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UNIVERSAL CRISS-CROSS CONTAINER FOR PACKAGING
MULTI-SIZED THREADED TAPS
Filed Aug. 9, 1968

3,499,525

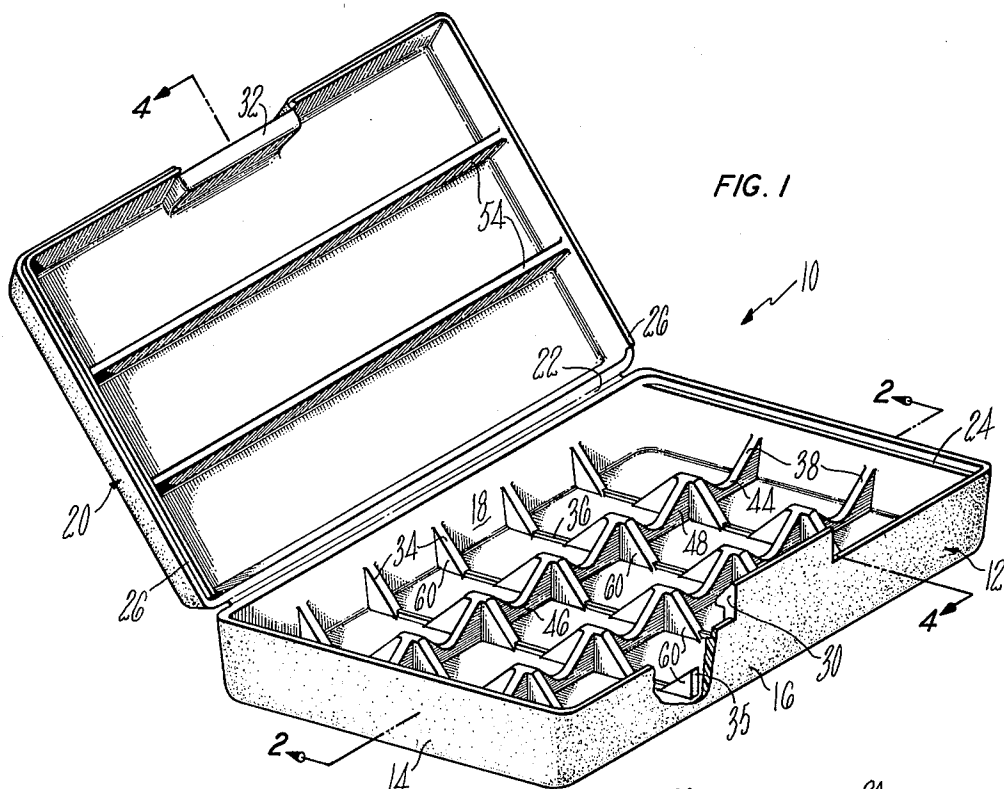


FIG. 1

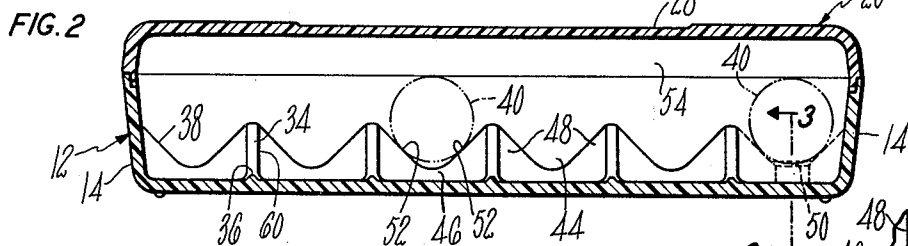


FIG. 2

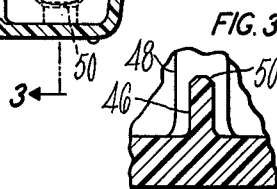


FIG. 3

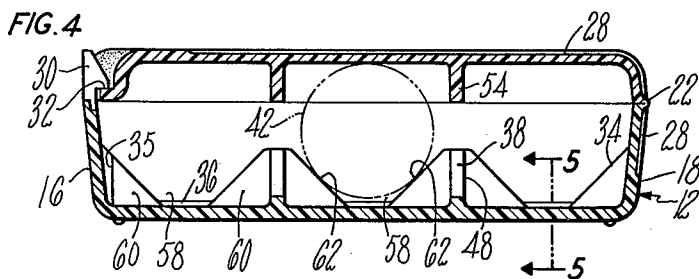


FIG. 4



FIG. 5

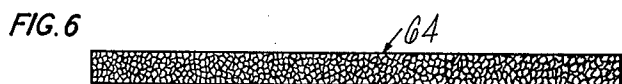


FIG. 6

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UNIVERSAL CRISS-CROSS CONTAINER FOR PACKAGING MULTI-SIZED THREADED TAPS

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4 Claims

ABSTRACT OF THE DISCLOSURE

A packaging case for individually immobilizing a plurality of taps of different diameters and lengths includes spaced intersecting partitions notched between the intersections in both the transverse and longitudinal directions for cradling the taps. The partitions in the longitudinal direction are spaced more widely than those in the transverse direction and the transverse partitions are notched more deeply to immobilize larger taps in cooperation with the cover. Longitudinal ribs overlie the longitudinal partitions to reduce the headroom for taps cradled transversely of the case.

This invention relates generally to a new and improved packaging container for immobilizing a plurality of elongated articles, such as threaded taps and the like.

An object of this invention is to provide a sturdy and compact packaging case for independently immobilizing a desired plurality of either of two or more sizes of elongated articles such as threaded taps.

Another object of this invention is to provide a packaging case of the type described that immobilizes each article therein, individually, irrespective of the size involved.

Another object of this invention is to provide a packaging case as described which immobilizes each article along several distinct and spaced planes of contact.

Another object of this invention is to provide a packaging case of the type described which is of lightweight, abrasion-resistant, semi-rigid construction, yet is sufficiently flexible to form an integral cover-carrying hinge and latch capable of repeated trouble-free actuation.

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

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an isometric view, partly broken away, of an embodiment of the packaging unit of the invention, with the cover open;

FIG. 2 is an enlarged section view taken along the line 2—2 of FIG. 1 with the cover closed;

FIG. 3 is an enlarged fragmentary section view taken along line 3—3 of FIG. 2;

FIG. 4 is an enlarged section view taken along line 4—4 of FIG. 1 with the cover closed;

FIG. 5 is an enlarged fragmentary section view taken along line 5—5 of FIG. 4; and

FIG. 6 is an enlarged end view of a resilient pad that may be used with the packaging unit.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings in greater detail wherein like reference numerals indicate like parts throughout the several views, the packaging unit of the present invention is shown as a one-piece injection-molded, covered carrying case, generally designated 10. The case includes an article receiving and generally rectangular base 12 having upstanding end walls 14, front and rear walls 16,

18, respectively, a substantially flat floor and a substantially flat cover 20 which is joined to the base 12 through an integral and flexible hinge 22 extending along at least part of the rear wall 18 and tending, when unlatched, to bias the cover open. Also as shown, the end walls 14 and front wall 16 may be stepped along their top edges as at 24 for receiving a peripheral overlapping flange 26 of the cover 20, thereby facilitating aligned closure and preventing skewing of the cover as it is pivoted on the hinge 22. This arrangement provides for a neat, external appearance when the unit or case 10 is closed. A smooth, slightly recessed area 28 may be provided on the external surface of the cover 20 and rear wall 18 for receiving appropriate identifying indicia. Advantageously, a label can be applied to the area 28 and over the flexible hinge 22 without causing a wear-line at the point of flexure, as the hinge is substantially flat in its relaxed open position. The remaining external case surface may be provided with a grained appearance to enhance both the aesthetic appearance and the handling characteristics of the case 10.

Further enhancing the neat exterior appearance of the case 10, is a flush, upstanding and front centrally located latch 30 flush with the front wall 16. This latch snaps over and cooperates with a step 32 in the cover to maintain the case 10 closed without projecting above or in front of the exterior surface of the case. Unlatching can be accomplished by providing the wall 16 or the base 12 with sufficient flexibility to ensure that the latch can only be outwardly deflected, which arrangement facilitates safekeeping in the case of sharp-thread articles such as taps. Although the webs 36 ordinarily provide the needed flexibility, additional flexibility may be provided, if desired, by having those partition terminal ends 35 most closely adjacent the latch 30 disconnected from the wall 16 as illustrated in FIG. 1.

In the illustrated embodiment, parallel partitions 38 are shown trisecting the base 12 between the front and rear walls 16, 18, intersecting the partitions 38. Partitions 38 are spaced further apart than partitions 34 to accommodate larger diameter taps therebetween. The intersecting members or partitions 34 and 38 intersect and terminate at a height which is shown as approximately half that of the unit 10 to provide an article supporting grid pattern in the base which includes pyramid-like structures at each intersection having upwardly converging spaced apart walls to provide cradles wider in the longitudinal than in the transverse directions.

FIGS. 2 and 4 illustrate how the base accommodates different sizes of elongated, rigid articles such as threaded taps 40, 42. The partitions 38 are each shown with six generally V-shaped grooves or notches 44 aligned in pairs across the case 10 between walls 16, 18. Connecting web portions 46 of the notches are generally shown rounded, FIG. 2, but alternatively may be linear, relatively thinner than the leg portions 48 joined thereby, and tapered, as shown in FIG. 3, to be received in the threads of taps laid in the grooves 44, along a plane of contact 50. Irrespective of the configuration of its web 46, each groove 44 terminates above the floor of the case 10, so that each confined article 40 is spaced from the floor. The leg portions 48 of each groove 44 are shown cradling a confined tap 40 upon separate planes of contact 52, each of which is distinct from the optional contact plane 50 provided with a tapered web. An included angle of 90° between the contact planes 52 has been found satisfactory although other angles can be used. Depending upon the configuration of the web 46, therefore, each larger tap or

article 40 disposed in the grooves 44 across the base 12 is securely cradled along two planes of contact, an arrangement conducing to security of each such tap. A single case 10 of convenient dimensions, such as about 5½ inches by 4¼ inches by 1¼ inches can readily accommodate six taps when they are disposed in tandem cradles in the grooves 44.

The cover 20 includes ribs 54 mutually parallel and spaced so that with the case closed the ribs substantially overlie the intersecting members 38 as shown in FIG. 4. The ribs protrude from within the cover so that in the closed case 10 they limit the headroom to a size just sufficient to permit the cradling of the largest tap size, say ⅝ inch, to be cradled in grooves 44, thereby additionally providing for the immobilizing of taps of that size.

The end wall-aligned partitions 34 shown in the drawings each have three generally V-shaped grooves or notches 58 aligned five deep along the case 10 between the end walls 14. Connecting webs 36 of these notches are shown as being tapered and somewhat thinner than the adjoining leg portions 60. These leg portions may be reduced and tapered, however, as indicated for the webs 46 of FIG. 3, for longitudinally immobilizing threaded taps 42 by engaging the threads thereof. An included angle of 90° separating article supporting contact planes 62 of the leg portions 60 has been found satisfactory, although other angles can be used. Threaded taps 42 disposed in the notches 58 along the base 12 are each securely cradled, therefore, along at least two spaced contact planes tangent to the tap circumference. The same case as utilizes the grooves 44 for transversely confining taps 40 can readily accommodate three taps of a plurality of sizes of taps larger, say up to 1 inch, than those cradled transversely of the case in grooves 44, when disposed one in each of the grooves 58, that is longitudinally of the case 10. This packaging arrangement thus conforms to the customary practice in the trade of packaging a greater number of smaller taps than are purchased of larger taps and does so by the use of a single packaging case.

The ribs 54 do not reduce the headroom for the taps cradled in grooves 58, and the cover 20 when closed preferably contacts the largest taps, say 1 inch, cradled therein. This arrangement also accommodates the greater length of larger taps longitudinally of the case. Articles intermediate in size to those discussed above can be immobilized in the same case 10 by being cradled in the same manner as the 1 inch taps by the use of a resilient pad 64 between such articles and the cover 20, and taps smaller than the ⅝ inch size cradled in the same manner as the ⅝ inch size can be immobilized in the same manner. In each instance, a plane of contact is established between the cover 20 and the taps, by means of the pad 64, thus also ensuring the immobilization and separation of taps of all sizes.

As mentioned, the container is preferably a one-piece molded unit of durable semi-rigid plastic material exhibiting sufficient strength to withstand repeated used, as well as the abusive treatment and handling conditions encountered during shipment. Additionally, the material should preferably be capable of forming an integral hinge and latch which will withstand repeated opening and closing of the packaging case. 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, a single packaging unit of the present invention is well suited for immobilizing a plurality of either of

two or more sizes of precision parts such as threaded taps or the like while obviating damage thereto by chipping or flattening the sharp edges due to contact therebetween during storage or shipment. The packaging unit or case provides for cradling individual articles within a sturdy, yet flexible carrying case adapted to provide for the individual immobilizing of each article, and a resilient spacer member ensures the individual immobilization of smaller sizes of articles so that one packaging unit can replace at least six separate sizes of package units heretofore needed. Additionally, the sturdy, abrasive resistant packaging unit provides a neat uncluttered appearance free from protruding portions which might otherwise detract from its appearance or cause it to open accidentally during storage or shipment.

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.

I claim:

1. A packaging unit for simultaneously and separately immobilizing several like elongated articles of any one of a plurality of sizes comprising a case including upstanding spaced intersecting members therein notched intermediate of the intersections in both directions to provide spaced apart cradles for articles positioned therein, the intersecting members being spaced more widely and the notches being deeper in one direction than in the other to cradle the larger sized articles received in the deeper notches and to immobilize the same when the cover of the case is closed and headroom reducing means comprising ribs on the cover, overlying the intersections when the cover is closed, and extending transversely of the shallower notches to reduce the headroom for the shallower notches only.

2. A packaging unit as set forth in claim 1 wherein the web portions of at least the intersecting members that are notched longitudinally of the case are convergently tapered toward their upper surfaces.

3. A packaging unit as set forth in claim 1 in which the notches are V-shaped to form article supporting planes disposed at an acute angle with respect to each other to engage any one of the plurality of sizes of articles cradled therein along planes tangential to the circumference of said articles.

4. A packaging unit for simultaneously and individually immobilizing a plurality of like elongated articles of any one of a plurality of sizes comprising a case having an article receiving base portion including a plurality of upstanding spaced pyramid-like structures aligned in intersection longitudinal and transverse rows within the base portion, the side walls of said pyramid-like structures being upwardly converging in both the longitudinal and transverse directions and being more closely spaced in one of said directions than in the other to provide smaller cradles for the smaller of the plurality of sizes of elongated articles, and headroom reducing means comprising ribs formed on the inside of a cover hinged to the case, said ribs overlying one of the transverse and longitudinal rows of pyramid-like structures to reduce the headroom of the smaller cradles only.

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