Collapsible Portable Carrier for Handling Stacked Articles, Especially Containers for Bakery Products

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This invention relates to a new and useful improvement or modification of certain collapsible portable carriers adapted conveniently for the handling and the distribution of bulky easily crushed products, for example, bakery products such as loaves of bread, pies, packaged rolls, or other "soft goods.

The subject matter of this application relates to the subject matter of my co-pending application Serial No. 297,627, filed July 8, 1952. In that application, I have disclosed a system of handling and distributing bread loaves or other soft or fragile articles, which makes use of collapsible tubular receptacles to receive and protect single layers of the articles as they are slid into the receptacles, for example, from wrapping machines, and these receptacles are held securely and transported in stacks by means of collapsing portable carriers which receive the receptacles through open ends and confine them against lateral displacements so that the receptacles of a stack in each carrier support one another in open condition without any freedom to collapse; and the carriers furthermore are constructed so that each carrier holding a stack of receptacles can be easily lifted and carried with one hand without danger of spilling products in the receptacles and can be stacked with other similarly loaded carriers for very efficient storage and conveyance at production plants and/or on delivery trucks or the like.

The collapsing carriers provided according to the invention of said co-pending application have the form of hollow collapsing parallelepipeds each of which is open at its front side to receive therethrough a stack of receptacles or other elongated articles to be transported and has all its side members hinged together on parallel axes for simultaneous relative swinging movements in a plane transverse to the back of the structure. The back and two opposite sides of the structure are defined by rigid substantially plane panel members, while the other two sides thereof are defined by rigid link or linear members which interconnect the side panel members and swing in substantially parallel relation to each other and to the back member.

Each carrier thus constitutes a freely deformable structure that can assume or be deformed easily to any desired angular position between a fully open position in which its meeting sides lie substantially square to each other and a fully collapsed position in which they lie nearly parallel to each other. Such a carrier structure provides an important combination of functions: It can be held in open position by fitting elongated articles, such as tubular bakery product receptacles, and these articles are easily inserted into it through its open front side; it can be carried comfortably in suspension by hand or on a hook, by means of structure near the front of its top side, whether it be loaded or empty, or open or collapsed; when so carried in loaded condition, the weight of the carrier and its contents assumes a balanced position, in which the contents project through the open front slope upwardly so as to be held securely in the assembly; the carrier will hold its contents securely both when resting on its bottom side and when being carried in suspension from its top side; when loaded and in fully open position it will support safely the weight of any desired number of similar loaded carriers stacked above it, thus enabling the extremely efficient storage and transportation of products distributed in its use; it can be changed from a collapsed position to an open position, or vice versa, by a simple direct lifting or lowering movement of the structure, even when the structure is collapsed it can be easily and efficiently piled or stacked and transported with many similar structures, so as to occupy extremely little storage space.

According to preferred embodiments of that invention, the carriers are made as largely open frameworks of hinged panel and link members, each member being of suitably rigid metal wire or bar stock; or they may be made as substantially open frameworks of hinged top, bottom and end members formed by centrally open rectangular pieces of pressed fibreboard or other suitably strong sheet material and interconnected by suitable link members at the lateral sides.

Carriers made according to that invention for use under conditions of substantially uniform loading, such as those used for distributing bread loaves in tubular receptacles, may serve most efficiently when provided with handles fixed in a definite location to frontal parts of their top structures. When similar collapsing carriers are used, for example, for returning emptied tubular receptacles to a bakery from points of distribution of the bakery's products, the conditions of loading will vary considerably, depending upon the number of collapsed receptacles stacked in a carrier at any moment, and under these conditions undesirable variations may occur in the angular position of the carrier when it is suspended from its handle.

According to the improvement or modification of the present invention, variations of that nature can be avoided by providing any carrier which is to be used under variable loading conditions with a handle so fixed to the top structure that the working position of the handle can be readily shifted backward or forward along the top structure to any of a plurality of different locations. In this way, a balancing handle location at which the suspended carrier will assume the desired angular position is made available for any degree of loading of the carrier, and when the degree of loading is such that the angular position of the carrier can be maintained by simply shifting its weight to another working position of the handle.

Further objects, features and advantages of this invention will be apparent from the following detailed description of preferred embodiments and from the accompanying illustrative drawings in which:

Figs. 1 and 2 are perspective views of a form of the collapsing carriers which are adapted for holding and transporting a variable load of collapsed tubular receptacles, or the like; Fig. 2 is an enlarged perspective view of the shiftable handle structure of the carrier of Fig. 1; and Figs. 3 and 4 are side elevations, respectively, showing the carrier of Fig. 1 suspended by its handle from an overhead support under different conditions of loading.

Each carrier D as illustrated in Figs. 1 to 4 embodies substantially the same framework construction as that of the carriers first illustrated and described in said co-pending application Serial No. 297,627, but each carrier D is made with a greater inside width, so as to accommodate the width of the collapsed tubular receptacles indicated at B, and as shown it is provided with a distinctive handle construction by which it can be assured of hanging in the desired angular position when suspended from the
handle, even though the load carried in it may be subject to wide variations. As shown in the drawings, carrier D has the form of a parallelepipedon defined by a framework open at the front side and composed of parallel rigid top and bottom panel members 110 and 111 respectively, a rigid back panel member 112 interconnecting back ends of the top and bottom members, and rigid lateral link members 114a, 115c and 114b, 115b which interconnect the top and bottom members at opposite lateral sides of the framework. The lateral members preferably are parts of rectanglar loops of rigid wire or bar stock, and the several rigid members are held sufficiently apart parallel axes so that the entire structure is readily deformable by a fully open position and a fully collapsed position by relative swinging movements of the hinged members in an upright plane transverse to the top, bottom and back members.

The top member 110 of carrier D is provided with a central longitudinal rigid wire or bar 150 which extends free of obstruction between spaced forward and backward transverse bar elements 119 of this top member. The central bar forms a support or shaft slideably engaged by the looped ends 131 and 132 of a U-shaped handle 130 which lies substantially parallel to the center line of the top member. The central bar is formed with a plurality of detents 152 which are spaced apart at intervals along the path of sliding movement of looped end 131. The detents and the cooperating looped end preferably are formed so that the handle is slideably freely along the central bar, without obstruction by the detents, when the handle lies in its idle position against part of the top member, but so that the detents will obstruct such sliding movement when the handle is in an upright or working position. For this purpose, the detents may be formed as flattened parts of the bar 150 which project horizontally from opposite sides of the bar, and the looped handle end 131 may be formed with a transverse inside dimension smaller than, and a longitudinal inside dimension substantially greater than, the horizontal width of bar 150 at the location of each detent.

The body or top part of handle 130 is formed with a coil 134 near its forward end for engagement by a hook or other suitable support, such as a hook on an overhead conveyor. The backward part of the handle body is formed to be engaged by the hand of a workman lifting or carrying the carrier D.

It will be evident that the handle 130 can be disposed quickly at any of several distinct locations along the supporting bar 150, and it will be easily replaced by the user or the carrier at any of these locations. The angular position assumed by the carrier when suspended from the handle will depend upon the location of the handle and the weight of the carrier and its contents, but for any degree of loading the handle can be placed quickly at a working location at which the carrier suspended from it will assume a desired angular position. For example, when the carrier D is empty or nearly empty, the handle 130 may be disposed advantageously at a forward location where the forward end 131 is confined between the foremost detent 152 and the forward transverse bar element 119, as illustrated in Fig. 13. When the carrier is only about half loaded with collapsed receptacles, the handle may be disposed advantageously at an intermediate position where its forward end 131 is confined between certain spaced detents 152, as illustrated in Fig. 13; and when the carrier is fully loaded the handle may be disposed at an extreme backward location on bar 150, only slightly forward of the center of gravity of the assembly. In all of these cases the carrier will hang from the overhead support in about the same angular position, which is chosen so as to facilitate the loading or unloading of the carrier as well as to prevent its contents from falling out of its open front side.

It will be understood that the new features described hereinabove and illustrated in the drawings may be embodied in various forms of apparatus, without restriction to details of the illustrated embodiments except as required by a fair construction of the claims.

What is claimed is:

1. A portable carrier for storing and transporting articles of the character described; said carrier comprising a collapsing framework in the form of a hollow parallelepiped open at its front side to receive said articles therethrough and defined by rigid top, bottom, back and lateral members hinged together on parallel axes for simultaneous relative swinging movements in a plane transverse to the back member, a handle support extending longitudinally of the carrier on the top thereof, a handle fixed to said support and shiftable back and forth therealong to any of a plurality of different working positions at a forward part of said top, and spaced stop means formed on said support for retaining said handle in each of said positions, whereby said handle is shiftable to any position so as to suspend the carrier in substantially the same tilted position when it is loaded to any of a plurality of different degrees of loading.

2. A portable carrier for storing and transporting articles of the character described; said carrier comprising a collapsing framework in the form of a hollow parallelepiped open at its front side to receive said articles therethrough and defined by rigid top, bottom, back and lateral members hinged together on parallel axes for simultaneous relative swinging movements in a plane transverse to the back member, a handle support extending longitudinally of the carrier on the top thereof, a handle fixed to said support and shiftable back and forth therealong to any of a plurality of different working positions at a forward part of said top, and spaced stop means formed on said support for retaining said handle in each of said positions, whereby said handle is shiftable to any position so as to suspend the carrier in substantially the same tilted position when it is loaded to any of a plurality of different degrees of loading.

3. A portable carrier for storing and transporting collapsed carriers of the character described; comprising a rigid back panel member and rigid opposite side panel members each formed of a plurality of interconnected longitudinal and transverse rigid wire elements, said back member being hinged at opposite ends respectively to the backward ends of said side panel members, at least two substantially parallel spaced rigid rectangular loops each having two opposite legs thereof hinged to said side panel members in parallel relation to each other and to the hinge connections of said back member, the other opposite leg of said loops being substantially parallel and of substantially the same length as said back member, a rigid bar element fixed to and extending along the longitudinal center line of the top of the carrier, a U-shaped handle lying substantially parallel to such center line and having legs with looped ends slideably engaging said bar element for longitudinal movement back and forth along the same to any of a plurality of different working locations at a forward part of said carrier and for vertical swinging movement between an upright working position and a lowered idle position, said bar element being formed with a plurality of detents projecting horizontally from opposite sides thereof at spaced intervals along said central axis of the handle, and said looped ends being formed with a transverse inside diameter smaller than, and a longitudinal inside diameter larger than, the horizontal width of the bar element at the location of each detent.

4. Apparatus as described in claim 3, wherein said handle is formed near its forward end with a coil for engage-
5. In a collapsing carrier having rigid top, bottom, back and lateral members hinged together on parallel horizontal axes for simultaneous relative swinging movements in an upright plane transverse to the top, bottom and back members, a handle assembly comprising a rigid bar element fixed to and extending longitudinally and centrally on the top member, a U-shaped handle lying substantially parallel to the longitudinal center line of the top member and having looped ends slidably engaging said bar element for longitudinal movement back and forth along the top member to any of a plurality of different working locations on said member and for swinging movement in a vertical plane between an upright working position and a lowered idle position, said bar element being formed with a plurality of detents projecting horizontally from opposite sides thereof at spaced intervals along the path of sliding movement of the handle, and said looped ends being formed with a transverse inside diameter smaller than, and a longitudinal inside diameter larger than, the horizontal width of the bar at the location at each detent.

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