April 7, 1953 W. C. GEORGE ET AL 2,634,038

CONTAINER

Filed March 25, 1952 4 Sheets-Sheet 1

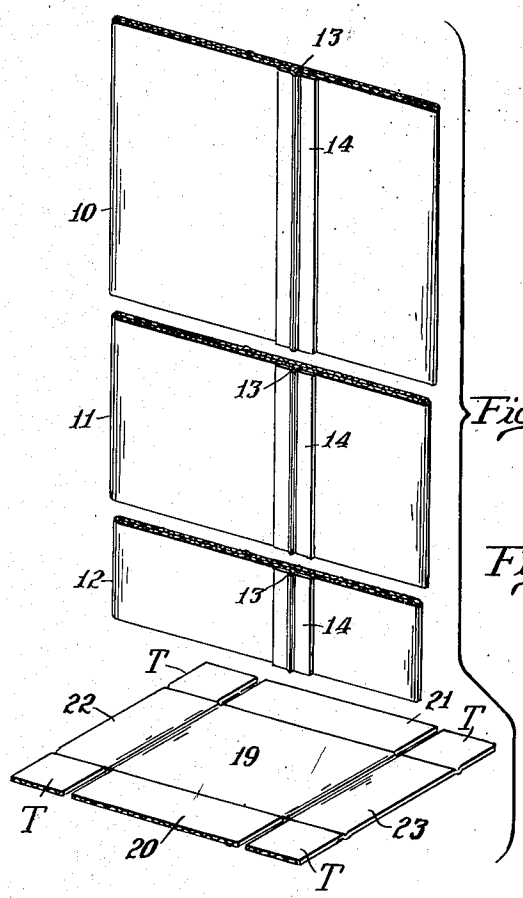

Fig. 1.

Fig. 2.

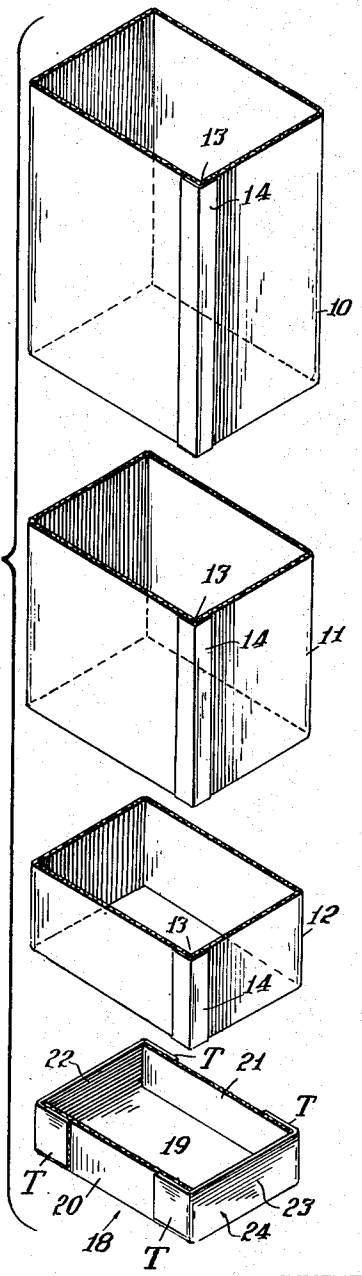

Fig. 5.

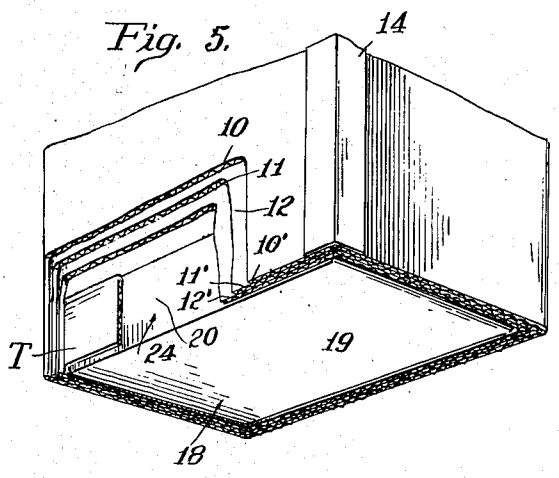

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Fig. 4.

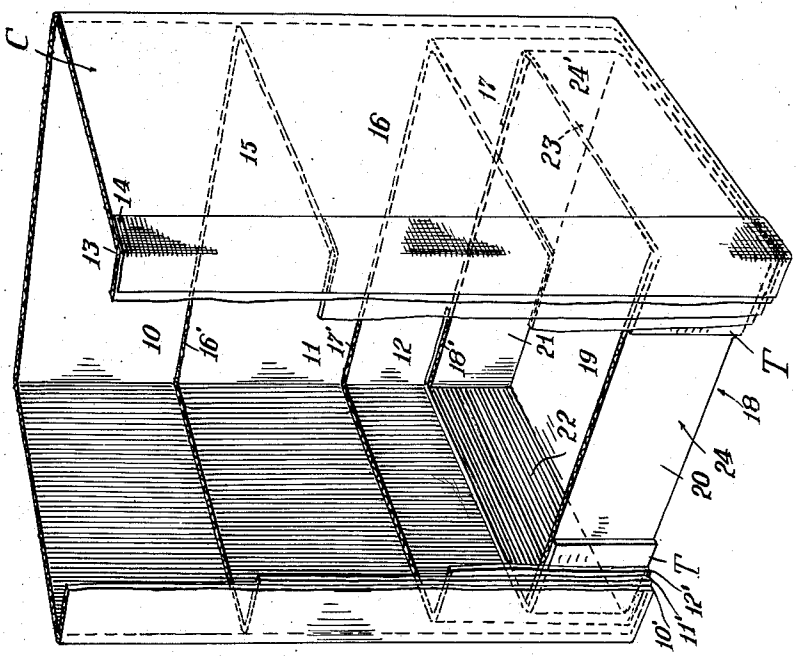
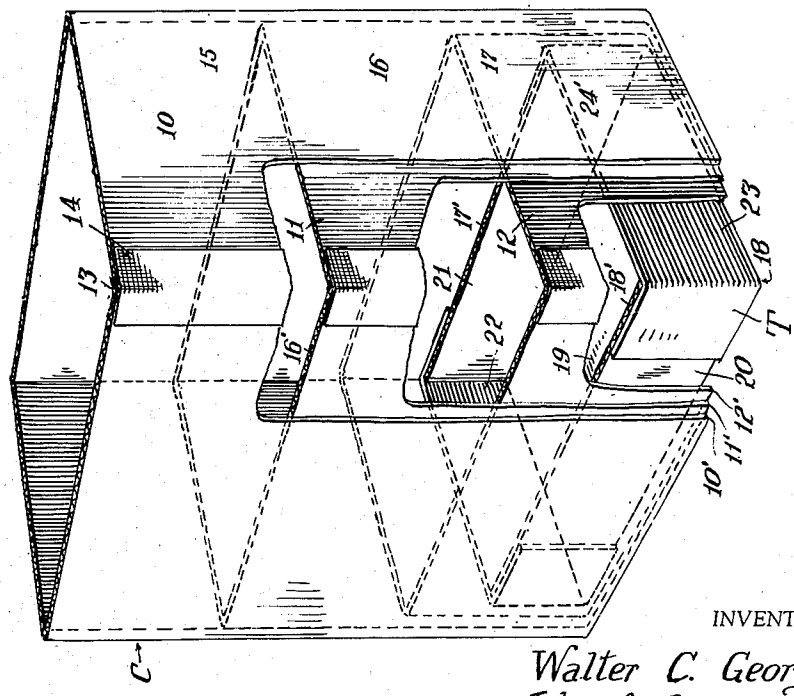


Fig. 3.



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CONTAINER

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Fig. 6.

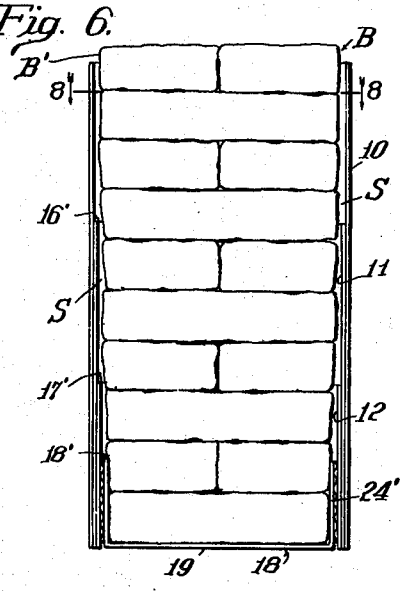


Fig. 7.

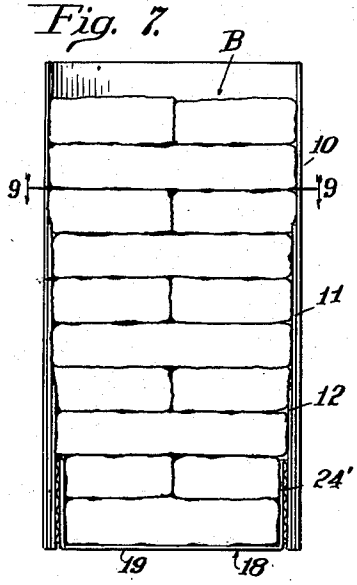


Fig. 8.

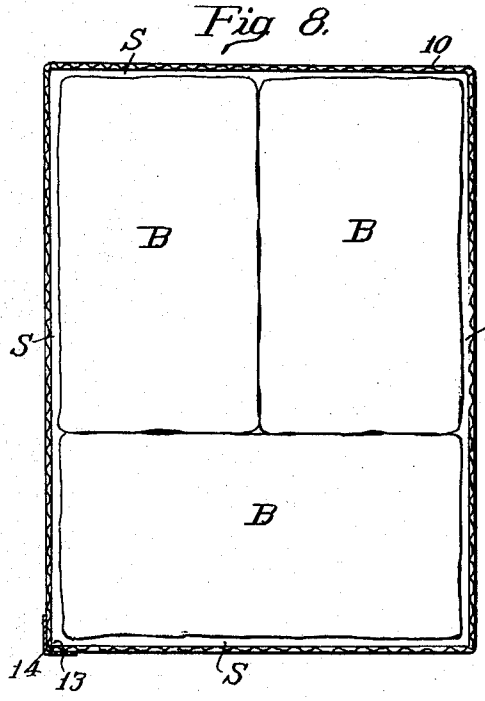
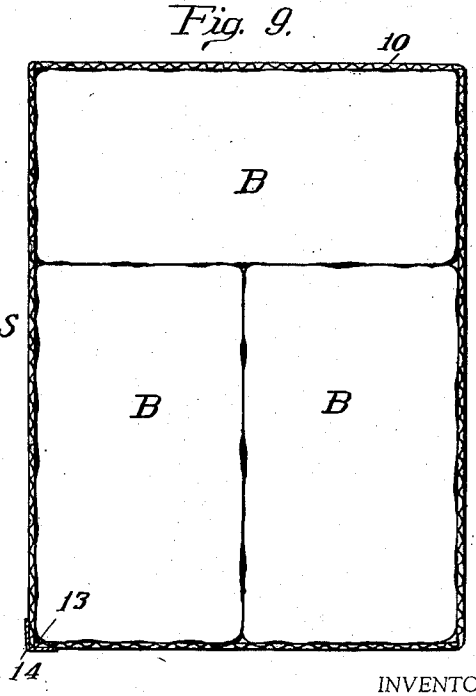


Fig. 9.



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CONTAINER

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Fig. 10.

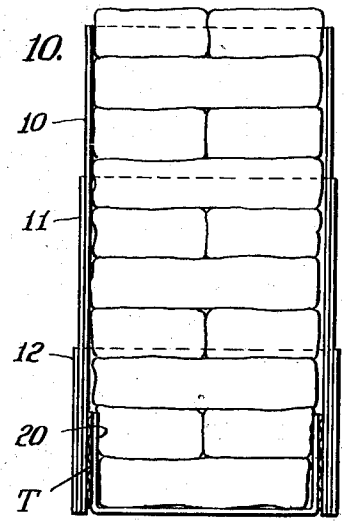
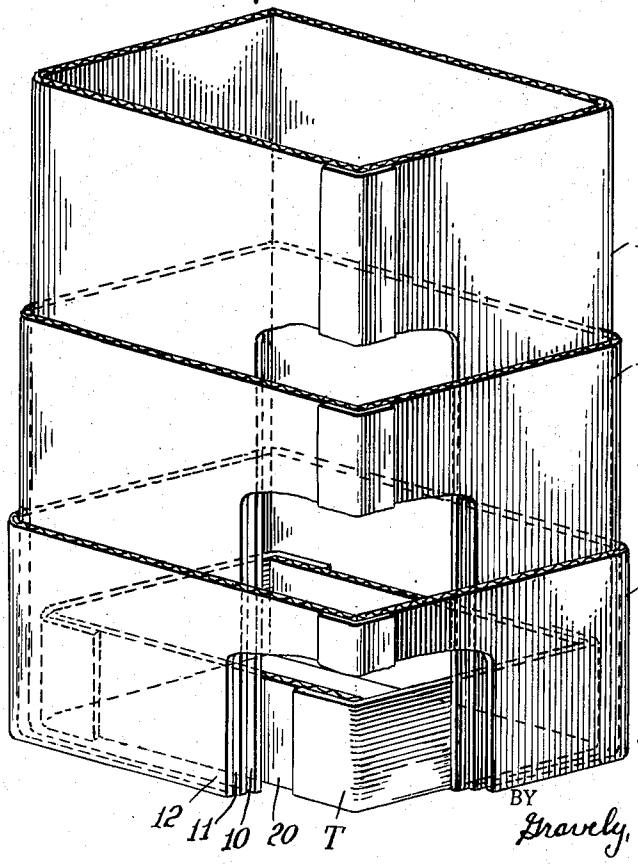


Fig. 11.



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UNITED STATES PATENT OFFICE

2,634,038

CONTAINER

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Application March 25, 1952, Serial No. 278,384

5 Claims. (Cl. 229—14)

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This invention relates to new and useful containers that are at least four feet high, and particularly to containers that are five or more feet in height.

These improved containers, which are preferably made from corrugated paperboard or other suitable material, are particularly adaptable for packing, shipping and storing materials and commodities therein which have inherent cold flowing characteristics after being placed in the containers. Synthetic rubber, for instance, is typical of these materials. Synthetic rubber, when packed in relatively tall containers, has a tendency to cold flow and spread out laterally, especially near the bottom of the container thereby exerting great pressure on the walls of the container, especially the lower portions thereof.

Containers fabricated in accordance with the present invention, while requiring only a minimum quantity of materials, provide the necessary reinforcement at the lower or bottom portion thereof so that the expansive forces or thrust exerted by the synthetic rubber blocks therein will not disrupt or objectionably distort the walls of the container. Moreover, the wall structure of the container is such that the synthetic rubber blocks that are packed and stored therein may be readily removed by a few simple manipulations hereinafter set forth.

Containers which embody the present invention are different from prior art relatively tall containers which merely provide a multi-ply wall throughout in order to attain the necessary reinforcement or rigidity of those walls. In these prior art containers, which are commonly used to pack fragile rayon cones, the plies of paperboard or the like forming the walls are usually parallel and of the same height. In instances where the walls are divided, the plies are in edgewise abutting relationship and are vertically aligned as distinguished from the wall structure of the present container which varies in thickness, or in the number of wall plies, from the bottom of the container to the top.

The present container comprises a flanged bottom tray section and a plurality of sleeves of different heights in telescoped or nested relation, each of said sleeves having its bottom edge in substantially coplanar relation with the bottom panel of said bottom tray section. This arrangement forms a plurality of wall sections disposed one above the other. The uppermost wall section has the least number of plies, preferably a single-ply. Each subjacent wall section has at least one additional ply. The lowermost wall

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section has a thickness equal to the combined thickness of all the sleeves plus the thickness of the upstanding flange of the bottom tray section. The present container requires no steel bands, staples, glue, or other fastening means for securing the sleeves and bottom tray section together.

In effect, the wall structure of the present container is what might be termed stepped with the lowermost step, which is the bottom portion of the container, having the greatest thickness or the greatest number of plies of material.

Heretofore the aforesaid blocks of synthetic rubber, which blocks weigh about 65 to 85 pounds each, have been individually dusted with talc, soapstone or some other material and placed in individual multi-wall paper bags to prevent the blocks from adhering to the bags and to each other while stacked. About 1000 to 1200 of the individual blocks in the bags constitute a full carload shipment from the place of manufacture of the blocks to the point of processing whereat the blocks must be removed from the bags and the blocks individually washed or otherwise treated so as to remove any pieces of paper, talc, soapstone or the like before these blocks can be further processed, as desired. The removal of the blocks from the bags and the removal of the paper, talc, soapstone, etc. from the blocks present an objectionable problem; viz. in unpacking the blocks from the bags, clouds of talc, soapstone or the like result which of course is very objectionable to the individuals removing the blocks from the bags and also others in the plant and, moreover, the traces of paper, talc, or the like must be thoroughly removed from each block before processing. Incidentally, the cost of the talc, soapstone or the like and its application to and removal from the rubber blocks, and especially the man hours necessary to do this, as well as the labor required to remove the blocks from the bags and the pieces of paper and talc from the individual blocks, before processing, is expensive, time consuming and troublesome. Until the containers of the present application were invented, it was believed impracticable to pack and ship the aforesaid rubber blocks in a paperboard container because the mere provision of a multi-wall or multi-ply paper board container would not serve the purpose for shipping a multiplicity of these blocks, for instance 30 or more blocks which total about 2000 or 2500 pounds, because of the weight and the expansive thrust due to the cold flowing characteristics

of the blocks after being placed in the containers.

In order to ship the 1000 to 1200 blocks in the hereinbefore mentioned paper bags, the bags containing the blocks must be stacked 10 or 11 layers high in the car. Thus it is necessary that the present containers be at least four feet high and preferably of a greater height so that 10 or more rows or layers of the blocks are in each container. Therefore, the same number of blocks can be shipped in car-load lots as were the blocks in the bags.

By utilizing the containers embodying the present invention, all of the difficulties in the handling, packing, shipping and unpacking of these rubber blocks are overcome. In utilizing the present containers, the rubber blocks may be encased in Pliofilm or other protective material or media which is compatible with rubber and are simply placed in superposed layers in the containers at the point of manufacture of the blocks and are shipped directly to a plant for further processing. The rubber blocks so shipped can be readily removed from the container and do not require any treatment precedent such as washing or otherwise rendering the blocks ready for processing.

One of the principal objects of the present invention is to provide a paperboard container which is sufficiently strong to hold a great weight of material which cold flows thereby exerting great lateral pressures on the walls, especially on the lowermost portions of the walls.

Another object of the present invention is to provide a container having unique wall structures which are thicker at the bottom of the container than at the top of the container.

Another object of the invention is to provide a container having unique wall structures which comprise a plurality of wall sections disposed one above the other, each of said sections being of substantially uniform thickness throughout and each subjacent section being of greater thickness than the section thereabove.

Another object of the invention is to provide a container including unique wall structures of stepped formation, the various steps in the wall structures defining horizontal sections, each of said sections being of uniform thickness throughout, but with the superposed sections being lesser in thickness.

Another object of the invention is to provide unique container wall structures formed by at least two telescoped open-ended tubular members, each of said tubular members being of different height, the lower edges of each of said members being substantially coplanar with a bottom closure, said bottom closure having a wall portion of less height than the tubular members and being contiguous to and substantially conforming in shape with the lower portions of the tubular members.

Another object of the invention is to provide unique containers fabricated from a plurality of open-ended substantially rectangularly shaped telescoped sleeves of different heights and a bottom closure in the form of a tray with upstanding flanges of less height than the sleeves, and which wall and bottom closure substantially conform to the outline of the ends of the sleeves and the said wall being disposed within the end portion of the telescoped sleeves.

With the above and other objects in view, the invention consists in the construction and novel combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings and pointed out in the claims hereto appended, it being understood that various changes in the form, proportions, and minor details of construction, within the scope of the claims, may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings:

Fig. 1 is an exploded perspective view of the collapsed component elements comprising the container of the present invention;

Fig. 2 is an exploded perspective view of the component elements of Fig. 1 in an erected condition and ready to be assembled;

Fig. 3 is a perspective view of the completed container with parts broken away to show the interior wall structure;

Fig. 4 is a view similar to Fig. 3 but broken away at a different portion of a front panel to further show the interior wall structure;

Fig. 5 is a view in perspective with parts broken away showing the lower section or structure of the container;

Fig. 6 is a more or less vertical transverse diagrammatic view of certain products initially packed in the containers of Figs. 3 and 4;

Fig. 7 is a view similar to Fig. 6 but showing the final relationship of the products packed within the container;

Fig. 8 is a transverse sectional view along the lines 8—8 of Fig. 6 looking in the direction of the arrows;

Fig. 9 is a transverse sectional view along the line 9—9 of Fig. 7 looking in the direction of the arrows;

Fig. 10 is a view similar to Fig. 6 disclosing the same manner of packing the products in the container but a different arrangement of wall structure; and

Fig. 11 is a view showing the wall structure of Fig. 10 and similar to Fig. 3.

The invention will be more readily understood by referring in detail to the attached drawings wherein similar numerals or characters in the several figures all denote the same parts.

The container as a whole is denoted generally at C and it is of rectangular outline. Here, it is to be understood that the outline or shape of the container may be varied in that instead of being rectangular, it may be of other polygonal outlines, for instance, square, hexagonal, octagonal, etc. and also circular or ovate depending upon the requirements of the user.

The container C consists of a plurality of partially nested or partially telescoped elongated sleeves **10**, **11** and **12**. These sleeves are each similarly formed from flat blanks of preferably double-faced corrugated paperboard and are each vertically scored at their corners so as to enable the same to be collapsed, Fig. 1, and to be set up into the tubular formation, Fig. 2. At one of the corners **13** of each of the sleeves **10**, **11** and **12**, the edges of the blanks are in substantial abutting and contacting relationship and held together by a fabric or other similar glue tape **14**, and this tape extends throughout the height of the respective sleeves. These tapes on the respective sleeves serve an additional function or dual purpose later to be described. Instead of utilizing the tape for the purpose just described, obviously a conventional glue strip (not shown) coextensive with and carried by one of the free end edges of the blank may be used.

The formed sleeves 10, 11 and 12 are of different heights, the outer sleeve 10 being of the greatest height with the sleeve 11 of an intermediate height relative to the outer sleeve and the innermost sleeve 12, which latter sleeve is of less height than the two previously mentioned sleeves, as clearly shown in Figs. 3 and 4. With these three sleeves 10, 11 and 12 in telescoped or nested relationship with each other, there will result stepped inner walls or a wall formation which in effect form different horizontal superposed sections or zones throughout the height of the container. These sections or zones of the wall formations are designated 15, 16 and 17 and while these zones or stepped wall formations are shown interiorly in the drawings, they may be reversed if desired so that the stepped formation will be exteriorly of the container thereby forming stepped exterior walls.

The container is completed by the addition or combination therewith of a bottom closure structure denoted generally at 18. This bottom structure 18 is in the form of a tray having a substantially flat bottom 19 and upstanding similarly formed and sized opposed front and back flaps 20 and 21 and opposed end flaps 22 and 23. Each of these opposed end flaps has an extension tab T integral therewith and these tabs overlap end portions of the respective flaps 20 and 21 as seen in Figs. 2, 3 and 4. The tabs loosely overlap these end portions and there is preferably no positive connection such as by staples or adhesive therewith but obviously some securing means may be utilized if desired.

In effect, when the flaps 20, 21 and 22, 23 are upstanding from the flat bottom 19 with which they are preferably integral, there results an upstanding continuous flange or lowermost wall portion enclosing the flat bottom 19. This wall portion as a whole is denoted at 24 and it, along with the complementally sized longitudinally extending lower portion of the sleeves 10, 11 and 12 provides the bottom section or zone 24' of the walls of the container which are those four-ply walls at this said bottom. Immediately above the aforedescribed section or zone of the container, there extends that portion of the sleeve 12 and that extending portion with a complemental, horizontally disposed portion of the adjacent sleeves 10 and 11 thus provides a three-ply wall formation or section 17; and above this section the portion of the intermediate sleeve 11 that projects beyond the edge of the sleeve 12, along with a complemental horizontal portion of the sleeve 10, provides the next adjacent wall section or two-ply section of the paperboard 16 and beyond the edge of this intermediate sleeve 11, the remainder of the wall or section 15 of the container is constituted by a single-ply of the sleeve 10 to the top thereof, see Figs. 3 and 4.

The above mentioned association and novel combination of the sleeves with the tray at the bottom thereof results in the walls in the wall formation of the container being of a stepped formation either interiorly or exteriorly of the container depending, of course, upon whether the sleeve of greatest length is positioned, exteriorly or interiorly of the other nested sleeves and tray. This stepped formation of the wall structure of the container therefore provides a horizontal reinforcement in the aforesaid separate sections or zones that are superposed and thus opposes expansive forces laterally from whatever products, material or commodities, in

the container. The several sleeves, and the number of these sleeves, will be determined by the products, commodities or material that is to be packed in and unpacked from the containers, and are so fabricated as to enable a snug nesting or telescoping of these sleeves one within the other with good frictional engagement so that the sleeves will not become accidentally displaced relative to each other. The extreme lower edges 10', 11' and 12' of the sleeves 10, 11 and 12 respectively are coplanar and these coplanar edges are also substantially coplanar with the flat bottom 19 of the tray, see Figs. 3, 4 and 5.

The horizontal sections 15, 16 and 17, and the lowermost section 24' of the container formed by the tray wall 24 are actually defined by the upper edges 16', 17' and 18' respectively of the sleeves 16, 17 and the wall 24 of the tray and as seen in Figs. 3 and 4, the actual sections 15, 16, 17 and 24' of the wall formation thereby result. The respective wall sections 24', 17, 16 and 15 are such that the lowermost section 24' is constituted of four plies of the corrugated paperboard and thus this lowermost section and the other sections are all of uniform thickness or are each comprised of a uniform number of plies of the paperboard but the thickness or number of plies constituting these sections of the container decreases from the lowermost section to the uppermost section, or stating it another way, the thickness of the sections or the number of plies increases from the uppermost section to the lowermost section.

While there is shown in the drawings an embodiment of the invention utilizing the three telescoped or nested sleeves 10, 11 and 12, along with the wall structure 24 of the tray which in effect is another sleeve, it is to be understood that two of the sleeves, for instance sleeve 11 and 12 with the wall structure of the tray 24 may be utilized to the exclusion of the sleeve 10 if heavier sleeve material is used in place of the material that we have and are using, or if a heavier or more rigid bottom tray section is used. Conversely, if more rigidity and reinforcement and a container of greater height may be desired, more than the said three sleeves, along with the tray and its wall 24, might be used and these sleeves may be telescoped or nested inwardly of the walls as depicted in the drawings Figs. 3, 4, 6 and 7 or they may be outwardly disposed to produce the stepped effect on the exterior of the container in the drawings Figs. 10 and 11. Obviously if the stepped wall formation of the container is to be exteriorly thereof as in Figs. 10 and 11, the dimensions of the sleeves 10, 11 and 12 would have to be such as to effect snug telescopic engagement with each other and the innermost sleeve 10, in this instance, would of course have to be so dimensioned as to have its lower portion snugly engage the upstanding wall of the tray. In the same vein, the wall 24 of the tray 18 may either be integral with the bottom 19 or otherwise conveniently associated with that bottom and in any event, this wall, as aforesaid, constitutes in effect a sleeve.

In order to conveniently and readily pack the hereinbefore described blocks of synthetic rubber or the like into the container, which is four feet or more tall when assembled, the lower portion of the sleeve 12 is telescoped over the upstanding wall or sleeve 24. This upwardly opening portion is then packed with the synthetic rubber blocks by disposing these blocks, designated B,

in the manner shown in Fig. 8. Two of the blocks are arranged in side-by-side relationship longitudinally and another is disposed transversely at the end of the two blocks successively reversing. The positioning of the longitudinal and transverse blocks is successively reversed, as shown in Fig. 9, until the lower portion of the container is filled, and this same procedure of packing the blocks is followed until it becomes necessary to telescope the sleeve 11 over the sleeve 12. This same procedure of packing is followed until it becomes necessary to telescope the sleeve 10 over the sleeve 11. The box is packed to the top or slightly beyond the same as shown in Fig. 6.

In Fig. 6, it will be noted that when the container is initially fully packed with the blocks, the blocks disposed in the lowermost portion of the container engage the inner faces of the upstanding sleeve all around the bottom of the container; whereas, the sides and ends of the superposed blocks in the container are spaced from the interior stepped wall formation of the container as denoted at S. The size of these spaces increase slightly toward the top of the container. The uppermost portion B' of the blocks, when the container is initially filled, projects beyond the open end of the container and, in some instances, a whole layer of these blocks will project beyond the open end of the container. However, due to the flowable characteristics of the blocks, the same will gradually settle down in the container until the upper surfaces of the uppermost blocks will be at least flush with or below the top edge of the container, see Fig. 7. Thus the container will be completely filled and there will be no spaces S between the sides and end edges of the blocks and the interior walls of the container, see Fig. 9. The cold flow characteristics of the blocks will result in a downward and laterally outward thrust. This thrust is the greatest at the lowest section of the container, which is reinforced from the bottom to the top in such a manner that objectionable outward deflection of the wall at any point, due to the lateral outward thrust of the blocks, is prevented.

Once the container has been loaded to capacity with these blocks, it can be handled as a unit by conventional fork lift trucks or the like and can be shipped and stored as such until ready for further processing. The overall weight of the blocks in each container is about 2500 pounds.

When the container is fully packed, it is not necessary that the same have a closure or protective covering at the open end but, in some instances, it is found desirable to either apply a sheet of kraft paper or the like to the end thereof or to use a conventional end closure or cap for the container to protect the contents from the elements, dirt, dust, etc.

When it is desired to unpack or remove the blocks or other products or materials from the container, the tape 14 or the glue strip, or the wall of the sleeve 10 is cut vertically and then simply ripped off. This exposes the upper successively packed rows of the blocks and allows them to be removed manually or by a suitable mechanical device for further processing. This same procedure is followed by successively cutting of the sleeves 11 and 12. Thus there is no problem in the ready and quick unpacking of the blocks or the like from the container.

When the sleeves have been thus cut and removed, they may be readily folded and stored or discarded.

With this construction, no staples, stitching, gluing, etc. of the sleeves to each other or to the tray is necessary. This is very remarkable particularly since the container is adapted to carry 2500 pounds or more of products, material or commodities therein. Under the most critical of such situations, one would expect that considerable stitching, stapling, etc. would be necessary as well as exterior steel bands or the like. However, due to the unusual and unique wall formation resulting in the reinforced sections of the container, sufficient rigidity is attained by the frictional engagement of the combined cooperative and component elements. It should be understood, however, that the spirit and purpose of the invention may not be circumvented by the use of stapling, stitching, adhesive securing, etc. of these component elements together. Staples, stitching, etc. may be utilized but it has been found that they are not necessary and, in packing and shipping synthetic rubber blocks such as described herein, they are indeed undesirable.

As indicated, containers embodying the present invention are especially useful for packing, shipping, and storing synthetic rubber blocks. These synthetic rubber blocks will adhere to paperboard and to each other during shipment and storage unless properly protected. A preferred method of overcoming this objectionable feature is to enclose the blocks in Pliofilm or other material compatible with the rubber so that it is unnecessary to remove the protective media from the blocks prior to further processing. Conceivably the protective media may be sprayed or otherwise applied to the blocks prior to packing them in the containers.

It is to be noted, as depicted in the drawings, that the innermost sleeve or wall 24 and the inner exposed superjacent portion of the next succeeding sleeve 12 are each of substantially the same height, and the combined height of these two exposed portions is substantially equal to the exposed portion of the superjacent sleeve 11 whereas the exposed portion of the longer or outer sleeve 10 substantially equals that exposed portion of the sleeve 11 directly subjacent thereto. This, of course, results in the interior stepped formation of the wall structure. The exposed portions of the telescoped sleeves define the sections hereinbefore referred to.

The overall dimensions of one embodiment of the container in this invention are 60 inches high, the side walls 42 inches and the end walls 28 inches.

The collapsed sleeves 10, 11, 12 and the collapsed tray 18 in Fig. 18, it will be understood, can be packed and shipped as such and, of course, this reduces the bulk in the initial packing and shipping of the component elements comprising the container as embodied in the present invention.

What is claimed is:

1. A tall heavy duty rigid container for shipping and/or storing material therein comprising a relatively shallow collapsible tray having a flat bottom with an upstanding wall thereabout and a plurality of open-ended collapsible sleeves, the sleeves each being interiorly unobstructed throughout their lengths, snugly telescoped and of greater successive lengths relative to each other and the said upstanding wall, the lower portions of all the sleeves being in parallel relationship with each other exteriorly of the outer surface of the upstanding wall and with the lower portion of the innermost sleeve in snug engage-

ment with the upstanding wall, the extreme lower end edges of all of the sleeves being in substantial alignment with each other and substantially coplanar with the exterior surface of the flat bottom, the upper edge of the shortest sleeve terminating upwardly and beyond the upstanding wall, and the upper edge of the next successive sleeve terminating spacedly upwardly beyond the upper edge of said shortest sleeve to provide a stepped wall throughout the length of the container.

2. A container as defined in and by claim 1, wherein three sleeves of different lengths are utilized.

3. A container as defined in and by claim 1 wherein the shortest sleeve is positioned next to the said upstanding wall and other sleeves are telescoped over said shortest sleeve successively in the order of their increasing length.

4. A container as defined in and by claim 1 wherein the longest sleeve of said plurality of sleeves is positioned next to the said upstanding wall and other sleeves are telescoped over said longest sleeve successively in the order of their decreasing length.

5. A container as defined in and by claim 1 wherein said tray comprises a bottom panel with

opposed side and end walls secured thereto, each wall of a pair of said opposed walls having a flap extending from each end folded into flatwise relation to a face of the adjacent wall, and wherein the said sleeves and tray are maintained in their cooperative relationship relative to each other solely by frictional engagement with one another.

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