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Confer

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[54] **CARTON AND METHOD OF MAKING**

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Related U.S. Application Data

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[52] **U.S. Cl.** ..... **93/94 R,** 93/36 DA, 93/58 P, 229/51 TS

[51] **Int. Cl.** **B32b 23/10,** B65d 5/54

[58] **Field of Search** ..... 93/115, 36 R, 94 R, 93/36.01, 36.6, 36 DA, 58 P; 229/51 TS; 206/65 C

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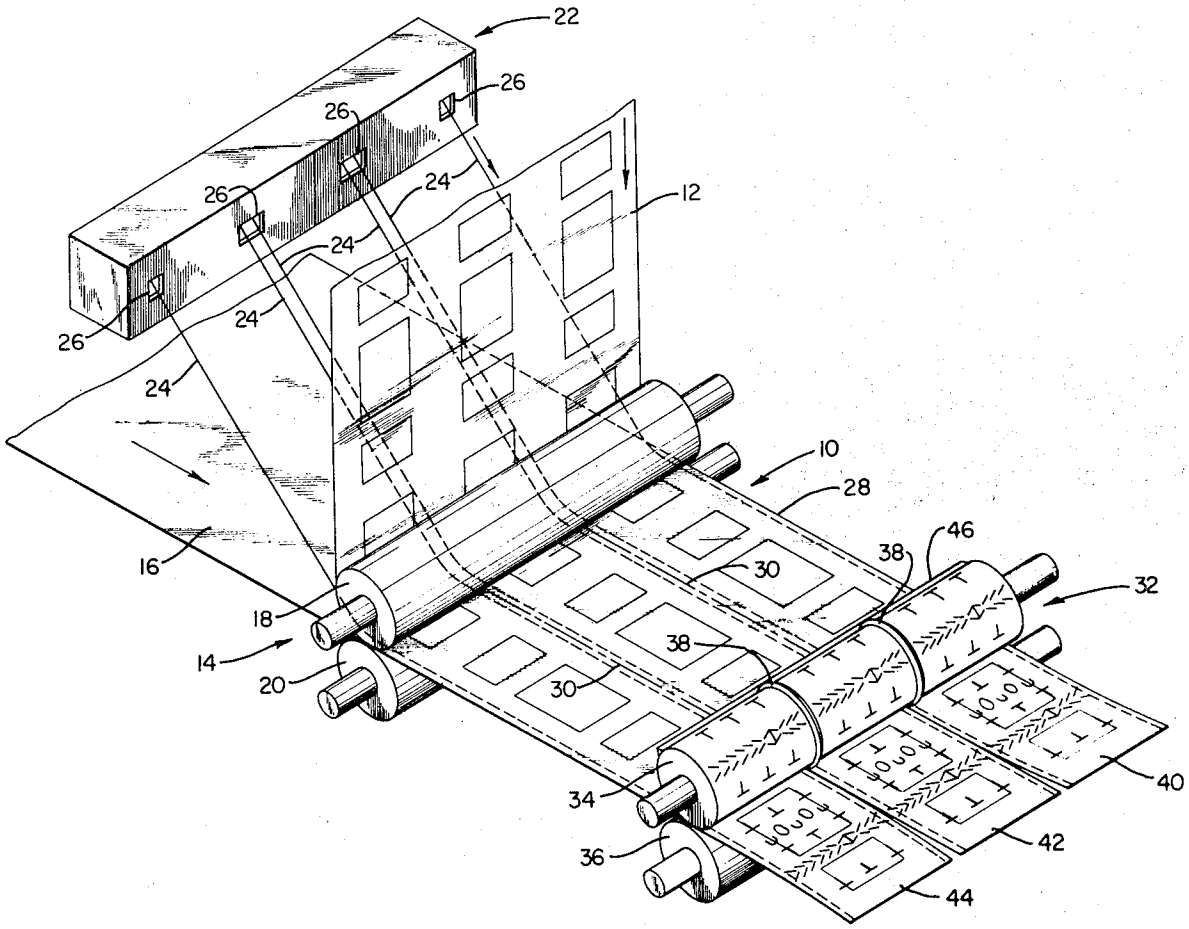
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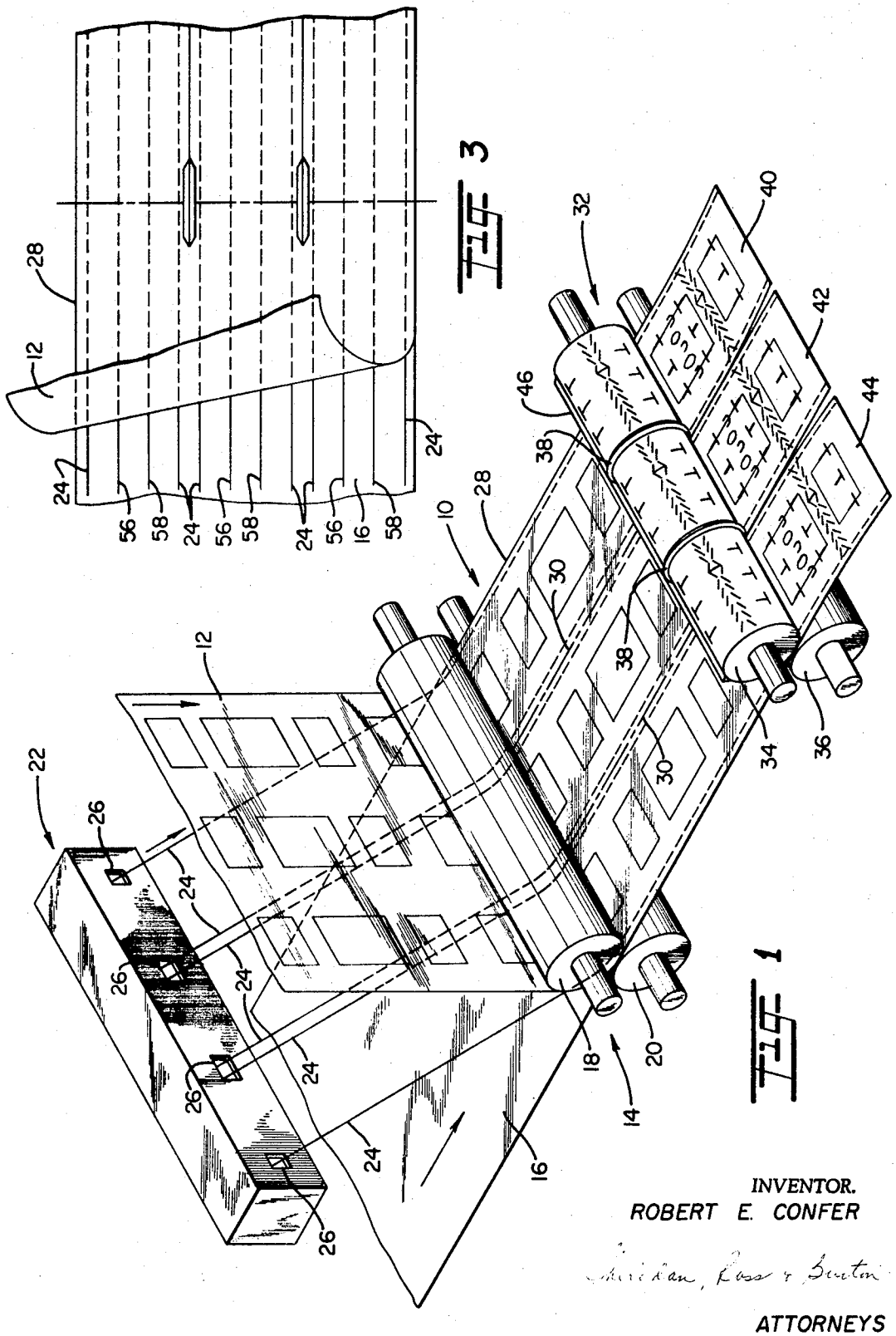
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[57] **ABSTRACT**

Open end carton of "six-pack" type has longitudinal slits on corner edges, one for each can. End slits tend to tear through to end margin, releasing cans. Reinforcing strand surrounds each end of container adjacent to margin, and its tensile strength prevents tearing. Tear strip is cut through strand intermediate top and bottom to permit intentional release. Additional reinforcing strands may be provided to retain each lateral row of cans separately, with multiple tear strips to release each row of cans separately. Carton blanks are made by laminating continuous label web and backing web wide enough for several blanks with longitudinal reinforcing strands between webs and spaced laterally at margins and lines of division of master strip. Latter is divided along lines of division to produce single strips having reinforcing strands along both margins, and then single strips are cut laterally to produce individual carton blanks having lines of reinforcement at two parallel margins.

4 Claims, 7 Drawing Figures





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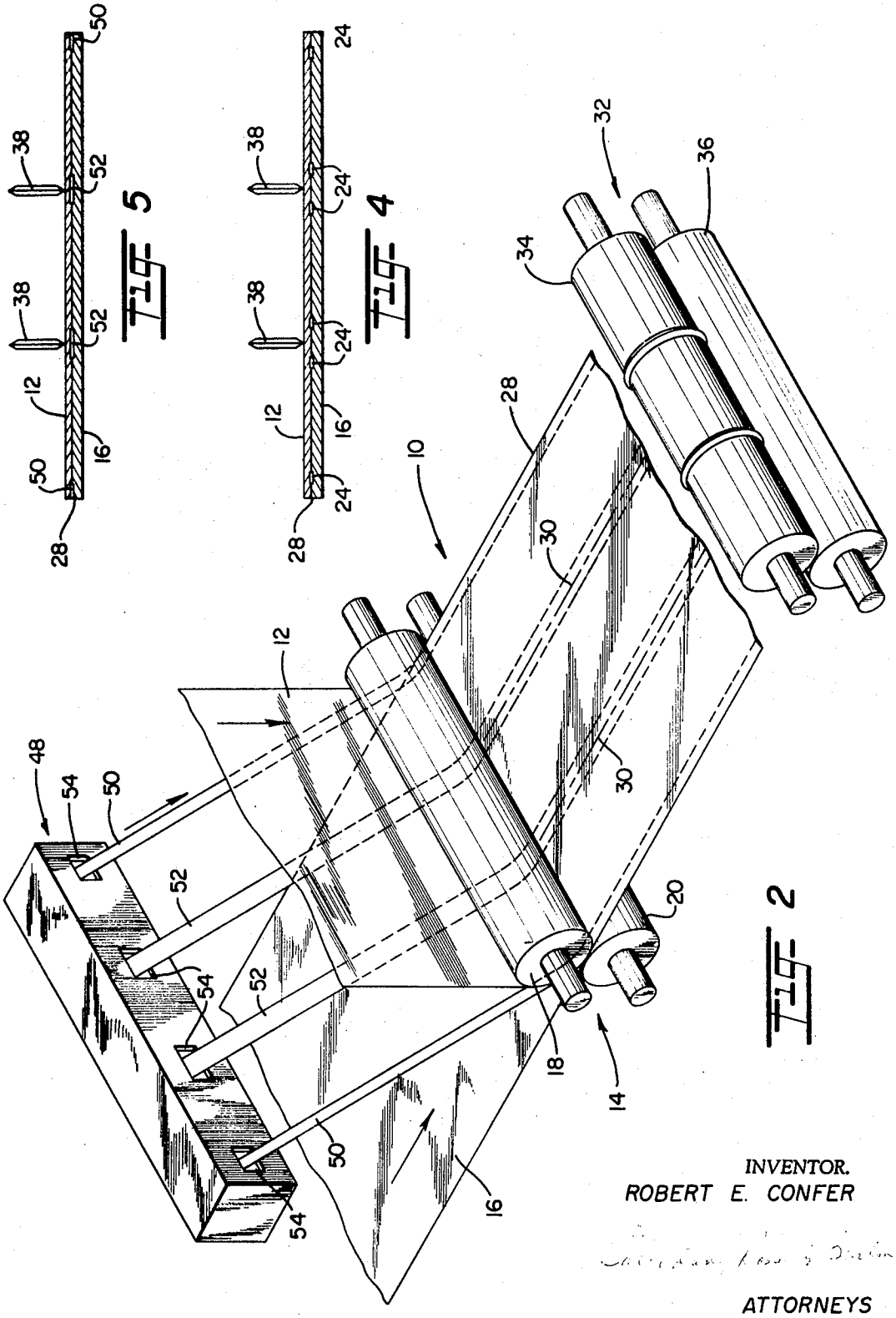


FIG 2

FIG 4

FIG 5

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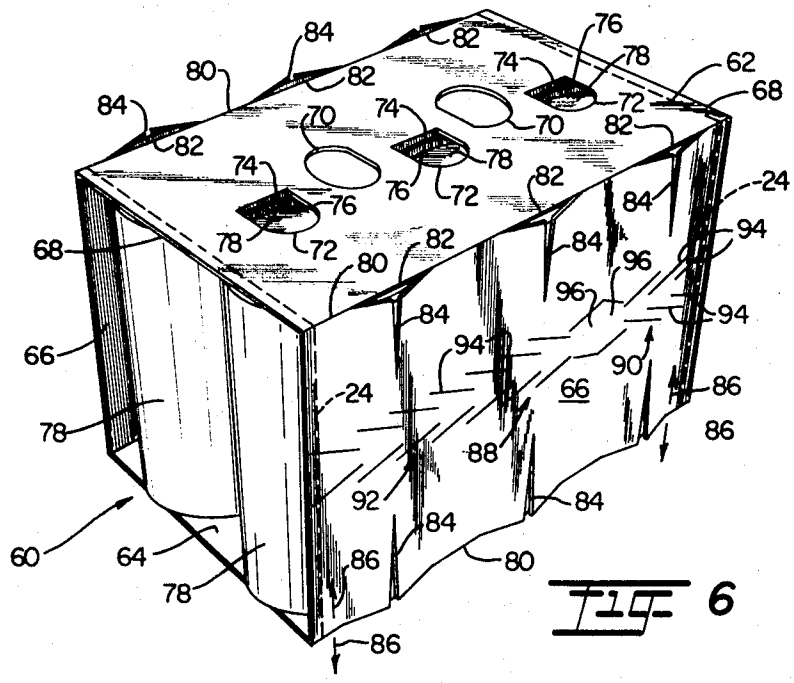


Fig. 6

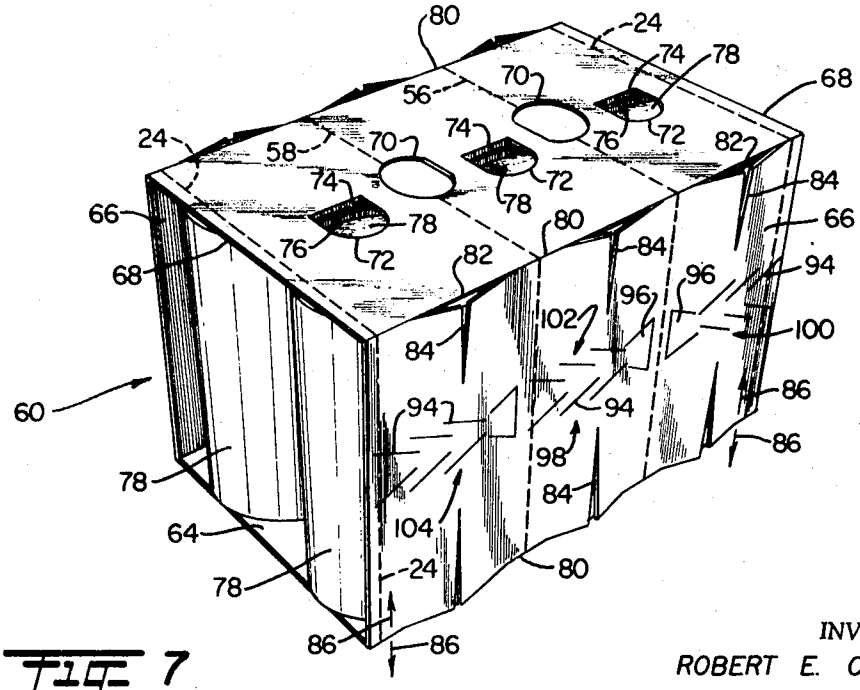


Fig. 7

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CARTON AND METHOD OF MAKING

This is a division of application Ser. No. 797,180, filed on Feb. 6, 1969, now U.S. Pat. No. 3,603,501.

BACKGROUND OF THE INVENTION

This invention lies in the field of packaging and relates to containers or cartons for holding and carrying pluralities of small containers of uniform size and shape and to a method of making such cartons. It is directed more particularly to the type of cartons commonly referred to as "six-packs" and "eight-packs" formed as open ended rectangular boxes or parallelopipeds to retain and carry six or eight beverage cans of uniform size and shape arranged along the length of the carton in three or four lateral rows of two cans each in upright position.

Cartons of the type mentioned have been used for many years and have been generally satisfactory for the intended purpose so long as they were handled with reasonable care. However, they are so constructed that they fail under rough usage, releasing one or more cans which may be damaged or broken open and may even cause personal injury.

As indicated above, a carton of the type under consideration is made up from a single substantially rectangular blank of paperboard folded along appropriate lateral lines to produce a top wall, a bottom wall, and two side walls, the whole fitting tightly around a set of cans and the free ends being adhesively bonded to form the bottom wall. The blank is a lamination of an outer thin layer of high quality label paper to receive desired printed matter and an inner considerably thicker layer of backing paper to provide strength and reasonable rigidity.

To provide the desired tightness, the top and bottom walls have a lateral width slightly less than the sum of the end diameters of two cans in a lateral row, at least when a thickness of the carton material is located between the rims to prevent direct contact between them. Thus it may be said that the top and bottom walls are too narrow and the adjacent portions of the side walls are too tight to receive the cans.

Therefore each of the right-angle folded longitudinal corner edges of the carton is provided with a series of longitudinal slits, one for each can along the length of the carton, centered at the point of contact with the can rim. A short vertical slit is provided in each side wall connecting with the center of the associated longitudinal slit. This combination provides a relief to allow each can end to bulge out slightly beyond the side wall of the carton. At the same time the unslit portions of the corner edges are too tight to allow passage of the can ends and thus serve to normally retain them in place until it is desired to release them.

The usual release means is a tear strip extending horizontally along one side wall spaced from the top and bottom walls. It comprises a series of spaced slits piercing through the thickness of the laminate and is pulled loose to tear open one wall of the container. The spacing between the slits leaves adequate strength in the carton wall for storage and carrying purposes.

A serious disadvantage of the construction described above is that the corner edge slits constitute lines of weakness in the carton exactly where the stress is greatest and they tend to initiate tears under rough handling when the can ends are urged longitudinally by vibration or other sudden movements. This is particularly serious

with the slits nearest to the end margins of the carton since they extend to points only about one half inch from such margins. When this small amount of material fails, there is no restraint of the end cans and they fall out immediately, causing damage and possible injury.

Various attempts have been made to overcome this difficulty but they have been primarily centered on the use of a thicker backing material or a higher quality backing material. A small increase in thickness or quality has been found to be ineffective, and a large increase has been found to be prohibitively expensive. Attaching metal corner pieces and the like is both clumsy and too expensive to be acceptable.

SUMMARY OF THE INVENTION

The present invention solves the problem in an eminently satisfactory manner. Not only does it provide the necessary reinforcement to an extent that corner failure is totally eliminated, but it lends itself to easy and very inexpensive incorporation in the article during manufacture.

Generally stated, corner failure is prevented by applying a loop of a narrow reinforcing strand extending around the periphery of the carton parallel and adjacent to the rectangular end margin of each open end of the carton. The presently preferred material is a rayon yarn, though it could be nylon or other suitable filamentary material. The reinforcing strand has a very high tensile strength compared to a similar cross sectional area of paperboard, and its strength is directed at right angles across the tear line so that its maximum strength is available to prevent failure. In addition it is adhesively bonded between the laminations to prevent any possibility of slippage which might allow a corner to pull open.

The cost of the reinforcing material is almost negligible because it constitutes such a minute portion of the total package. The cost of applying it is also almost negligible because of the manner in which it is incorporated in the laminate. Briefly, the manufacture of the carton blanks comprises applying repeated copies of printed matter to a continuous label web, bringing the web continuously into face to face contact with a backing web at a laminating station to produce a master strip having a width equal to several carton blanks, preferably three to five, dividing the master strip longitudinally into single strips one carton wide, and dividing the single strips laterally into individual carton blanks.

The reinforcing strands are continuously introduced longitudinally between the two webs at the laminating station and spaced laterally so that there are strands at the margins of the master strip and also along the lines of division of the master strip. When the latter is divided, each subsequent single strip has a reinforcing strand extending along each of its longitudinal margins. When the single strips are divided laterally, each resulting carton blank has reinforcing strands at two parallel margins which become the end margins of the finished carton. A waterproof adhesive, such as a polyvinyl resin, may be applied to each of the components separately ahead of the laminating station or together at the laminating station.

A standard tear strip as previously described may be used with the improved article. In order that the tear strip action may be completed when desired for intentional release, the tear strip slits nearest to the end mar-

gins are located to cut through the reinforcing strand. This does not reduce the corner protection because the strand is adhesively bonded between the paper laminations throughout its length.

BRIEF DESCRIPTION OF THE DRAWINGS

Various other advantages and features of novelty will become apparent as the description proceeds in conjunction with the accompanying drawings, in which:

FIG. 1 is a diagrammatic view in perspective of apparatus for laminating the components and dividing them into carton blanks, illustrating the manner of introducing the reinforcing strands;

FIG. 2 is a similar view showing a variation of the reinforcing strands;

FIG. 3 is a diagrammatic plan view illustrating the division of the master strip to produce single strips reinforced at both edges;

FIG. 4 is a sectional view of a master strip showing division between adjacent strands;

FIG. 5 is a view similar to FIG. 4 showing division along the centers of wider strands;

FIG. 6 is a perspective view of a carton made in accordance with the invention; and

FIG. 7 is a view similar to FIG. 6 showing a modified form of carton.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The method of making the carton blanks in accordance with the invention may be suitably performed with the apparatus **10** shown in FIG. **1**. A continuous web **12** of high grade printing paper which has been previously provided with the desired markings is fed downwardly to the laminating station **14** where it meets in face to face contact with backing web **16**, and the two webs then pass longitudinally between laminating rollers **18,20**.

Supply station **22** contains a plurality of spools (not shown) of reinforcing strands **24** of rayon yarn or the like which are fed from the supply station through apertures **26** to the laminating station **14** and enter longitudinally between webs **12** and **16** to pass between rollers **18** and **20**. Adhesive may be applied to webs **12** and **16** at an upstream point and strands **24** may pass through adhesive pots in supply station **22**, or the adhesive may be applied to all components at the laminating station.

As the webs are bonded together at the laminating station they become a master strip **28** equal in width to several carton blanks. In the example shown, they have a width of three carton blanks, divisible along lines **30**. The strands **24** are laterally spaced to provide strands at each margin of the master strip and along each line of division **30**, with one strand spaced slightly to each side of each line.

The strip then passes on to the blanking station **32**. The blanking may be done by flat dies or otherwise, the present example showing roller dies **34** and **36**. Die **34** incorporates roller knives **38** to sever the master strip **28** into separate single strips **40, 42,** and **44**, and also a lateral blade **46** to cut the entire master strip laterally and produce individual carton blanks. Various other formations are provided as shown to pierce the blanks where desired.

The apparatus **10** of FIG. **2** is substantially identical to that of FIG. **1**. In this case, supply station **48** contains spools of reinforcing strands **50** and **52** considerably wider than the slender strands **24** of FIG. **1**, which are fed out through apertures **54**. Strands **50** are directed to lie exactly on the outer margins of the webs, and strands **52** are directed to straddle the lines of division **30**. Consequently, when the master strip is severed, there will be a ribbon of reinforcing strand directly on each longitudinal margin of each single strip. The strips are severed and cut into individual carton blanks in the same way as in FIG. **1**.

FIG. **3** illustrates webs **12** and **16** forming master strip **28** in the same manner as in FIG. **1** but in addition to the reinforcing strands **24** of FIG. **1**, there are provided additional intermediate strands **56, 58** to provide the modified form of carton shown in FIG. **7**. The master strip is severed in the same way as before to form individual single strips.

FIG. **4** shows how the slender strands **24** are spaced slightly inwardly from the longitudinal margins of strip **28** and to each side of the line of division marked by severing knives **38** to provide strands spaced inwardly from the severed margins.

FIG. **5** shows how the wider strands **50** are located directly on the longitudinal margins of strip **28** while the intermediate wider strands **52** straddle the line of division marked by knives **38** to provide strands of uniform width at each margin of each single strip.

FIG. **6** illustrates a completed carton **60** in the presently preferred form of the invention comprising a container holding three lateral rows of six cans each along its length. The container includes top wall **62**, bottom wall **64**, and two side walls **66**, the two ends of the container being open to define rectangular end margins **68**. The top wall includes hand grip openings **70** and tab openings **72** providing downwardly extending tabs **74** serving to separate the rims **76** of cans **78**.

The widths of top and bottom walls **62** and **64** are made slightly less than the sum of the diameters of two can rims **76** plus tab **74**. Therefore the container is too tight for the cans. The longitudinal corner edges **80** are provided with longitudinal slits **82**, one for each can along the length of the container, with each slit being centered on the point of contact of the can with the side wall. Short vertical slits **84** in the side walls connect with the center of each slit **82** and provide relief for each can to extend out slightly beyond the side margins of the top and bottom walls. Since the portions between and beyond the slits **82** are less than the combined can diameters each transverse row of cans is rather firmly held in place.

The problem with the container is that slits **82** have a natural tendency to elongate and to initiate a tear along corner edge **80**. The distance from end margin **68** to the nearest slit is only about one half inch and this can tear out readily under rough handling. Merchandise of this type is tossed about rather freely during transportation and handling in retail stores, and the weight of the can through its adjacent edge exerts a strong tension force as indicated by arrows **86**, particularly at the outer corners, which tears them through in a relatively short time, allowing the end cans to fall out and be damaged. The falling cans also frequently injure persons carrying the cartons.

It will be seen that strands **24** which encompass each end of the container and extend parallel and adjacent to end margins **68** pass around each corner and exert their maximum tensile strength in direct opposition to the tensile forces exerted by the cans. Although the slits

82 may tear as far as the strands they are stopped at that point and the cans are held securely until it is desired to release them.

For purposes of intentional release a standard tear strip 88 may be provided. It includes a short section 90 and a long section 92. Each comprises a series of spaced slits 94 piercing through the entire laminate together with a tab 96 to initiate the tearing action. The outermost slits of each section pierce through the reinforcing strand 24 which otherwise would impede the completion of the tearing action. When it is desired to release only two cans, the short section 90 is torn out. The other four cans may be released by tearing out section 92. The same general arrangement may be used if the carton is enlarged to hold eight or more cans. Although the tear strip cuts through both reinforcing strands they still perform their intended function because the strands are securely bonded between the two webs of the laminate and no slippage of the strands can occur.

The modification illustrated in FIG. 7 is generally the same as that of FIG. 6 but the added features provide maximum security and flexibility. In this modified form, additional intermediate reinforcing strands 56 and 58 are provided as described with reference to FIG. 3. These strands are located in planes which generally correspond to the planes of division between adjacent transverse rows of cans along the length of the container. It will thus be seen that every transverse row of cans is separately totally protected against inadvertent release through tearing of the corner edges.

To obtain maximum flexibility or utility from this modified arrangement a modified form of tear strip is employed. The total strip 98 is divided into sections 100, 102, and 104 with spaced slits 94 and starting tab 96 for each section. Section 100 extends only from a position short of strand 56 to the adjacent end margin and hence releases only the outermost transverse row of cans at that end. Similarly, section 104 extends only from a position short of strand 58 to the adjacent end margin and hence releases only the outermost transverse row of cans at that end. The third section 102 extends from a position short of strand 56 to and through strand 58 to release the last row of cans. It will be seen, therefore, that each transverse row of cans is restrained and released independently. If there are eight or more cans, each transverse row may be restrained and released independently or all of the inner rows may be released together by the use of a longer intermediate tear strip.

From the above it will be seen that the invention provides maximum security for any quantity of cans in an open ended rectangular parallelopiped type carton while retaining complete flexibility and choice in the matter of intentional release.

It will be apparent to those skilled in the art that various changes may be made in the method and construction disclosed without departing from the spirit of the invention, and it is intended that all such changes shall be embraced within the scope of the following claims.

I claim:

1. A method of producing carton blanks adapted to be formed into cartons for holding quantities of uniform sized cans, comprising: supplying a first continuous web of label material and a second continuous web of backing material, said webs being of the same width and said width being a multiple of the width of a single finished carton blank; moving said webs continuously to and through a laminating station with their confronting faces approaching and subsequently contacting each other to travel in a single predetermined direction; supplying laminating adhesive between said faces; supplying a plurality of reinforcing strands; feeding said strands continuously longitudinally between said webs at the laminating station with the strands laterally spaced to provide strands along each longitudinal marginal edge of the webs and along the lines of subsequent division of the multiple width webs into separate single widths; laminating the webs and strands to produce a laminated master strip with laterally spaced lines of longitudinal reinforcement; forming laterally extending tear strips in the master strip in the form of a series of spaced slits piercing through the thickness of the laminate, with the slits piercing through the reinforcing strands; dividing the master strip into multiple single strips, each with a line of reinforcement along each of its marginal edges; and dividing each single strip along successive lateral lines to produce individual carton blanks, each having two parallel marginal edges provided with reinforcing strands.

2. A method as claimed in claim 1; including providing at least the intermediate reinforcing strands in the form of ribbons of appreciable width; directing the ribbons so that their widths extend laterally across the lines of division of the master strip; and dividing the master strip along said lines of division to provide a portion of a ribbon incorporated in each of two adjacent longitudinal margins of the single strips.

3. A method as claimed in claim 1; including providing the reinforcing strands in substantially filamentary form; feeding the strands so that one strand is spaced slightly inwardly from each longitudinal margin of the master strip and one strand is spaced slightly laterally to each side of each line of division of the master strip; and dividing the master strip along said lines of division between adjacent strands to provide a reinforcing strand along each longitudinal margin of each single strip.

4. A method of producing carton blanks adapted to be formed into cartons for holding quantities of uniform sized cans, comprising: supplying a first continuous web of label material and a second continuous web of backing material, said webs being of the same width and said width being a multiple of the width of a single finished carton blank; moving said webs continuously to and through a laminating station with their confronting faces approaching and subsequently contacting each other to travel in a single predetermined direction; supplying laminating adhesive between said faces; supplying a plurality of reinforcing strands in substantially filamentary form; feeding said strands continuously longitudinally between said webs at the laminating station with the strands laterally spaced to provide strands along each longitudinal marginal edge of the webs and along the lines of subsequent division of the multiple width webs into separate single widths; laminating the webs and strands to produce a laminated master strip with laterally spaced lines of longitudinal reinforcement; forming laterally extending tear strips in the master strip in the form of a series of spaced slits piercing through the thickness of the laminate, with the slits piercing through the reinforcing strands; dividing the master strip into multiple single strips, each with a line of reinforcement along each of its marginal edges; and dividing each single strip along successive lateral lines to produce individual carton blanks, each having two parallel marginal edges provided with reinforcing strands.

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