

Dec. 14, 1965

M. SCHNEIDER

3,222,843

FOAM PACKAGING METHOD AND CONSTRUCTION

Filed Nov. 20, 1961

4 Sheets-Sheet 1

FIG. 1

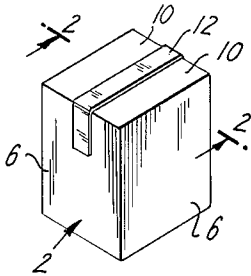


FIG. 2

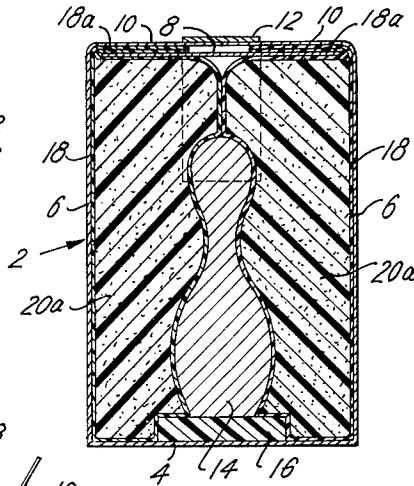


FIG. 3

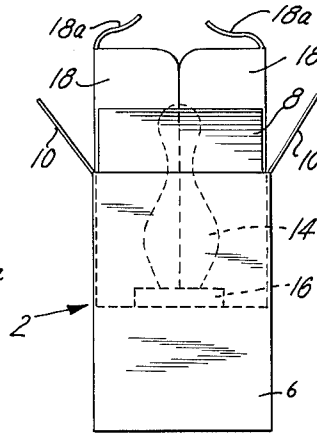


FIG. 5

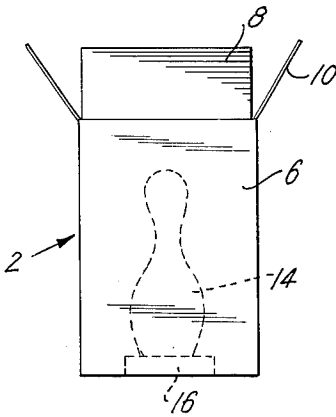


FIG. 4

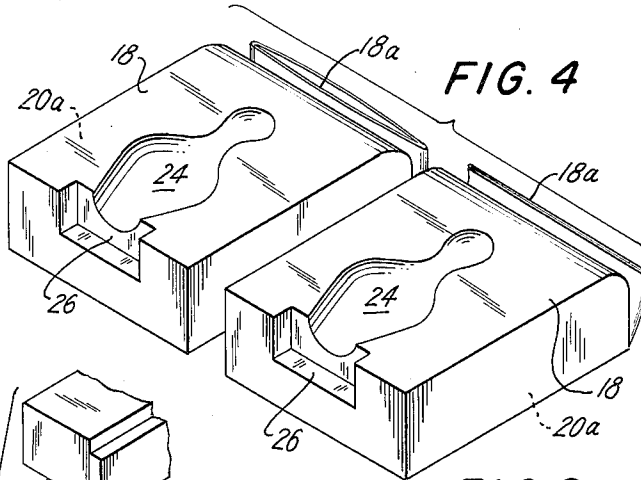


FIG. 7

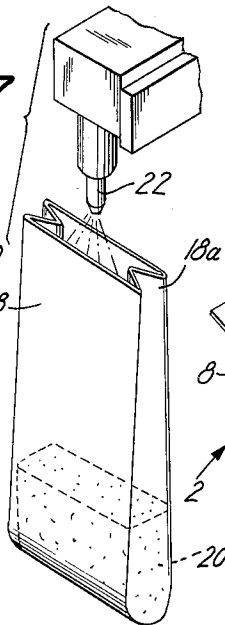


FIG. 6

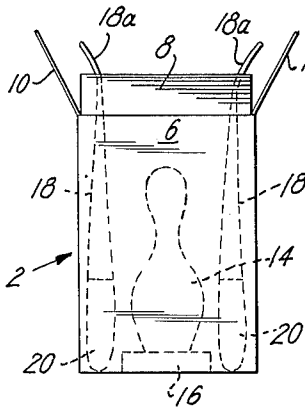


FIG. 8

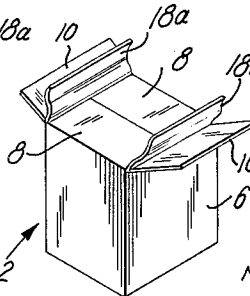
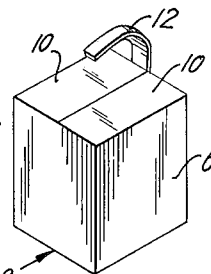


FIG. 9



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FIG. 10

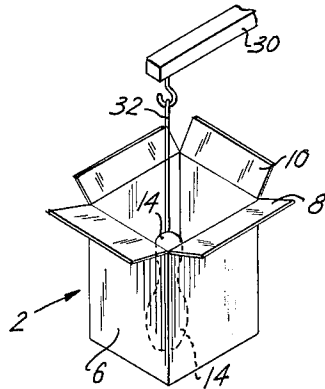
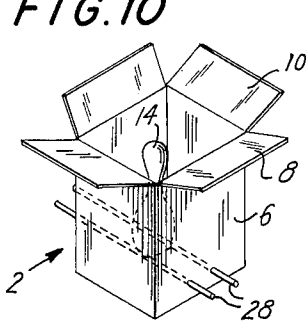


FIG. 11

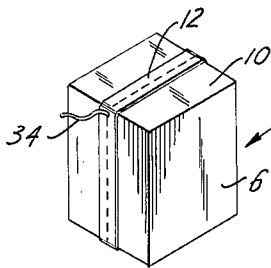


FIG. 12

FIG. 14

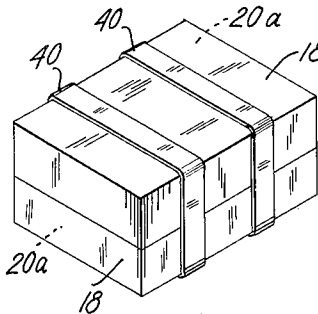


FIG. 13

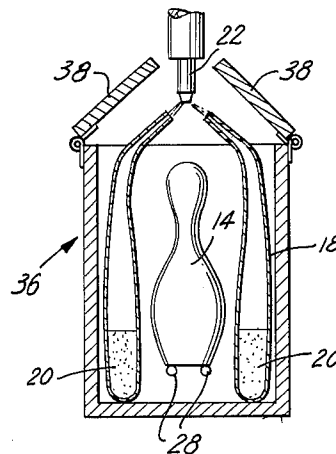
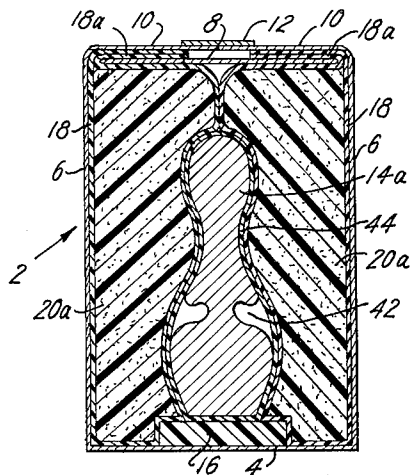


FIG. 15



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FIG. 17

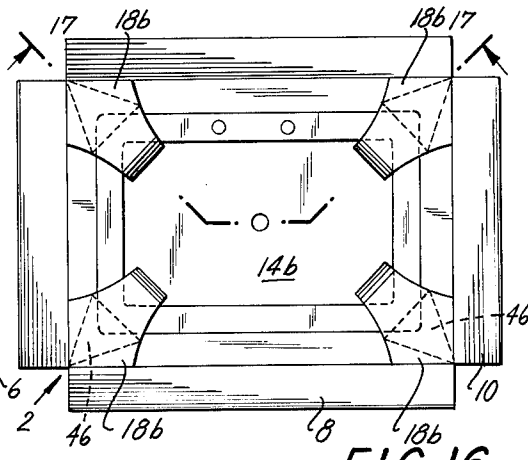
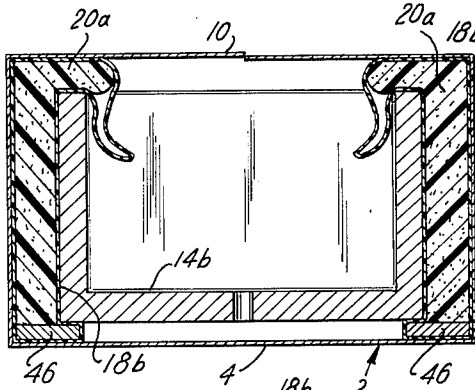


FIG. 16

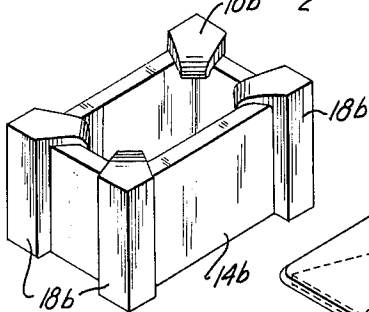


FIG. 18

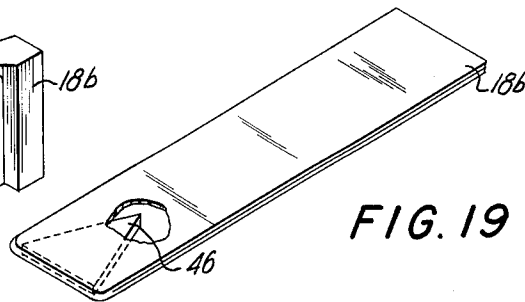


FIG. 19

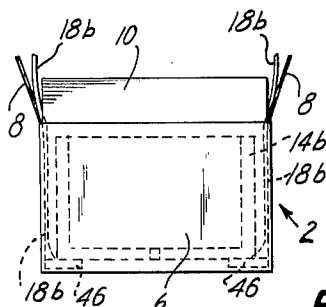
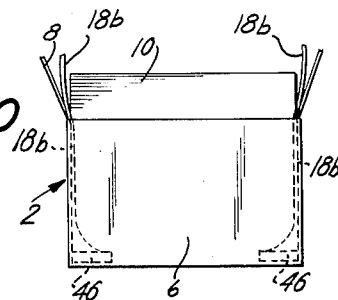


FIG. 21

FIG. 20



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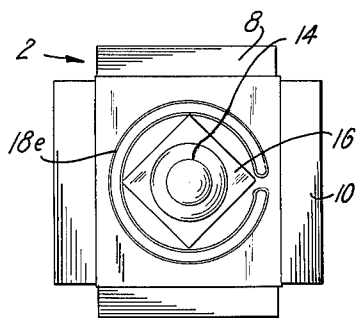
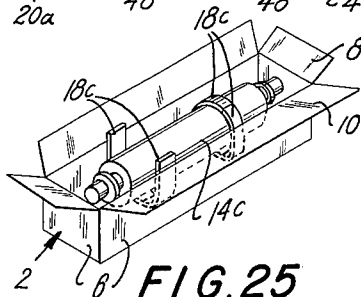
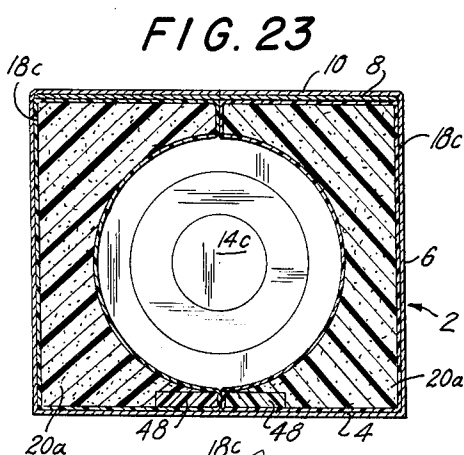


FIG. 28

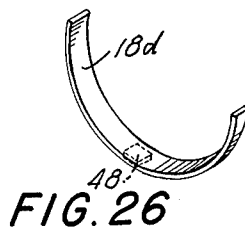
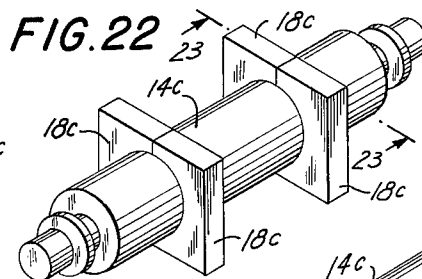


FIG. 26

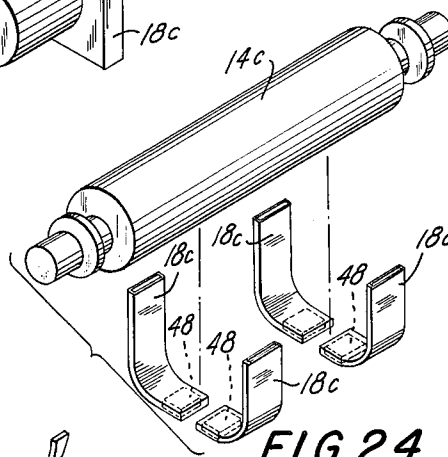


FIG. 24

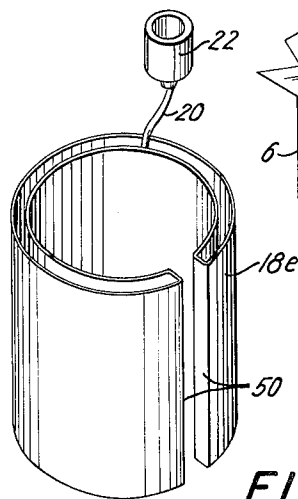


FIG. 29

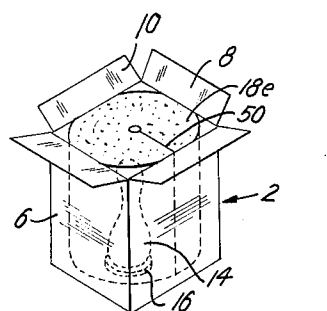


FIG. 27

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Filed Nov. 20, 1961, Ser. No. 153,406
20 Claims. (Cl. 53—27)

The present invention relates to an improved method for utilizing foamed plastic materials in connection with the packaging and protection of objects, and to the package produced thereby.

The use of foamed plastic materials for packaging and protection is widespread, because such foamed plastic materials, when caused to wholly or partially surround an object, are effective to protect that object against shock, thermal changes, electric fields, moisture, contamination, radiation, and a wide variety of other external influences. The foamed materials, which are considerably lighter than water, may also be used to provide floatation for an otherwise non-floating object, and may be mold-proof, mildew-proof, vermin-proof, and fire retardant. While packaging for purposes of shipment is most common, packaging broadly considered is used for many other purposes not involved with actual shipment. Thus objects may be "packaged" within a complete or partial covering for thermal, acoustic or vibration damping, to protect against dust or moisture, and for many other purposes, while said objects are in storage or in use. It is often desired in such instances that said objects be accessible for repair, replacement or adjustment. The term "packaging," as here used, comprehends these and comparable applications.

As conventionally used in the prior art, the object to be packaged or protected is placed within a container in spaced relation to the walls thereof and foamable plastic is introduced into the spaces between the object and the container walls, the plastic material then foaming, expanding and setting so as to take up substantially all of the space between the object to be protected and the container walls.

This technique, although in widespread use, is subject to many disadvantages. The foamed material must be provided in sufficient quantity to substantially completely encompass the object to be protected and to fill all of the space between that object and the outer container. While this is often desirable or satisfactory, there are many instances where it represents a waste of foamed material, and hence a source of additional expense and weight. The prior art techniques do not readily permit the selective use of foamed material only at the specific areas where protection or support may be required.

With the prior art techniques much difficulty is experienced in removing the encased object from its package or protective covering when the packaged object is to be used, and under most circumstances such removal results in destruction of the foamed covering, preventing its reuse.

The prior art techniques usually require the use of an outer container which surrounds the foamed material, that outer container forming a part of the overall package. Where, as is usually the case, the outer container is of a type such that the foamed plastic material will tend to adhere thereto, great difficulty is presented in removing the foamed material, together with the encased object, from the container.

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In accordance with the teachings of the present invention all of the disadvantages of the prior art foamed resin packaging techniques are avoided without any sacrifice in the advantages inherent in the use of foamed plastic materials for packaging or protection purposes. More specifically, the amount of foamed material used, and the location of that material relative to the object to be packaged or protected, may be modified and controlled to suit the particular object of the particular problem, and all in a simple and easily accomplished manner. The foamed plastic bodies are formed in such a manner as to readily be reusable with the same object or objects of similar shape. Not only are the prior art difficulties in removing foam-encased objects from their containers and separation of such objects from their foam encasements eliminated, but the removal of such objects is greatly facilitated even when compared with more conventional packaging techniques.

The technique of the present invention represents a substantial improvement over prior art techniques for the further reason that the packaging operation can be carried out in more efficient manner from a production point of view. Packages may be formed and closed as quickly as the desired amount of foaming material is inserted thereinto, and without waiting for that material to foam and set, because the desired volume of foaming material can be more accurately ascertained than has previously been the case. All in all, the cost savings inherent in the practice of the instant invention derive from a combination of lowered material cost, labor costs, storage space for pre-formed materials, shipping weight, and container size, all with no sacrifice in the degree of protection or insulation afforded to the packaged objects.

In accordance with the present invention, the foaming material is contained within a flexible bag into which it is introduced either in unfoamed or in foamed but unset condition. When unfoamed material is introduced the foaming takes place in situ in the bag. These individual bags are appropriately positioned between the object and an outer enclosure, the size and distensibility of the bags and the amount of foamable material inserted thereinto being correlated with the particular packaging or protection problem involved, to the end that when the plastic material has foamed and set the bag containing that material will have been distended into simultaneous engagement with selected portions of the outer surface of the object being packaged and corresponding portions of the inner surface of the enclosure. This distension may or may not include resilient stretching. In this way the bagged foamed material will take on the contour of the object and thus will provide extremely effective cushioning and protection therefor. The bags are made of material through which the foamed substances cannot pass and of material which will not tend to adhere either to the object or to the enclosure walls. Consequently no problem is involved in removing the foamed bodies from the enclosure nor in separating the object from the foamed bodies. The walls of the bag define built-in partitions between the foamed material on the one hand and the object and the surrounding enclosure on the other hand, and at the same time constitute walls for the foamed bodies which permit those bodies to be manipulated readily as individual entities.

Thus the use of bags for the plastic, and the causing of the plastic to foam or otherwise expand in situ within the bags, greatly facilitates the application of the foamed material, accurately controls the location of the foamed

material relative to the object being packaged, facilitates the removal of the foam-encased object from the outer enclosure and its separation from the foamed protective bodies, permits the use of the foamed protective bodies independently of a surrounding container if desired, and facilitates the handling and reuse of the foamed bodies for permanent or temporary protective purposes.

To the accomplishment of the above, and to such other objects as may hereinafter appear, the present invention relates to a packaging method and to the structure of a package formed thereby, as defined in the appended claims, and as described in this specification, taken together with the accompanying drawings, in which:

FIG. 1 is a three-quarter perspective view of a complete package made in accordance with the present invention;

FIG. 2 is a cross-sectional view thereof on an enlarged scale;

FIG. 3 is a side elevational view thereof, showing the foam-protected object in the process of being removed from the surrounding container housing;

FIG. 4 is a three-quarter perspective view of the two protective foamed parts of the package, shown separated and with their object-engaging surfaces uppermost;

FIG. 5 is a side elevational view showing the first step in the formation of the package of FIG. 1;

FIG. 6 is a view similar to FIG. 5, but showing the plastic-containing bags in place;

FIG. 7 is a view illustrating a typical way in which plastic material is adapted to be inserted into the bags;

FIG. 8 is a three-quarter perspective view of the package with certain of the top flaps turned down;

FIG. 9 is a view similar to FIG. 8, but with all of the top flaps turned down, and with a piece of sealing tape in the course of being applied;

FIGS. 10 and 11 are three-quarter perspective views similar to FIG. 5, but showing different ways in which the object to be packaged may be initially supported in a position raised above the bottom wall of the outer container;

FIG. 12 is a three-quarter perspective view of another embodiment of a completed container;

FIG. 13 is a side cross-sectional view of apparatus which may be employed to produce foamed protective bodies which may be employed independently of an outer container;

FIG. 14 is a three-quarter perspective view of a package formed from the foamed bodies produced in accordance with FIG. 13;

FIG. 15 is a view similar to FIG. 2 and showing a way in which the present invention may be employed when the object to be packaged is provided with undercut areas or the like;

FIG. 16 is a top plan view of a container in which the packaged object is supported and protected in a manner specifically different from that of the previous embodiments, the top of the outer container being shown in open position;

FIG. 17 is a cross-sectional view taken along the line 17—17 of FIG. 16, the outer container being shown closed;

FIG. 18 is a three-quarter perspective view of the packaged object of FIG. 16 removed from the outer container with the foamed bodies attached thereto;

FIG. 19 is a three-quarter perspective view, partially broken away, of one of the bags used in the embodiment of FIG. 16;

FIG. 20 is a side elevational view of the package of FIG. 16 with the bags in place, and before the object to be packaged has been put in place;

FIG. 21 is a view similar to FIG. 20, but showing the object to be packaged in position;

FIG. 22 is a three-quarter perspective view of another embodiment of the present invention;

FIG. 23 is a cross-sectional view taken along the line 23—23 of FIG. 22, and showing the packaged object within a surrounding container;

FIG. 24 is a three-quarter perspective exploded view illustrating the manner in which the object to be packaged and the plastic containing bags of the embodiment of FIGS. 22 and 23 are adapted to be associated;

FIG. 25 is a three-quarter perspective view of the packaged object and bags of FIG. 24 inserted in a surrounding container, the bags being shown prior to the foaming and setting of the plastic;

FIG. 26 is a three-quarter perspective view of an alternative embodiment of a plastic-containing bag adapted to be used instead of the bags of FIGS. 23—25;

FIG. 27 is a three-quarter perspective view of another embodiment of a complete package made in accordance with the present invention, the top flaps of the outer container being shown in open condition;

FIG. 28 is a top plan view of the embodiment of FIG. 27, but showing the plastic-containing bag before the plastic has foamed and set; and

FIG. 29 is a three-quarter perspective view of the bag used in the embodiment of FIGS. 27 and 28 and showing one way in which the plastic may be inserted therein.

FIGS. 1—9 illustrate one manner in which the present invention may be carried out and disclose the use of foamed plastic to completely surround an object shipped within a surrounding container or carton of more or less conventional form.

The conventional container or carton is generally designated 2 and may be formed of any suitable material such as corrugated paper, cardboard, wood, metal or the like. It may comprise a bottom wall 4, side walls 6 and two sets of top closing flaps 8 and 10, all as is conventional, the top closing flaps being adapted to be secured in closed position by a strip 12 of sealing tape or the like.

The object to be shipped, here symbolically illustrated and generally designated 14, is initially located within the container 2 so as to be spaced from the side walls 6 thereof, and may be supported above the bottom wall 4 by a preformed body 16 of rubber, foamed plastic, stacked or rolled corrugated board, or any other suitable padding material. (See FIG. 5.)

Next, as shown in FIG. 6, a plurality of flexible bags generally designated 18 are inserted into the container 2 between the side walls 6 thereof and the object 14. As here shown two such bags 18 are employed. The term bag is used generically to comprehend any flexible and distensible container, whether distension is achieved by the resilient stretching of walls, the unfolding of folded or gusseted walls, or in any other way. The bags 18 may be formed of substantially non-stretchable sheet materials, the bags distending by unfolding, or of stretchable sheet materials, the bags distending by stretching. In the particular embodiment here under discussion each of the bags 18 is distensible so as to occupy a volume substantially equal to one-half that of the space between the object 14 and the side container walls 6. The bags 18 may be formed of a wide variety of different types of materials impervious to the passage therethrough of the foamed plastic which is to be used, and preferably of materials which will not adhere to the object 14 nor to the walls and flaps of the container 2. Such substances as polyethylene, cellophane, Mylar type polyesters, and coated paper are suitable. In practice we have employed bags 18 formed of polyethylene with wall thicknesses between ½ mil and 5 mils with highly satisfactory results. If the particular foamed plastic reacts exothermically during foaming, or if heat must be applied to cause foaming, the material of which the bags 18 are formed should, of course, be capable of withstanding the temperatures involved without deterioration.

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While the use of bags 18 separate from the container 2 is here specifically disclosed, and for many purposes is preferred, it will be understood that the bags 18 could be attached to the inner surfaces of appropriate walls of the container 2, as by heat sealing, adhesive, or fasteners, and could even comprise a sheet secured to a wall of the container 2 so that said wall constitutes one wall of the bag 18. In either instance the bags 18 would then become a fixed part of the container 2.

The bags 18, either before or after they are inserted in place as shown in FIG. 6, are charged with an unfoamed mixture of foamable plastic, as indicated schematically in FIG. 7, where a charge of the unfoamed material, designated by the reference numeral 20, is being inserted into the open top of a bag 18 from a nozzle 22 which may form part of any suitable dispensing machine. Manual charging may, of course, be employed if desired. The type of foaming plastic which may be used may vary widely. Some examples of suitable materials are polyurethane foams of any density which cure to either rigid, semi-rigid or flexible material, as well as foams formed from rubbers, epoxy resins, silicone resins, polysulphide resins, phenolic resins and acrylic resins. The foaming agents may also be of any type, such as carbon dioxide, fluorinated hydrocarbons such as trifluorochloro methane, or air, gases, or other chemical blowing agents. The thrust of the instant invention is not limited to the use of any particular composition, but relates generally to the use of any material which undergoes a volume change and change in physical state while within the bags 18. Thus the term "foamed" as here used is applicable to such substances as expandable polystyrene beads.

Once the appropriate amount of foamable material 20 has been inserted into the bags 18, the container 2 may then be closed, the material 20 thereafter foaming and setting in situ within the bags 18. As the material 20 foams and expands, the bags 18 are distended, as permitted by their size and shape, and when a proper amount of material 20 has been inserted into each of the bags 18, the bags 18, when they distend, will be pressed into engagement with the outer surfaces of the object 14 and the inner surfaces of the walls of the container 2, thereby taking on the configuration of all of those surfaces. The foamed and set material, generally designated 20a, in each of the bags 18 thus surrounds and protects the object 14. Since it is not necessary for the foaming action to have been completed, or even to have begun, the container 2 is closed and sealed, it will be apparent that the instant technique readily lends itself to mass packaging procedures.

If desired, the open ends of the bags 18 may be sealed and closed in any conventional manner before foaming has taken place. On the other hand, it may be desirable to permit the air within the bags 18 to escape as the material 20 foams. As here specifically disclosed, the open ends of the bags 18 are substantially sealed in the following manner well adapted to mass handling techniques. The height of the bags 18 is such that their open upper ends 18a extend above the top of the container 2, as shown in FIG. 6. The closing flaps 8 are folded down to closed position as shown in FIG. 8, with the bag ends 18a being compressed between the flaps 8 and the side walls 6. The bag ends 18a are then folded down over the flaps 8, the flaps 10 are moved to closed position, and the sealing strip 12 is applied as shown in FIG. 9.

This general mode of manipulation, in which the upper ends 18a of the bags 18 are folded between the flaps 8 and 10, not only provides for an effective closing of the top of the bags 18 which causes the foamed plastic 20a to stay within the confines of the container 2 and at the same time permits some escape of air from the bag 18, if that is necessary. It also provides for the ready removal of the packaged object 14 from the thus-formed package. When such removal is desired, and as is indicated in FIG. 3, the sealing strip 12 is cut or otherwise

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removed and the container flaps 8 and 10 are folded open. This exposes the upper ends 18a of the bags 18, which may then be grasped and pulled, thus lifting the bags 18 with their foamed set plastic contents 20a, and with the object 14 sandwiched therebetween, out from the container 2. This operation is facilitated by reason of the fact that the material of which the bags 18 are formed does not adhere to the inner surfaces of the container walls. Thereafter the free bag ends 18a may be pulled apart, thus separating the bags 18 from one another, and from the object 14. Each of the individual bags 18 will take the form shown in FIG. 4, having a cavity portion 24 corresponding to the shape of the object 14 and a cavity portion 26 corresponding to the shape of the supporting pad 12 if one is used. The existence of the bags 18 encasing the foamed plastic material 20a causes that foamed plastic material to retain its shape and permits the continued use and reuse of the bags 18 and their encased foamed bodies 20a in the temporary or permanent protection of the objects 14.

It is within the purview of the present invention to fill the bags 18 with partially or fully foamed material 20 in an unset and freely flowable condition, that material distending the bags 18 to engage and conform to the object 14 and thereafter setting to a firm shape-retaining condition. Further, the bags 18 could be wholly or partially filled after the container 2 is closed by providing suitable filling ports in the container 2 communicating with the bags 18. The shape which the bags 18 assume when they are distended and the areas of the object 14 with which they come into contact can be controlled through the use of abutments or walls appropriately located within the container 2.

FIGS. 10 and 11 illustrate alternative ways in which the object 14 may be supported in a position raised above the bottom container wall 4 prior to the time that the material 20 is caused to foam. In FIG. 10 the object 14 rests upon a pair of rods 28 passing through appropriate apertures in the container side walls 6, which rods 28 may be externally supported in any appropriate manner if necessary. Once the material 20 within the bags 18 is foamed sufficiently to cause the bags 18 to distend under the object 14, thus providing vertical support therefor, the rods 28 may be withdrawn, or they may become a permanent part of the overall package, their projecting ends being first removed. If the body 16 is smaller than the bottom of the object 14, the body 16 could be removed from the containers 2 after the foamed material has set, ledges of foamed material serving to support the object 14 thereafter. In FIG. 11 the object 14 is shown as being hung from a suitable external support 30 by means of line 32, the external support being separated therefrom after the foamed material has interposed itself between the object 14 and the bottom container wall 4.

As indicated in FIG. 12, the container 2 may be provided with a rip strip 34 so that it may be separated into two sections which may readily be removed from the bags 18, thus making it unnecessary to lift the bags 18 and their encased object 14 from the container 2.

Because of the nature of the foamed protective bodies 20a thus formed, and particularly because of the existence of the bags 18 which surround and protect those bodies and cause them to be reliably self-sustaining and individually readily manipulatable, foam-filled bags 18 of the type described may be employed for packaging and protective purposes without an outer container 2. Thus, as indicated in FIG. 13, one may use a permanent mold 36 comparable to the container 2, the object 14 may be supported therein in any appropriate manner, as by means of rods 28 similar to those disclosed in FIG. 10, bags 18 similar to those shown in FIGS. 1-9 may be inserted into the mold 36 and charged with foamable material 20, and the cover panels 38 of the mold 36 may be closed. As the material 20 foams the bags 18 will be distended in the same manner as described above in connection with

the embodiment of FIGS. 1-9, and the rods 28 may be removed at an appropriate time. The bags 18 will also take on the internal configuration of the mold 36. After the foaming material has set the distended bags 18, together with the object 14 which they encompass, are removed from the mold 36 and may be secured together in any appropriate manner, as by means of the binding straps 40 (see FIG. 14), to constitute a shippable package which may readily be transported and handled in a reliable manner without any protective outer cover other than the walls of the bags 18.

If the object 14 is provided with undercut areas the foamed material 20a will normally tend to enter those areas. This will make it difficult to separate the bags 18 containing the foamed material 20a from the object 14. FIG. 15 illustrates one technique which may be employed to eliminate this difficulty. There the object 14a has undercut areas 42. Before the object 14a is inserted into the container 2 it is placed within a sheath 44 of any suitable material, such as plastic sheeting, which extends across the undercut area 42. As the material 20 within the bags 18 foams and expands, the bags 18 will be pressed against the sheath 44 and will be prevented by that sheath from entering the undercut areas 42, but those bags 18 will nevertheless otherwise conform to the shape of the object 14. In some cases the size of the bags 18 may be such that they can expand only sufficiently to engage the high spots of the object 14 and not enter into the undercut areas 42, thus eliminating the need for the sheath 44.

Some items, because of their nature (low cost, low weight, lack of fragility, etc.) or their particular shape, do not require that they be entirely surrounded by foamed plastic when they are shipped, and this where they are to be shipped within an outer container 2 or not. The technique of the present invention is particularly well adapted for situations of this type, since the use of bags 18, within which the plastic material foams and sets in situ, facilitates control of the amount of foamed material utilized and the location of that material at the precise areas on the surfaces of the object where it is needed.

In FIGS. 16-21 an object 14b is designed to be supported within a container 2 only at its corners. In accordance with the procedure shown in those figures, four bags 18b are employed, one located in each corner of the container 2, and a preformed supporting body 46 of appropriate material, comparable to the supporting body 16 shown in FIG. 2, is positioned within the bag 18b near its closed end prior to the insertion of the foamable material 20, that body 46 preferably being wedge-shape so that it can fit into a corner of the container 2, thus serving to locate its bag 18b and also providing vertical support for the object 14b. Compare FIGS. 20 and 21, which show the position of the bags 18b and the supporting blocks 36 respectively before and after the object 14b is placed in position.) The upper ends of the bags 18b may be folded over the top of the object 14b and bent down inside the central opening thereof, and the cover flaps 8 and 10 of the container 2 are folded to closed position. The foaming material 20, as it expands, will remain within and conform laterally to the position of the bags 18b and, if the proper amount thereof is inserted into each bag 18b, will not only fill the spaces between the corners of the object 14b and the corners of the containers 2, but will also extend over the top of the object 14b, as shown in the perspective view in FIG. 18.

FIGS. 22-26 disclose another specific embodiment in which bags 18c may be employed in conjunction with an elongated, cylindrical or shaft-like object 14c. Here four bags 18c are employed in two opposed pairs, each of the bags having a support body 48 at its inner end. As shown in FIG. 25, the bags of each pair are placed within the container 2 with their closed ends adjacent one another, and preferably touching. The object 14c is inserted into the container 2 as to rest upon the supporting blocks 48, and the upwardly extending open ends

of the bags 18c, after the foaming material 20 has been inserted therein, are folded around the object 14c, after which the container cover flaps 8 and 10 are moved to closed position. As the foaming material expands and sets it causes the bags 18c to assume the configuration both of the outer surfaces of the object 14c which it engages and the opposed inner surfaces of the container 2, thereby assuming the configuration best shown in FIGS. 22 and 23.

In place of using two pairs of bags 18c, a single pair of bags 18d may be employed, as shown in FIG. 26, each bag 18d taking the place of an opposed pair of bags 18c. The bags 18d are open at both ends, the supporting body 48 being inserted therein to a point substantially midway of the length thereof, after which foaming material is inserted into each end of the bag 18d.

FIGS. 27-29 disclose the use of a single bag 18e of a length such as to be wrappable around the object 14, which object may, as in several of the preceding figures, be supported within the container 2 on a supporting body 16. The distensible bag 18e is initially located as shown in FIG. 28, and an appropriate amount of foaming material 20 is inserted therein through its open top in any appropriate manner, as via the nozzle 22. The container 2 is then closed, and as the material 20 foams and sets, the bag 18e will be distended into the condition shown in FIG. 27. When the object 14 is to be removed the bag 18e is spread apart at the line 50 defined by the meeting sides of the bag 18e thus permitting the object 14 to be removed therefrom.

The object 14 may not be the actual object to be packaged, but only a replica thereof, used in quasi-molding technique, especially as shown in FIG. 13, to form a large number of foam-filled bags 18 of predetermined size and more or less complex configuration adapted to be assembled subsequently with appropriate objects at other times or places. The fact that the shaped set foamed material is encased with a bag 18 facilitates handling and transportation and adds strength to the formed objects.

The specific embodiments here disclosed are, of course, but typical, and it will be appreciated that the use of the bags 18 within which the foamed material sets, and even foams, in situ makes the technique of the present invention particularly capable of different manners of use for different specific applications.

Through the use of this technique close control over the amount of foamed material used is achieved, thus making for minimization of material cost and package weight. No special container lining or materials need be used, and the optimum type of foaming material may be employed without regard to the nature of the surface of the surrounding container, if one is used, or the object being packaged. Where foamed material protection is desired only at pre-selected locations, this may be accomplished effectively and efficiently. Where external containers are used, the actual packaging operation can be performed rapidly, and without having to wait for the insulating material to foam and set.

While but a limited number of embodiments have been here specifically disclosed, it will be apparent that their details may be widely varied, and that the teachings of the present invention are of wide applicability, as indicated by the following claims.

I claim:

1. The protective packaging method which comprises at least partially surrounding an object with at least one flexible bag having connected side walls defining an enclosure, one of said side walls being directed against said object and another of said side walls being directed away from said object, inserting a foaming settable plastic material into said enclosure of said bag, and causing said plastic material in said bag to set in foamed condition while said bag is engaged with said object, said bag and the foamed set plastic therein taking on the configuration of that portion of said object against which it engages.

2. In the packaging method of claim 1, in which said object has an undercut area over the portion thereof against which said bag engages, the step of covering said portion of said object with a sheath extending across said undercut area prior to engaging said bag therewith, whereby said bag and the foamed set plastic therein will take on the configuration of said sheath and will not enter said undercut area.

3. In the packaging method of claim 1, placing within said bag, prior to causing said plastic material to set a preformed supporting member, and resting said object on said supporting member.

4. The protective packaging method which comprises at least partially surrounding an object with at least one flexible bag having an open end and having side walls defining an enclosure, one of said side walls being directed against said object and another of said side walls being directed away from said object, inserting a foaming settable plastic material into said enclosure of said bag, closing said open bag end, and causing said plastic material in said bag to set in foamed condition while said bag is engaged with said object, said bag and the foamed set plastic therein taking on the configuration of that portion of said object against which it engages.

5. In the packaging method of claim 2, in which said object has an undercut area over the portion thereof against which said bag engages, the step of covering said portion of said object with a sheath extending across said undercut area prior to engaging said bag therewith, whereby said bag and the foamed set plastic therein will take on the configuration of said sheath and will not enter said undercut area.

6. In the packaging method of claim 4, placing within said bag, prior to causing said plastic material to set, a preformed supporting member, and resting said object on said supporting member.

7. The packaging method which comprises placing an object within a surrounding body having a wall so as to be spaced from said wall by a given distance, positioning at least one flexible bag between said object and said wall, said bag having connected side walls defining an enclosure, one of said side walls being directed against said object and another of said side walls being directed away from said object, inserting sufficient foaming settable plastic material into said enclosure of said bag for said plastic material, when foamed and set, to span the distance between said object and said wall, causing said plastic material in said bag to set in foamed condition, thereby distending said bag to engage against an area of said object and causing said bag and the foamed set plastic therein to take on the configuration of that portion of said object against which it engages, and securing said bag against said object.

8. In the packaging method of claim 7, in which said object has an undercut area over the portion thereof against which said bag engages, the step of covering said portion of said object with a sheath extending across said undercut area prior to engaging said bag therewith, whereby said bag and the foamed set plastic therein will take on the configuration of said sheath and will not enter said undercut area.

9. In the packaging method of claim 7, said body having a bottom wall, the step of supporting said object vertically within said body so as to be spaced from the bottom wall thereof prior to causing said plastic material to set.

10. In the packaging method of claim 7, placing within said bag, prior to causing said plastic material to set, a preformed supporting member and resting said object on said supporting member.

11. The packaging method which comprises placing an object within a surrounding body having a wall so as to be spaced from said wall by a given distance, positioning at least one flexible bag between said object and said wall, said bag having an open end and having side walls

defining an enclosure, one of said side walls being directed against said object and another of said side walls being directed away from said object, inserting sufficient foaming settable plastic material into said enclosure of said bag for said plastic material, when foamed and set, to substantially span the distance between said object and said wall, closing said open bag end, causing said plastic material in said bag to set in foamed condition, thereby distending said bag to engage against an area of said object and causing said bag and the foamed set plastic therein to take on the configuration of that portion of said object against which it engages, and securing said bag against said object.

12. In the packaging method of claim 11, in which said object has an undercut area over the portion thereof against which said bag engages, the step of covering said portion of said object with a sheath extending across said undercut area prior to engaging said bag therewith, whereby said bag and the foamed set plastic therein will take on the configuration of said sheath and will not enter said undercut area.

13. In the packaging method of claim 11, said body having a bottom wall, the step of supporting said object vertically within said body so as to be spaced from the bottom wall thereof prior to causing said plastic material to set.

14. In the packaging method of claim 11, placing within said bag, prior to causing said plastic material to set, a preformed supporting member and resting said object on said supporting member.

15. The packaging method which comprises placing an object within a surrounding container having walls so as to be spaced from at least some of the walls thereof by a given distance, positioning flexible bags between said object and said walls, said bags having side walls defining an enclosure, one of said side walls being directed against said object and another of said side walls being directed away from said object inserting sufficient foaming plastic material into said enclosure of said bags for said plastic material, when foamed and set, to span the distance between said object and said walls, and causing said plastic material in said bags to set in foamed condition, thereby distending said bags against said object and against the container walls opposed thereto and causing said bags and the foamed set plastic therein to take on the configuration of those portions of said object against which they engage.

16. The packaging method of claim 15, in which said bags and the foamed set material therein collectively fill substantially all of the space between said object and the walls of said container.

17. The packaging method of claim 15, in which said bags and the foamed set material therein are spaced from one another around said object.

18. In the packaging method of claim 15, the step of supporting said object vertically within said container so as to be spaced from the bottom wall thereof prior to causing said plastic material to set.

19. The packaging method which comprises placing an object within a surrounding container having walls so as to be spaced from at least some of the walls thereof by a given distance, positioning flexible bags between said object and said walls, said bags having open ends, and side walls defining an enclosure, one of said side walls being directed against said object and another of said side walls being directed away from said object, inserting sufficient foaming settable plastic material into said enclosure of said bags for said plastic material, when foamed and set, to substantially span the distance between said object and said walls, closing said open bag ends, and causing said plastic material in said bags to set in foamed condition, thereby distending said bags against said object and against the container walls opposed thereto and causing said bags and the foamed set plastic therein to take on

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the configuration of those portions of said object against which they engage.

20. The packaging method which comprises placing an object within a surrounding container having walls so as to be spaced from at least some of the walls thereof by a given distance, said container having an open top provided with closing flaps, positioning flexible bags between said object and said walls, said bags having open ends extending up beyond said container top and having side walls defining an enclosure, one of said side walls being directed against said object and another of said side walls being directed away from said object, inserting sufficient foaming settable plastic material into said enclosures of said bags for said plastic material, when foamed and set, to span the distance between said object and said walls, closing said open bag ends by folding them around said container closing flaps when the latter are located in container-closing position, and causing said plastic material in said bags to set in foamed condition, thereby distending said bags against said object and against the container walls opposed thereto and causing said bags and the foamed set plastic therein to take on the configuration of those portions of said object against which they engage.

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