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STORAGE AND SHIPPING CONTAINER

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FIG. 1

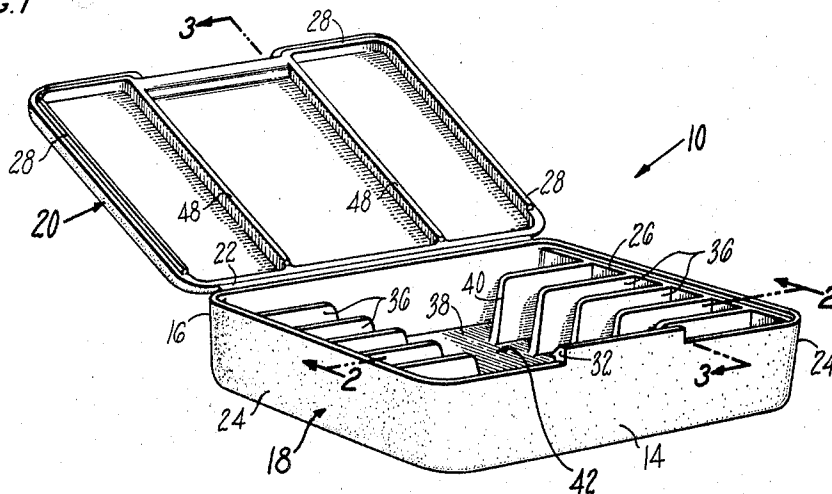


FIG. 2

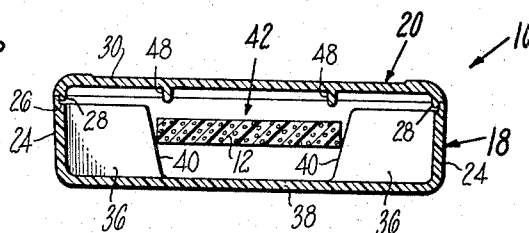
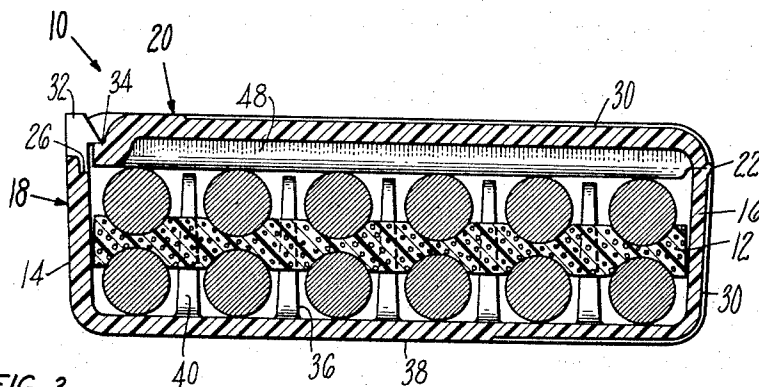


FIG. 3



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1

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## STORAGE AND SHIPPING CONTAINER

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### ABSTRACT OF THE DISCLOSURE

A compartmentalized one piece packaging unit for storing and shipping multiple layers of elongated articles includes aligned spaced partitions projecting inwardly from opposite sides of the unit to form individual compartments and a compartment-traversing foam interlayer contacting and immobilizing the individual parts positioned within the separate compartments.

The present invention relates to a new and improved packaging container for storing and shipping multiple layers of elongated articles, such as threaded taps and the like.

A principal object of the present invention is to provide a sturdy, durable and compact packaging unit compartmentalized for receiving multiple layers of elongated articles and for immobilizing the articles to prevent their contact with each other.

Another object of the present invention is to provide a new and improved one piece, covered packaging unit for receiving multiple layers of elongated items such as taps and the like, the individual items in each layer being provided with isolating compartments; the unit including a resilient interlayer contacting and immobilizing the items to thereby eliminate deforming contact between the sharp edges thereof as well as damage to the packaging unit itself during shipment.

A further object of the present invention is to provide a molded, one piece packaging unit of the type described having a neat exterior design, free of protrusions and including an integrally, substantially fatigue-free hinge secured to a cover for the unit which upon closing embeds and immobilizes packaged parts within a cellular interlayer traversing all the compartments within the packaging unit.

Still another object of the present invention is to provide a new and improved packaging unit of the type described which is of lightweight, abrasion-resistant, semi-rigid construction, yet sufficiently flexible to form an integral cover-carrying hinge capable of repeated trouble-free actuation.

Other objects will be in part obvious and in part pointed out more in detail hereinafter.

The invention accordingly consists in the features of construction, combination of elements and arrangement of parts which will be exemplified in the construction hereafter set forth and the scope of the application which will be indicated in the appended claims.

In the drawing:

FIG. 1 is a perspective view of the one piece packaging unit of the present invention with the cover open to show the internal compartmentalized structure of the unit;

FIG. 2 is a sectional view taken along the line 2-2 of FIG. 1 and illustrating the packaging unit with its foam-cushioning interlayer in place; and

FIG. 3 is an enlarged sectional view taken along the line 3-3 of FIG. 1, illustrating the multilayer packaging unit with two layers of elongated parts immobilized within the compartments of the unit.

Referring now to the drawing in greater detail, wherein like reference characters indicate like parts throughout

2

the several figures, the packaging unit of the present invention is shown as comprised of a one piece, covered carrying case, generally designated 10, and an interlayer 12 centrally positioned within the case 10 for disposition between adjacent layers of parts. The interlayer 12 is a cellular or sponge-like sheet member and extends along the full length of the case from the front wall 14 to the rear wall 16 (FIG. 3). The carrying case 10 includes a part-receiving bottom member 18 of box-like, generally rectangular configuration and a substantially flat cover 20 joined to member 18 through the integral hinge 22 extending along a substantial portion of the top of the back wall 16. As shown, the upstanding side walls 24 and front wall 14 of member 18 may be provided with an internal rabbit notch 26 along their top edges for receiving the peripheral flange 28 offset from the cover 20, thereby assuring aligned closure of the cover as it pivots on the hinge 22 and preventing undesirable skewing which might adversely affect the operable life of the hinge. Additionally, it provides for a neater external appearance when the packaging unit is closed. A smooth, slightly recessed area 30 is provided on the external surface of the cover 20 and rear wall 16 for receiving a suitable label for the packaging unit. Advantageously, the flexible hinge 22 permits a label to be applied to the recessed area 30 without causing a wear-line at the point of flexure, as it is substantially flat in its relaxed open position. If desired the remaining external surface may be provided with a textured appearance to enhance not only its aesthetic appearance but also its handling characteristics.

In keeping with the neat exterior appearance of the unit, the front wall 14 of the bottom member 18 is provided with a flush, upstanding, centrally located latch 32 which snaps over and cooperates with the recessed lip 34 of the cover 20 to maintain the unit closed without projecting substantially above the exterior surface of the cover.

As illustrated, the part-receiving bottom member 18 of the packaging unit is divided along the interior of each side wall 24 by a number of compartment-forming partitions 36 substantially parallel to the member's front and rear walls 14, 16. The partitions 36 are integral with the sides 24 and the base or floor 38 of member 18 and extend inwardly from each side in an aligned fashion to form the individual compartments of the unit. As shown, the partitions are substantially the same height as member 18 but extend inwardly only about one quarter the width of the unit, terminating in downwardly and inwardly tapered inner edges 40 which define an enlarged partition-free central area 42 extending from the front wall 14 to the rear wall 16 for accommodating the compartment-traversing interlayer 12.

In accordance with the present invention and as best shown in FIG. 2, the resilient interlayer 12 in the form of a rectangular, foamed or sponge-like spacer is positioned within the central area 42 of the casing, coming to rest against the tapered edges 40 of the partitions 36 at about their midpoints. As mentioned, the interlayer or spacer 12 extends from the front wall 14 to the rear wall 16 with its longitudinal dimension being at a right angle to the aligned partitions 36. Accordingly, it will be appreciated that when a packaging unit contains a number of layers the user not only can readily observe how many parts are within the unit but also can easily remove an individual part by depressing one end thereof causing the spacer to act as a pivot to raise the opposite end of the part out of the unit for easy access. The foamed sheet spacer 12 can be made from various inexpensive and readily available materials. In this regard, the synthetic foam sheets such as flexible polyurethane foam have given good results.

The cover 20 of the packaging unit is provided with a pair of inwardly depending ribs 48 centrally located above the area 42 and extending transversely of the compartmentalizing partitions 36 to thereby extend across all the compartments within the lower member 18. As the cover 20 is closed the ribs 48 will contact the elongated parts in the uppermost layer of the unit forcing them against and embedding them within the foam-cushioning interlayer 12 which in turn is compressed against the lower layer of parts. Thereby all the parts within the unit are not only individually compartmentalized but also immobilized as the cover is closed and secured by the latch 32. As can be appreciated, this is particularly advantageous for threaded or sharp-edged parts since the edges contact and are held by the foamed spacer 12 to prevent slippage in any direction which might cause injury to the parts.

As mentioned, the container is preferably a one piece molded unit of durable semi-rigid plastic material exhibiting sufficient strength to withstand repeated use, as well as the abusive temperature and handling conditions encountered during shipment. Additionally, the material should be capable of forming an integral hinge which will withstand repeated opening and closing of the cover portion of the container. For this reason the high impact polyolefins are particularly advantageous in view of their ready moldability, abrasion-resistance and good mechanical properties combining strength, flexibility and toughness. In particular, the high impact polypropylene polymers and copolymers are preferred in view of their resistance to stress and cracking and their excellent flexural strength.

As will be appreciated from the foregoing detailed disclosure, the compartmentalized packaging unit of the present invention is ideally suited for storing and shipping precision parts such as cylindrical taps or the like while obviating deformation thereof by chipping or flattening the sharp edges due to vibrational contact therebetween. The package provides for the resilient retention of individual parts through the cooperation of a sturdy, yet flexible carrying case and a foam or sponge-like spacer member which immobilizes and protects the stored parts while at the same time permitting ready access thereto and ease of removability thereof. Additionally, the sturdy, abrasion-resistant, packaging unit provides a neat uncluttered appearance free of protruding portions which might otherwise detract from its appearance.

As will be apparent to persons skilled in the art, various modifications and adaptations of the structure above-described will become readily apparent without departure from the spirit and scope of the invention. The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows.

I claim:

1. In a compartmentalized packaging unit for storing and shipping multiple layers of rigid elongated parts comprising a covered carrying case consisting essentially of a part-receiving, box-like member and a substantially flat latchable cover hinged to the part-receiving member, said member being provided with a central interlayer receiving

area defined by the facing edges of a plurality of spaced partitions respectively extending therefrom toward oppositely disposed adjacent side walls of the member in aligned spaced relationship to form parallel compartments for receiving individual parts, the combination wherein the central interlayer receiving area has a dimension longitudinally of the compartments greater than that of the partitions from said facing edges to the adjacent side wall of the member, the packaging unit including a removable, compressible, resilient interlayer for disposition between adjacent layers of packaged parts spaced from the cover and the bottom wall of the member, said interlayer having planar dimensions substantially equal to the central area and being received therein for stabilized separation of the overlying parts from the underlying parts and biasing the overlying parts away from the underlying parts, the uncompressed thickness of the interlayer being sufficient to cause contact between the cover and each elongated part in an uppermost layer and to cause contact between each elongated part in the lowermost layer and the bottom wall of the member upon closure of the cover whereby the resilient interlayer biases the parts into compressive engagement with the cover and bottom wall of the member when the cover is latched to render the parts immobile.

2. The package of claim 1 wherein the cover is provided with inwardly projecting ribs traversing the part-receiving compartments and engageable with each of the uppermost layer of parts.

3. The package of claim 1 wherein the interlayer is a foam, sponge-like member.

4. The package of claim 3 wherein the interlayer is a synthetic foam sheet material and the carrying case is made of a semi-rigid plastic material capable of forming a relatively thin, flexible, integral substantially fatigue-free hinge.

5. The package of claim 1 wherein the interlayer is a foam sheet material, the case is formed from a plastic material selected from the group consisting of polymers and copolymers of polypropylene and the parts are elongated cylindrical threaded taps.

6. The package of claim 1 wherein the box-like member has a base and the partitions are provided with tapered edges facing the central area, said edges removably supporting the interlayer in spaced relationship to the base.

7. The package of claim 1 wherein the part-receiving member is provided with a side wall having a flush upstanding integral latch provided with an inwardly directed latching shoulder perpendicular thereto for engaging a mating recessed lip in the edge of the cover.

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