

July 2, 1946.

B. BOGOSLOWSKY

2,402,943

CONTAINER

Filed Nov. 21, 1942

2 Sheets-Sheet 1

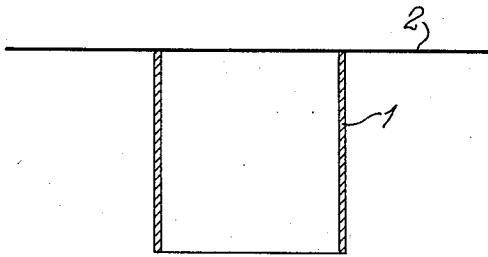


Fig. 1.

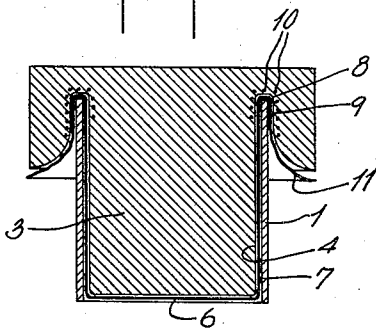


Fig. 2.

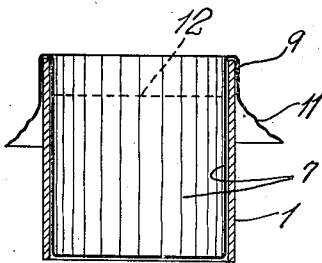


Fig. 3.

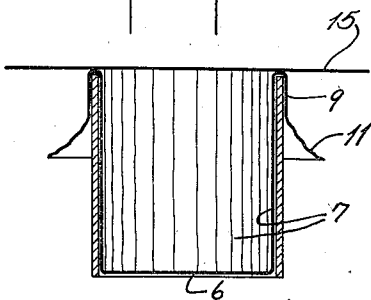


Fig. 4.

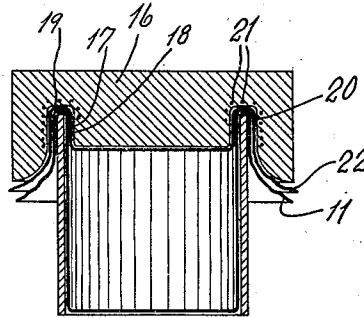


Fig. 5.

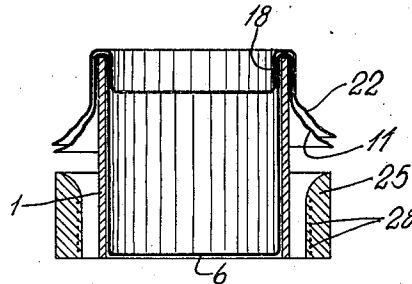


Fig. 6.

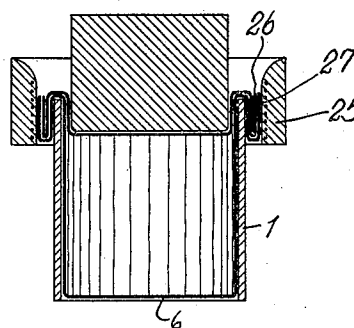


Fig. 7.

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2 Sheets-Sheet 2

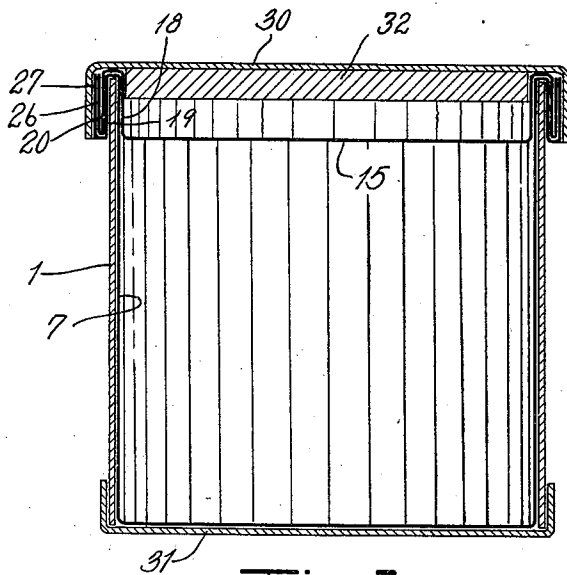


Fig. 8.

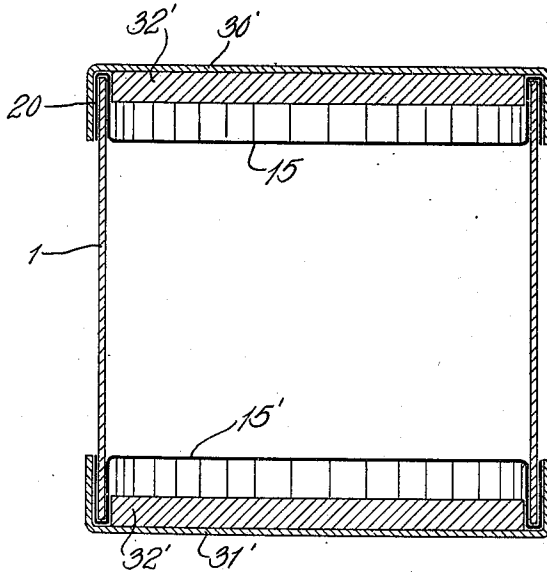


Fig. 9.

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UNITED STATES PATENT OFFICE

2,402,943

CONTAINER

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Application November 21, 1942, Serial No. 466,424

1 Claim. (Cl. 229—5.5)

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This invention relates to containers, and particularly to containers of paper or plastic film materials or combinations thereof.

It is an object of the invention to provide a container of a size and shape comparable to the ordinary tin can, having provision for sealing the contents, either liquid or dry, against leakage or contamination, having strength adequate to withstand the normal handling to which such containers are subjected, and capable of use for packaging some of the products ordinarily packaged in tin cans.

Other objects and advantages of the invention will appear hereinafter.

A preferred embodiment of the invention selected for purposes of illustration is shown in the accompanying drawings, in which,

Figures 1 to 7 inclusive are vertical sectional views showing a method of making such containers.

Figure 8 is a similar view showing a completed container.

Figure 9 is a similar view showing a modified form of completed container.

In the above figures of the drawings, because of the impracticability of showing thickness of sheets of paper or plastic films of the order of .0015" to .003", such sheets are illustrated by single lines, but in order to avoid confusion at points where such sheets abut or lie contiguously, such lines are spaced apart in order that the configuration of the sheets may be followed. In a sense, therefore, the above figures are diagrammatic, in that a space between two adjacent lines representing such sheets must be understood to be for purposes of clarity in illustration only.

The container may be conveniently described with reference to one method of making the same, and Figures 1 to 7, illustrating such method will now be referred to.

Referring to Figure 1, a cylindrical shell 1 is provided, which said shell may be made of any desired material such as spiral wound paper board of suitable thickness. As the first step in making the container a flat sheet 2 of suitable material is placed over one of the open ends of the cylindrical shell. As will appear hereinafter, the sheet 2 forms a lining for the shell, but such lining constitutes the real body of the container, as the shell 1 serves merely as a forming tool during the making of the container and as a strengthening and protective shell for the finished container. The sheet 2, therefore, should be selected from that group of paper or plastic film materials which is known or can be proven to

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provide the desired protection for the product to be packaged. Among the group of materials from which selection may be made are sheet or film materials such as Cellophane, Pliofilm, Vinylite, cellulose acetate, and paper coated, impregnated or otherwise treated to impart water or oil resistant qualities. Preferably, for reasons which will appear, such sheet or film materials should be thermoplastic or heat sealing, or should be coated with thermoplastic or heat sealing material.

After arranging the sheet 2 as shown in Figure 1, a die 3 is brought down from above, which said die has a lower cylindrical wall 4 fitting rather closely to the interior wall of the shell 1. The downward movement of the die inserts the sheet 2 into the shell to form a cup shaped body having a smooth flat bottom 6 and pleated cylindrical side walls 7. The upper portion of the die 3 is provided with an annular groove 8 which fits snugly over the upper edge of the shell, thus reversely folding the upper section or marginal portion of the pleated side walls over the upper edge of the shell to form a downwardly extending collar 9.

Preferably the die is provided with an electrical heating element 10 along the wall of the annular groove, so that if thermoplastic or heat sealing materials are used as previously described, the overlapping folds of the pleats may be sealed so as to hold the cup shaped body in shape after removal of the die. It will be noted, however, that the sheet 2 is of sufficient size so that a loose skirt 11 of pleated material extends below the sealed portion of the collar 9 for purposes hereinafter described.

After removal of the die 3, the container, as shown in Figure 3, is ready for filling. Preferably, however, it is only filled to a level somewhat below the upper edge as indicated by the dotted line 12.

After filling, the next step is to place a sheet 15 of suitable material over the cup shaped body as shown in Figure 4, said sheet being preferably a material of the same nature as the material from which the body is formed and adapted to serve as a closure therefor. After thus arranging the sheet 15, a die 16 is brought down from above, which said die has a relatively short cylindrical wall 17 fitting rather closely to the upper portion of the interior wall of the cup shaped body. The downward movement of the die depresses the central portion of sheet 15 approximately to the filling level of the container, and forms pleated side walls 18 lying contiguous to the interior walls of the cup shaped body. The

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upper portion of the die 16 is also provided with an annular groove 19 which fits snugly over the upper edge of the shell and cup shaped body thus reversely folding the marginal portion of the sheet 15 over the edge of the cup shaped body to form a downwardly extending collar 20.

Preferably the die 16 is provided with an electrical heating element 21 along the wall of the annular groove, so that the margin of the closure sheet 15 may be sealed to the cup shaped body. Preferably such sealing extends along the contiguous portions of the collars 9 and 20 and over the edge of the shell and along at least a portion of the contiguous sections on the interior of the cup shaped body. Such sealing may extend over the entire area of such contiguous sections, but by sealing only the upper portion thereof, as for example one-fourth to one-half of the distance from the upper edge, provision is made for expansion of the contents of the container in the cases where such expansion is likely to occur. Again it may be noted that the sheet 15 is of sufficient size so that a loose skirt 22 extends below the sealed portion of the collar 20.

The container is now tightly sealed and if desired, after removal of the die 16, the skirts 11 and 22 may be trimmed off to provide a finished container which is adequate for many purposes. However, I prefer to further improve the seal and strengthen the container as follows. Referring to Figure 6, a ring 25 is placed around the container and is moved upwardly to the position shown in Figure 7, thereby engaging the skirts 11 and 22 and forcing them upwardly to form a two ply collar 26, 27, concentric with and abutting the collar 20. Preferably the ring 25 is provided with an electrical heating element 28, which, in the case of thermoplastic or heat sealing material, seals the plies and folds of the collar 26 to each other and seals the collar 26 to the collar 20. If desired, a cylindrical plug 29 may be inserted in the depression in the closure to cooperate with the ring 25 during the sealing operation. It will be understood that while the collar 26 is shown outside the collar 20, by a slight change in the shape of the ring 25 the loose skirts 11 and 22 might be tucked inside the collar 20 and sealed in the same manner.

In the foregoing description, it will be understood that while heat sealing materials are preferred because of their convenience, suitable adhesives may be used if desired, within the scope of the invention.

One form of the completed container is illustrated in Figure 8, wherein for strengthening and protective purposes the top and bottom of the shell are provided with paper board covers 30 and 31. If desired, the top cover may be provided with a paper board plug 32 which projects into the end of the shell, as shown. The outer periphery of such a plug engages and holds the closure material against the internal wall of the shell and prevents breaking of the seal even when subjected to considerable internal pressure. It will be noted, however, that the lower surface of the plug is spaced from the flat portion of the sheet 15, so as to retain the advantage of the expansion chamber. It will be understood, however, that for many purposes the container may be used without such covers. It will also be understood that for certain purposes, and particularly for containers of the smaller sizes, the shell 1 is not required in the finished container and may be withdrawn after the forming operations

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are completed, thus leaving merely the liner and closure which in themselves form a complete sealed container.

A modified form of container is illustrated in Figure 9. In this form, the interior lining is dispensed with and the cylindrical shell 1 forms the side walls of the container. By treating paper board from which such shells may be formed with wax or asphaltum in accordance with known processes such material may be rendered moisture or oil resistant to an extent sufficient for many purposes.

In making this modified form of container the closure sheet 15 is applied directly to the upper edge of the shell following the steps illustrated in Figures 4 and 5. In this form, however, it is less important to perform the steps illustrated in Figures 6 and 7, and any depending skirt of loose material below the sealed collar 20 may be trimmed off as previously described.

A similar closure sheet 15' may be applied directly to the lower edge of the shell in precisely the same manner. While it is only necessary to make provision for expansion at one end of the container, it is advantageous to use this type of closure at both ends because of the additional protection provided against leakage, particularly when the package is subjected to crushing stresses.

Covers 30' and 31' of paperboard may also be provided for the top and bottom, respectively, and such covers may be provided with paper board plugs 32' which project into the ends of the shell, as before.

It will be understood that the invention may be variously modified and embodied within the scope of the subjoined claim.

I claim as my invention:

A container comprising a seamless cup shaped body formed from a flat sheet of material and having a substantially flat bottom portion and pleated side walls, the upper section of said pleated side walls being reversely folded and extending downwardly from an upper edge formed by said fold substantially parallel to said side walls, and a closure for said cup shaped body, said closure being formed from a second sheet of material extending transversely across the open upper end of said cup shaped body below the upper edge thereof, and having a portion extending upwardly therefrom contiguous to said pleated side walls, said second sheet consisting of thin material having a high degree of flexibility and having heat sealing properties, the upper part of said contiguous portions being heat sealed together, and leaving the lower part of said contiguous portions unsealed, said second sheet being reversely folded over the upper edge of said cup shaped body and extending downwardly therefrom substantially parallel to said reversely folded portions of said side walls, said parallel portions being heat sealed together, the flexibility of said second sheet being such that the transversely extending portions of said second sheet and the unsealed portions thereof extending upwardly therefrom present no appreciable resistance to deformation when the upper rim of said cup-shaped body is subjected to deformation, and no appreciable resistance to deformation on expansion of the contents of the container, whereby stresses tending to tear said second sheet are avoided when said sheet is deformed for either reason.

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