Oct. 2, 1962

L. A. DEINERT

3,056,525

TOTE BOX

Filed Sept. 12, 1960

2 Sheets-Sheet 1

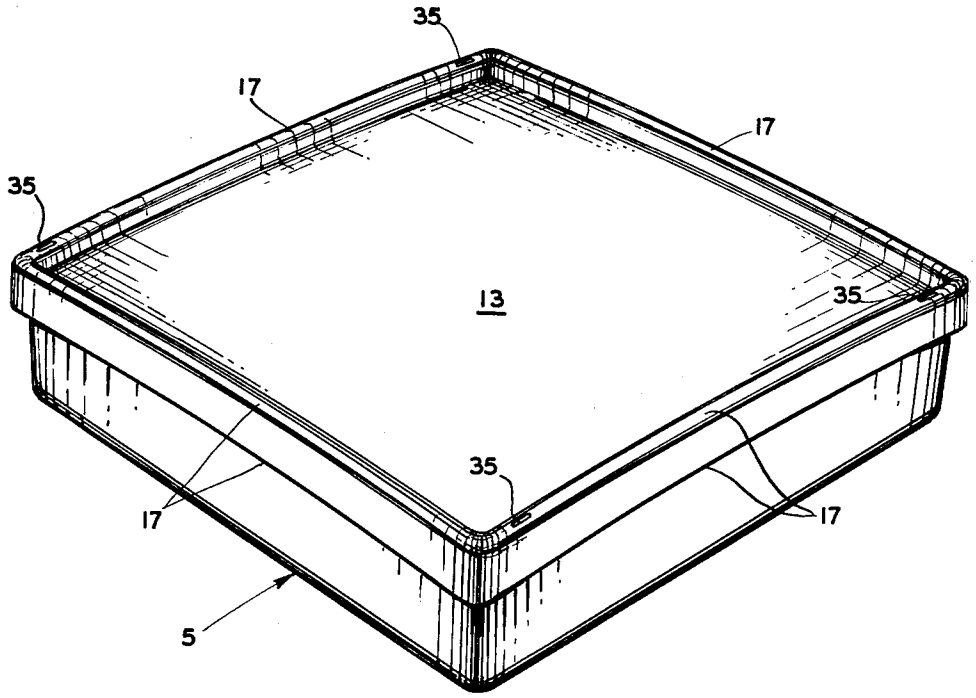

FIG. 1

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Filed Sept. 12, 1960 2 Sheets-Sheet 2

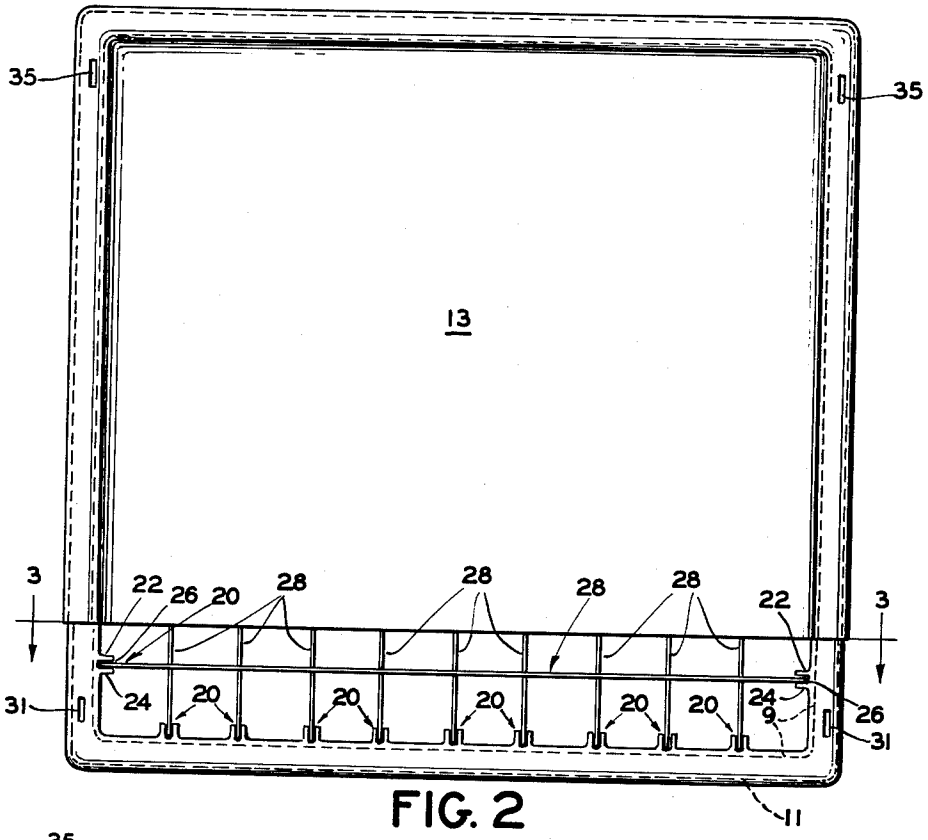

FIG. 2

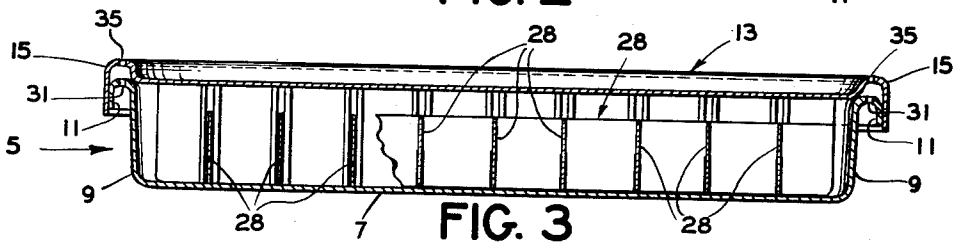

FIG. 3

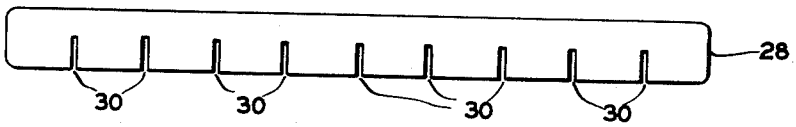

FIG. 4

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TOTE BOX

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The invention relates to improved tote boxes for use in carrying and maintaining assembly parts of precision instruments such as gyroscopes, computers, amplifiers and general flight instruments in a dust proof condition and readily accessible for use of assembly personnel.

In the assembly of such precision instruments it has been found to be extremely important to protect the instrument parts from damage by dirt and dust so as to greatly reduce the scrap and rework of critical parts and assemblies. A significant step in effecting the foregoing has been the development of improved tote boxes formed of a white polyethylene plastic material having interchangeable dust proof covers, designed as a stacking platform with a rail about the outer edge thereof for facilitating the stacking of one box upon another and including within the box separator members removably mounted in the base portion of the box so that desired compartment sizes may be effected.

Moreover, in order to assure absolute cleanliness in the handling of such precision instrument parts, the improved tote box for carrying such parts has been formed of a white polyethylene plastic material which may be subject to a cleansing process including the steps of first passing the tote box under a jet blast of a hot detergent, then under a jet blast of clear water, and finally a hot air drying stage so that the tote box upon completing the cleansing process is surgically clean. In addition to the practicability of the polyethylene tote boxes, the white color provides and incentive toward keeping the tote boxes clean.

Further, an object of the invention is to provide a novel tote box of a molded white plastic material such as a high density polyethylene having flexible characteristics with a plastic self-lubricant glaze on the cover and base portions so as to permit the cover to slide over the corners of the base portion and fit snugly thereabout to protect the instrument assembly parts carried therein from dust and dirt.

Another object of the invention is to provide a tote box of the aforenoted type in which there are formed along the inner surface of the side walls of the base portion of the box inwardly projecting ribs to support the sides of the base portion of the box, while providing channels for receiving end portions of removable interlocking spacer members formed of a like flexible plastic material and having a plastic self-lubricant glaze so that the spacer members may be readily inserted in the channels to form separate compartments in the base portion for receiving various parts of the assembly instrument and in which the arrangement of the spacer members is such that the size of the respective compartments may be changed by the removal of one or more of the interlocking spacer members or the re-insertion of other spacer members as the case may be so that compartments formed by the spacer members may meet the requirements as to the size and shape of the respective parts to be received therein.

Another object of the invention is to provide a tote box of the aforenoted type in which the base portion of the box has a hand grip channel ridge formed about the outer edge of the cover portion of the box for receiving in said channel a corresponding hand grip channel ridge formed about the outer edge of the base portion of the box with a snap fit and in which arrangement

the hand grip channel ridges about the outer edges of the cover and base portions provide for the convenient manual manipulation of the cover and base portions by the person handling the tote boxes, while in addition the hand grip channel ridge protruding above the cover portion of the box serves as a stacking rail so that other similar tote boxes may be conveniently stacked one upon the other within the stacking rails thereof.

Another object of the invention is to provide in the stacking rail of the cover and the hand grip channel ridges of the base portions of the tote suitable slots to permit wash water tending to collect therein during the cleansing process to drain therefrom.

Another object of the invention is to provide a tote box of the aforenoted type in which the cover portion is formed intermediate to the corner portions thereof so as to provide resilient bowed portions effecting a snap fit of the cover portion on the respective corner portions of the base of the tote box to protect the assembly parts therein from dust and dirt.

These and other objects and features of the invention are pointed out in the following description in terms of the embodiment thereof which is shown in the accompanying drawings. It is to be understood, however, that the drawings are for the purpose of illustration only and are not a definition of the limits of the invention, reference being had to the appended claims for this purpose.

In the drawings:

FIGURE 1 is a perspective view of the novel tote box showing the cover portion thereof warped or bowed intermediate the corner portions thereof and in a frictional fit over the respective corner portions of the base of the tote box.

FIGURE 2 is a top plan view of the tote box of FIGURE 1.

FIGURE 3 is a sectional view of the tote box of FIGURE 2 taken along the lines 3—3 and looking in the direction of the arrows.

FIGURE 4 is a side view of one of the separator members of the tote box of FIGURE 2.

Referring to the drawings, the improved tote box, as shown in FIGURES 1, 2 and 3, includes a base portion **5** having a bottom **7** and side walls **9** with a turned over hand grip channel ridge **11** about the lip of the side walls **9**. The base portion **5** is molded of a white plastic material such as a high density polyethylene material having flexible characteristics and a plastic self-lubricant glaze on the surfaces thereof.

A cover portion **13** is likewise molded of a white plastic material such as a high density polyethylene material having flexible characteristics and a plastic self-lubricant glaze on the surfaces thereof. The cover portion **13** as molded has a turned over hand grip channel ridge **15** about the outer edge thereof for receiving therein the hand grip channel ridge **11** formed about the outer edge or lip of the side walls **9** of the base portion. The plastic surfaces of the channel ridge **15** and channel ridge **11** have a self-lubricant glaze so that the channel ridge **11** slides into the channel ridge **15** with the flexible wall portions thereof providing a snap frictional fit.

The cover portion **13**, as shown in FIGURE 1, is longitudinally warped or bowed at **17** along the sides thereof intermediate the corners of the cover portion **13** so that the corner portions of the cover portion **13** slide over the corners of the base portion **5** and fit snugly thereabout with a frictional fit to protect the interior of the base portion **5** and assembly parts carried therein from dust and dirt.

Further, as shown in FIGURES 2 and 3, there are formed integral with the bottom **7** and the inner surface of the side walls **9** of the base portion **5** of the tote box inwardly projecting ribs **20** which are arranged in like

manner in spaced relation along the inner surface of each of the side walls 9 so as to provide rigidity thereto. Further, as shown in FIGURE 2, each of the ribs 20 have portions 22 and 24 providing a channel 26 for slidably receiving an end portion of a removable interlocking spacer member 28, shown in detail in FIGURE 4. The spacer members 28 are also formed of a molded white plastic material, such as high density polyethylene, having flexible characteristics with a plastic self-lubricant glaze so that the end portions of the member 28 may be readily inserted into the channels 26 of ribs 20 projecting from opposite side walls 9, as shown in FIGURE 2, while along the spacer members 28 are provided in spaced relation suitable slots 30 for receiving corresponding slots in other intersecting spacer members 28, shown in FIGURE 2, so as to facilitate the withdrawal and insertion of one or more of the spacer members 28 relative to the base portion 5. Thus, the compartments formed by the intercrossing spacer members 28 in the base portion 5 may be varied to meet the requirements as to size and shape of the assembly parts to be received therein.

Further, opening through the hand grip channel ridge 11 and the hand grip channel ridge 15 are slots 31 and 35 respectively so arranged as to permit wash water which might otherwise tend to collect in the channels during the cleansing process to drain therethrough and out of the channels.

In the cleansing process, the tote boxes formed of a white polyethylene plastic material are subject to a jet blast of a hot detergent, the tote boxes are then subject to a jet blast of clear water, and are finally passed through a hot air drying stage so that the tote boxes upon completing the cleansing process are surgically clean.

The hand grip channel ridges 11 and 15 provide a means for conveniently carrying the tote box and also means whereby the person handling the base 5 and cover 13 may conveniently lift and position the same relative one to the other in the cleansing thereof during the aforenoted process. The channel ridges 11 and 15 also provide convenient means whereby the cover portion 13 may be fitted to the base portion 5 with a frictional fit, as heretofore described, to protect the interior thereof from dirt and dust.

In addition, the protruding portion of the hand grip channel ridge 15 provides a stacking rail about the outer edge of the cover portion 13 so that the tote boxes may be successively stacked one upon the other in which arrangement the upper box is stacked within the stacking rail of the lower tote box for ease in handling and packing.

Although only one embodiment of the invention has been illustrated and described, various changes in the form and relative arrangements of the parts, which will now appear to those skilled in the art may be made without departing from the scope of the invention. Reference is, therefore, to be had to the appended claims for a definition of the limits of the invention.

What is claimed is:

1. A tote box for carrying assembly parts of a precision instrument, comprising a base portion of a flexible self-lubricant high density polyethylene plastic material, said base protion having a bottom portion and side wall portions, ribs formed integral with the bottom portion and projecting inwardly in spaced relation from the inner surface of the side wall portions, each of said ribs having a channel provided therein, flexible separator members having end portions slidably positioned in the channels of the ribs at opposite side wall portions for separating the base portion into compartments for receiving assembly parts, a flexible cover of said polyethylene plastic material, said cover having longitudinally bowed side portions extending intermediate opposite corners of the cover, the corners of the cover flexibly fitting over corresponding corners of the side wall portions, and said longtiudinally bowed side portions causing the corners of the cover to slidably engage the corresponding corners of the side wall portions with a frictional fit.

2. A tote box for carrying assembly parts of a precision instrument, comprising a base portion of a flexible self-lubricant high density polyethylene plastic material, said base portion having a bottom portion and side wall portions, ribs formed integral with the bottom portion and projecting inwardly in spaced relation from the inner surface of the side wall portions, each of said ribs having a channel provided therein, flexible separator members having end portions slidably positioned in the channels of the ribs at opposite side wall portions for separating the base portion into compartments for receiving assembly parts, a flexible cover of said polyethylene plastic material, a first hand grip ridge channel about an outer edge of said side wall portions, a second hand grip ridge channel about an outer edge of said cover, said second ridge channel having longitudinally bowed side portions extending intermediate opposite corners of the cover, the corners of the cover flexibly fitting over corresponding corners of base portion, said first ridge channel being frictionally engageable within the second ridge channel, said bowed portions causing the corners of the cover to frictionally engage the corresponding corners of the base portion in such a manner as to secure said cover to said base portion with a frictional fit to protect the interior of the base portion from dust and dirt, and the first and second ridge channels being manually operable in one sense for carrying the box and in another sense for positioning the base portion and the cover relative one to the other.

3. The combination comprising a base portion of a flexible self-lubricant high density polyethylene plastic material, said base portion having a bottom portion and side wall portions, a flexible cover of said polyethylene plastic material, a first hand grip ridge channel about an outer edge of said side wall portions, a second hand grip ridge channel about an outer edge of said cover, said second ridge channel having longitudinally bowed side portions extending intermediate opposite corners of the cover, the corners of the cover flexibly fitting over corresponding corners of the base portion, said first ridge channel being frictionally engageable with the second ridge channel, and said bowed portions causing the corners of the cover to frictionally engage the corresponding corners of the base portion in such a manner as to secure said cover to said base portion with a frictional fit to protect the interior of the base portion from dust and dirt, and the first and second ridge channels being manually operable in one sense for carrying the box and in another sense for positioning the base portion and the cover relative one to the other.

4. A tote box for carrying assembly parts of a precision instrument, comprising a base portion of a flexible self-lubricant high density polyethylene plastic material, said base portion having a bottom portion and four side wall portions formed integral with the bottom portion, ribs formed integral with the bottom portion and projecting inwardly in spaced relation from the inner surface of the side wall portions, each of said ribs having a channel provided therein, flexible separator members having end portions slidably positioned in the channels of the ribs at opposite side wall portions for separating the base portion into compartments for receiving assembly parts, a flexible cover of said polyethylene plastic material, a first hand grip ridge channel about an outer edge of said side wall portions, a second hand grip ridge channel about an outer edge of said cover, said second ridge channel having longitudinally bowed side portions extending intermediate opposite corners of the cover, the corners of the cover flexibly fitting over four corresponding corners of the base portion, said first ridge channel being frictionally engageable with the second ridge channel, said bowed portions causing the corners of the cover to frictionally engage the four corresponding corners of the base portion in such a manner as to secure said cover to

said base portion with a frictional fit to protect the interior of the base portion from dust and dirt, the first and second ridge channels being manually operable in one sense for carrying the box and in another sense for positioning the base portion and the cover relative one to the other, and the second ridge channel forming a stacking rail above the upper surface of the cover to facilitate the retention on the cover of another tote box upon said other tote box being stacked thereon.

5. A tote box for carrying assembly parts of a precision instrument, comprising a base portion of a flexible self-lubricant high density polyethylene plastic material, said base portion having a bottom portion and four side wall portions formed integral with the bottom portion, ribs formed integral with the bottom portion and projecting inwardly in spaced relation from the inner surface of the side wall portions for rigidly supporting the side wall portions, each of said ribs having a channel provided therein, flexible separator members having end portions slidably positioned in the channels of the ribs at opposite side wall portions for separating the base portion into compartments for receiving assembly parts, a flexible cover of said polyethylene plastic material, a first hand grip ridge channel about an outer edge of said side wall portions, a second hand grip ridge channel about an outer edge of said cover, said second ridge channel having longitudinally bowed side portions extending intermediate opposite corners of the cover, the corners of the cover

flexibly fitting over four corresponding corners of the base portion, said first ridge channel being frictionally engageable within the second ridge channel, said bowed portions causing the corners of the cover to frictionally engage the four corresponding corners of the base portion in such a manner as to secure said cover to said base portion with a frictional fit to protect the interior of the base portion from dust and dirt, openings through both the first and second ridge channels for the drainage of cleansing water from said channels, the first and second ridge channels being manually operable in one sense for carrying the box and in another sense for positioning the base portion and the cover relative one to the other in the cleansing thereof, and the second ridge channel forming a stacking rail above the upper surface of the cover to facilitate the retention on the cover of another tote box upon said other tote box being stacked thereon.

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