

June 15, 1965

W. W. McFARLAND

3,189,251

CONTAINER

Filed April 25, 1961

3 Sheets-Sheet 1

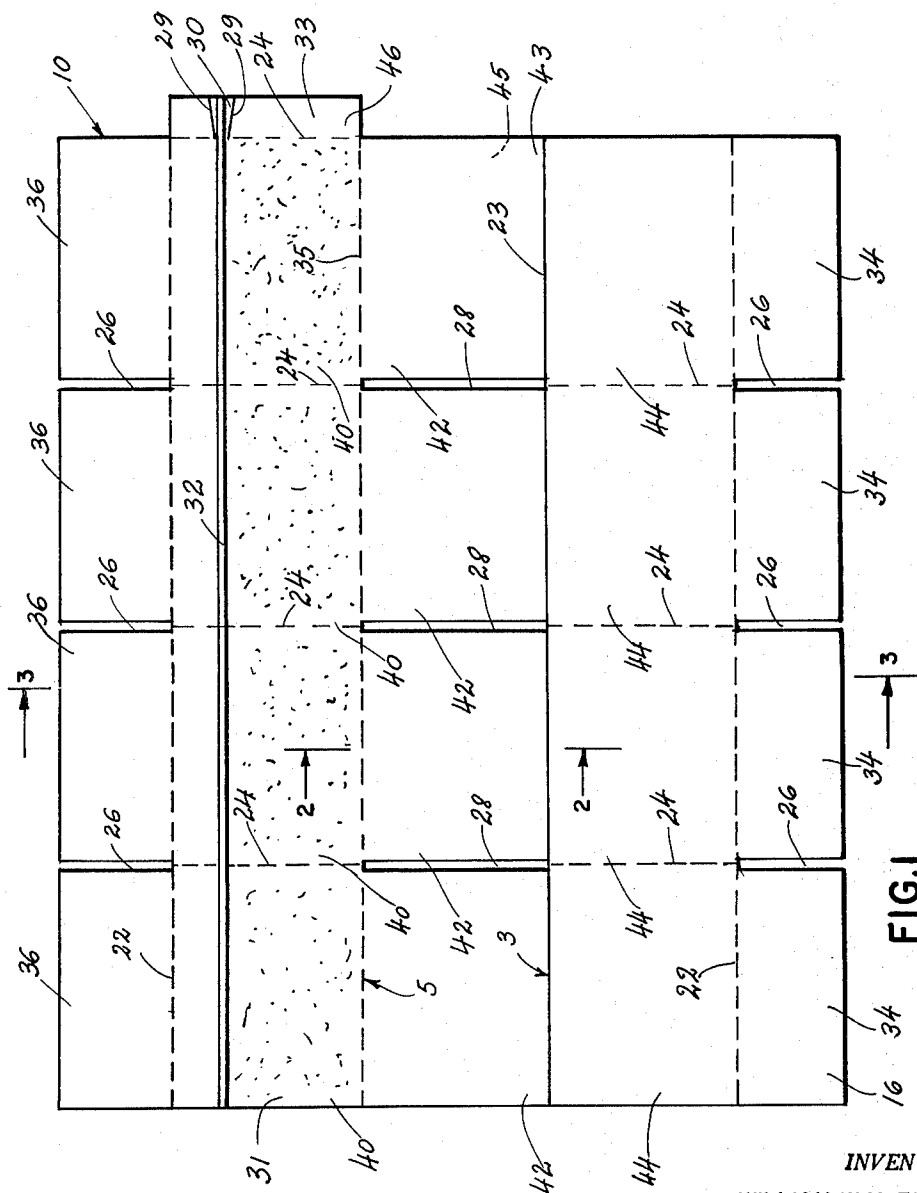


FIG. 1

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3 Sheets-Sheet 2

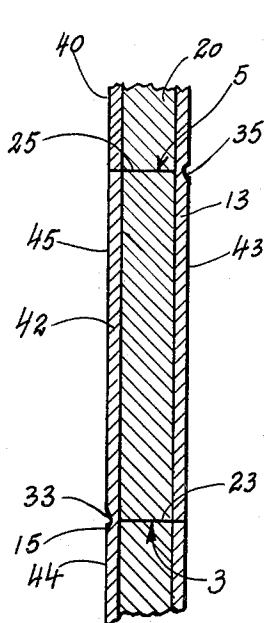


FIG. 2

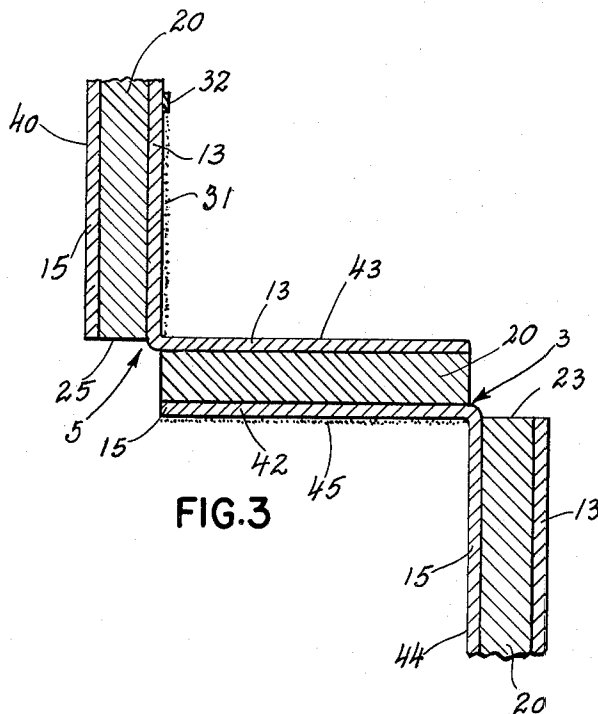


FIG. 3

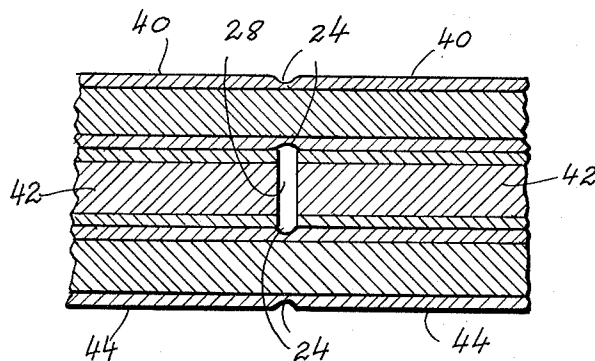


FIG. 6

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3 Sheets-Sheet 3

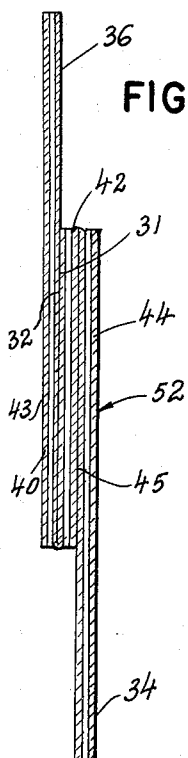


FIG. 4

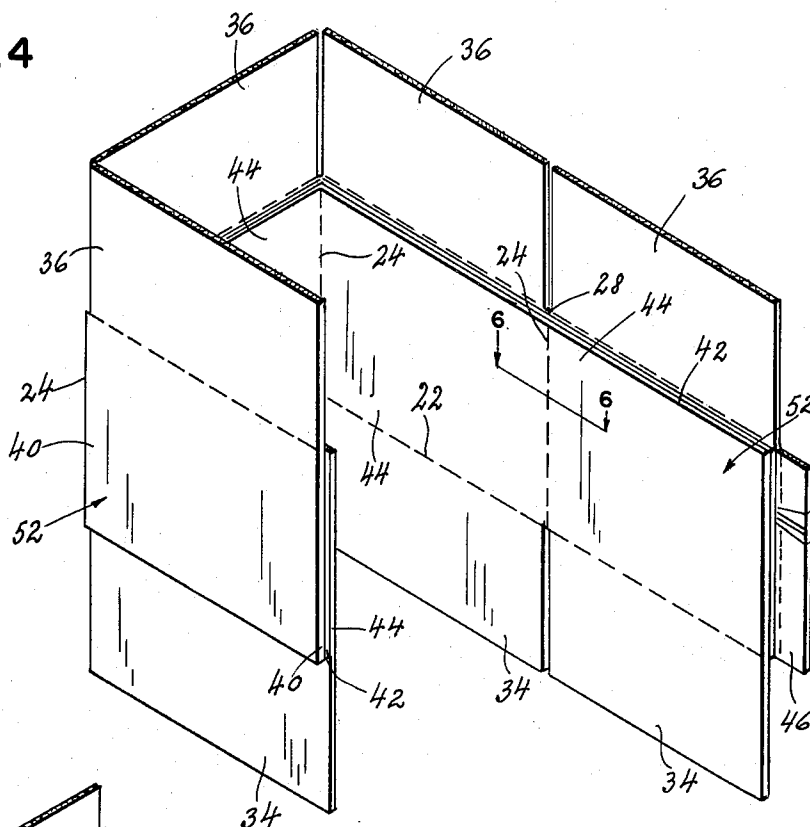


FIG. 5

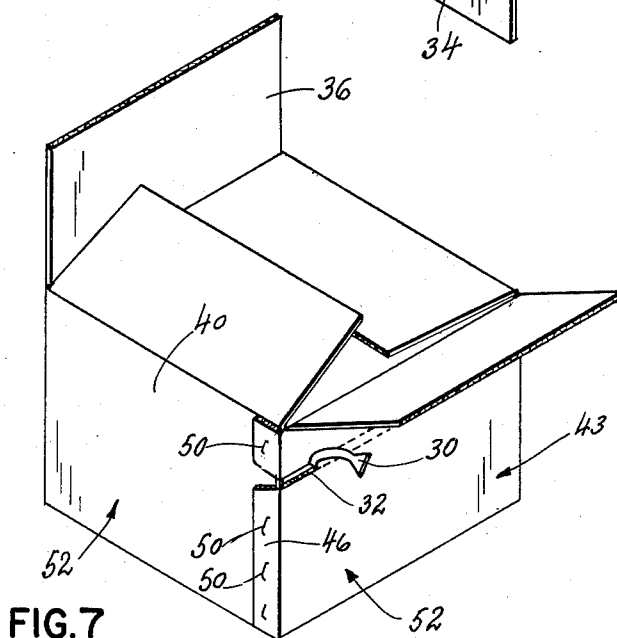


FIG. 7

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3,189,251 CONTAINER

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11 Claims. (Cl. 229-51)

This invention relates to containers and more particularly to a container that has reinforced side walls and is formed from a one-piece blank of foldable sheet material.

The one-piece blank or the partly formed and collapsed container can be shipped to the user in flat condition. This greatly reduces shipping costs. The one-piece construction also increases the ease with which the containers can be formed from the blanks. It is, therefore, an object of this invention to provide a one-piece blank or partly formed container that can be shipped flat and then readily and simply formed, by the user, into the completed container.

It is commonplace to stack packed containers one on the other during shipment or in storage. It is, therefore, important that the walls of the containers have adequate strength to withstand the considerable loads to which they may be subjected in use. This problem has been solved in the past in a number of ways, primarily by affixing to the walls, a reinforcing member of wood or a like material. This, of course, involves additional parts and further complicates shipping and assembling. It is therefore, a further object of this invention to incorporate in the blank per se means to form a container having reinforced side walls.

The blanks of this invention are cut from a suitable sheet material, preferably corrugated board, and scored to provide fold lines. It is a relatively easy matter to fold a single thickness blank of corrugated board, which has been properly scored, into container form. However, if the folding required to form the container involves two or more thicknesses or plys of corrugated board, as it does in the present invention, in the formation of the reinforced walls, it is quite difficult, in fact often impossible, to obtain accurate and symmetrical corners without placing stress on one or more of the plys, particularly the outer ply, at the corner fold. This stress, in time, can cause a rupture along the corner fold, thereby weakening the box to such an extent as to destroy its utility. It is, therefore, another object of this invention to provide a blank having incorporated therein means to fold two or more thicknesses of corrugated board to form a container having accurate and symmetrical corners.

A standard container, called a regular slotted container, is the one most generally used by the shipping industry, because it is the most economical to manufacture and uses less material than any other providing the same strength and volume of shipping space. As a result, the greatest number of available automatic machines for setting up and closing containers are those designed to service the regular slotted container. It is, therefore, another object to provide a blank that is foldable to form a regular slotted container having triple ply side walls that can be set up on and closed by standard machines.

Further objects and advantages will appear from the following detailed description.

In the drawings:

FIG. 1 is a plan view of a blank, in accordance with the invention, from which a container is made;

FIG. 2 is an enlarged fragmentary section taken along line 2-2 of FIG. 1;

FIG. 3 is an enlarged section taken along line 3-3 of FIG. 1 showing the initial stages of folding;

FIG. 4 is an enlarged section showing the completion of the initial stages of folding;

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FIG. 5 is a perspective view showing further stages of folding;

FIG. 6 is a fragmentary section taken along line 6-6 of FIG. 5; and

FIG. 7 is a perspective view of the box showing stages of folding the top flaps.

The container 13 shown in FIG. 7 is formed from a one-piece blank 10 (FIG. 1) cut from suitable sheet material, preferably corrugated board, which consists of a first liner 13 and a second liner 15 adhesively secured to a corrugated medium 20, as shown in FIGS. 2 and 3.

The blank 10 has longitudinal scores 22, 33 and 35 and transverse scores 24 which provide fold lines for erecting the container. The fold lines each of which is of substantially uniform width throughout its length, generally define and hingedly connect bottom closure flaps 34, top closure flaps 36, outer walls 40, intermediate walls 42, inner walls 44 and a stitch or glue flap 46.

Scores 33 and 35 can be impressed on both sides of blank 10, so as to provide two parallel lines of indentation, one in the plane of first liner 13 and one in the plane of second liner 15, per score and such impressions afford even greater folding facility. But the greatest folding facility is achieved when slit score constructions 3 and 5 are substituted for or are used supplementary to the single or double line of indentations of which scores 33 and 35 are constituted so that, in a preferred embodiment, tape hinging means are supplied to blank 10 in the following manner; slit score 3 along the lower edge of intermediate walls 42 is made up of a first slit 23 cut through first liner 13 and corrugated medium 20, but not through second liner 15, and a parallel line of indentation 33 on second liner 15 and slit score 5 along the upper edge of intermediate walls 42 is made up of a second slit 25 cut through second liner 15 and corrugated medium 20, but not first liner 13, and a parallel line of indentation 35 on first liner 13. As shown, slit scores 3 and 5 extend from one transverse edge of the blank to the other.

Slits 29 extend inwardly in a converging relation from the free edge of the flap 46 to a fold line 24, thereby defining a tear tab 30.

The outer walls 40 have means to sever them along a tear line for the purpose further to be described, including the tear tab 30 and a tear tape 32 which is adhesively secured to an inner surface 31 of the outer walls and extends under the tear tab from a transverse edge of the outer walls to a transverse edge of the flap.

The elements of the blank have been described with reference to the positions which they occupy when the blank has been folded into container form. It will be understood that the blank elements and fold lines are appropriately formed and disposed to permit folding of the blank to produce the container in the manner to be described.

To form the container, the inner and outer walls 40 and 44 are folded, as shown in FIG. 3, along the longitudinal fold lines 33 and 35 at the opposite edges of the intermediate walls 42, and into abutting contact with the opposed surfaces of the intermediate walls where they are secured in place by glue applied to prior to or during formation of the container. In this position, as shown in FIG. 4, the outer walls are in abutting contact with an outer surface 43 of the intermediate walls and the inner walls are in abutting contact with an inner surface 45 of the intermediate walls.

The glued and superimposed inner, intermediate and outer walls which are of substantially equal height, and the flap 46 are then folded along the transverse fold lines 24 and are secured together by an appropriate means, such as staples 50 which pass through the four layers thus provided, thereby forming a manufacturer's joint.

Thus folded, the inner, intermediate and outer walls constitute triple ply side walls that are generally designated 52 as seen in FIG. 6. The reinforced walls 52 have exceptional strength which enables them to support heavy loads without risk of collapse and injury to the contents of the box when the loaded containers are placed in stacks of considerable height. It should be further noted that in this condition the partly formed container is a regular slotted container. It can be folded and shipped flat to the user and as such set up and closed on standard machines.

When the container is to be filled, it is erected into a rectangular condition and the bottom closure flaps 34 are folded, along the fold lines 22 defining the bottom flaps, perpendicular to the inner walls 44 to which they are connected and are surface glued or otherwise secured to form the bottom closure. After the container is filled with its contents, the top closure flaps 35 are folded, along the fold lines defining the top flaps, perpendicular to the outer walls 40 to which they are connected, where they are secured in the same manner as the bottom flaps to form the top closure.

The intermediate walls are separated from each other by means defining a plurality of transverse slots 23 that are disposed between their lower and upper edges and connect the intersections of the longitudinal and transverse fold lines. When the inner, intermediate and outer walls are superimposed, these slots are positioned between the respective fold lines 24 that define the inner and outer walls. In other words, as shown, for example in FIG. 6, the fold line 24 defining inner wall 44 directly overlies the slot 23 defining intermediate wall 42 which in turn directly overlies the fold line 24 defining the outer wall 40.

The slots constitute a means to fold the triple ply walls 52 perpendicular to each other without undue stress being placed on the corners and particularly on the outer ply at the perpendicular corner fold.

Without the presence of the slots 23 there would be three thicknesses of corrugated board at the corner folds. It is extremely difficult to mold three thicknesses of corrugated board, particularly to obtain accurate and symmetrical corners and even if acceptable corners are obtained, the stress placed on the outer ply is often so great as to cause rupture because in forming the corner, the outer ply must be stretched disproportionately to the intermediate and inner plys.

With the slots 23, there are only two thicknesses of corrugated board at the corner folds and when folded to form a corner the slots accommodate the convex corners of the inner walls thereby relieving the stress on the corners of the outer walls. By so doing, accurate and strong corners are obtained without placing undue stress on the outer walls at the corner folds.

Preferably, the glue for securing the inner, intermediate and outer walls together is applied to the entire inner surface 45 of the intermediate walls and to the inner surface 31 of the outer walls in a zone bounded by their lower edges and the lower edge of the tear tape 32 and is omitted in a zone bounded by their upper edges and the upper edge of the tear tape, for the reason to be further described.

To open the container 13, the tab 30 may be grasped and pulled outwardly, as shown in phantom in FIG. 6, thereby severing the outer walls 40 along a tear line. As the outer walls are torn, the tear is guided and reinforced by the tear tape 32 so that a continuous tear strip is removed from one transverse edge of the outer walls to the other.

This divides the outer walls into two parts. The lower part is secured to the intermediate walls by the glue applied to the outer walls below the tear line, as has been explained. However, since glue has been omitted from the outer walls above the tear line, the upper part is free to move with respect to the intermediate walls being held in place only by the staples 50 that secure the flap 46

and the triple ply side walls together, above the tear line.

The container may now be opened by exerting a slight upward pull on the outer walls in the immediate area of the staples, thereby pulling them free of the staples. In so doing, the outer walls are completely separated from the intermediate walls. It is important to note that the upper part of the outer walls and the top flaps forming the top closure constitute a cover that can now be removed and re-set at will, the outer walls telescoping over the intermediate walls when it is replaced.

It is, of course, possible to open the container without completely removing the cover. This may be done by exerting an upward pull on the outer walls at the corner directly opposite the staples. In so doing the cover is pivoted upwardly in an arc about the portion of the outer walls secured by the staples to the intermediate walls above the tear line. This portion constitutes, as such, a cover hinge means by which the cover is secured to the intermediate walls and which functions as a pivot about which the cover is swung to open the container.

In the preferred embodiment of this invention, the flap 46 is secured to the triple ply side walls by staples that pass through the flap and all three layers of the side walls. However, if it is desired the flap may be secured by staples or glue to the outer walls only. When this is done, of course, once the tear strip is removed there is nothing securing the cover to the intermediate walls and it may readily be removed and replaced at will.

While the container is preferably formed of corrugated board, it is also contemplated that a container constructed in accordance with this invention may be made of other material such as a heavy sheet of paper-board.

What is claimed is:

1. A one-piece blank of sheet material foldable to form a container, said blank including intermediate walls having opposed surfaces, inner and outer walls connected to said intermediate walls at opposite edges thereof, said inner, intermediate and outer walls being of substantially equal height and tape hinging means along said opposite edges of said intermediate walls whereby said inner and outer walls are foldable into abutting contact with said opposed surfaces of said intermediate walls.

2. A one-piece blank of sheet material foldable to form a container, said blank including intermediate walls having inner and outer surfaces, inner and outer walls connected to said intermediate walls at opposite edges thereof said inner, intermediate and outer walls being of substantially equal height and tape hinging means along said opposite edges of said intermediate walls whereby said outer walls are foldable into abutting contact with said outer surface of said intermediate walls and said inner walls are foldable into abutting contact with said inner surface of said intermediate walls, said tape hinging means being in the form of slit scores.

3. A one-piece blank of sheet material foldable to form a container, said blank having inner, intermediate and outer walls of substantially equal height, said blank having intersecting longitudinal and transverse fold lines generally defining said walls and hingedly connecting them to each other, each of said fold lines being of substantially uniform width throughout its length, said intermediate walls having means defining a plurality of transverse slots, said slots extending between opposite edges of said intermediate walls and connecting the intersections of said longitudinal and transverse fold lines.

4. A one-piece blank of sheet material foldable to form a container, said blank having inner, intermediate and outer walls of substantially equal height, and a flap, said blank having intersecting longitudinal and transverse fold lines generally defining said walls and said flap and hingedly connecting them to each other, and severing means including a tear tab formed at one of said transverse fold lines and tear means affixed to said outer walls and extending from said tear tab longitudinally to a transverse edge of said outer walls.

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5. The blank of claim 4 in which said flap is connected to said outer walls and in which said tear tab is formed in said flap.

6. A container having reinforced side walls comprising intermediate walls having opposed surfaces and opposite edges, tape hinging means along said opposite edges of said intermediate walls, inner and outer walls connected to said intermediate walls by said tape hinging means, said inner, intermediate and outer walls being of substantially equal height, said inner walls being folded along one of said tape hinging means and into abutting contact with one of said surfaces of said intermediate walls and said outer walls being folded along the other of said tape hinging means and into abutting contact with the other of said surfaces of said intermediate walls.

7. The container of claim 6 in which said tape hinging means along said opposite edges of said intermediate walls are in the form of slit scores.

8. A container having reinforced side walls comprising inner, intermediate and outer walls of substantially equal height, said container having intersecting longitudinal and transverse fold lines generally defining said walls and hingedly connecting them to each other, each of said fold lines being of substantially uniform width throughout its length and said intermediate walls having means defining a plurality of transverse slots, said slots extending between opposite edges of said intermediate walls and connecting the intersections of said longitudinal and transverse fold lines.

9. A container having reinforced side walls comprising inner, intermediate and outer walls of substantially equal height, said container having intersecting longitudinal and horizontal fold lines generally defining said walls and hingedly connecting them to each other, severing means including a tear tab formed at one of said transverse fold lines and tear means affixed to said outer walls and extending from said tear tab longitudinally to a transverse edge of said outer walls, said inner and outer walls being folded into abutting contact with opposed surfaces of said intermediate walls and secured thereto by zones of glue and at least one of said zones of glue being disposed so as to leave an area of abutting sur-

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faces of said intermediate and said outer walls free of glue above said severing means.

10. In the container of claim 9, a flap connected to said outer walls by one of said transverse fold lines and means securing said flap to said inner, intermediate and outer walls.

11. A paperboard shipping container comprising four side wall panels foldably connected together into a tubular configuration, top closure flaps foldably connected to the upper edges of said side wall panels and arranged to close the upper end of said tubular configuration, first panels foldably connected to the lower free edges of each of said side wall panels, second panels foldably secured to the outer free edges of said first panels, said first and second panels having a height substantially equal to said side wall panels, said first and second panels folded into parallel relation with said side wall panels, said side wall panels, first panels, and second panels being adhesively secured together at their respective interfaces, and bottom closure flaps foldably secured to the free edges of said second panels, said bottom closure flaps arranged to close the lower end of said tubular configuration.

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