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3,252,568

DATA TAPE PACKAGE

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FIG. 1

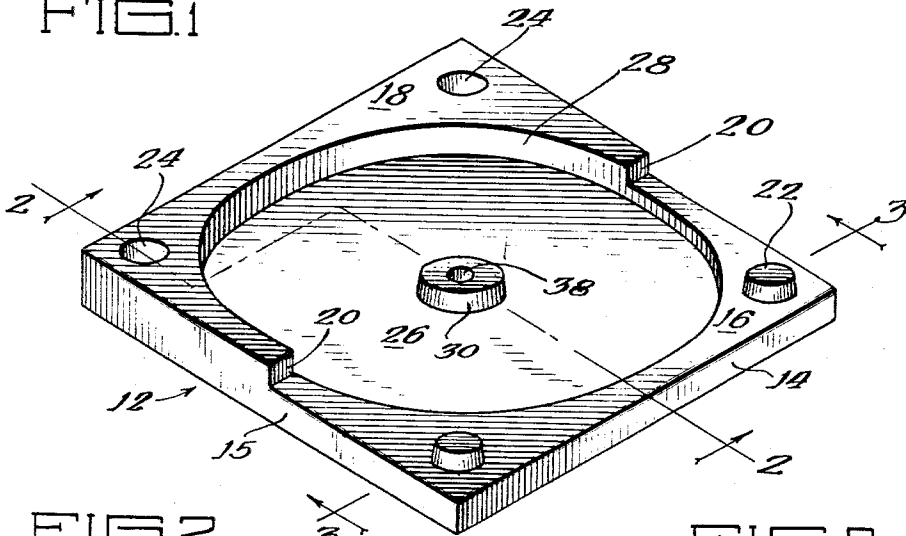


FIG. 2

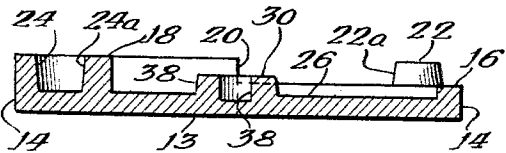


FIG. 3

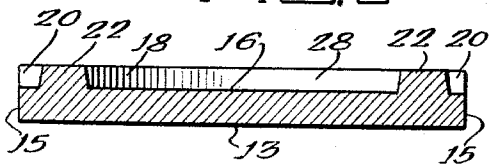


FIG. 5

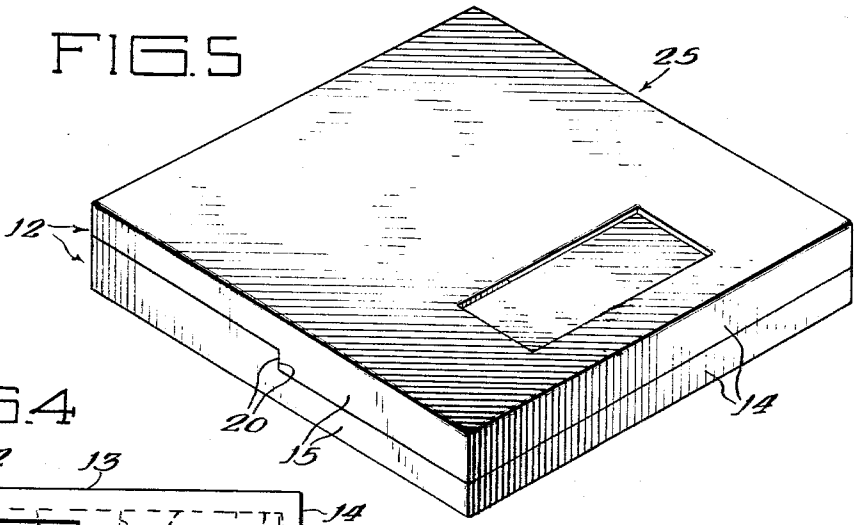
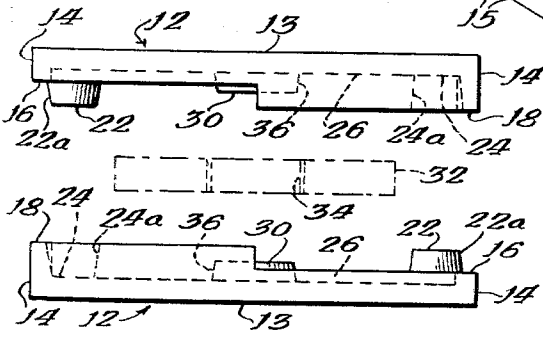


FIG. 4



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3,252,568

**DATA TAPE PACKAGE**

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 3 Claims. (Cl. 206-52)

This invention relates to packaging means and more particularly to a new and improved package for packaging tape rolls or the like.

Data tape of the type having selected holes punched therein to encode a program which may be sensed therefrom by appropriate sensing means requires a great deal of care in handling and storing. This tape is relatively expensive and must be maintained free of creasing or scoring or the like. Such tape is particularly suitable for use in numerical control, such as in testing sequences for guided missiles or the like. The tape is extremely thin and may be easily damaged by severe bumps thereagainst. A common problem is that an average size roll of data tape, in the order of a thousand feet or so, is relatively heavy and, if dropped, the core thereof may collapse which renders the tape unsatisfactory for use.

It is to be understood that the nature of the use of such tape requires extreme accuracy and the maintenance of precise tolerances. Thus, the surface thereof must be kept extremely smooth and even minute accumulations of dust cannot be tolerated for they may influence the sensing machine which reads the encoded program from the tape. It is further understood that tape of this type is subjected to repeated use and is stored in between such uses. Thus, an acute problem has arisen in providing a package which satisfactorily houses such tape against damage and is suitable for shipment. Furthermore, it is desirable to provide such a package which will also provide a suitable storage receptacle for the tape when it is not in use.

The packaging art has greatly expanded recently with the use of strong lightweight precisely moldable packaging material, such as expanded polystyrene. It is applicant's intention that the package of this invention be formed of such a material because of its desirable qualities. Although several new package constructions have been provided which utilize a molded article embracing portion or area for satisfactorily supporting or encasing relatively delicate articles against damage from shock or the like, applicant knows of no such package hitherto provided which has been suited for use with the data tape as described herein.

It is therefore a general object of this invention to provide a new and improved data tape package.

It is another object of this invention to provide a new and improved data tape package which will adequately house a roll of relatively delicate tape therein and protect the same against damage due to shock.

It is still another object of this invention to provide a new and improved data tape package which may be used in shipping the tape to a customer and which may be used by the customer for storing the tape when the tape is not in use.

It is a further object of this invention to provide a new and improved data tape package which is substantially dust-proof and moisture-proof.

It is yet a further object of this invention to provide a new and improved data tape package of a relatively cheap lightweight resilient material which is self-locking in nature and completely houses a roll of relatively sensitive tape to protect the same against dust, damage and other foreign elements.

It is still a further object of this invention to provide a new and improved data tape package which is self-locking in nature, may be used as the complete packag-

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ing means for shipping the tape to a customer and may be used by the customer for storing the tape when not in use, is substantially shock-proof and comprises two identical elements which may be made from a single mold.

Other objects, features and advantages of the present invention will be apparent from the following description of the preferred embodiment illustrated in the accompanying drawings, in which:

FIGURE 1 is a perspective view of the package tray of this invention which may be combined with another duplicate tray to form the data tape package of this invention;

FIGURE 2 is a section view of the tray taken along the line 2-2 of FIGURE 1;

FIGURE 3 is a side section view of the tray taken along the line 3-3 of FIGURE 1;

FIGURE 4 is an expanded side elevational view showing the relative position of the mating identical tray components and the tape to be encased thereby; and

FIGURE 5 is a perspective view of the completed package of this invention.

Referring now to the drawings, the novel package of this invention includes a unique tray-like body 12 having a substantially flat base 13 and generally flat rectangular upstanding end and side walls, such as 14 and 15, respectively. The face of the tray is divided into a male portion 16 and a female portion 18 which are horizontally offset relative to each other forming a substantially upright shoulder 20 therebetween.

The male portion is so designated because it is provided with male fastening means, such as the studs 22, and the female portion is also so designated because it is provided with female fastening means, such as the bores 24. The male and female portions of each tray are adapted to mate relative to each other so that when two such trays 12 are juxtaposed one over another in opposed spaced relationship with the faces thereof facing toward each other and the male portion of one tray overlying the female portion of the other, the two trays may be brought together with the studs 22 registering in the bores 24 and the shoulders 20 abutting each other in line contact to form an assembled self-locking, box-like, substantially dust-proof package 25. The upstanding shoulders 20 limit lateral movement of one tray relative to the other in the assembled package, preventing possible deformation of the studs and bores due to such lateral movement to maintain the frictional locking engagement therebetween.

To facilitate the self-locking feature of the package, the male stud members 22 are made slightly frusto-conical in configuration so that they have slightly inclined side walls 22a. Similarly, the female bores 24 are hollowed out in a slightly frusto-conical configuration and slightly inwardly inclined interior walls 24a. Preferably the male studs are formed slightly oversized relative to the female bores. As a stud 22 is inserted into the bore 24 the inclined walls of each will permit easy initial registration thereof and insure a satisfactory frictional engagement therewith as registration is completed. This frictional engagement between the studs and the bores is such as to hold two sets of tray members together in the package form 25 against dislodgement or separation, requiring conscious physical manipulation to separate the members. Expanded polystyrene is especially suited for use as the tray material since it is resilient and has a high coefficient of friction which aids in the frictional gripping relationship between the bosses 22 and bores 24.

The tray 12 is further provided with an article receiving recess or compartment 26 having a generally circular upstanding side wall 28. In the illustrated embodiment, this recess or compartment is generally circular in configuration so as to satisfactorily accommodate and em-

brace a roll of tape. It is to be noted that the height of the side wall 28 is greater in the female portion of the tray than in the male portion due to the horizontal offset but when two such trays 12 are assembled with the male portion of one overlying the female portion of the other it can be readily seen that the compartment formed therebetween will be of a uniform depth.

The compartment or recess is further provided with a positioning or registering means, such as an upstanding boss or hub 30. Boss 30 is suited for positioning the tape 32 accurately within the compartment by registering in the hollow core 34 thereof. The boss is preferably formed so that the outer diameter thereof is only slightly smaller than the inner diameter of the tape roll core so that the boss will serve the function of holding the tape against lateral movement relative to the package. To this end, the boss may be also formed so that it is frusto-conical in configuration, having slightly inclined side walls 36. As the tape roll is registered on the boss and moves relative to the boss toward the recess 26, the slightly inclined walls will afford a progressively smaller tolerance with the inner diameter of the roll of tape, insuring that the tape will be securely held when the trays are assembled into the package 25 with each boss 30 projecting to the interior of the core 34.

The boss, in addition to protecting the original roll of tape against damage by securing the same against lateral movement, also serves to protect the subsequently used or remaining portions of the tape. Data tape is commonly sold in rolls of 1000 to 1200 feet. The length of an ordinary programmed strip of data tape is generally in the order of 300 feet. The unused portion of the tape, having its diameter diminished due to the portion which has been taken therefrom is still adequately protected in the package due to the same positioning against lateral movement therein. The inner diameter of the tape roll will remain constant as successive quantities of tape are removed from the roll. Thus, the roll will always be sufficiently retained within the recess against movement relative thereto. Furthermore, those strips of the tape which may be removed and programmed may be secured on other cores 34 and stored in a package comprising the trays of this invention and protected against damage due to shock or the like. The bore 38 in the boss may be formed to provide uniform heat dissipation during molding.

The completed package 25 provides a novel means for shipping and storing data tape and protecting the same against hazards which might render the tape unsatisfactory for use. As has been mentioned, polystyrene is especially suitable for use as the material from which the package is made due to its lightweight, shock resistant, and nonabsorbent qualities. It is to be noted that the structure of this package requires the use of but a single mold to form the single tray component 12 thereof. Two such trays make a completed package. The trays are provided with suitable registering means such as the male studs and the female bores which also serve to lock the package as a unit so that it is self-locking due to the friction fit of the generally frusto-conical stud and the generally frusto-conical bores, requiring a conscious physical manipulation to separate the two members. To insure that the package will maintain its assembled condition when subjected to the possible extreme abuses in shipping or delivery, small portions of well known adhesive tape may be applied to selected points of the side and end walls or a relatively heavy paper or cardboard sleeve may be positioned thereabout.

The generally box-like configuration of the completed package is extremely suited for shipping of the tape as well as shelf storage thereof when not in use. The facial engagement of the two packages when in assembled condition in combination with the line engagement of the abutting shoulders thereof provides a package which is substantially dust-proof and, due to the nature of the polystyrene material, is lightweight and economical to

produce. The tape itself is satisfactorily housed within the package against substantial movement relative thereto by the boss 30. Little or no movement of the tape roll 32 can occur. Collapsing of the core is eliminated and scoring or creasing of the tape itself is also eliminated. Manual physical manipulation will easily open the package so that the tape may be removed therefrom and yet simple registration of the two tray components 12 in juxtaposition with each other will easily close the package to satisfactorily lock a roll of tape therein in protected encasement in the compartment thereof so that the tape may be neatly stored on a shelf for future use in the box-like assembled package 25.

The package of this invention protects the contents thereof by impaling the article within a cavity so that the article cannot move relative to the cavity. The article receiving compartment closely embraces the sides of the tape roll but the delicate or critical surface of the tape to be protected, that being the flat side thereof, is not in contact with the packaging material. The outer configuration of the assembled package is independent of the exterior configuration of the article being held. If the article increases or diminishes in size (for example, if tape is taken from or added to the roll) the same package tray elements will be used and, when assembled, will have the same package configuration.

The foregoing detailed description has been given for clearness of understanding only, and no unnecessary limitations should be understood therefrom, for some modifications will be obvious to those skilled in the art.

I claim:

1. A package for storing and protecting a tape roll therein consisting of two identical parts, each part comprising: a tray having a face with a recess therein, said recess defining a bottom and a surrounding wall terminating in said face, an upstanding boss spaced from the surrounding wall and protruding upwardly from the bottom of said recess toward said face impaling said tape roll and holding the same in the recess against lateral movement relative to the tray so that the containment of the tape roll is independent of the outer dimension thereof; and male and female locking members on said face, two such trays being juxtaposed with the male locking member of one face frictionally engaging the female locking member of the other face with the trays locked together forming a tape roll storage package.

2. A package for storing and protecting a tape roll therein, said package consisting of two identical parts, each part comprising: a tray having a face with a tape roll recess and a tape roll held therein, said face including a planar surface defining a male portion and an offset shelf-like planar surface defining a female portion, said male portion provided with generally frusto-conical upstanding studs and said female portion provided with generally frusto-conical bores, the location of the studs relative to the center of the tray being a mirror image of the location of the bores relative to the center of the tray; two such trays being juxtaposed with the male and female portions reversed relative to each other and facing inwardly towards each other and locked together as a unitary package with the male studs frictionally engaging the female bores.

3. A package for storing and protecting a tape roll therein, consisting of two substantially identical parts, each part comprising: a tray having a face with a recess therein, said recess defining a wall terminating in said face; an upstanding frusto-conical boss centrally protruding from said recess for impaling the core of said tape roll and holding the same against shifting movement in said recess, said face having a male portion and an offset shelf-like female portion of greater depth than said male portion, the juncture of said male and female portions defining an upstanding shoulder therebetween; a plurality of generally frusto-conical upstanding studs on said male portion and a plurality of matching generally frusto-conical bores in said female portion, two

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such trays being juxtaposed with the faces thereof facing inwardly towards each other and the male portion of one tray overlying the female portion of the other with the mating portions of the two trays registering with each other, forming a tape package wherein the boss protruding from each recess impales a portion of the core of the tape roll to hold the roll against lateral movement relative to the package regardless of the outer dimension of the roll and the frusto-conical studs mate in locking engagement with the bores to maintain the package in assembled condition.

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