottom walls and being integrally affixed to said wall along a score line extending perpendicular to said side walls, said spacer flap being reversely folded along said score line to extend into said carton, the opening in said wall resulting from said spacer flap being cut therefrom forming said window, said spacer flap including at least one panel which is vertically disposed, said vertically disposed panel supporting said top bottom walls in spaced apart relationship to thereby prevent them from collapsing, the edge of said vertically disposed panel forming a stop for said article while positioning and retaining said article in alignment with said window.

2. The carton of claim 1, wherein said spacer flap has a pair of score lines on it dividing the same into three panels, at least one of said panels being vertically disposed.

3. The carton of claim 1, wherein said spacer flap has a pair of score lines on it dividing the same into three panels, one of said panels forming a glue flap, another one of said panels forming a spacer panel and the other one of said panels forming a supporting panel, said glue flap being adhesively affixed to said top wall and said spacer panel being vertically disposed between said top and bottom walls.

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