Feb. 11, 1969

C. BAYER

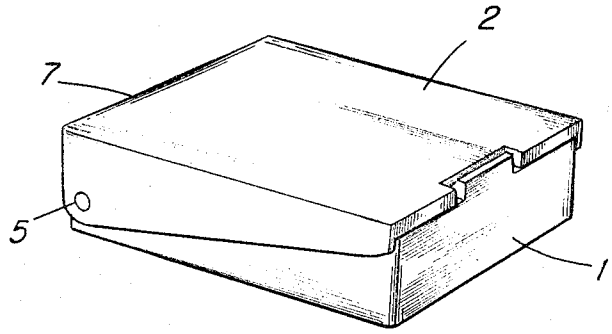
TAP BOX

3,426,890

Filed Dec. 20, 1967

Sheet 1 of 2

FIG. 1



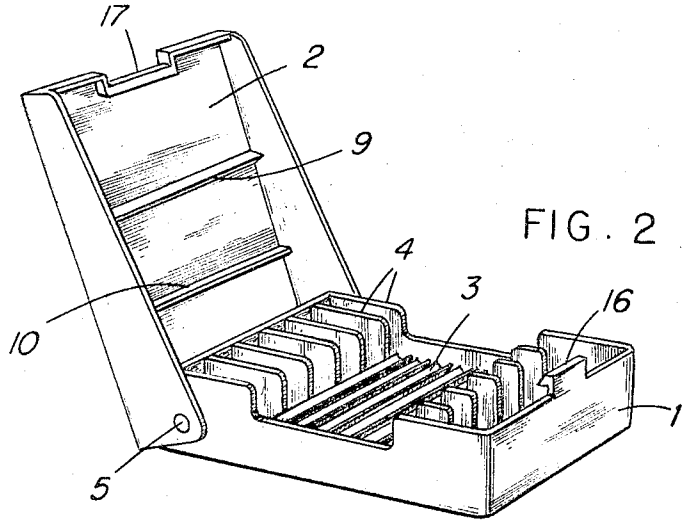


FIG. 2

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TAP BOX

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FIG. 5

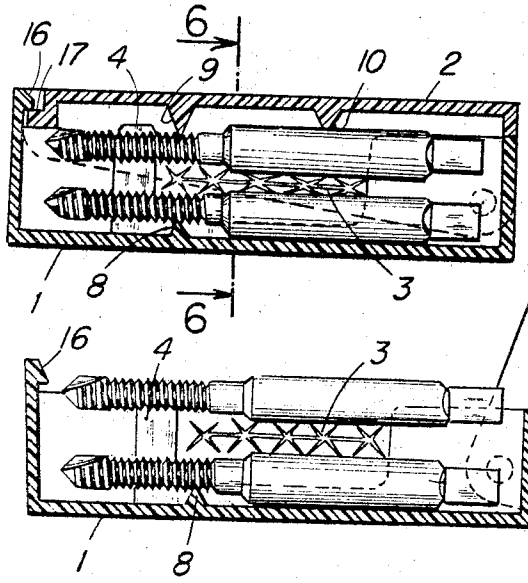


FIG. 4

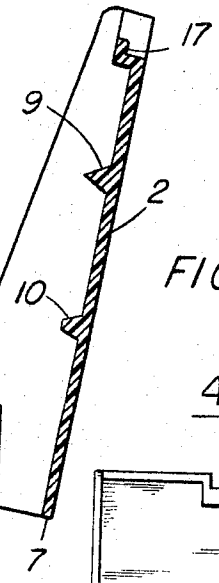


FIG. 7

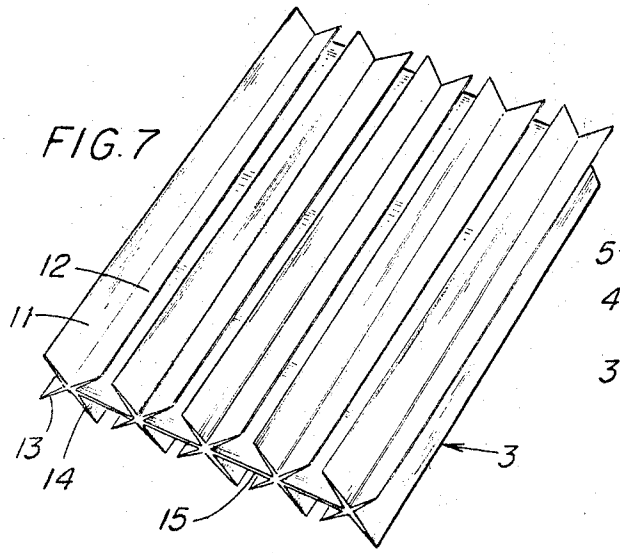
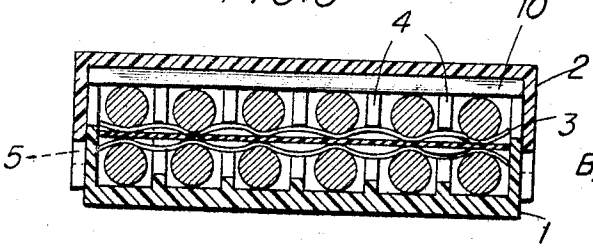


FIG. 6



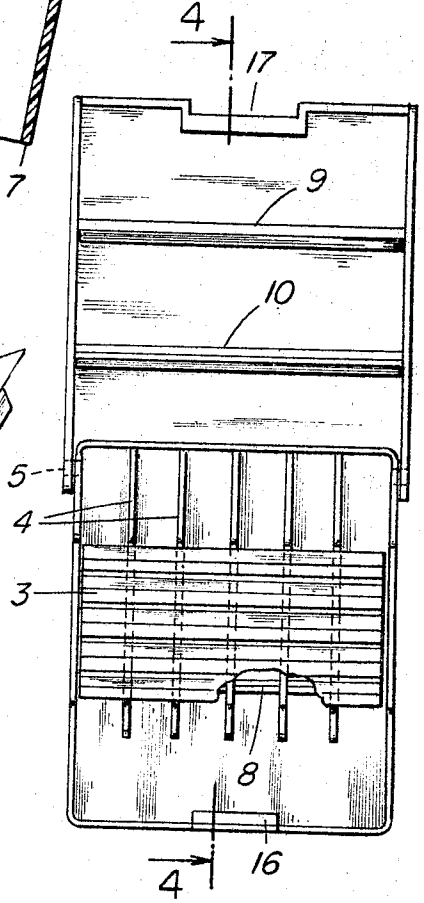


FIG. 3

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TAP BOX

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Filed Dec. 20, 1967, Ser. No. 692,041
U.S. Cl. 206—17 6 Claims
Int. Cl. B65d 85/54; A45c 11/26

ABSTRACT OF THE DISCLOSURE

An injection molded plastic box having integral longitudinal dividers forms a package for taps. Angular ridges formed in the box prevent longitudinal motion of the taps. An inexpensive extruded resilient cushion member separates layers of taps and prevents damage and rattling.

Elongate, generally cylindrical, fragile items such as taps and drills have traditionally been packaged in dozens or fractions thereof in small cardboard or wooden boxes which are provided with longitudinally channeled wooden divider tray members to maintain orientation of the items and to prevent damage to the individual items from mutual impact. Cushioning has frequently been provided by an overlying piece of corrugated board or other impact absorbing fibrous material.

Because of their lower fabrication cost and attractive appearance, plastic materials are desirable for such packages. Plastic packages better protect the contents from moisture and are more resistant to soiling. Flexible plastic foams have been proposed for cushioning materials because they are more permanently resilient than corrugated board and fibrous bats. Such foams have proven to be too costly for acceptance in this use.

Tap packages are necessarily sized to the particular item to be packaged. Because of the great many different tap sizes, a manufacturer requires a great variety of package sizes to accommodate his products. This requirement increases his cost attributable to packaging by virtue of a burdensome package inventory and procurement since he is not able to ship his product without previously securing the proper number of the correct size box to suit his actual production needs.

The packaging of taps could be made more efficient by providing packages which can be used with more than one size tap. While a range of several diameters of taps can be accommodated with a particular divider tray channel width, differences in length are not as easily accommodated. When the package is filled with taps shorter than the box length, the taps tend to shift longitudinally of the channels. This shifting is referred to as "shucking". The greater the disparity in length between the group of taps and box, the greater the problem of shucking.

The packages generally is use are opaque and therefore, require explicit labeling of the contents. The label is the only external information of size, form and type for the contents. The label is attached to the overfitting lid of the traditional cardboard box thereby permitting inadvertent interchange of lids among similar boxes. The resultant mislabeling is an annoyance which occasionally results in production delays for the user of the taps. A transparent box would be advantageous since the nature of the contents can be readily observed and errors in selection of the proper tap could be sharply reduced.

The known prior attempts at providing plastic tap boxes have been unsuccessful because shucking of the taps is much more apparent than with cardboard boxes. The shucking and rattling noises are magnified by the plastic box. Shucking movements cause the sharp surfaces of the taps to scratch the inner surfaces of plastic

boxes. Such scratching soon renders the box unsightly and creates the impression that the goods are old stock not of recent manufacture. Such scratching is particularly noticeable in transparent boxes and soon obscures the transparency. This disadvantage outweighs the visual advantages of transparent boxes.

The plastic tap package of the present invention overcomes each of the above noted problems. It can be economically produced by injection molding from low cost plastics such as polystyrene and its copolymers. When molded from transparent materials it permits excellent visibility of the contents. The package is configured so as to prevent the contained taps from marring the box surfaces. The annoying shucking movements of the taps are prevented. Each pacakge size can accommodate a relatively wide range of tap diameters and lengths. A unique and effective separator cushion is provided for use between the layers of taps which cushion is less expensive than plastic foams. The cushion can be made transparent whereas the prior cushions are opaque. Unlike plastic foams which can be made only with expensive specialized machines, the present cushion can be fashioned with inexpensive equipment which is ordinarily present in a plastic molding plant. The molder need not purchase cushioning materials from another vendor thereby improving his profits.

An embodiment of the present invention will be described with reference to the drawings in which,

FIGURE 1 is a perspective view of the closed package,

FIGURE 2 is a perspective view of the package with the box empty and with the cover open,

FIGURE 3 is a top view of the package with the box open and with cushion in place,

FIGURE 4 is an elevational view in section along lines 4—4 of FIGURE 3, showing a group of taps and the cushion in place, but the cover open.

FIGURE 5 is a view similar to FIGURE 4 showing the cover closed and the cushion compressed.

FIGURE 6 is a transverse sectional view along the line 6—6 of FIGURE 5, and

FIGURE 7 is a perspective view of the cushion.

The package illustrated in the drawings comprises an injection molded box **1** and cover or lid **2** and a separate flexible extruded cushion member **3**. The box and lid are preferably molded from polystyrene although other materials such as cellulose acetate, ABS, vinyls, polyethylene, polypropylene, nylon and various copolymers may be employed. The cushion is most economically extruded from flexible materials such as plasticized vinyls, polyethylene, etc.

Divider walls **4** are molded integral with the box **1** and serve to separate laterally adjacent taps. Divider walls **4** define longitudinal channels for receipt of taps. Tap diameters can be accommodated in these channels which range from the maximum diameter which can be fitted to a minimum diameter determined by the practical consideration of excessive clearance in the channel. In practice the minimum diameter is ordinarily about half the maximum diameter. Divider walls **4** are partially cut away or notched to provide a transverse channel for receiving the separating cushion **3** in a manner which will be subsequently described.

The cover or lid **2** is hinged to the box **1** by means of short integral pins **5** formed in the side walls of the box and corresponding pin receiving apertures in the side walls of the lid. It is obvious that other forms of simple hinges could be used. The hinge axis determined by the location of pins **5** and the lid apertures is positioned low and toward the rear of the box to permit the cover to open at least to the vertical position seen in FIGURES 2 and 4 such that the lid is completely clear of the box interior. The lid will remain open since it rests on its rear surface

7 in the open position. This construction allows for easy access to the taps by one hand. The lid remains attached to the base when the box is opened. This prevents loss or inadvertent interchange of lids. The lid securely fastens in the closed position by means of a snap catch **16** on the box which engages a surface **17** on the lid.

A transverse ridge **8** is molded on the interior surface of the bottom of the box **1**. A similar ridge **9** is molded on the interior of the lid. The ridges **8** and **9** form an elongate prism having an included angle between the faces of approximately 60° which angle is equal to the included angle of most tap threads. As is best seen in FIGURE 5, ridge **8** interfits with and engages the threaded portion of the taps on the lower layer. Similarly, ridge **9** interfits the threaded portion of the taps in the upper layer when the box is closed. By so interfitting, ridges **8** and **9** prevent longitudinal shucking movement of the taps. Ridges **8** and **9** also serve to hold the sharp threads away from contact with the inner surfaces of the box and lid thereby preventing abrasion of the box and possible damage to the tap thread peaks. Because of the identity of angle, ridges **8** and **9** interfit equally well with all taps within the diameter range accommodated by a particular box size.

The separating cushion member **3** of the present invention is illustrated in FIGURE 7. The cushion is and extrusion of plasticized vinyl in its preferred form. It is extruded as a continuous length and cut into pieces of appropriate size. The cushion is in the form of a plurality of divergent fin-like elements **11–14** formed integrally with a central web **15**. The fins are symmetrically disposed at acute angles with the web. This configuration is easily compressed in thickness and thus conforms readily to the cylindrical form of the taps which lie in a direction transverse to the fin members. Because all the elements of the cushion are extruded through straight slots, the extrusion die is relatively inexpensive. The cushioning action provided by this configuration is ideal since resistance of the fins to deflection increases as the deflection increases. Thus, the taps are gently cradled by the cushion but are more firmly restrained during severe impacts.

The operation of the above described cushion **3** is best seen in reference to FIGURES 4–6. FIGURE 4 shows the package provided with two layers of taps separated by the cushion. When the lid **2** is brought to the closed position of FIGURE 5, a transverse rib **10** is brought to bear down on the shank portion of the upper layer of taps and transverse ridge **9** is forced in between the threads of the upper taps. The upper taps are thus depressed into the resilient cushion **3**. The cushion resiliently conforms to the longitudinal configuration of the taps and presses the layers of taps apart into ridges **8** and **9** and against the lid and box bottom to snuggly hold the taps against rattling and to prevent mutual damaging contact of the vertically adjacent taps. The cushion is sufficiently resilient to effectively accommodate a wide range of tap diameters. As can be seen in FIGURE 6, each of the taps is discouraged from lateral movement by the tendency of the cushion toward resuming its relaxed thickness in those areas between the laterally adjacent taps. Cushion **3** is retained in its proper position by its location in the transverse channel formed by the cut away portions of divider walls **4**. The cushion acts in concert with ridges **8** and **9** and rib **10** to hold the taps against rattling or shucking. Visibility of the contents is maximized when the cushion **3** is also formed of transparent material.

It is apparent that the interior of the package of the present invention can be made other than rectilinear to accommodate a set of graduated sizes of taps. For a graduated set, the ridges **8** and **9** can be disposed at an angle to correspond with the increasing length of taps in a set. The height of the ridges can be decreased and the spacing between the divider walls **4** can be increased as the tap diameters progressively increase.

The features of the present invention are applicable to packaging fragile or delicate elongate articles other than taps and drills. For example, glass items such as ampoules for medicants, artist's pastels or chalks, electronic devices, and the like.

I claim:

1. A plastic package for taps comprising a box having a plurality of longitudinal divider walls for separating laterally adjacent taps, a hinged cover for said box, and a resilient cushioning member adapted to lie transverse of the axes of the taps, said cushioning member being a flexible plastic extrusion comprising a web having formed thereon a plurality of elongate fin members, adjacent pairs of fins being oppositely directed at acute angles with one side of the web, similar fin pairs being symmetrically arranged on the opposite side of the web.

2. The package of claim **1**, wherein an interior surface of the box is provided with a ridge configured and located to engage the threaded portion of the taps to arrest axial movement of the taps.

3. A tap package comprising a box and cover, said box being provided with divider walls to separate laterally adjacent taps and having a ridge transverse to the divider walls formed on the inside surface of the box bottom, said ridge being in the form of an elongate substantially equilateral prism such that the apex of the prism enters between adjacent threads of a tap to discourage axial movement of the taps.

4. The package of claim **3** wherein the inside of the cover is provided with a similar thread engaging ridge.

5. A plastic package for taps comprising a box having a plurality of longitudinal divider walls for separating laterally adjacent taps, a hinged cover for said box and a resilient member for separating and cushioning vertically adjacent layers of tap, said box being provided on its interior bottom surface and interior cover surface with ridges configured and located to engage the threaded portion of the taps, said divider walls being partially cut away to permit the location of said cushion member across the taps of the lower layer.

6. A plastic package for taps comprising a box having a plurality of longitudinal divider walls for separating laterally adjacent taps, a hinged cover for said box and a resilient member for separating and cushioning vertically adjacent layers of taps, said box being provided on its interior bottom surface with an elongate ridge member in the form of a prism having faces with an included angle of approximately 60° which are adapted to engage a threaded portion of a tap to arrest axial movement of the tap, said cover being provided with a similar tap thread engageing ridge, said resilient cushion member being an extrusion of flexible plastic and comprising a plurality of elongate fins radiating from a central web, said cushion fins being oriented transverse to the axes of the taps, said divider walls being partially cut away to form a channel for accommodating said cushion.

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