Oct. 13, 1970 R. T. ELIAS 3,533,874

PACKAGE WITH TOTALLY ENCLOSED PARALLEL CHANNELS

Filed April 22, 1966 3 Sheets-Sheet 1

FIG. 1

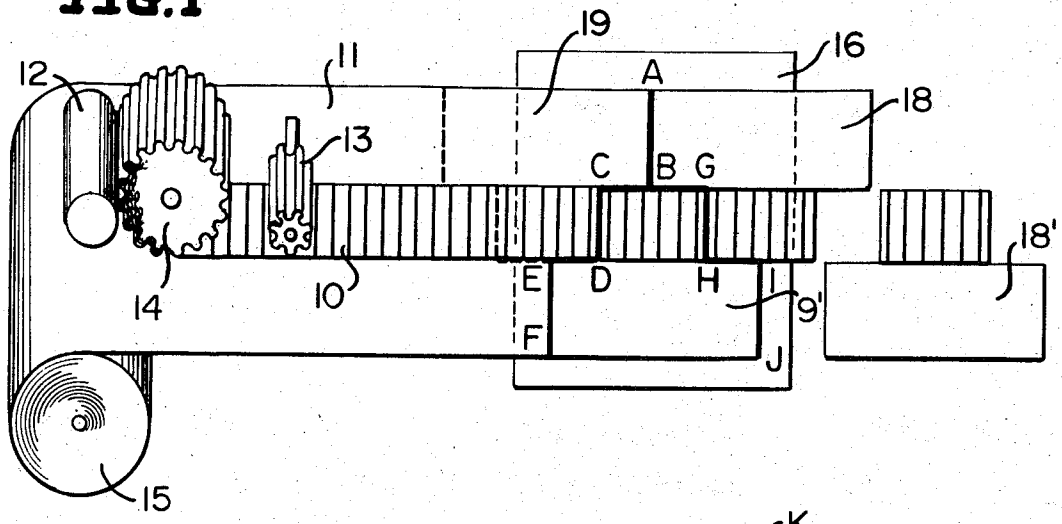
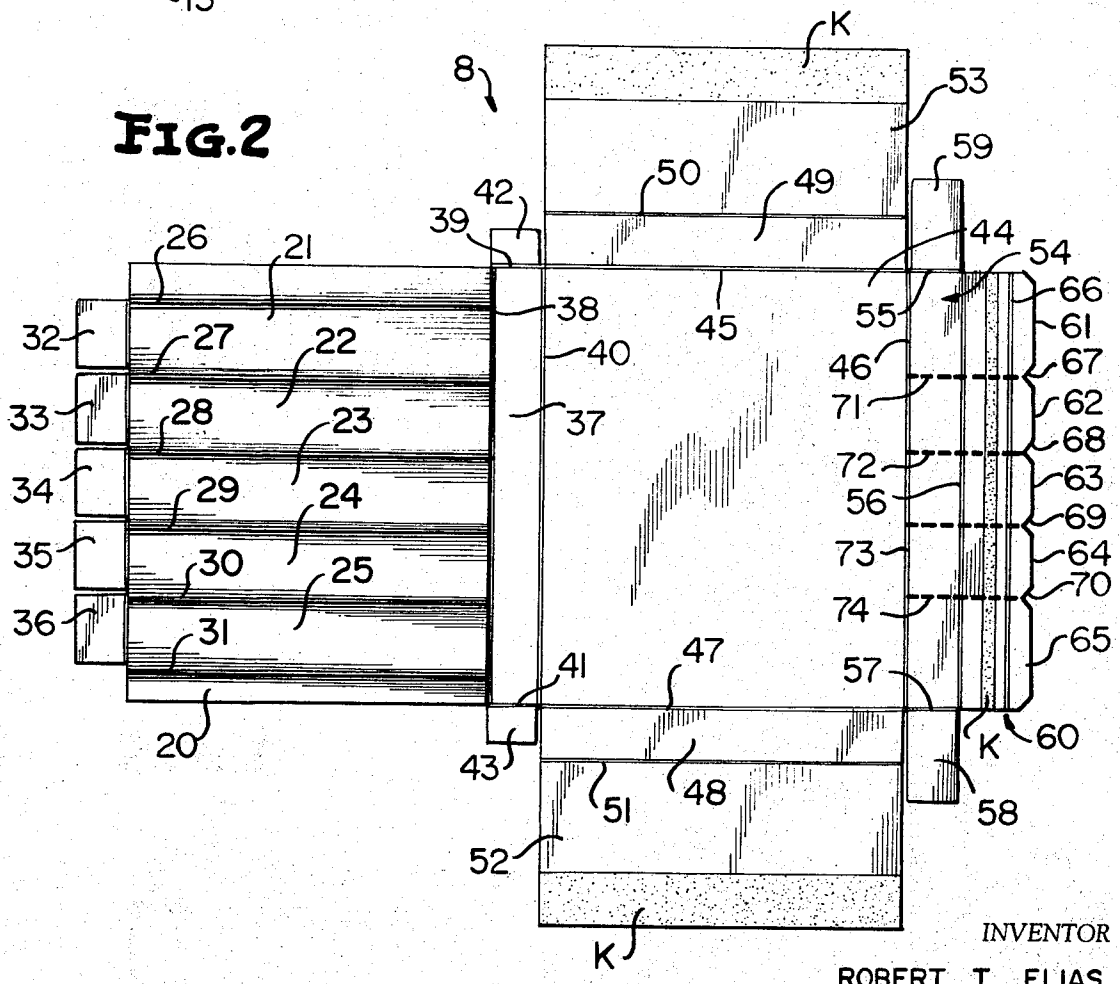


FIG. 2



INVENTOR
ROBERT T. ELIAS

BY Mason, Porter, Miller & Brown
ATTORNEYS

Oct. 13, 1970 R. T. ELIAS 3,533,874

PACKAGE WITH TOTALLY ENCLOSED PARALLEL CHANNELS

Filed April 22, 1966 3 Sheets-Sheet 2

FIG. 3

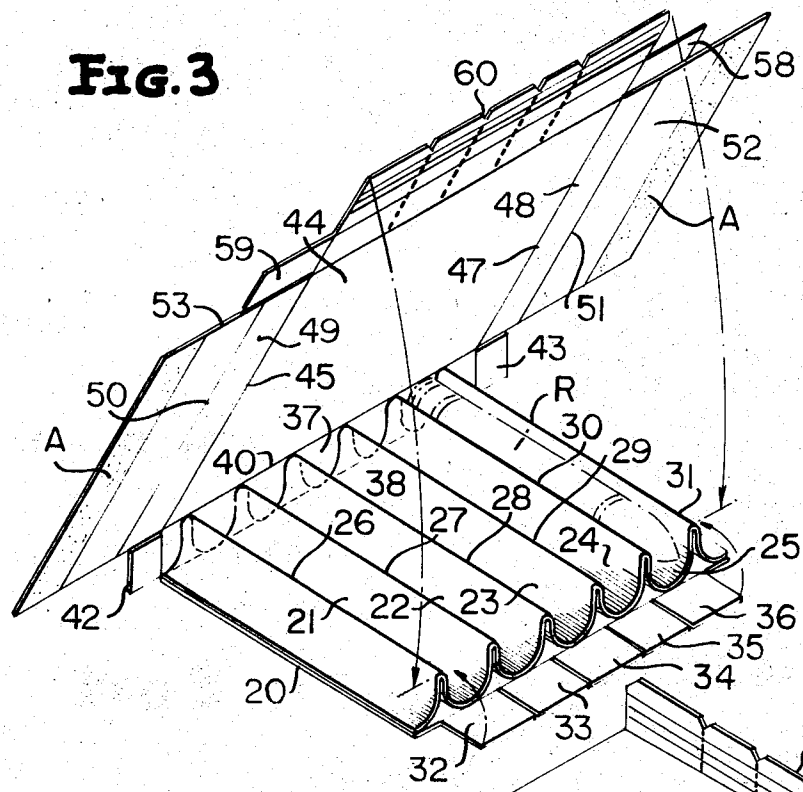
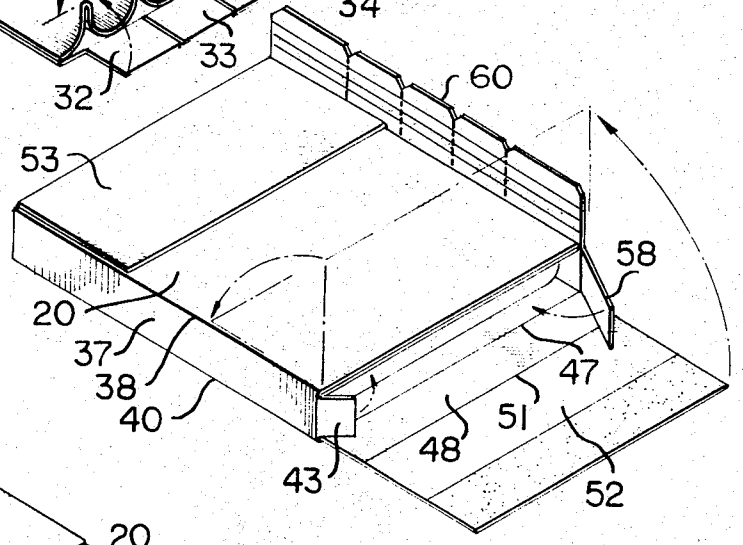


FIG. 4



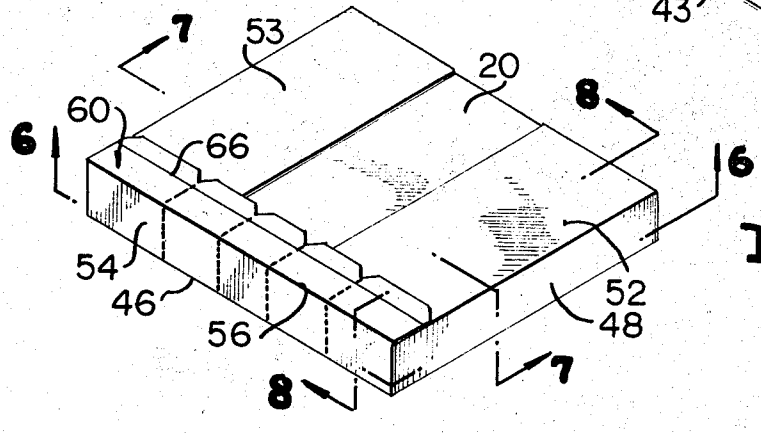


FIG. 5

INVENTOR
ROBERT T. ELIAS

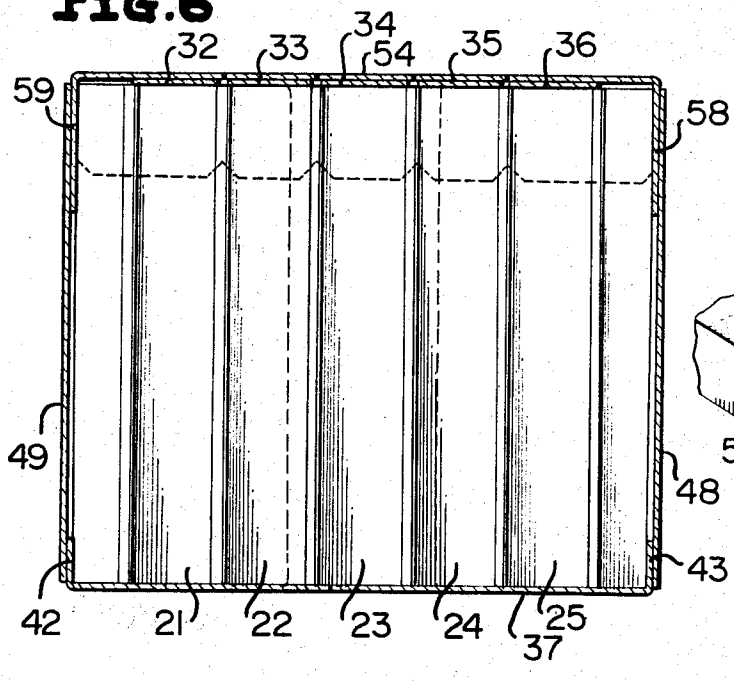
BY
Mann, Parker, Miller & Brown
ATTORNEYS

Oct. 13, 1970 R. T. ELIAS 3,533,874

PACKAGE WITH TOTALLY ENCLOSED PARALLEL CHANNELS

Filed April 22, 1966 3 Sheets-Sheet 3

FIG.6



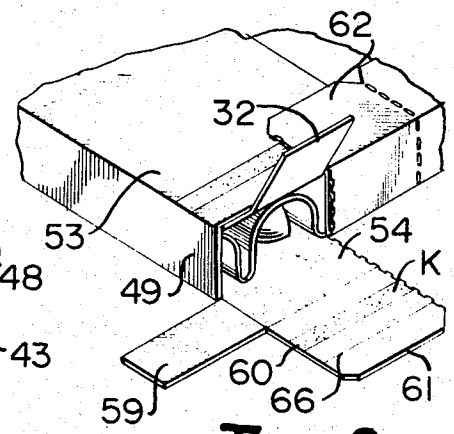
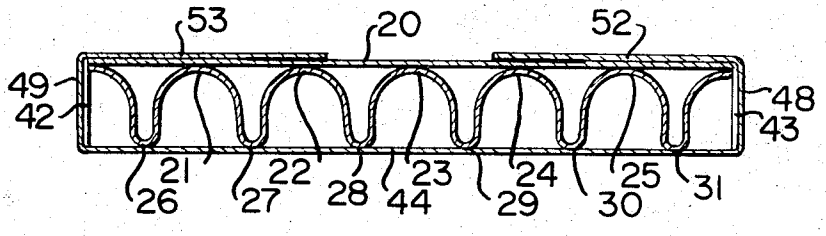


FIG.9

FIG.7



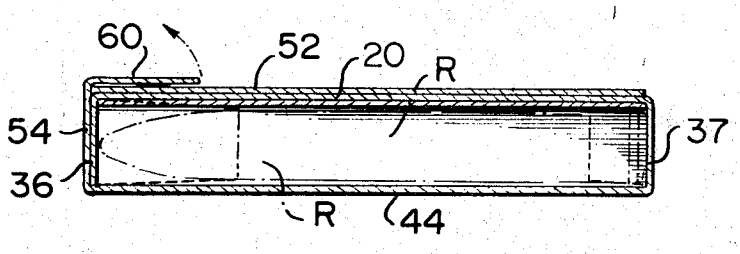


FIG.8

INVENTOR
ROBERT T. ELIAS

BY Thacher, Porter, Sillis & Brown
ATTORNEYS

United States Patent Office 3,533,874 Patented Oct. 13, 1970

3,533,874

PACKAGE WITH TOTALLY ENCLOSED PARALLEL CHANNELS

Robert T. Elias, Downers Grove, Ill., assignor to Continental Can Company, Inc., New York, N.Y., a corporation of New York

Filed Apr. 22, 1966, Ser. No. 544,426
Int. Cl. B32b 31/00
U.S. Cl. 156—269 4 Claims

ABSTRACT OF THE DISCLOSURE

This invention relates to packages having totally enclosed parallel channels therein and to a method for mass producing package blanks from which said packages can be formed. The invention is principally characterized by a novel method of forming package blanks from continuous rolls of flat and corrugated package material, and by a novel method of cutting package blanks in the form of interlocked T shapes to minimize wastage of material. The invention is also characterized by a novel T-shaped package blank for forming a package having totally enclosed parallel channels.

In packaging cylindrical objects such as small arms ammunition or the like, it is desirable to provide a plurality of parallel channels within the package so that the cylindrical objects will not rattle around loosely in the package after it has been partially emptied. This has been done in the past by placing a separate fluted insert within the package after it has been formed, the fluted insert comprising a corrugated material defining a plurality of adjacent parallel channels for receiving cylindrical objects. This invention provides an improved package of the above noted type and an improved method of mass producing such packages with a minimum of waste material and a minimum of time.

In accordance with the method of this invention, packages with a plurality of totally enclosed parallel channels are formed by attaching a web of corrugated package material to a web of flat package material and then by die cutting the combined materials in such manner as to form a blank with the corrugated material being an integral part of the blank. This eliminates the step of placing a corrugated insert into the package after it is formed, and it also eliminates the inner lining material which has been customarily used in the past to prevent the prior art corrugated insert from buckling. In accordance with a further aspect of this invention, the corrugated material is secured to the center of a larger web of flat material, and package blanks in the form of interlocking T-shaped configurations are cut from both sides of the large web to insure a minimum of waste material. In accordance with another aspect of the invention, the individual package blanks are shaped so that they can be easily folded into a closed package which is sturdy in construction, easy to fill, and easy to open.

Accordingly, one object of this invention is to provide an improved package having totally enclosed parallel channels and an improved package blank therefor.

Another object of this invention is to provide an improved method of forming package blanks for packages having totally enclosed parallel channels.

Other objects and advantages of the invention will become apparent to those skilled in the art from the following description of one specific embodiment thereof, as illustrated in the attached drawings, in which:

FIG. 1 is a diagrammatic representation of one specific method of forming package blanks in accordance with this invention;

FIG. 2 is a plan view of one specific package blank of this invention;

FIG. 3 shows the first step of folding the package blank of FIG. 2 into a package;

FIG. 4 shows the remaining steps in folding the package blank of FIG. 2 into a closed package;

FIG. 5 shows a closed package formed from the package blank of FIG. 2;

FIG. 6 is a sectional view taken on the plane 6—6 of FIG. 5;

FIG. 7 is a sectional view taken on the plane 7—7 of FIG. 5;

FIG. 8 is a sectional view taken on the plane 8—8 of FIG. 5; and

FIG. 9 shows the closed package of FIG. 5 with one of the tabs thereof opened to empty the contents of one of the parallel channels therein.

FIG. 1 is a diagrammatic representation of apparatus for forming package blanks in accordance with the method of this invention. As shown in FIG. 1, a continuous web of corrugated package material **10** is fastened to the center of a continuous web of flat package material **11** by means of a cylindrical adhesive roller **12**, which applies an adhesive to the ridges of corrugated material **10**, and a fluted pressure roller **13**, which presses the corrugated material **10** against the flat material **11** to produce an adhesive bond between the adhesive coated surfaces of the corrugated material **10** and the flat material **11**. The corrugated and flat package material, which can comprise any suitable material such as fiberboard or the like, are drawn respectively from feed rolls **14** and **15**. Although the supporting and driving mechanism for feed rolls **14** and **15** are not shown in the drawings, it will be understood by those skilled in the art that any suitable prior art supporting and driving means can be used to convey the materials from their feed rolls to the rollers **12** and **13** which join the materials together. It will also be understood that suitable prior art support and guiding means must be used throughout the length of the combined web to support it and to guide it through the indicated operations. Since these means are not germaine to the method of this invention, they are not disclosed in the drawings, and it is to be understood that any suitable prior art guide and support means can be used in connection with this invention.

As will be described later, the central position of corrugated material **10** with respect to the flat material **11** is an important feature of the method of this invention. Although the corrugated material could be fastened to one side or the other of the flat material, the central position indicated in FIG. 1 permits package blanks to be cut from either side of the combined web material in an interlocking T-configuration which minimizes wastage of material. The cutting is performed by die means **16**, which can comprise any suitable prior art die for cutting, scoring, and forming fold lines in package blanks. Die means **16** is synchronized with fluted roller **13** so as to insure that the channels defined by the troughs in corrugated material **10** will bear a predetermined relationship to the boundaries of the package blank, as will be explained in detail later. The means for synchronizing die means **16** with a fluted roller such as roller **13** is also well known in the art, and any suitable prior art synchronizing means can be employed in the method of this invention.

Die means **16** is adapted to cut the combined web material generally along the lines indicated as A, B, C, D, E, F and B, G, H, I, J. This produces interlocked pairs of generally T-shaped package blanks as indicated by the numerals **18**, **18'**, **19**, and **19'** in FIG. 1. In each of these generally T-shaped blanks, the stem of the T is formed by a section of the corrugated material **10**, and the cross

bar of the T is defined by a wider strip of flat package material. In this particular embodiment of the invention, the stem of the T is approximately half the width of the cross bar of the T, so that when the T blanks are interlocked with their stems adjacent and their cross bars opposing, as shown in FIG. 1, the waste material is held to a very low value. This is particularly important in the packaging art, where millions upon millions of packages must be formed for any given item on a continuing basis.

After the package blanks have been cut as indicated in FIG. 1, they are removed and packaged by conventional means not shown in the drawings. In some applications of the invention, the lower side of flat web **11** will be printed or embossed at a printing station located between fluted roller **13** and die means **16**. In other applications of the invention, the flat web **11** may be pre-printed when it is rolled onto feed roll **15**. But since the particular method of printing is not germaine to this invention, the printing means is not shown in the drawings.

It will be apparent to those skilled in the art that many differing types of package blanks can be formed from the general interlocked T pattern indicated in FIG. 1. FIG. 2 shows one particular T-shaped package blank which is adapted to form a container for relatively large cylindrical objects such as rounds of rifle ammunition or the like. This particular blank is generally designated by the reference numeral **8**, and comprises a first main panel **20** which is formed by an underlying flat surface of the flat material **11** and an overlying section of corrugated material **10** attached thereto and defining five individual channels as indicated by the numbers **21** through **25**. The channels **21** through **25** are defined by corresponding ridges **26** through **31** in the corrugated material, and opposite each of the channels **21** through **25** a corresponding tab **32** through **36** projects from the plain material which underlies the corrugated material in panel **20**. Tabs **32** through **36** serve as inner closures for their particular channels, as will be explained later. The channels **21** through **25** are correctly aligned with respect to their opposing tab members **32** through **36** by synchronizing the cutting die **16** with fluted roller **13** at the start of the operation so that the cutting action does not occur until the channels of the corrugated material are correctly positioned with respect to the die. This assures the proper positioning of the channels **21** through **25** with respect to the boundaries of base panel **20** and also with respect to their opposing tab members **32** through **36**.

Immediately adjacent to base panel **20** is a first side panel **37** which is defined by fold lines **38**, **39**, **40** and **41**. Adjacent to fold lines **39** and **41** are two side tabs **42** and **43**. Also adjacent to side panel **37** is a second main panel **44**, which is defined by fold lines **40**, **45**, **46**, and **47**. It will be apparent from the drawings that second main panel **44** serves to cover the open tops of channels **21** through **25** on first main panel **20**, and that side panel **37** serves to close off one end of the channels **21** through **25**.

Two additional side panels **48** and **49** are joined on opposing sides of main panel **44** by means of fold lines **50** and **51**. Side panel **49** is defined by fold lines **45** and **50**, while side panel **48** is defined by fold lines **47** and **51**. A first lap panel **52** is foldably attached to the side of side panel **48**, and a second lap panel **53** is foldably attached to the side of side panel **49**. Lap panels **52** and **53** are coated with an adhesive material K at their outer ends for sealing to the bottom surface of main panel **20**. Foldably joined to the remaining side of main panel **44** is a fourth side panel **54** defined by fold lines **46**, **55**, **56**, and **57**. Side tabs **58** and **59** are foldably joined to opposing ends of side panel **54**, and an end closing panel generally indicated by the numeral **60** is foldably joined to side panel **54** by fold lines **56**. For convenience in opening the package formed from this package blank, closing tab **60** is divided into five independently openable rip strip tabs as indicated by numerals **61** through **65**. The end of each rip strip tab is fitted with a fingernail tab defined by a fold line **66** and by notches **67** through **70** indented in the outer edge of panel **60**. Panels **60** and **54** are divided into independent rip strips by means of perforations **71** through **74**, and a strip of adhesive material K is applied to panel **60** between fold lines **56** and **66** to secure panel **60** to the bottom surface of base panel **20**.

FIGS. 3 through 9 illustrate the method by which the blank of FIG. 2 is folded into a closed package. As shown in FIG. 3, the package blank is first folded along fold lines **38** and **40** to bring main panel **44** into opposing relationship with main panel **20**, thus closing off the open top and one open end of the channels **21** through **25** defined by the troughs **26** through **31** in the corrugated material of main panel **20**. Cylindrical objects such as the round of ammunition R indicated by phantom lines in FIG. 3 can be inserted into the channels **21** through **25** at any appropriate stage of the package forming operation, as will be apparent to those skilled in the art.

After main panel **44** has been brought into contact with the ridges of the corrugated material forming a part of main panel **20**, tabs **42**, **59**, **43**, and **58** are tucked in, and the package blank is bent along fold lines **45**, **50**, **47**, and **51** to seal lap panels **52** and **53** to the botom of main panel **20** as best indicated in FIG. 4. Then, assuming that the contents of the package have already been inserted into their respective channels at this point, the package is closed by folding the package blank along fold lines **46** and **56** (FIG. 5) to bring side panel **54** over the open end of channels **21** through **25** and to seal panel **60** to the surface of lap panels **52** and **53** and to the exposed portion of main panel **20** as best illustrated in FIG. 5. It will be understood by those skilled in the art that the inner tabs **32** through **36** (FIGS. 2 and 3) must be tucked in before panels **54** and **60** are closed. It will also be apparent to those skilled in the art that inner tabs **32** through **36** are not essential to the package and package blank of this invention, but that they serve to add an extra thickness of material to prevent the pointed ends of the ammunition rounds R from puncturing or distorting panel **54**, as best indicated in FIGS. 8 and 9.

The above described package can be conveniently opened to dispense one round at a time by inserting a fingernail under the appropriate one of the fingernail tabs **61** through **65** and tearing the tab along the perforated lines as indicated in FIG. 9. It will be appreciated by those skilled in the art that the score line **66** makes it easy to insert a fingernail under tab **61** for the purpose of tearing it free along the perforated line. This small convenience may be very important to a hunter when he has to open a package of ammunition in the field during the winter time, and the ability to remove the cartridges one at a time without spilling the others is equally important under these conditions.

While one form of the package blank and package blank forming method of this invention has been shown for purposes of illustration, it is to be understood that various changes in the details of construction, arrangement of parts, and steps of the method may be made without departing from the spirit and scope of the invention as defined in the appended claims. For example, although the flutes of the corrugated material are transverse to the direction of web movement in the illustrated embodiment of the invention, they could be placed parallel to the direction of web movement if desired. The end closing panel and tear tabs could be foldably attached to the first main panel rather than to the second main panel as shown, and the corrugated material could be formed from a roll of flat material instead of being taken from a roll of pre-corrugated material as shown. These and many other modifications of the disclosed examples will be apparent to those skilled in the art, and this invention includes all modifications falling within the scope of the following claims.

I claim:

1. A method of forming package blanks having a plurality of parallel channels attached thereto comprising the steps of advancing a continuous strip of substantially flat package material, advancing a continuous strip of corrugated package material having a plurality of parallel channels therein, attaching said corrugated material to one surface of said flat material to form a combined package material, and cutting the combined package material in a substantially T-shaped configuration with the stem of the T comprising a section of said corrugated material and the cross-bar of the T comprising a section of said flat material to thereby form package blanks having a plurality of parallel channels attached thereto.

2. The method defined in claim 1 wherein said T-shaped package blanks are cut from opposite sides of said strip of combined package material with the stem end of each T-shaped blank being adjacent to the lower crossbar edge of two T-shaped blanks cut from the opposite side of said strip of combined material, and the stem of each T-shaped blank being flanked by the stems of said two T-shaped blanks cut from the opposite side of said strip of combined material.

3. A method of forming package blanks having a plurality of parallel channels attached thereto comprising the steps of advancing a continuous strip of substantially flat package material, advancing a continuous strip of corrugated package material having a plurality of parallel channels therein, attaching said corrugated material to one surface of said flat material to form a combined package material, and cutting the combined package material into side-by-side alternately inverted T-shaped configurations to form package blanks each of a T-shaped configuration having a plurality of parallel channels attached thereto wherein the stem of each T comprises a section of the corrugated material and the cross-bar of each T comprises a section of the flat material.

4. A method of forming package blanks having a plurality of parallel channels attached thereto, comprising the steps of advancing a continuous strip of substantially flat package material, advancing a continuous strip of corrugated package material having a plurality of parallel channels therein, said corrugated material being narrower in width than said flat material, attaching said corrugated material to the central portion of one surface of said flat material to form a combined package material, cutting the combined package material to form substantially T-shaped package blanks with the stem of the T comprising a section of said corrugated material and the crossbar of the T comprising a section of said flat material, said T-shaped package blanks being cut from opposite sides of said strip of combined material with the stem end of each T-shaped blank being adjacent to the lower crossbar edge of two T-shaped blanks cut from the opposite side of said strip of combined material, and the stem of each T-shaped blank being flanked by the stems of said two T-shaped blanks cut from the opposite side of said strip of combined material.

References Cited

UNITED STATES PATENTS

1,121,817	12/1914	Ferres	156—470
3,311,524	3/1967	Hecker	156—471
3,172,796	3/1965	Gulker	156—269
3,236,713	2/1966	Taff	156—510

DOUGLAS J. DRUMMOND, Primary Examiner

U.S. Cl. X.R.

93—36