

May 28, 1963

J. M. PEETERS
PACKAGE

3,091,331

Filed June 22, 1956

3 Sheets-Sheet 1

Fig. 2.



Fig. 1.

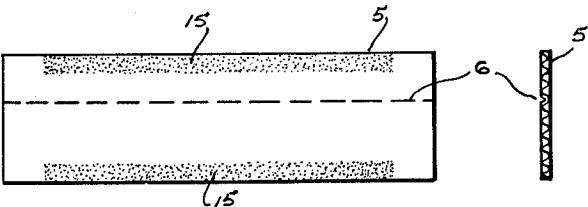
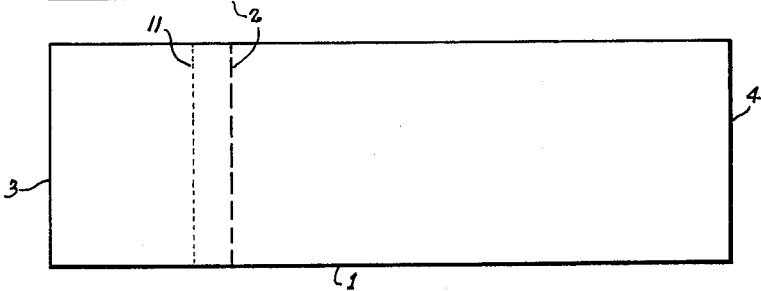


Fig. 3.

Fig. 4.

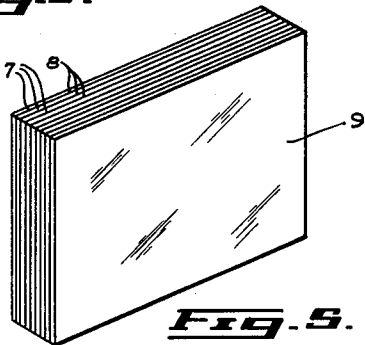


Fig. 5.

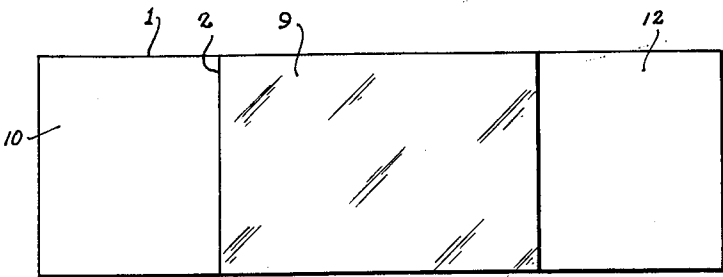


Fig. 6.

INVENTOR
Jearn M Peeters
By *Bailey, Hopkins & Smith*
Attorneys

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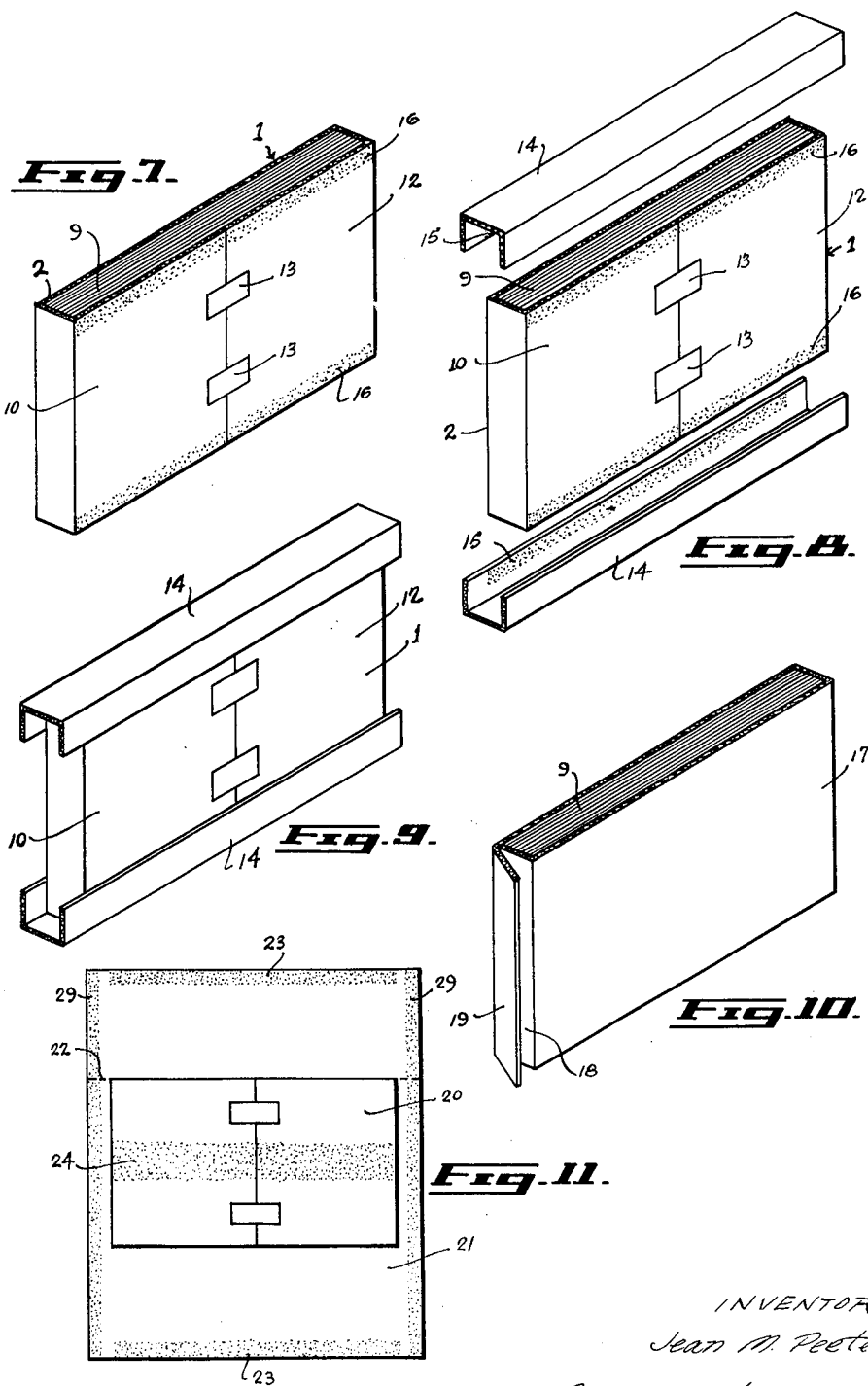
J. M. PEETERS

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PACKAGE

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3 Sheets-Sheet 2



INVENTOR

Jean M. Peeters

By *Bailey Stephens & Kistner*
Attorneys

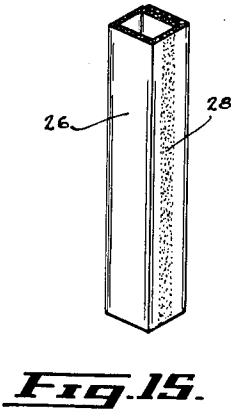
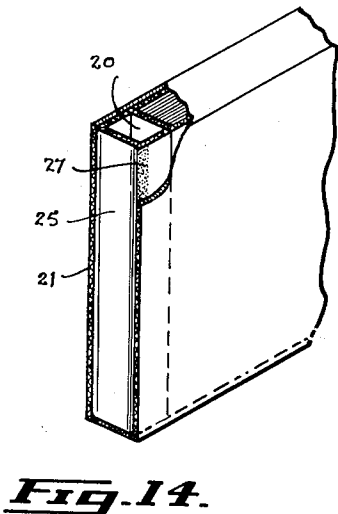
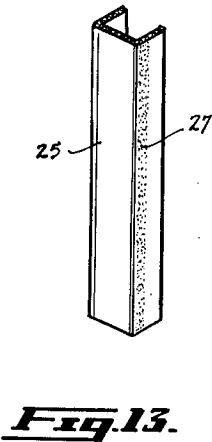
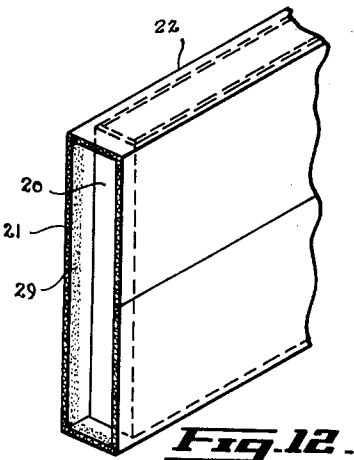
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PACKAGE

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3 Sheets-Sheet 3



INVENTOR
Jean M. Peeters

By *Bailey Stephens & Hunting*
Attorneys

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3,091,331
PACKAGE

Jean M. Peeters, St. Laurent, Quebec, Canada, assignor
to Canadian Pittsburgh Industries Limited, Toronto,
Ontario, Canada

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3 Claims. (Cl. 206-62)

This invention relates to a novel manner of packaging sheet glass.

In the past it has been the practice to package sheet glass in wooden boxes for storage and shipping, the latter term including, of course, transportation by road and rail vehicles as well as water borne conveyances. The disadvantages inherent in this system are many. Firstly, there is the cost of the boxes themselves which involves substantial items in respect of the lumber and in labour for the construction of the boxes. Secondly the weight of the box in comparison with the weight of the contents is high, thus increasing the total weight and the shipping charges. Moreover the final package is usually bulky, since the use of wooden boxes has led to the packing of glass in large quantities in order to minimise the proportion of the total weight represented by the packing materials. Another disadvantage of the wooden cases is that it is uneconomical to return them empty to the glass manufacturer, whereas they often present a storage or disposal problem to the receiver. Finally it has always been found impractical to pack sheet glass into wooden boxes any other way than by hand.

It is the principal object of the present invention to provide a light-weight readily disposable package for sheet glass that will provide improvements in respect of the above-mentioned disadvantages.

It is also an object of the present invention to provide a method of packaging sheet glass inherently suited to operation by packaging machines.

The reason for the use of wooden boxes in the past has had its basis in the fact that it has always been assumed that it is necessary for the casing alone to provide the strength and rigidity that the whole assembly must have if breakage of the glass is to be avoided.

It has now been discovered that a high degree of reliance can be placed on the inherent strength that the glass exhibits when the sheets are packed tightly face to face in a laminated arrangement notwithstanding the fact that there is no bonding between the glass faces other than the friction resulting from compression in the package. It follows from this discovery that it is no longer necessary to employ inherently rigid material such as wood to form an outer casing for the glass, and the principal feature of the present invention resides in the idea of employing a material which in itself is not of any great strength, for example corrugated fibreboard. Double-faced corrugated board is the most practical commercially available cheap material. It has a certain degree of strength while at the same time being relatively easily bent by the application of manual pressures. The invention may thus be defined as a shipping package comprising, a stack of glass sheets in laminated arrangement, a packaging member of fibreboard wrapped around said stack to envelope tightly the opposite faces and one set of opposite edges of said stack, and at least one further packaging member of fibreboard covering the remaining, otherwise exposed edges of said stack.

The invention is illustrated by way of example in the accompanying drawings in which:

FIGURE 1 is a plan view of a fibreboard blank employed in assembling a package according to the invention;

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FIGURE 2 is an elevation view of this blank seen from the top of FIGURE 1;

FIGURE 3 is a plan view of a similar piece of board employed to form an edge channel in the finished package;

FIGURE 4 is a view of such piece of board seen from the right in FIGURE 3;

FIGURE 5 is a perspective view of a stack of glass sheets which it is desired to package;

FIGURE 6 is a plan view of this stack of glass sheets in position on a blank such as illustrated in FIGURE 1;

FIGURE 7 is a perspective view of the parts of FIGURE 6 at a later stage in the wrapping operation;

FIGURE 8 is a view similar to FIGURE 7 but also showing diagrammatically the manner of application of the edge channels formed from pieces such as those illustrated in FIGURES 3 and 4;

FIGURE 9 is a view of the parts seen in FIGURE 8 at a later stage in the assembly of the package, the edge channels being in their final position in this illustration;

FIGURE 10 is a perspective view showing an alternative method of wrapping the blank around the glass sheets otherwise corresponding generally to FIGURE 7;

FIGURE 11 is a plan view of the sub-assembly of FIGURE 7 positioned on a further blank preparatory to the formation of a modified form of outer wrapping;

FIGURE 12 is a fragmentary view of the parts seen in FIGURE 11 at a later stage in the operation when the outer wrapping has been placed in its final position;

FIGURE 13 is a perspective end view of a channel member adapted for assembly with the parts shown in FIGURE 12;

FIGURE 14 is a view illustrating the manner of assembly of the parts of FIGURES 12 and 13; and

FIGURE 15 is an end perspective view of an alternative form of channel member.

Referring firstly to FIGURES 1 and 2, the principal element of the package is formed from a blank 1 of double-faced corrugated fibreboard of rectangular shape having a prescored line 2 extending parallel with the two shorter sides 3 and 4. As appears from FIGURE 2 the direction of extent of the corrugations is transverse to the length of the blank 1 so that the scoreline 2 extends parallel with such corrugations. This is essential if the board is to be comparatively easily bendable about such scoreline and about other parallel lines during the later stages of the wraparound operation.

In one form of package constructed in accordance with the present invention the glass sheets are enclosed within a covering formed from a single blank 1 and two edge channels each formed from blanks such as the blank 5 illustrated in FIGURES 3 and 4. Each blank 5 is of elongated rectangular form and has a single scoreline 6 extending parallel with its longer sides. As before the direction of extent of the corrugations is chosen to be parallel with the scoreline 6.

A typical stack 9 of glass sheets requiring packaging for storage and shipment is illustrated in perspective in FIGURE 5. This drawing shows a series of glass sheets 7 placed face to face and separated only by thin sheets of paper 8 provided to prevent scratching. This form of assembling the glass sheets into a stack 9 is conventional.

In accordance with a first embodiment of the invention, the stack 9 is placed centrally on a blank 1 as shown in FIGURE 6 with the scoreline 2 coincident with a lower edge of the stack 9. The left-hand end 10 of the blank 1 can then readily be bent up about the scoreline 2 and then again around the upper edge of the stack 9 to lie flat against its outer face as seen from FIGURE 7.

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If desired a further scoreline such as illustrated in broken lines at 11 in FIGURE 1 may be provided on the blank 1 relatively close to and parallel with the scoreline 2, in order to provide an easy point of bending for the end 10 around the upper edge of the stack 9; but in practice it is usually found that such an additional scoreline is unnecessary, for which reason it will normally be omitted as representing increased simplicity in manufacture. In some cases it may even be practical to dispense with the initial scoreline 2, but this scoreline has been found desirable in simplifying commencement of the bending operation.

After the end 10 has been bent around into the position shown in FIGURE 7, the other end 12 of the blank 1 is similarly bent around the end edges of the stack 9 to lie also against the outer face of such stack. The end edges of the portions 10 and 12 lie close to one another so that temporary fixing means such as strips of adhesive tape 13 may conveniently be placed across from one edge to another to hold the wrapping tightly in place. There has now been produced what will for convenience be termed a sub-assembly 20. FIGURE 7 illustrates this sub-assembly.

The next stage in the assembly of the complete package is to form a pair of edge channels 14 (see FIGURE 8), each such channel 14 being formed from one of the blanks 5 illustrated in FIGURES 3 and 4. As before there will only normally be formed a single scoreline 6 in each blank 5, and this scoreline may even be dispensed with. It will be noted that each channel 14 is appreciably longer than the sub-assembly 20 so that when such channels are placed along each exposed edge of the stack 9, they project somewhat from the ends thereof as shown in FIGURE 9 which illustrates these parts in their fully assembled position. The channels 14 are held in place by means of glue. Preferably one of the pressure-sensitive types of glue will be employed and will be placed both along the edges of the blanks 5 as shown at 15 in FIGURES 3 and 8 and along the sub-assembly 20 shown in FIGURES 7 and 8, as indicated at 16. The package is then complete.

FIGURE 10 shows an alternative method of wrapping a blank 17 around a stack 9 of glass sheets. The blank 17 will be similar to the blank 1 except that it will be a slight amount longer and the initial scoreline will be differently positioned. FIGURE 10 corresponds generally to a stage in the operation equivalent to FIGURE 7, and the only difference is that the two flaps 18 and 19 of the blank are arranged to meet, and in this case overlap, at an end of the stack 9. These flaps may be connected together by convenient means such as glue and again edge channels such as shown at 14 in the other figures will then be placed in position to provide a generally similar final assembly to that shown in FIGURE 9.

As an alternative to the use of edge channels, a further wrap-around covering may be placed over one of the sub-assemblies illustrated in FIGURE 7 or 10. FIGURES 11 and 12 illustrate such a method applied to the sub-assembly of FIGURE 7. In this case the sub-assembly 20 is placed on a further blank 21 provided with a scoreline 22 extending along a lower edge of the sub-assembly 20 that is transverse to the lines of bending of the original blank 1 during formation of such sub-assembly. As before the blank 21 will be made of double-faced corrugated fibreboard and the scoreline 22 will be parallel to the corrugations. It will be noted from FIGURE 11 that the blank 21 is made rather wider than the sub-assembly 20 is long.

Pressure-sensitive glue is deposited along a pair of edge lines 23 of the blank 21 and is also applied after the first part of the operation to the medial area 24 of the sub-assembly 20. The blank 21 is then folded about the sub-assembly 20 in a manner generally similar to that previously adopted in forming such sub-assembly,

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thus bringing the areas of pressure-sensitive glue into register with one another. As soon as pressure is applied against the exterior of the package a highly effective seal is obtained which in practice is appreciably stronger than the fibreboard material of which the blanks are made so that it is usually found that the package can only be opened by tearing of the material itself.

FIGURE 12 illustrates the form of the complete assembly after this latter operation, the greater width of the blank 21 giving rise to overhanging portions beyond the ends of the sub-assembly 20. Although the packages may be considered complete at this stage and will provide adequate protection to the glass during shipment, it will in some instances be preferred to fill the cavities formed by these overhanging portions by means of channels of similar corrugated fibreboard, such as those illustrated by way of example in FIGURES 13 and 15 which show channels 25 and 26 provided with strips 27 and 28 of pressure-sensitive glue arranged to co-operate with a similar facing of such glue positioned along the edges of the blank 21 as shown at 29. FIGURE 14 provides an illustration of the manner of mounting the channel 25 of FIGURE 13 in the assembly illustrated in FIGURE 12.

It has been found that under practical storage, handling and shipping conditions no greater incidence of breakage is experienced with glass packaged in accordance with the present invention than in wooden cases. On the other hand large savings in material and handling costs have resulted as well as lower freight charges.

It is preferred to employ double-faced corrugated fibreboard of the type commercially available under the description "275 pound board," this description being a reference to the minimum load per square inch to which the board is tested. It is the practice in the trade to package glass in "50 foot" amounts, sometimes "100 foot" amounts, which means that the package contains sufficient sheets to make a total glass area of 50 or 100 square feet as the case may be, or rather the number of sheets to give the nearest approximation to one of these areas. By this means a comparatively constant weight for all packages is obtained although the number of sheets may vary from as few as 6 sheets of large size glass to as many as about 90 sheets of a small size. These variations will of course change the dimensions of the glass stack so that a different size blank will be required for each glass size.

This application is a continuation-in-part of application Serial No. 475,437, filed December 15, 1954.

I claim:

1. As a shipping package, a stack of glass sheets in laminated arrangement, a packaging member of corrugated fibreboard wrapped around said stack to envelope tightly the opposed faces and one set of opposite edges of said stack whereby to form a sub-assembly with said stack, and a pair of channel members of corrugated fibreboard each covering one of the remaining, otherwise exposed edges of said stack and projecting beyond those opposite edges of said sub-assembly formed by the first packaging member, said packaging members having bends extending parallel to the direction of extent of the corrugations therein.

2. As a shipping package, a stack of glass sheets in laminated arrangement, a packaging member of corrugated fibreboard wrapped around said stack to envelope tightly the opposed faces and one set of opposite edges of said stack, and a pair of channel members of corrugated fibreboard each covering one of the remaining, otherwise exposed edges of said stack and projecting beyond the edges of said stack covered by the first packaging member, said members having bends extending parallel to the direction of extent of the corrugations therein, and wherein said channels are secured to said packaging member by means of pressure-sensitive glue.

3. A package of glass sheets comprising a stack of

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glass sheets in laminated arrangement, a unitary sheet of double-faced corrugated fibreboard wrapped around said stack to envelope tightly and to abut the opposite faces and one set of opposite edges of the stack, adhesive means joining the end portions of said fibreboard sheet, said first sheet of fibreboard having its edges coplanar with the other set of opposite edges of the stack, and a pair of channel members of double-faced corrugated fibreboard each covering and abutting a respective edge of said other set of opposite edges of the stack, said pair of channel members being adhered to said unitary sheet to maintain said unitary sheet tightly wrapped around said stack, and extending beyond the portions of said unitary sheet covering said one set of opposite edges of

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the stack, said other set of opposite edges of the stack being covered only by said pair of channel members of double-faced corrugated fibreboard.

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