

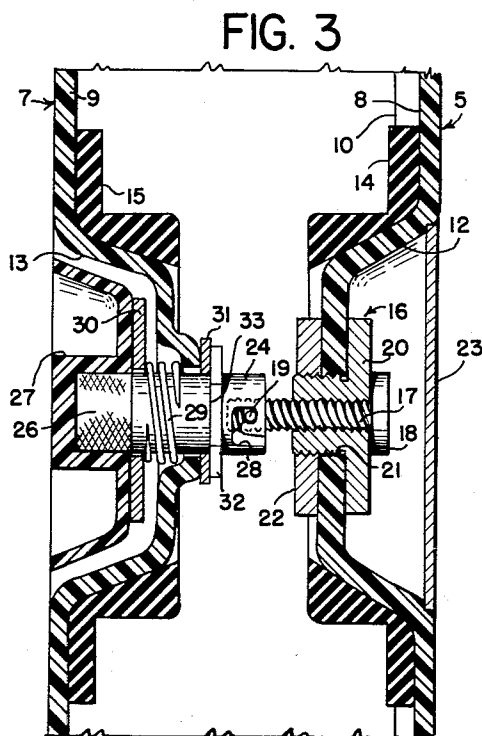
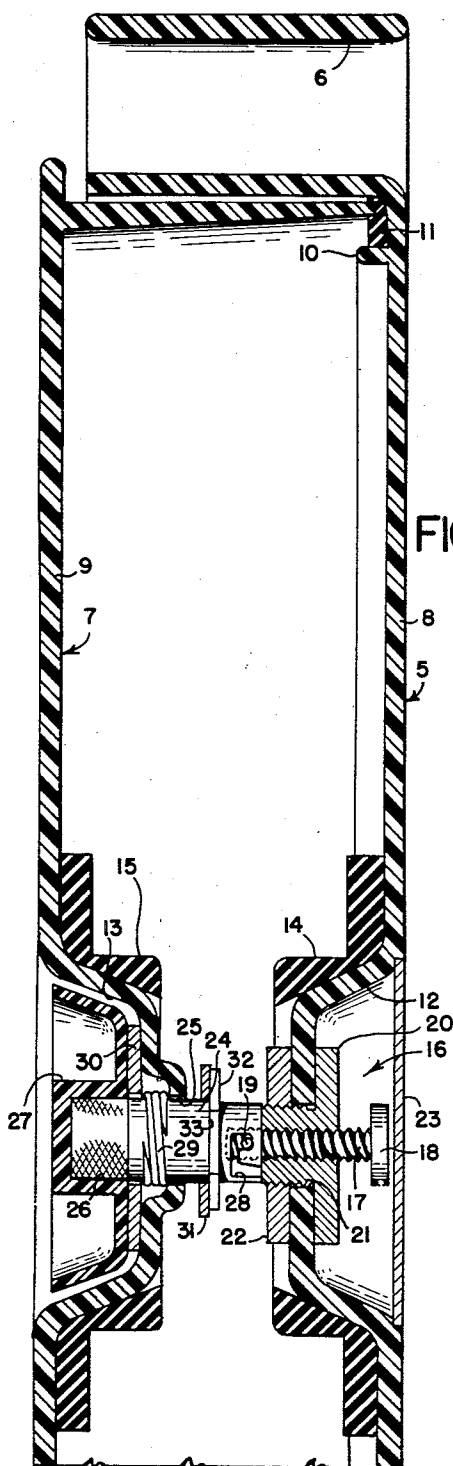
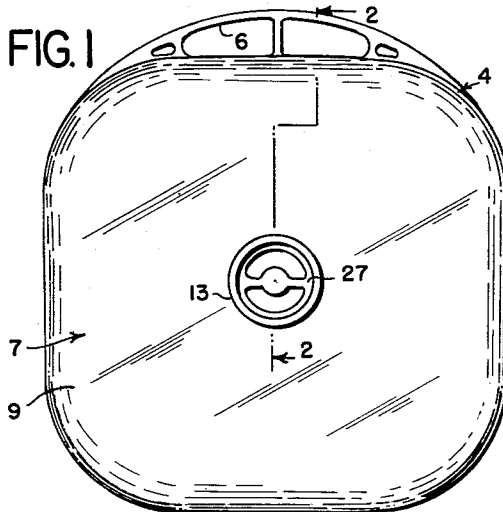
Oct. 27, 1964

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3,154,193

CONTAINER AND CLOSURE MEMBER

Filed Jan. 4, 1963



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CONTAINER AND CLOSURE MEMBER

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 Filed Jan. 4, 1963, Ser. No. 249,451
 3 Claims. (Cl. 206—52)

This invention concerns containers, and more particularly to storage and shipping containers for tape reels or the like and to closures for such containers.

The amount of video tapes that are being produced every day bearing recordings of programs or news events for subsequent use and reuse is becoming very great. The necessary handling, shipping and storage of these tapes has created a problem for television stations or studios.

It is desirable that reels of the tapes be stored in dust-proof containers which can be easily opened and closed for removal of the tape therefrom for convenience in storage. Since the tapes are often shipped it is also desirable to have a container which can be easily and securely locked so that the same containers may serve as shipping cartons. This would alleviate the present time consuming practice of packing the tapes in disposable boxes.

Briefly, the present invention concerns a novel locking device or closure fastener for fastening together two members such as a pair of interfitting box-like members adapted to enclose therein a reel of tape. This device comprises a first shaft threadably received in one of the members to be fastened and an activating member such as a second shaft mounted for sliding and rotative movement in the other member and having a coupling adapted to engage a coupling on said first shaft. The device includes biasing means for maintaining the couplings in engaged relation. The first shaft has a quick-disconnect position wherein the shafts are free to move sufficiently to effect a disconnection and has a locked position wherein the shafts are restrained against axial movement. Means such as a handle fixed to the end of the second shaft on the side of said member opposite the coupling are provided for turning the first shaft through the coupling engagement with said second shaft to move the first shaft between said quick-disconnect and said locked positions. The novel device thus provides a unitary quick-disconnect fastening and a positive, shock and vibration-proof lock which will withstand all modes of shipment.

This novel locking device solves the present need in the industry for a container which may be opened or shut with a single quick motion and so used for storage in the studio and yet provides a positive lock such that the tape reel may be shipped therein without the present time-consuming need to pack for shipment.

The novel features of the present invention will become more apparent as this description proceeds when read in conjunction with the accompanying drawing wherein:

FIGURE 1 is an elevational view of a container formed in accordance with the present invention;

FIGURE 2 is a vertical transverse sectional view taken along line 2—2 of FIGURE 1; and

FIGURE 3 is a fragmentary vertical transverse sectional view similar to that of FIGURE 2, with the closure member in the quick-release position.

Referring particularly to FIGURE 1 of the drawing, there is shown a generally rectangular storage and shipping container 4 having a first box-like member 5 (FIGURE 2) formed with an integrally molded handle 6 on one side wall thereof and a second box-like member 7 which has the side walls thereof formed to telescopically fit within the side walls of the member 5. The box-

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like members have end walls 8 and 9 respectively which with the side walls define a chamber therebetween.

The inner face of the box-like member 5 is formed with a raised rib 10, extending around the marginal portion thereof adjacent the side walls and has a gasket or washer 11 of resilient material placed between said rib and the side walls. The washer 11 is engageable with the edge of the side walls of the box-like member 7 when said members 5 and 7 are in interfitting relation. The washer 11 forms a seal between the box-like members to provide a dust-proof and moisture proof closure at the periphery of the container.

The end walls 8 and 9 of members 5 and 7 are formed with centrally located, generally cylindrical depressions 12 and 13 respectively. Positioned within the box-like members 5 and 7 and fitted about the depressions 12 and 13, are resilient pads 14 and 15 formed of a size to fit snugly within the hub of a tape reel (not shown). The pads 14 and 15 are cemented in place.

A locking device, generally designated 16, is fitted centrally at the depressions 12 and 13 of the members 5 and 7, and is adapted to secure the two members together when the same are in telescoped interfitting relation. The locking device includes a threaded first shaft 17, having a head 18 on one end thereof and having a pair of radially extending lugs 19 forming a coupling at the opposite end thereof. The lugs are preferably formed by press fitting a pin through a diametrical bore in the end of the shaft 17. The shaft 17 is threadably received in the member 5 by a collar 20 which fits through a central opening 21 formed in the depression 12 and is fixed to the depression 12 by a locking nut 22. A cover plate 23 is fitted over the depression 12 flush with the outer face of the end wall 8 to protect the member 17 and to improve the outward appearance of the container.

The portion of the locking device 16 carried by the box-like member 7 comprises a second shaft 24 which is mounted for axial and rotative movement in an opening 25 formed in the depression 13. The shaft 24 is formed at one end with a knurled end portion 26 to provide a surface to which a handle 27 is readily fixed. The opposite end of the shaft 24 is center bored to fit about the end of the threaded shaft 17 and is formed with diametrically opposed bayonet slots 28 in the wall thereof. The slots 28 provide a coupling on the shaft 24 which together with the coupling on the shaft 17 comprises a bayonet joint.

The depression 13 is formed with an additional recessed portion to receive therein a helical compression spring 29 which engages said recessed portion at one end and a washer 30 at its other end to bias the shaft 24 outwardly of the chamber formed by said box-like members 5 and 7. A washer 31 is carried on the shaft 24 on the side of the recessed portion opposite that of the washer 30 and said washer 31 is retained thereon by a spring clip 32 fitted in a suitable groove 33 formed in the shaft 24. The washer 31 and clip 32 retain the shaft 24 on the box-like member 7. Movement of the handle 27 can effect axial and rotational movement of the shaft 24 to a position where each lug 19 is received in latching relationship in the bayonet slots 28, and the spring 29 biases the shaft 24 axially to place the lugs 19 under pressure and to hold the box-like members 5 and 7 together.

Referring now particularly to FIGURE 2, the locking device 16 is shown in the locked shipping position with the shaft 17 threaded to the right as viewed in FIGURE 2, drawing the end surface of the shaft 24 at its slotted end tight against the opposing end of said collar. In this position the shaft 24 cannot be moved axially to release the lugs 19 from the slots 28. In this position a reel, if placed in the container, would be supported by the pads

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14 and 15. The spacing for the end walls 8 and 9 is such that the pads would be slightly compressed to hold the reel in place but are not compressed to the extent that they cannot act to relieve shock loads placed on the reel during shipment.

To open the container 4, the handle 27 is rotated counterclockwise to impart rotation to the shaft 24 and to the shaft 17 through the bayonet joint to thread said shaft 17 to the left and thereby space the end surface of shaft 24 at its slotted end from the collar 20 as shown in FIGURE 3. This position permits axial movement and then rotational movement of the shaft 24 and disengagement of the couplings. In this quick-disconnect position of the locking device the container may be readily opened and closed for handling and storage of the tape reels within a studio or station. Quick connection and disconnection is enhanced if the shaft 17 is turned with sufficient pressure to draw the head 18 tightly against the collar 20 and bind the shaft in the position shown in FIGURE 3.

It will be observed that the locking device is contained wholly within the depressions 12 and 13 in either of its locked positions such that a plurality of containers 4 may be stored in an orderly fashion.

Having thus disclosed one embodiment of a container constructed in accordance with the present invention, what is claimed as the invention is:

1. A tape reel shipping and storing container comprising first and second enclosure members each of which is formed with a central depression having an opening in the end wall of the depression, said members being telescopically interfitted with said openings in aligned relation, and a locking device mounted within said openings and comprising a first shaft threadably received in said opening of said first member and having at one end of the shaft an enlarged head positioned within said depression from said first member, a pair of lugs projecting radially from said first shaft adjacent the opposite end thereof, a second shaft slidably supported in the opening of said second member and formed with an axial bore to receive therein said first shaft and having lug seating slots formed to receive said radial lugs in coupling relation, the other end of said second shaft carrying a handle fitting within said depression of said second member and affording means for turning said second shaft and said first shaft when in coupled relation to move said shafts from a quick-disconnect position permitting axial movement thereof relative to each other to a locked position limiting said axial movement and vice versa.

2. A device for fastening two complementary box-like members together comprising a collar adapted to be secured to one of said members and formed with a threaded bore, a first threaded shaft threadably received in said

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bore in the collar and having a pair of lugs adjacent one end and projecting radially therefrom, a second shaft adapted to be slidably and rotatably supported in the other of said members, said second shaft having an axial bore to receive said one end of said first shaft and having a pair of bayonet slots formed therein to receive said lugs, means associated with said second shaft and adapted for engagement with said other of said members for biasing said second shaft axially away from said first shaft, and handle means on said second shaft for moving said second shaft to effect a quick-disconnect coupling between said slots and lugs with said one end of said first shaft positioned within the bore of said second shaft and for rotating said coupled shafts to move the coupled lugs and slots axially in a direction toward said collar secured to said one of said members to a position such that relative movement between the two shafts is limited to effect a positive lock between said shafts.

3. A shipping and storing container comprising first and second box-like members each of which is formed with at least one depressed portion having an opening in the end wall of said portion, said members being formed to define an enclosure when positioned with said openings in aligned relation, and a locking device mounted within said openings and comprising a first shaft threadably received in said opening of said first member and having at one end of the shaft an enlarged head positioned within said depressed portion of said first member, at least one lug projecting radially from said first shaft adjacent the opposite end thereof, a second shaft slidably supported in the opening of said second member and formed at one end with an axial bore to receive said first shaft therein and having at least one lug-seating bayonet slot formed to receive said at least one lug in coupling relation, the other end of said second shaft carrying a handle positioned within said depressed portion of said second member and affording means for turning said second shaft and said first shaft when in coupled relation to move said shafts from a quick-disconnect position permitting axial movement of said shafts relative to each other to a locked position limiting said axial movement and vice versa.

References Cited in the file of this patent

UNITED STATES PATENTS

2,533,115	Huelster	Dec. 5, 1950
2,552,779	Griffin	May 15, 1951
2,859,868	Janorski et al.	Nov. 11, 1958
2,996,178	Forrest	Aug. 15, 1961
3,074,546	Burgess et al.	Jan. 22, 1963

FOREIGN PATENTS

694,401	Great Britain	July 22, 1953
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