Nov. 3, 1959 J. A. DIENNER 2,911,129

SELF-OPENING PACKAGE

Filed Dec. 23, 1957 2 Sheets-Sheet 1

Fig. 1.

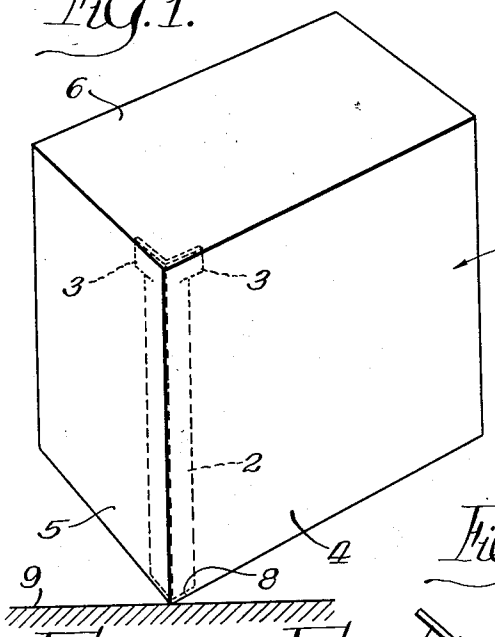


Fig. 2.

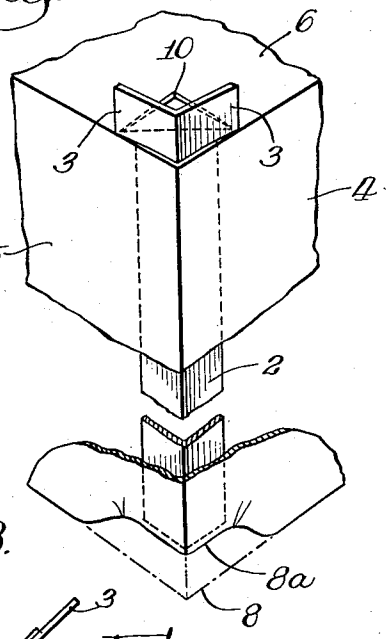


Fig. 3.

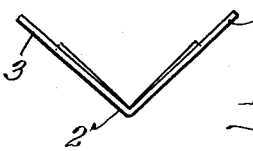


Fig. 4.

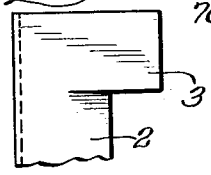


Fig. 5.

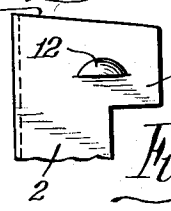


Fig. 8.

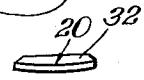


Fig. 10.



Fig. 7.

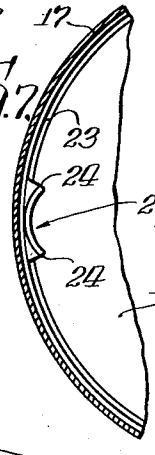


Fig. 9.

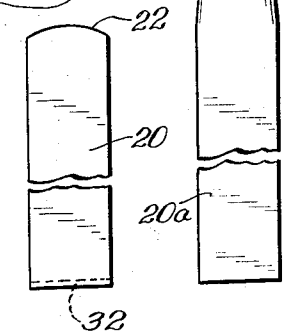


Fig. 6.

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Fig. 11.

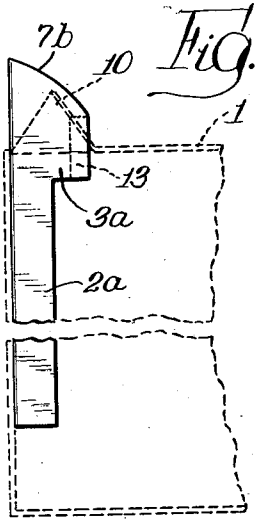


Fig. 13.

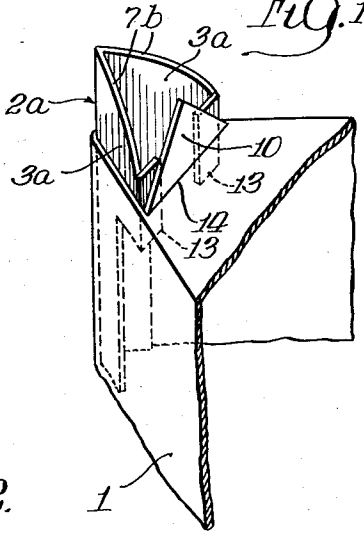


Fig. 14.

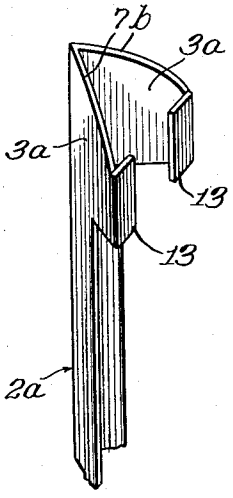


Fig. 12.

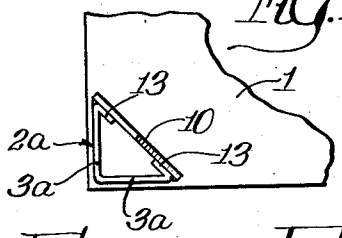


Fig. 18.

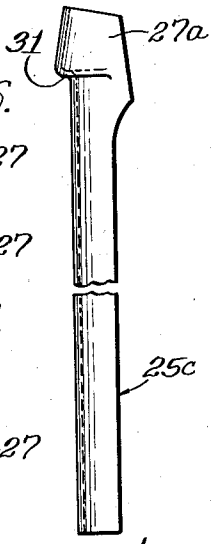


Fig. 20.

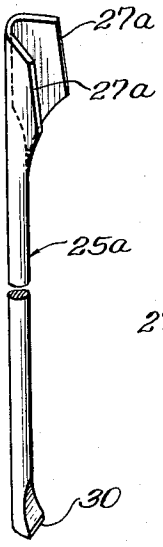


Fig. 21.

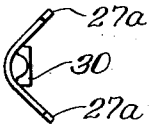


Fig. 15.

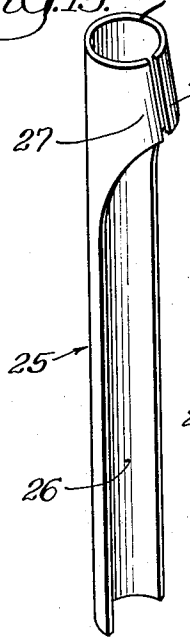


Fig. 16.

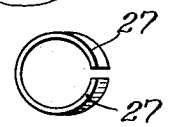


Fig. 17.

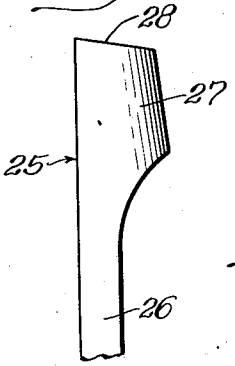


Fig. 22.

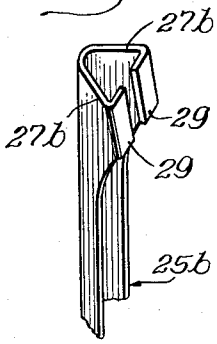


Fig. 19.



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SELF-OPENING PACKAGE

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Application December 23, 1957, Serial No. 704,765

7 Claims. (Cl. 222—83)

This invention relates to the art of packaging. More particularly, it is concerned with the feature of opening a container, such as a box or a can, which is closed and may also be sealed. In addition to providing means for opening the box, can, or the like, my invention provides a pouring spout for the contents of the container. There are many packages involving containers which are required to be closed or even sealed against escape of the contents. Frequently, the user finds it difficult to open such a container under the circumstances of use. Many package containers involving contents in granular, crystal, pulverulent or liquid or the like form, would be far more convenient for the user if they were provided with a pouring spout. It is old to provide cans wtih a permanent or a removable pouring spout, but such containers with attached pouring spouts generally do not stack satisfactorily, and if the pouring spout device is detachable, the detachable part may become displaced or lost or deformed.

My invention aims to satisfy the requirement for an ever present but unobtrusive opening means for the container and likewise for an unobtrusive spout forming means, preferably employed also as the opening means.

According to the present invention a container having sidewalls and top and bottom walls is provided with an opening bar disposed inside the container longitudinally along a sidewall in parallel relation therewith, and having its lower end disposed in contact or substantially in contact with the inside of the bottom wall where it joins the sidewall and having its upper end disposed in contact or substantially in contact with the inside of the top wall where it joins said sidewall.

The upper end of the bar adjacent said top wall constitutes means to cut or produce an opening in said top wall, and is adapted to cut or produce said opening when said bar is thrust upwardly relative to the top wall and the adjacent attached sidewall.

The preferred embodiment of the invention comprises a thin walled box suitable to be grasped by a single hand of the user so that it may be grasped and struck against a table top or any like flat or convex surface to perform the operation of driving the opening bar up through the top wall to the extent of producing an opening therein.

That part of the bottom wall of the box which is in register with the lower end of the opening bar is the part which is to be struck against the table top.

In producing the opening of the box it is necessary to force the bar upward relative to the top wall so as to produce the opening in said top wall. By striking the edge of the bottom wall which is in register with the opening bar against the table top, said edge is carried upward relative to the remainder of the package, and a movement of the bar relative to the top and adjacent sidewall is produced.

Where the package is rectangular, the opening bar is preferably disposed in a corner of the sidewalls where it tends to be retained by the contents of the box. A bar

of a cross section like an angle bar is advantageous for this purpose.

The contents of the box provide inertia which is useful in producing movement of the walls of the major part of the box when the box is struck against a table top to produce the opening in the top.

The sidewalls of the box at the lower end where the box engages the table top are crumpled sufficiently to make the sidewalls shorter than the opening bar whereby the bar is thrust through the top wall.

The bar may be so constructed that after producing the desired opening it may serve as a pouring spout. After each such use the bar may be pushed back, and the flap of the top wall produced by such cut or opening operation pushed back to close the opening.

The chief object of the invention is to provide a package of pourable material which may be grasped by the hand of the operator and whereof a lower edge may be struck against a table top or other solid wall to produce an opening at the top of the package through which the contents may be poured.

Now in order to acquaint those skilled in the art with the manner of constructing and operating the preferred embodiment of my invention, I shall describe, in connection with the accompanying drawings, a specific embodiment of the same.

In the drawings:

Figure 1 is an isometric view of a package comprising a rectangular cardboard box container having an opening bar disposed on the inside thereof, and in one corner of the same;

Figure 2 is a fragmentary isometric view showing the upper end of the opening bar projected through a corner of the top wall to form a pouring spout;

Figure 3 is a vertical plan view looking at the upper end of the opening bar shown in Figures 1 and 2;

Figure 4 is a side view of an opening bar and pouring spout member such as is shown in Figures 1, 2 and 3;

Figure 5 is a fragmentary side elevational view of a modification of the same;

Figure 6 is an isometric view of a container comprising a cylindrical can having an opening bar disposed on the inside thereof;

Figure 7 is a fragmentary plan view of the container showing the disposition of the opening bar of arcuate cross section adjacent the concaved inner walls of the can with the lower end of the bar sitting in a groove in the lower end of the can;

Figure 8 is an end view; and

Figure 9 is a side view of an opening bar suitable for the opening of a can as illustrated in Figures 6 and 7;

Figure 10 shows the form of opening bar for use in the container as illustrated in Figures 6 and 7;

Figure 11 is a side elevational view of another form of opening bar and pouring spout, the container being shown in dotted line;

Figure 12 is a top plan view of a rectangular container with the opening bar projecting through the corner of the top wall;

Figure 13 is a perspective view of the parts shown in Figure 12;

Figure 14 is an isometric view of the top of the opening bar and pouring spout element shown in Figures 11, 12 and 13;

Figure 15 is an isometric view;

Figure 16 is a top plan view;

Figure 17 is a side elevational view of a modified form of opening bar and pouring spout;

Figure 18 is a side elevational view and

Figure 19 a top plan view of a modified form of pouring spout;

Figure 20 is an isometric view;

Figure 21 is a top plan of a modified form of opening bar and pouring spout; and

Figure 22 is an isometric view of the upper end of a combined opening bar and pouring spout illustrating a further modification.

There are numerous materials which are packaged in closed containers. Many of them are adapted for home or kitchen use. Frequently, they are materials having considerable weight and of such fineness of grain or subdivision, such as granular, crystalline, pulverulent or even liquid as to require the container to be sealed. The container generally does not need to be rigid, or it does not need to be rigid throughout, but must be tight enough to avoid escape of the contents and strong enough to hold its shape. The housewife frequently finds it difficult to open such a package without going to the trouble of hunting up a knife or some other means for cutting or breaking the container. Examples of materials in such packages are powders, such as detergent powders, soap powders, starch, sugar, salt and the like. Numerous examples of liquids contained in cans present the same difficulty. Paper milk cartons, aluminum biscuit cartons and the like are further examples. Also cans of lubricating oil and the like are suitable subjects for the application of the present invention.

In Figure 1, I have shown in isometric view a rectangular package of starch, which is a finely divided powder normally capable of pouring out through a relatively small opening. The rectangular container **1** is sealed up tight, so that the contents will not escape in the shipment and handling of the package. The walls of the container **1** are made of cardboard suitably folded and sealed with adhesives in a preferred manner. In the corner presented towards the viewer in Figure 1, on the inside of the container there is disposed as shown in dotted lines in Figure 1 the opening bar **2** which consists of a thin piece of stiff sheet material such as sheet metal, paper board, plastic or the like, formed in cross section like an angle bar with two legs of the angle at approximately 90° to each other so as to fit into the corner, either throughout the entire length of the bar or throughout the upper portion thereof. As shown in Figures 1 to 4, the upper end of the bar **2** is provided with wider portions or wings **3—3** extending beyond the edges of the legs of the angle bar. These wings are bent to slightly more than a 90° angle relative to each other, so that when the bar **2** is thrust up through the top wall, as shown in Figure 2, these wings **3, 3** may overhang the upper edge of the sidewalls **4** and **5**. The box **1** is preferably made of cardboard of suitable weight and strength to hold the contents in desired generally rectangular form. The bar **2** must be strong enough that when it is thrust upwardly, it will cut or tear the edges of the top wall **6** from the adjacent side walls **4** and **5** and thrust itself upwardly through the top wall into the position shown in Figure 2. This movement of the bar **2** relative to the walls of the container **1** may be produced by pressure applied to the lower corner **8** in register with the lower end of the bar **2**. Said pressure may be applied by striking the said corner so as to crumple or push together the walls of the corner as indicated at **8***a* in Figure 2. This may most easily be done by grasping the package in the hand or hands and striking the corner thereof which contains the bar **2** as indicated at **8** in Figure 1 upon a firm support such as a table top **9**. In this operation, the weight of the contents of the container assist in crumpling the corner and thrusting the bar **2** upwardly out of the container, tearing away a cornered flap **10**, which readily folds back to provide an opening through which the contents may be poured out. The wings **3, 3**, as shown in Figures 2, 3 and 4, overhang the edges of the sidewalls **4, 5** so as to hold the spout in position, and to facilitate pouring the contents out of the opening and along the said spout portion at the top of the bar. Instead of having the wings themselves overhang the side walls **4, 5**, punched out ears or projections **12**, as shown in Figure 5, may be provided to perform this function. In such event, the wings **3, 3** may be extended lengthwise of the bar, so that they will lie partly within the package when the spout is in normal use.

The upper or cutting edge of the bar **2** may be disposed diagonally to the longitudinal axis of the device so as to form a point or peak at the very corner of the bar **2**. This is shown at the edge **7***a* of Figure 5. By thus forming the cutting edge in the shape of a diagonally disposed knife on each limb of the angle, the severing of the flap **10** from the side walls **4** and **5** at the upper corner is facilitated, since the point or peak at the corner will first break through the top wall **6**, and then will progressively shear the edges on each wall **4** and **5** as the bar **2** progresses upwardly relatively to said side walls and top wall. The combined opening bar and pouring spout may be made in a variety of forms. The particular advantage of the angle bar shape, aside from its simplicity, is that it nests well in the corner of a cardboard or similar rectangular box, and will be held in that position by the flowable contents of the box. If desired, the main stem part of the bar **2** may be compact and rodlike, while the upper part is channel-shaped, as will be explained more fully in connection with Figure 20. The function of puncturing the top wall to produce an opening and the function of guiding the material as it is poured out by means of a part constructed or organized to perform as a pouring spout are embodied in the same article.

Figure 11 shows an opening bar and spout member in full lines with the adjacent parts of the box or container **1** shown in dotted lines. The main shaft or shank of the bar **2***a* may be angular in cross section, like an angle bar, i.e., with two legs of the angle at 90° to each other. The lower end may be flanged at right angles to the longitudinal axis to increase the stiffness thereof and to present a greater area for the application of pressure to the bar, or it may be merely cut off square to rest against the bottom wall at the corner. The extended wing portions **3***a* have upper edges **7***b* extending diagonally upward towards the corner of the bar so as to form a more or less spearlike cutting edge which cuts or tears the extreme corner first, and then progressively parts the same from the sidewalls to form the triangular flap **10** shown in dotted lines in Figure 11, and shown in full lines in Figures 12 and 13. The wings or extensions **3***a* preferably lie in the plane of the angular legs of the main body of the bar **2***a*, although, as in the case of the form shown in Figures 1 to 4, a shoulder or projection like **12** in Figure 5 which may rest on the upper edge of the side walls of the box may be provided. In the present structure, the extensions or wings **3***a* have flange members **13, 13** folded in at a 45° angle to the wings or extensions **3***a*, **3***a*, and these flanges **13, 13** tend to hold the triangular flap **10** away from the opening. The flap is bent up along the line **14**. Thus with the combined opening bar and pouring spout disposed wholly inside the box, and guided in the corner thereof in the same manner that the member **2** is shown in Figure 1, the operator grasps the box or container and strikes the lower corner in register with the lower end of the bar **2***a*, against a solid support. This crumples up or folds upwardly the walls of the corner of the box, as previously explained in connection with Figure 2, whereby the spearlike upper end of the bar **2***a* and spout portion **3***a* is driven upwardly through the corner of the box folding back the flap **10**. If the operator wishes to do so, he may pull the pouring spout farther out, as by inserting the finger in the pouring spout and engaging the flanges **13, 13** and pulling on the same to extend the spout outwardly. In such an operation of driving the opening bar through the top wall, the weight of the contents of the box plays a significant part in that the contents have inertia and will tend to drive down the bottom wall and pull the at-

tached side walls downwardly, even though the corner is crumpled or folded as indicated at **8***a* in Figure 2.

If the operator wishes to reclose the box, the opening bar may be pushed part way or all the way back into the container and the flap **10** folded down into closed position. The pouring spout may be forced down only far enough to bring the flanges **13**, **13** out of the way, and then the triangular flap **10** may be pushed into the corner of the pouring spout, and it will be held there fairly firmly by friction of the said flap with the inner surface of the pouring spout. It may be driven out again by hitting the corner of the box against the table top, as shown in Figure 1.

In Figures 6 to 10, I have illustrated the manner in which the opening bar may be applied to a cylindrical can of circular cross section. In Figure 6, the cylindrical can **15** of thin sheet material which may be tin plate, aluminum, cardboard, plastic or other material, has a head or top wall **16**, cylindrical sidewalls **17** and a bottom wall **18** form a closed sealed liquid containing can. Obviously, the contents of the can may be subdivided solid material. Within the can **15**, there is disposed the opening bar **20** which, as shown in Figures 8 and 9, may be a strip of steel or the like arcuate in cross section and having a convex or pointed upper edge, as indicated at **22**.

The lower end of the arcuate bar **20** may sit in an annular groove **23** formed as a bead in the bottom wall **18**. Alternatively, it may sit flat on the bottom. The top edge **22** may likewise be held in a groove in the upper head or wall of the can if so desired. Alternatively, the bar **20** may be disposed against the side wall and held there temporarily by a drop of adhesive which is not affected by the contents of the can.

The upper end of the bar **20***a*, as indicated in Figures 7 and 10, may be curved more sharply, both to reduce the size of the opening circumferentially and to form a greater depth of pouring spout or channel. This may be done by bending toward each other the upper corners **24** of the said bar **20***a* to produce less width and greater depth of curvature of the said upper end, as will be seen in Figure 7. When the bar is used as shown in Figure 6, its lower end may be flanged as at **32** to increase the area against which impact pressure is applied.

The can is opened as indicated in Figure 6 by the operator grasping the can and striking a lower corner at the point where the lower end of the bar is located. This location may be indicated on the outside of the can by a suitable indication. Again the contents of the can help to push inwardly or crumple the walls of the corner, and thereby force the opening bar upwardly through the top wall adjacent the outer periphery of the top wall **16**.

For various types of packages and various contents of the same, different forms of the opening bar and spout may be employed. Thus, as shown in Figures 15, 16 and 17, an opening bar and spout member **25**, has the main shank thereof formed as a substantially cylindrical or arcuate channel **26**. At the upper end wings **27**, **27**, which form extensions of the channel shaped stem walls are curved into a conical spout. The upper edge of the said spout lies in a plane diagonal to the longitudinal axis, so that there is a diagonal cutting edge provided by said spout member. This spout may be disposed in the corner of a rectangular box with the open side disposed towards the center of the box, so that the uppermost corner of the cutting edge falls closely within the corner of the box. Pressure upon the lower end of the stem **26** drives the diagonal cutting edges up through the top wall adjacent the corner and produces an opening through which the spout projects. The spout may be pulled out by the operator as by inserting his finger in the spout opening. So long as the box has contents which hold the bar in position, the spout may be pushed back into place and the flap which is cut loose by the operation of the diagonal edges **28** may be pushed back into place to reclose the package. It may again be opened as above explained by the operator striking the corner of the package against the table top.

In the form shown in Figures 20 and 21, the wings **27***a*, **27***a*, instead of being folded into a closed tubular member, are left as an open channel with the depth of the wall of the wings **27***a*, **27***a* increasing away from the upper end, so that the spout portion, which is formed by the said wings **27***a*, **27***a*, will tend to wedge in the opening which is cut by the upper diagonal cutting edge. Said cutting edge is formed by cutting off the upper edges substantially on a plane which is at an inclination to the longitudinal axis of the device. As explained in connection with Figure 15, this will produce a progressive shearing action as the bar **25***a* is driven upwardly through the top wall of the container. The stem part of the bar shown in Figures 20 and 21 is a solid rod which may be circular in cross section, and be provided with an enlarged foot portion **30**. Such a bar is conveniently made of plastic material. The walls of the foot and of the spout portion are shaped to fit conveniently into the corner of the box, or along the sidewalls of a can, shown in Figure 6.

A modification of the form of spout shown in Figures 20 and 21 is portrayed in Figure 22, where flanges **29** are formed on the edges of the wings **27***b*.

The form of opening bar and spout shown in Figures 18 and 19 is a modification of that shown in Figure 20 to the extent that at the upper end of the bar, where the wing portions **27***a*, **27***a* form the pouring spout, the channel is enlarged as by expanding the said walls **27***a*, **27***a* and producing the shoulder **31**, which allows the outer end of the spout to overhang the adjacent edges of the wall through which the device has cut the opening. This form is shown as employing a channel shaped stem **25***c*. Obviously, a solid rod-like stem may be employed in any of the foregoing forms. Also the provision of a foot at the lower end may be made.

In any of the forms shown, the upper edge of the bar may be sharpened or otherwise shaped to facilitate cutting through the top wall to provide an opening.

Numerous modifications and diverse applications of the invention will occur to those skilled in the art. I do not intend therefore to be limited to the precise details shown and described herein, but intend the claims to be construed as broadly as is consistent with the position of the invention relative to the prior art.

I claim:

1. The combination with a cardboard box having sidewalls forming an outwardly projecting corner and having top and bottom walls joining the sidewalls at said corner, a stiff bar disposed with its length parallel to said sidewalls and lying in said corner substantially in contact with the adjacent sidewalls and extending substantially from said top wall to said bottom wall at substantially right angles to said top and bottom walls, the end of said bar adjacent said top wall constituting means to produce an opening in said top wall whereby striking the bottom wall of said box at said corner against a solid wall will crumple the sidewalls at said corner and drive the bar longitudinally of the sidewalls to separate a portion of the top wall from the side walls at said corner to produce an opening of the box at said corner.

2. The combination of claim 1 wherein the upper end of the bar constitutes a concave pouring spout.

3. The combination of claim 1 wherein the box contains a filling of loose particulate material whereby upward motion of the bar relative to the side walls may be produced by striking the bottom of the corner of the box in which the bar is disposed against a firm flat object such as a table top.

4. A closed package of pourable material comprising top and bottom walls and a side wall joined to said top and bottom walls, said bottom and side walls being made of flexible material, an opening bar in said package said

bar being disposed along its length substantially in contact with said vertical sidewall and at right angles to said top and bottom wall and having its ends substantially engaging said top and bottom walls, the upper end of the bar constituting means adapted to be thrust through the top wall adjacent a sidewall to produce an opening, the lower end of the bar being disposed adjacent the junction of the bottom wall and said side wall, the package with its contents when struck against a flat surface of a solid causing the side walls at said junction to be crumpled and the opening bar to be thrust through the top wall to produce an opening therein.

5. The package of claim 4 characterized by the upper end of the bar being shaped like an angle bar in cross section.

6. The package of claim 4 characterized by four side walls at substantially right angles to each other forming four corners said opening bar being an angle bar nested

in a vertical corner of the container and held laterally in said corner by the contents of the package and said bar being trough-shaped at its upper end to form a pouring spout.

7. The package of claim 4 characterized by four side walls at substantially right angles to each other forming four corners and wherein the bar lies in one of said corners and is trough-shaped at its upper end to form a pouring spout said pouring spout constituting a finger hold into which the finger of the operator may be inserted to pull the bar outwardly.

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