July 9, 1963 L. PILLER 3,096,923

MOVING AND STORAGE CONTAINER AND STRENGTHENING FRAME THEREFOR

Filed Nov. 23, 1960 2 Sheets-Sheet 1

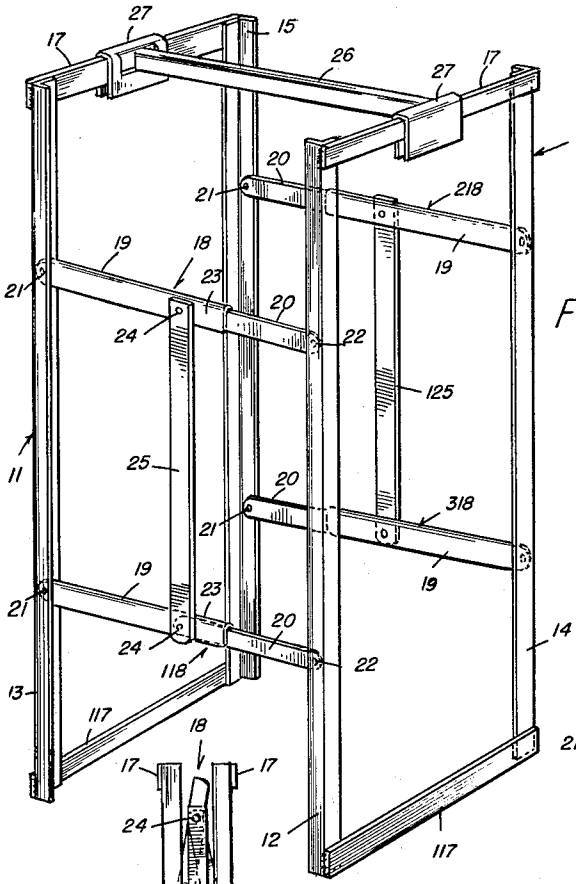


FIG. 1

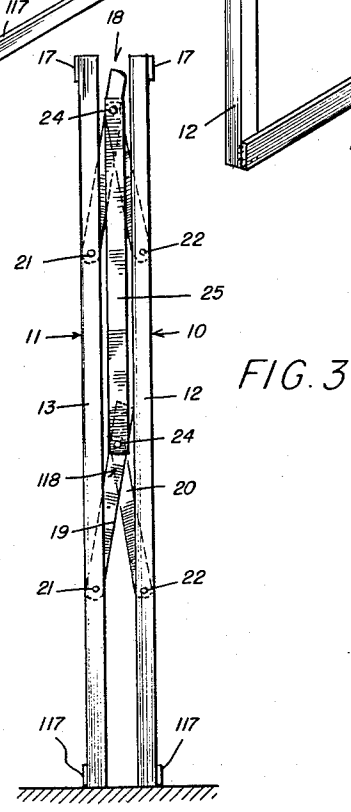


FIG. 3

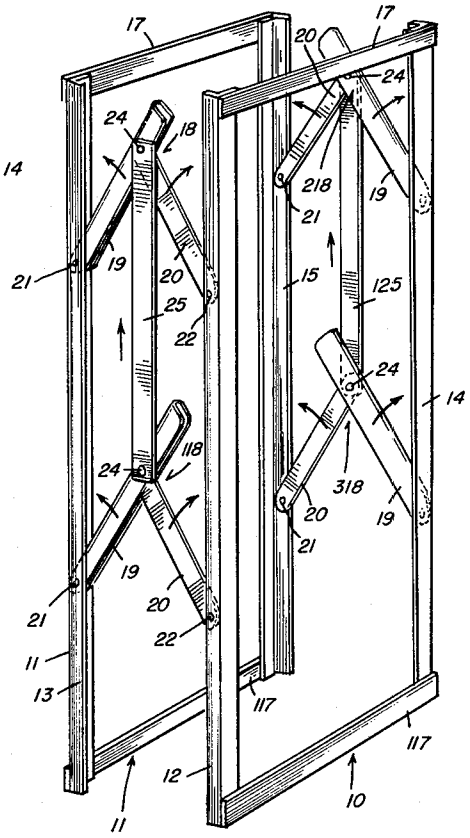


FIG. 2

July 9, 1963 L. PILLER 3,096,923

MOVING AND STORAGE CONTAINER AND STRENGTHENING FRAME THEREFOR

Filed Nov. 23, 1960 2 Sheets-Sheet 2

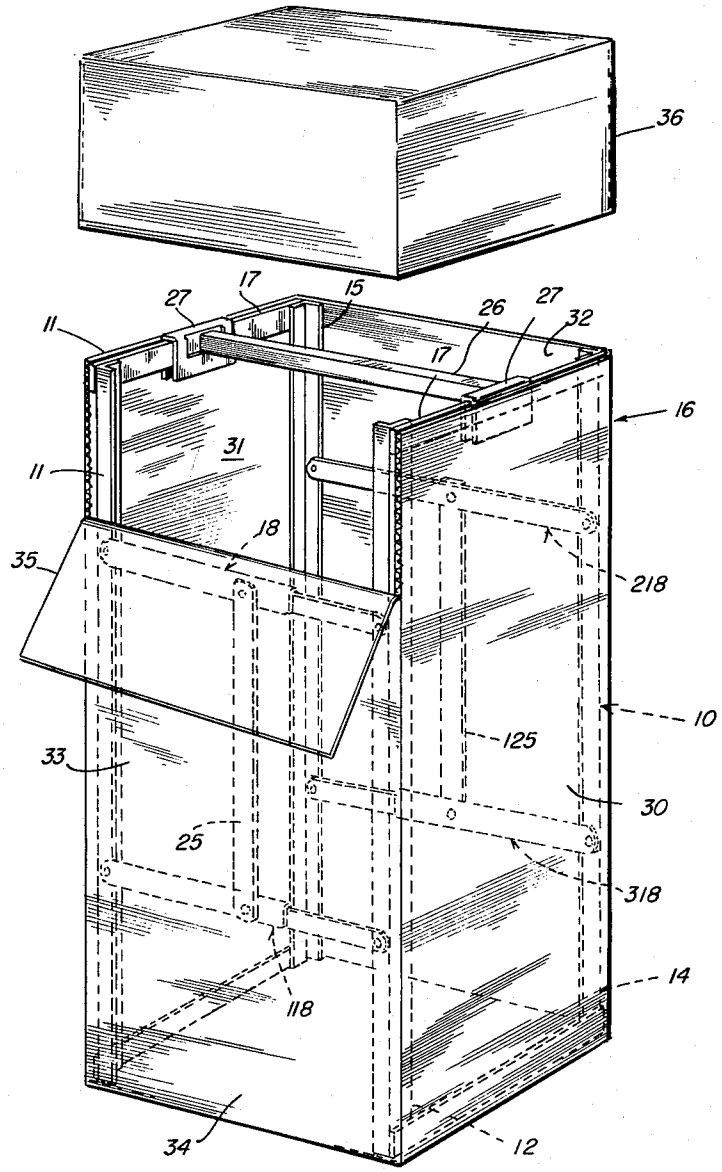


FIG. 4

United States Patent Office 3,096,923 Patented July 9, 1963

3,096,923
MOVING AND STORAGE CONTAINER AND STRENGTHENING FRAME THEREFOR

Lawrence Piller, 1416 Brooklyn Ave., Brooklyn 3, N.Y.

Filed Nov. 23, 1960, Ser. No. 71,210
2 Claims. (Cl. 229—49)

The present invention is concerned with a moving and storage container and a removable, foldable strengthening frame therefor. It is of importance in the moving and storage of materials to have a container that is inexpensive, of relatively light construction and of sufficient rigidity to enable materials contained therein to be easily moved and stored without danger of damage. In the interest of economy, it is desirable that this container be suitable for use over and over again. This is particularly so in the shipping and storing of clothing wardrobes, which are adapted to carry garments in a suspended position from garment hangers, during movement of the wardrobe from one place to another or during storage.

The moving and storage of clothing garments is generally accomplished by placing the garments in large cartons of corrugated cardboard, which have a hanger bar mounted on the sidewalls of the carton at its top end from which the clothing is suspended on hangers. The cartons are light in weight and are constructed of a gauge or thickness intended to give a degree of strength and rigidity enabling them to be loaded and moved with a minimum of danger to the contents therein. However, after nominal use, the cartons, being generally of cardboard or like construction, become weakened from the highly concentrated load being supported and there is a tendency for the carton and especially the side walls of the carton to buckle. When this happens, the hanger bar is no longer properly supported and the clothing may sag to the bottom of the carton thereby rendering the carton worthless for use as a clothing wardrobe. As a result of the inherent weakening of the carton with successive loadings, they are generally used two or three times for the shipment of clothing therein and the cartons are then, of necessity, discarded.

In addition, because of the relatively weak structural strength of the corrugated cardboard, it is not practical, when storing such cartons in a warehouse, or when transporting them, to stack one on top of the other since heavy loads may crush the cartons thereby rendering them useless.

The present invention is particularly useful and advantageous in that the life of a carton is greatly prolonged by the insertion therein of a removable frame to provide support therefor. The frame greatly increases the structural strength of the clothing wardrobe. In addition, the invention allows the use of a carton of corrugated cardboard, paperboard, fibreboard, or other suitable sheet material of relatively thin gauge material or light construction since the carton walls no longer must provide the necessary structural strength to support the load of clothing. The frame is simply constructed and easily assembled and inserted inside the container by an unfolding operation, for permanent or one trip use. The frame, being foldable, may be stored in a relatively small space when not in use or conveniently shipped from one place to another as required. It may be extended or folded in a few seconds and, being a united assembly to be handled as a unit, does not require any tools, nails or bolts for its use. Containers equipped with the foldable frames of the invention may be stacked one on top of the other and heavy loads may be placed upon them without fear of damage to the containers or the contents thereof. Ease of insertion, removability and foldability of the frame allows flexibility in its use over and over again in many different containers.

A further object of the present invention is to provide a structural embodiment thereof which may be readily constructed and assembled in an economical manner in mass production, and which allows efficient use thereof in a very simple way.

Various other objects and functional features will be made apparent from the embodiment described hereinafter and the invention comprises the frame and the container having a frame therein, embodying the features of construction, combination of elements and arrangement of parts all as exemplified in the following detailed disclosure.

Reference should be had to the accompanying drawings in connection with the description in which drawings.

FIGURE 1 is a perspective view showing the frame of the present invention in extended or unfolded position;

FIGURE 2 is another perspective view of the frame showing it in a partially folded position, illustrating the folding manipulation of parts;

FIGURE 3 is a front elevational view of the FIGS. 1 and 2 frame in the completely folded or collapsed position; and

FIGURE 4 is a perspective view showing a container having the frame of FIGS. 1 to 3 inclusive inserted and expanded in container-supporting and strengthening position.

Referring to the drawings, in which like numerals identify similar parts throughout, and particularly FIG. 1, it will be seen that an embodiment of the frame of the present invention consists of a pair of rectangular side panels **10** and **11** opposed to each other in laterally spaced relation when the structure is in its open or unfolded and extended position. Side panel **10** has a vertical front edge **12** and a vertical back edge **14**; and side panel **11** has similar vertical front and back edges **13** and **15**. Each of the side panels **10** and **11** is of a size and shape so that the edges **12** to **15** inclusive thereof may be disposed inwardly of and adjacent to or nested in the corners of an outer casing **16**, as shown in FIG. 4, thereby increasing rigidity of the casing and providing support therefor.

Side panels **10** and **11** may be of a construction comprising a rigid rectangular open framework made from elongated members of steel, aluminum, wood, plastic or other like or suitable material. In the preferred embodiment shown in the drawings, the front and back edges **12** to **15** inclusive of side panels **10** and **11** are defined by lengths of angle iron stock serving as vertical or upright side members thereof. Each of the side panels **10** and **11** includes a pair of top and bottom lateral members **17** and **117** which may be bars or flat straps welded, riveted or secured in any well known fashion at their ends to the top and bottom ends of the upright members **12** to **15** inclusive, thereby forming each of the pair of side panels in the form of a rigid rectangular open framework.

Front edge upright members **12** and **13** of the side panels **10** and **11** respectively preferably are connected together by a set or pair of vertically-spaced foldable toggle braces **18** and **118**, which may be of like construction. In the preferred embodiment, each of the toggle braces **18** and **118** consists of rigid arms **19** and **20** of suitable material, such as metal. Arm **19** has one end pivotally connected at **21** to the inner sides of the front face flange of angle member **13** and it may be in the form of a metallic strap folded lengthwise to have a U-shaped cross section providing an inverted channel adapted to receive slidably therein an end portion of companion arm **20**. Arm **20** may be a flat rigid metallic strap having one end pivotally connected at **22** to the inner side of the front face flange of angle member **12** with its other end slidably received in the channel of lapping end section **23** of arm **19** and pivotally connected to the latter at a point **24**,

intermediate front members 12 and 13. Such a toggle brace, 18 or 118, may thus be broken at the pivot point 24 to permit its arms 19 and 20 to be swung upwardly simultaneously to move the side members 12 and 13 toward each other. In the open or extended positions of these toggle braces 18 and 118 shown in FIG. 1 the lapping end sections 23 of channel arms 19 form stops preventing downward folding of the arms below aligned positions there shown, so as together to form rigid braces in their unfolded positions. Thus, in such unfolded positions the extended toggle braces 18 and 118 rigidly connect together and brace front edge members 12 and 13, i.e. the front edges of the side panels 10 and 11, in laterally spaced relation. In the drawings are shown that two such toggle braces 18 and 118 form a set thereof, which connect together front edge members 12 and 13, and where two or more such vertically-spaced toggle braces form such set, a rigid strap 25, of metal or other suitable material, may be used pivotally to connect or tie together all of said toggle braces in the set at their breaking pivot points, thereby causing said toggle braces simultaneously to swing in the same direction when collapsing the frame to the condition depicted in FIG. 2. In the preferred embodiment, strap 25 may have its ends pivotally connected conveniently to toggle braces 18 and 118 at pivot points 24. Thus, rigid tying strap member 25 provides strengthening support for the frame in its extended position and ties the toggle braces in the set together for simultaneous folding and unfolding action.

Back edge angle members 14 and 15 of side panels 10 and 11 respectively are connected together by a similar set of toggle braces 218 and 318, tied together by a like tying strap member 125, in a similar manner to that described for connecting together front edge angle members 12 and 13. For balanced strengthening of the frame the locations of arms 19 and 20 of toggle braces 218 and 318 may be reversed, as shown.

In the embodiment shown in the drawings, the arms 19 and 20 of the toggle braces 18, 118, 218 and 318, and the tying strap members 25 and 125 are shown pivotally connected at similar intermediate points 24 located medially between front and rear edge members 12 and 13, and 14 and 15. However, it is obvious that other points for such pivotal connections, not medially located but intermediate front edge members 12 and 13 and intermediate back edge members 14 and 15, may be utilized, and that tying strap member 25, or 125, may be connected to toggle brace 18, or 118, at a point other than the one which pivotally connects the arms 19 and 20 together. For example, the tying strap 25, or its equivalent 125, may be pivotally connected to the arms 19 or arms 20, at companion points laterally of pivot points 24 of the set of toggle braces 18 and 118, or two such tying strap members may be employed, one on each side of the pivot points 24 with one connecting the arms 19 together and the other connecting the arms 20 together in like fashion.

It is thus seen that the frame of the present invention is of a simple unitary assembly construction which may be conveniently and easily expanded for carton-strengthening use or folded for separate storage or shipment in a few seconds.

When the assembled frame is expanded and ready for insertion into container 16, or is inserted therein in folded condition and unfolded to its expanded position, as is illustrated in FIG. 4 a hanger bar 26 having inverted U-shaped end clips 27, may be inserted between frame side panels 10 and 11 and slidably engaged over top lateral members 17. Conventional hangers carrying the clothing may have their hooks engaged over the hanger bar 26 for suspension of the clothing therefrom, thereby distributing the weight of the clothing evenly over the entire frame.

The outer casing or carton 16, shown in FIG. 4 as covering the present foldable frame, may be a container generally known and used as a clothing wardrobe constructed from corrugated cardboard, paperboard, fibreboard or other suitable sheet material. Casing 16 has a body section of the type comprising side wall panels 30 and 31, back wall panel 32, front wall panel 33 and bottom panel 34. Front wall panel 33 may have a hinged flap 35 which folds downward over the outside of the container. Although FIG. 4 shows flap 35 hinged nearer the upper end of panel 33, containers may be provided with layer flaps hinged along a line lower on front panel 33, thereby providing a larger opening and permitting easier access to the interior of the container when it is being loaded with clothing and unloaded. The top of the container 16 may be closed by any conventional cover, such as a slip top cover 36 telescoped down over the top end of the container. Other casings made of suitable blanks and provided with crease lines whereby they may be folded from the flat to set-up condition may also be used, to be conveniently strengthened by frames of the present invention.

Thus it will be seen that the manipulatable frame is of a simple unitary assembly construction which may be easily folded to the compact condition of FIG. 3 and simply unfolded to the carton strengthening and supporting condition of FIG. 4. When in the expanded or unfolded condition of FIG. 1 the frame may be quickly and easily folded, when the hanger bar is not attached thereto, to allow for easy shipment of the frame or storage when not in use. When it is desired to set up a carton for use and loading, the folded frame shown in FIG. 3 may be expanded to its extended position as shown in FIG. 1 and easily and quickly inserted into outer casing 16 as shown in FIG. 4; and such unfolding manipulation may be done after the collapsed frame of FIG. 3 is inserted into the carton by pushing down on the tops of the arms of top toggle braces 18 and 218. Hanger bar 26 may then be mounted upon upper lateral members 17, by engaging its clips 27 thereof, and the unit is then ready for loading. Since the frame itself is inherently able to support the clothing load, the outer casing 16 may be made of an unusually light gauge material, particularly since the latter need not provide the rigid structural requirements and have the strength heretofore necessary. The frame may be of light weight construction, so that it does not materially add to the weight of the assembled unit. By allowing the weight of the clothing to be distributed over the rigid frame, the outer casing 16 is not subjected to excessive stresses and the outer casing may be reused many times, thereby materially prolonging its useful life. Set up clothing wardrobes equipped and strengthened with frames of this construction may be stacked one on top of the other and heavy distributed loads may be placed on them without fear of damage to their outer casings or their contents. Stacking of cartons in this manner permits a more efficient utilization of space in warehouses, vans or other transportation means.

It will thus be seen that the objects set forth above, among those made apparent from the preceding description, are efficiently obtained and since certain changes in carrying out the construction of the above apparatus set forth may be made without departing from the scope of the invention, it is the intention that all matter contained in the above description and shown in the accompanying drawings shall be considered illustrative and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention herein described, and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A foldable frame for internally strengthening a rectangular moving and storage container comprising, in combination, a pair of rigid and rectangular side panels lying juxtaposed to each other with each of a size and shape

to be disposed inwardly of and adjacent to the edges of one of a pair of opposed rectangular side walls of a container conventionally having relatively weak side walls to increase its rigidity and with each of said side panels having front and back side edges, two sets of foldable toggle braces, each toggle brace comprising a pair of arms, means pivotally mounting one end of each arm to one of said side panels with each set comprising a plurality of said toggle braces longitudinally spaced apart, all of said pivotally mounting means of said toggle braces being located inwardly from the ends of said side panels a distance at least the length of the longest toggle arm to prevent projection therebeyond on folding, one of said sets pivotally connecting the front edges of said side panels together and the other set pivotally connecting the back edges of said side panels together, said toggle brace arms pivotally connected together intermediate said side panels for folding swing in one direction and means tying together said toggle braces in each set with all of said toggle braces on the front being swingable simultaneously in the same direction and all of those on the back being similarly swingable simultaneously in the same direction.

2. A moving and storage container comprising, in combination, a generally rectangular carton formed of interconnected side walls of relatively stiff material, a foldable self-supporting frame of unitary assembly adapted for internally strengthening said carton, said frame comprising a pair of rigid and rectangular side panels lying juxtaposed to each other disposed inwardly of and adjacent to the edges of the side walls of the carton and with each

of said side panels having front and back side edges, two sets of foldable toggle braces, each toggle brace comprising a pair of arms, means pivotally mounting one end of each arm to one of said side panels with each set comprising a plurality of said toggle braces longitudinally spaced apart, said pivotally mounting means being located inwardly from the ends of said side panels a distance at least the length of the longest toggle arm to prevent projection therebeyond on folding, one of said sets pivotally connecting the front edges of said side panels together and the other set pivotally connecting the back edges of said side panels together, said toggle brace arms pivotally connected together intermediate said side panels for folding swing in one direction and means tying together said toggle braces in each set with all of said toggle braces on the front being swingable simultaneously in the same direction and all of those on the back being similarly swingable simultaneously in the same direction.

References Cited in the file of this patent

UNITED STATES PATENTS

1,122,524	Marcum	Dec. 29, 1914
1,206,618	Thrasher	Nov. 28, 1916
1,226,227	Lucy	May 15, 1917
1,412,694	Loughran	Apr. 11, 1922
2,685,962	Druth	Aug. 10, 1954
2,770,357	Sheard	Nov. 13, 1956
2,934,389	Krey	Apr. 26, 1960
2,974,779	Belsinger	Mar. 14, 1961