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REEL SUPPORTING STRUCTURE

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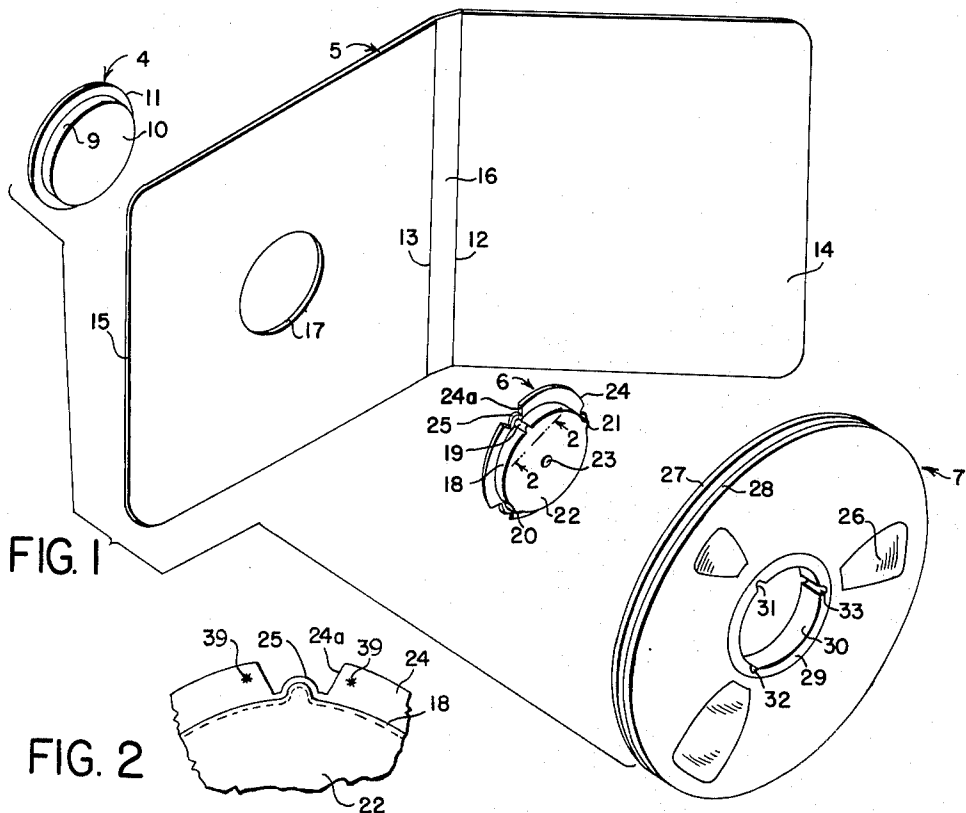


FIG. 1

FIG. 2

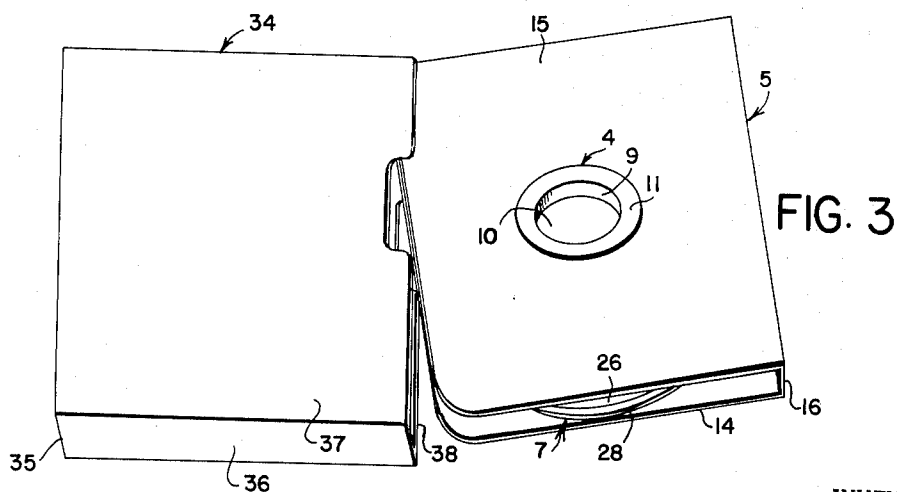


FIG. 3

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REEL SUPPORTING STRUCTURE

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3 Claims. (Cl. 206—52)

This application is a continuation of our copending application, Serial No. 212,257, filed July 25, 1962.

This invention relates generally to a shipping and storage carton for reels and the like (upon which, for example, magnetic tape is wound) and more particularly to means for supporting said reel within said carton.

Previously known supporting devices for reels when shipping or storing the same allow movement of said reels relative to the storage cartons. Also, the previously known devices have not been able to withstand the shock and stress put thereon by the reel when the carton is being shipped or when the carton is dropped from the hands of the handler. Movement of the reels relative to the cartons has in the past caused a dust to form due to abrasion between the reel flanges and the carton which has a deleterious effect upon the magnetic tape or the like wound upon the reel. Also droppage of the carton causes the flanges in the reel to become damaged and no longer useable when an adequate support for the reel is not provided.

It is therefore an object of the present invention to provide means for supporting said reels within a shipping carton and/or storage container which will not allow movement of the reel relative thereto or displacement of the reel when placed in said carton.

It is a further object of the present invention to provide a new carton for shipping and storing reels of magnetic tape or the like.

The above and further objects and novel features of the present invention will appear from the following detailed description when the same is read in conjunction with the accompanying drawings, wherein:

FIGURE 1 is a perspective view of the several parts of the present invention shown in disassembled relation and shown with a reel to be supported thereby;

FIGURE 2 is a partial elevation view taken substantially along the lines 2—2 of FIGURE 1; and

FIGURE 3 is a perspective view showing the component parts of the present invention in partially assembled relation.

Referring now to the drawings, and particularly to FIGURE 1 thereof, there is shown several parts of the supporting device, made in accordance with the present invention, in disassembled relation. The several parts comprise a male plug 4, a supporting member or file 5, and a female plug 6 adapted to be press-fitted on said male plug 4 to form a reel supporting core. A reel 7 of the type adapted to be supported by said core is also illustrated in FIGURE 1.

The male plug 4 is formed with a cylindrical wall portion 9 and an end wall or plate 10 forming a tubular member having one closed end and an opposite open end. The open end of the cylindrical wall portion 9 is encircled by a radially outwardly extending flange 11 formed integrally with said cylindrical wall portion 9. The plugs 4 and 6 are preferably formed by stamping thin sheet material such as tin plate or other easily deformable material.

The reel supporting member 5 is formed of a single sheet of corrugated fiberboard or similar material scored twice so as to fold upon itself as shown by the lines 12

and 13. The folding of the sheet provides two opposing panels 14 and 15 joined by an end wall 16 having a width substantially the same as the width of the reel to be supported by said member 5. The member 5 thus takes the shape of a loose-leaf binder or file forming a combination unit for a sleeve or box-like shell 34, see FIGURE 3. The panel 15 of the member 5 is provided with a generally centrally located opening 17 therein, having a diameter substantially equal to the outer diametrical dimension of the cylindrical wall member 9 of the male plug 4.

The female plug 6 comprises a cylindrical wall portion 18 having axially extending, radially outwardly projecting semicylindrical ribs or protuberances 19, 20 and 21. The protuberances 19, 20 and 21 are equally and circumferentially spaced about the periphery of the wall portion 18 and extend the length of said portion. The female plug is formed with one end wall 22 enclosing said cylindrical wall portion and one end of said protuberances. As shown in the drawings, the end wall is provided with a small opening 23 for purposes to be hereinafter described. The opposite end of the cylindrical wall portion 18 is open and is formed with a substantially radially outwardly projecting flange 24 encircling the open end of said wall portion and the protuberances 19, 20 and 21. The flange 24 is notched as at 24a in the area adjacent each of the protuberances 19, 20 and 21. The notches 24a remove substantially all of the flange member adjacent the protuberances 19, 20 and 21 but leave small lip areas 25 encircling said protuberances.

The inside diametrical dimension of the cylindrical wall portion 18 of the female plug 6 is slightly smaller than the outside diametrical dimension of the cylindrical wall portion 9 of the male plug 4. As an illustrative example, if the tin plate from which the female plug is formed has a thickness of 0.014 inch the inside diametrical dimension may be .020 to .028 inch smaller than the outside diametrical dimension of the cylindrical wall portion 9 of the male plug 4.

The reel 7 illustrated in FIGURE 1 is adapted to support magnetic tape or the like 26 and comprises a pair of flanges 27 and 28 secured to a hub 29. The hub 29 is formed with an enlarged central opening 30 and axially extending grooves 31, 32 and 33, adapted to fit over the driving spindle of a magnetic recorder and/or reproducer (not shown).

In assembling the several parts shown in FIGURE 1, the cylindrical wall member 9 of the male plug 4 is inserted through the opening 17 in the panel 15 to bring the flange portion 11 thereof substantially flush with one surface of said panel 15. The female plug is then carried into position axially aligned with the cylindrical wall member 9 of the male plug 4, so that said cylindrical wall portion 9 may be press-fitted within the cylindrical wall member 18 of the female plug. The plugs are pressed together to a position such that the end wall 10 of the male plug 4 is brought toward and in many instances may even be juxtapositioned against the end wall 22 of the female plug 6. The press-fit is accomplished by a suitable press and jig (not shown) which presses against the flanges of both the male plug and the female plug. During this assembling process the flanges of the respective plugs are brought into flush engagement with the opposite surfaces of the panel 15 and compress the material forming said panel therebetween until the outer surface of the flange 11 on the male plug 4 is placed in aligned planar relation with respect to the outer surface of said panel 15. As the male plug 4 and the female plug 6 are brought together, outwardly extending knobs (not shown) formed on the jig or press engage and deform the flange 24 of the female plug 6 adjacent the notches 24a and protuber-

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ances 19, 20 and 21, as illustrated in FIGURE 2, at 39. This deformation of the flange 24 forms nodules on the opposite side of said flange 24. These nodules are thus pressed into the panel 15 and aid in preventing rotation of the reel supporting core, formed by the male plug 4 and the female plug 6, relative to said panel. The opening 23 formed in the end wall 22 of the female plug 6 serves as a vent allowing the escape of air which may be trapped between said plugs during assembly and equalize the pressure on each side of said wall 22.

Referring now to FIGURE 3, the reel support member 5 is shown in the folded assembled relation with the reel 7 mounted on the supporting core. In this position the opening 30 in the hub 29 of the reel 7 is fitted over the cylindrical wall member 18 of the female plug 6 with the protuberances 19, 20 and 21 fitting in the grooves 31, 32 and 33. The panels 14 and 15 of the supporting member are folded upon themselves to enclose the reel therebetween. The sleeve 34, in which the supporting unit 5 is slidably and telescopically fitted, comprises a bottom wall 35, a pair of end walls 36, only one of which is shown in the drawings, and two opposing side panels 37 and 38. The sleeve 34 is thus formed with a rectangular open side opposite the bottom wall 35, allowing insertion of the supporting unit 5 and the reel 7 into said sleeve. When the supporting unit 5 is inserted within the sleeve 34, the wall portion 16 of said sleeve encloses the open side of said sleeve 34. The sleeve 34 may be formed of corrugated fiberboard, solid fiberboard or other material, and may be formed from a single sheet of such material which is cut, folded and glued or stapled together to form the sleeve 34 as illustrated.

While one embodiment of the invention has been shown and described, it will be appreciated that this is for the purpose of illustration and that changes and modifications can be made herein without departing from the spirit and the scope of the invention.

We claim:

1. A supporting device for reels comprising: a female plug formed of malleable sheet material and having a generally cylindrical wall portion with at least one integral semicylindrical radial protuberance on the outer peripheral surface thereof which extends axially the full length of said wall portion, an end wall having an opening therein formed at one end of said cylindrical wall portion, and an integral radially outwardly extending flange encircling the opposite end of said cylindrical wall portion and said at least one protuberance, one face of the flange on the female plug being adapted to engage one surface of a support panel, said at least one protuberance affording means for engaging a cooperating groove on the hub of a reel to restrict relative rotation therebetween; a male plug formed of malleable sheet material and having a cylindrical wall portion formed with an end wall enclosing one end thereof, and a radially outward extending flange encircling the opposite end thereof, one face of the flange on said male plug being adapted to snugly engage a surface of a said support panel opposite a said one surface with said cylindrical wall portion of said male plug being adapted to fit through an opening in a said support panel and being snugly fitted within the cylindrical wall portion of said female plug in tight frictional engagement therewith and with said end walls of said plugs being juxtapositioned; and nodules formed on one face of a said flange to engage a said support panel to restrict rotation between the plugs and a said panel.

2. A supporting device for reels comprising: a supporting member having opposite planar surfaces and an opening formed therein; a female plug comprising a generally cylindrical wall portion formed with three integral

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radial protuberances on the outer peripheral surface thereof which extend axially the full length of said wall portion, an end wall substantially enclosing one end of said cylindrical wall portion, and wide radially outward extending arcuate flange portions joined with said cylindrical wall portion adjacent the opposite open end thereof between said protuberances and having a narrow radially outward extending lip formed at the open end and around the periphery of each said protuberance and joining the corresponding flange portions, said protuberances affording means for receiving a cooperating groove in the hub of a said reel to prevent relative rotation between said plug and a said reel; and a male plug comprising a cylindrical wall portion formed with an end wall enclosing one end thereof and a radially outward extending flange encircling the opposite end thereof; said male plug being positioned in said opening in said supporting member with the flange thereof engaging one of said planar surfaces, said female plug being fitted over said male plug with the cylindrical wall portions of the plugs in snug frictional engagement and the flange portions of said female plug engaging the other of said planar surfaces of said supporting member to prevent axial movement of said plugs relative to said supporting member.

3. A packaging and supporting device for a tape reel having a hub formed with at least one axially extending semicylindrical shaped groove comprising a hollow sleeve having a rectangular open end, a combination unit formed with a first side panel, a second side panel and an end wall joining said side panels, said first side panel having an opening formed therein and a core mounted in and over said opening, said unit being slidably interfitted within said sleeve and said end wall enclosing said rectangular opening thereof, said core comprising a male plug formed with a cylindrical wall portion projecting through said circular opening in said first side panel, an end wall enclosing one end of said cylindrical wall portion and a radially outwardly extending flange encircling the opposite end of said cylindrical wall portion and engaging one side of said first side panel, a female plug formed with a cylindrical wall portion having at least one radial protuberance adapted to fit within a said groove in the reel hub and formed on the outer peripheral surface thereof and extending axially the length of said wall portion, an end wall substantially enclosing one end of said female cylindrical wall portion and a radially outwardly extending flange encircling the opposite open end of said cylindrical wall portion of said female plug and said at least one radial protuberance, said female plug being aligned with said male plug and snugly fitted and frictionally held on said cylindrical wall of said male plug with the flange of said female plug engaging a second side of said first side panel, whereby axial movement of said core is prevented relative to said first side panel, and nodules on the surface of the flange of said female plug opposite said second side of said first side panel and pressed into said first side panel to afford means preventing rotation of said plugs relative to said combination unit.

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70 THERON E. CONDON, *Primary Examiner*.

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