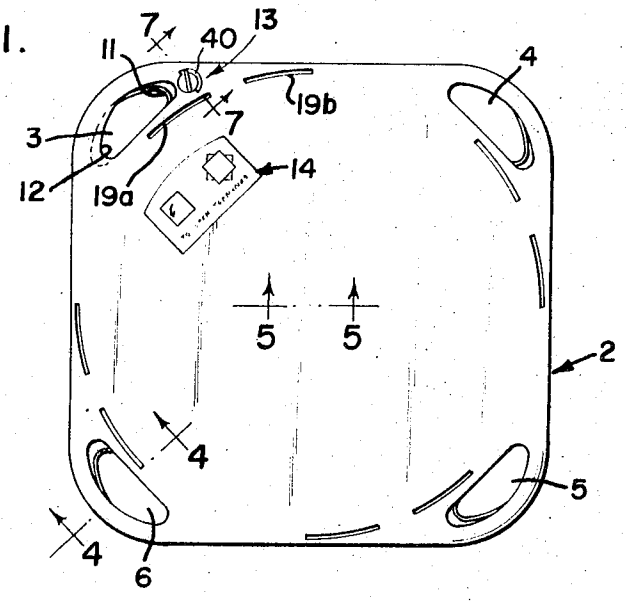
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CARRYING CASE

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Fig. 1.



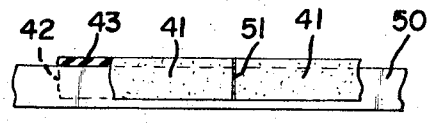
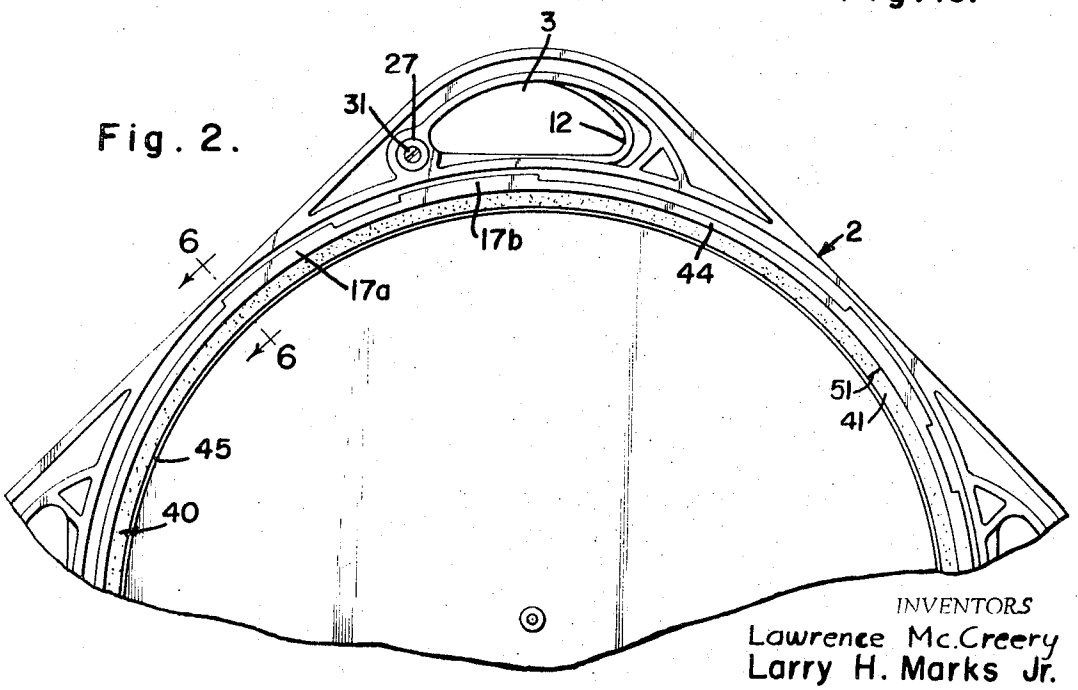


Fig. 10.

Fig. 2.



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Fig. 3.

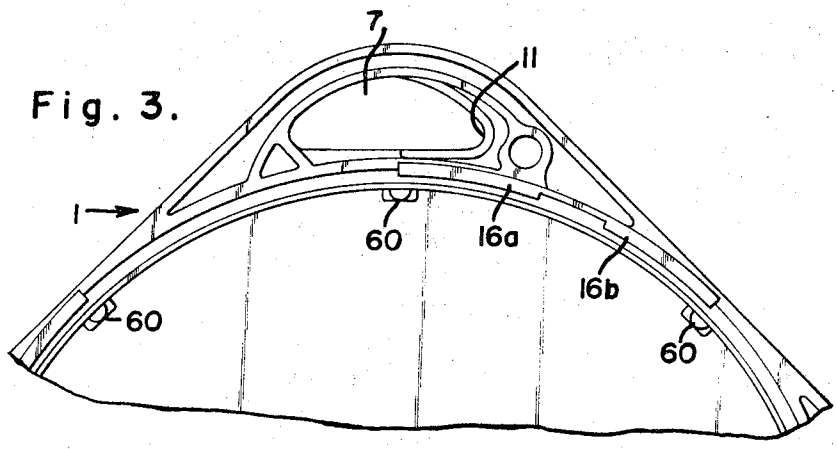


Fig. 4.

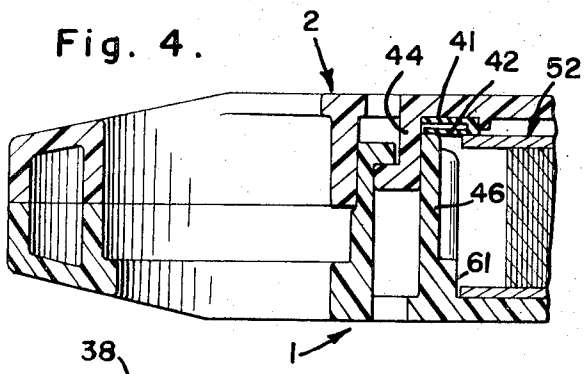


Fig. 5.

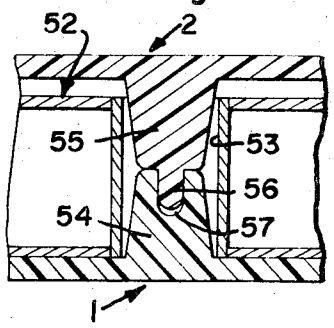


Fig. 9.

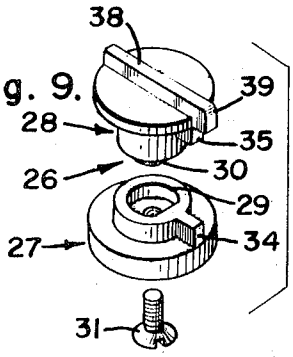


Fig. 7.

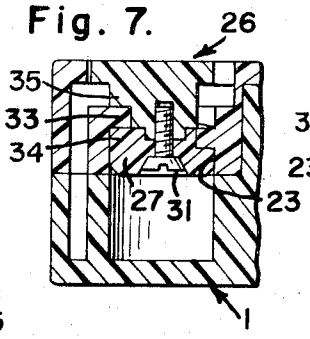
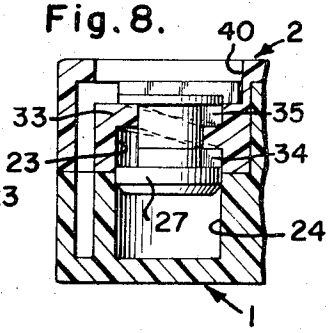


Fig. 8.



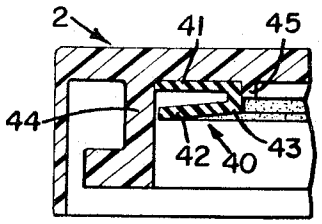


Fig. 6.

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Fig. 11.

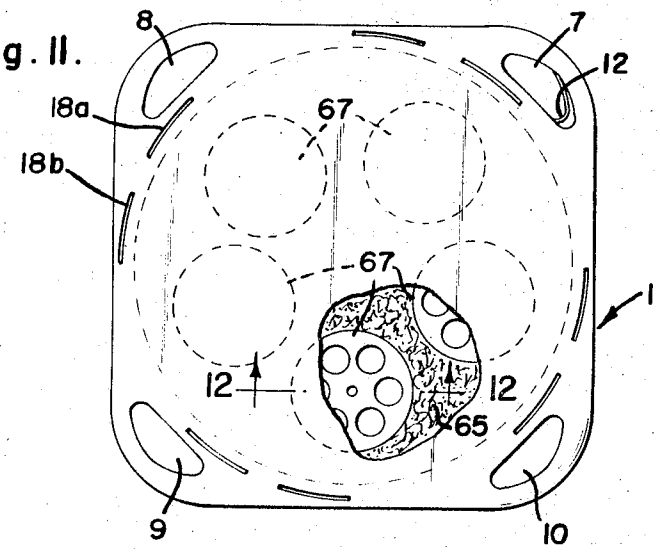
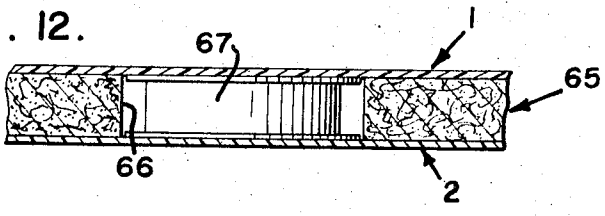


Fig. 12.



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CARRYING CASE

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Filed Oct. 1, 1965, Ser. No. 491,922
12 Claims. (Cl. 206—1)

This invention relates to a carrying and storage case that is particularly adapted for use in carrying or storing reels of movie film or like articles. The general construction of the present invention is similar to that of the carrying case disclosed in Patent No. 3,169,682 which is assigned to the assignee of the present application. Reference is made to said patent for those details of construction and use that are not included herein.

The carrying case disclosed in the above noted patent is adapted to be made of strong resilient plastic and the case portion and cover portion are preferably die cast. In die casting an article of this type having a relatively large area certain problems are encountered in minimizing the amount of plastic employed and at the same time obtaining the strength that is essential in the subject type of case.

One of the main objects of the present invention is to generally improve the construction of the carrying case shown in Patent No. 3,169,682 to the end that the weight of the carrying case is minimized without adversely affecting the strength and operation of the case.

Another object of the invention is the provision of an improved gasket for a carrying case of the subject type and which gasket is effective to provide a relatively tight seal against the entrance of air or moisture into the case and which at the same time does not present so much frictional resistance as to make the torque required to open or close the case so great that use of the case becomes impractical. In this connection it will be understood that in an article of this type that provides a relatively large diameter storage space many conventional gaskets which require deformation to effect a suitable seal would create so much resistance to relative movement between the gasket and the element with which it cooperates that an inordinate amount of torque would be required to close and open the case. It is therefore an object of the present invention to provide a novel type of gasket that not only effects a good seal but which deforms in such a manner as to minimize the frictional resistance required to make or break the seal.

Another object of the invention is the provision of a novel locking device for releasably securing the case portion and cover portion of the carrying case together so that it is not inadvertently opened in transit or when subjected to rough usage.

Still another object of the invention is the provision of a carrying case incorporating means for storing and protecting a relatively large reel of film as for example a 1200′ or 1600′ 16 mm. film and which at the same time provides means for storing one or more smaller reels if this becomes desirable.

Other objects and advantages will be apparent from the following specification and from the drawings.

FIG. 1 is a top plan view of the carrying case.

FIG. 2 is a fragmentary plan view of the interior of the cover portion of the carrying case.

FIG. 3 is a fragmentary plan view of the interior of the case portion of the carrying case.

FIG. 4 is a typical cross section through one corner of the carrying case in closed condition as taken in a plane indicated by lines 4—4 of FIG. 1.

FIG. 5 is a fragmentary cross section of the closed carrying case at the central portion thereof as taken in a plane indicated by lines 5—5 of FIG. 1.

FIG. 6 is a typical cross section at the periphery of the cover portion as taken in a plane indicated by lines 6—6 of FIG. 2.

FIG. 7 is a cross section of the carrying case at the locking device with the latter in unlocked condition.

FIG. 8 is a view similar to FIG. 7 with the locking device in locked position.

FIG. 9 is an exploded perspective of the locking member.

FIG. 10 is a semischematic view showing the butting ends of the gasket and the method of securing the same.

FIG. 11 is a top plan view, partly broken away, of the carrying case with the case portion uppermost and partly broken away to show another form of the invention.

FIG. 12 is a cross section of the device of FIG. 11 taken in a plane indicated by lines 12—12 of FIG. 11.

First with reference to FIGS. 1 to 5, the carrying case of the present invention includes a case portion generally designated 1 and a cover portion generally designated 2. At the four corners of the cover 2 there are provided hand or finger openings 3, 4, 5 and 6 and at the corners of the case portion 1 there are provided similar openings 7, 8, 9 and 10 (FIG. 11) which, when the case is closed, cooperate respectively with openings 3, 4, 5 and 6 to provide a handle means at each corner of the case.

It is desirable to afford the user as much leverage as possible for opening and closing the case and especially for opening the case. When the hand openings in the case and cover are in exact registration it is sometimes difficult for the user to overcome the friction required to open the case. To permit the user to develop a greater torque the case of the present invention is provided with an arcuate portion 11 which is offset inwardly of the opening 7 so that it is out of registration with the corresponding portion of the corresponding opening in the cover 2. By this construction the user is not required to cause relative rotation between parts that have exactly registering surfaces but is provided with an offset portion in one surface so as to obtain additional leverage for starting the opening movement. Since one of the important features of this type of case is the provision of a convenient handle means at each corner it is desirable to provide the offset portion 11 at each of the four corners of the case portion. Such offset portion 11 provides sufficient leverage for starting the opening movement of the case without requiring similar offset portions on the cover of the case. However, the leverage provided the user is considerably increased by providing a similar offset portion on the cover. Since such offset portion adds to the weight of the device, although only slightly, it is preferable to provide only one of said portion 12 on the cover. Such an offset portion is indicated in FIG. 2 at the opening 3 which is adjacent the locking member generally designated 13 (FIG. 1) which will subsequently be described in detail.

In this connection it is preferable to provide an instruction label **14** which, when the device is used for the first time may be referred to and followed when the case is opened. By providing the offset portion **12** at the opening **3** there are thus provided opposed offset portions **11**, **12** which when urged in opposite directions by the fingers of a user facilitate the opening movement.

It will be understood that the offset portions **11**, **12** are molded integrally with the case and cover and require little additional weight in comparison with the advantage they afford.

In Patent No. 3,169,682 a carrying case is disclosed that is provided with four sets of bayonet type joints which function to urge the case and cover together to effect the necessary seal. In order to provide the interengaging lips required in the bayonet type joint it is necessary, in the structure of the cited patent, to provide slots on the case and cover portions which represent the spaces required for the die inserts employed to form the interengaging lips during the molding process. It has been found that such slots become inordinately long when the interengaging joints are made as extensive as possible. These die insert slots thus have the effect of weakening the case and cover especially against diaphragming action tending to distort the case parts and also tending to cause leakage in the gasket.

By the present invention the above noted disadvantage is overcome by forming the bayonet joints in segments. Thus, as best seen in FIGS. 2 and 3, there are provided bayonet joint segments **16***a*, **16***b* (corresponding to lips **13** in Patent No. 3,169,682) in the case portion **1** and segments **17***a*, **17***b* (corresponding to lips **14** in Patent No. 3,169,682) in the cover portion **2**. The segments **16***a*, **16***b* require the provision of slots **18***a*, **18***b* in the case portion **1** to provide for the die inserts and similarly slots **19***a*, **19***b* are required in cover **2** for receipt of the die inserts that form the bayonet joint lips **17***a*, **17***b*. It will be apparent that the reduction in length of the die insert accommodating slots and the continuity of the material of the case portion and cover portion between the smaller slots contribute to a substantial increase in strength of the portions of the carrying case and also the rigidity of the same.

The locking device of the present invention is shown in FIGS. 1, 2, 7, 8 and 9. The cover **2** is provided with a bore **23** which, when the case portion and cover portion are in registration, is in alignment with a bore **24** in case portion **1**. Received within said bore **23** is a locking member **26** formed in two parts and including an inner locking end portion **27** (FIG. 9) and an outer portion **28**. Inner and outer portions **27**, **28** are respectively provided with recess **29** and an axially extending projection **30** of noncircular cross section so that said portions may be secured together by a self tapping screw **31** at assembly.

Molded integrally with cover **2** is a cam track **33** which is slantingly disposed relative to the axis of bores **23**, **24** and which extends radially inwardly of bore **23**. Integral with portions **27**, **28** of locking member **26** are a pair of axially spaced shoulders **34**, **35** respectively which, when the locking member is assembled, are disposed on opposite sides of the cam track **33**. By this structure it will be apparent that upon rotation of locking member **26** the opposed shoulders **34**, **35** engaging the cam track **33** will cause the locking member to move axially. For the purpose of facilitating rotation of locking member **26** the outer portion **28** is provided with an enlarged head and a diametrally extending ridge **38** which is adapted to be grasped by the fingers of the user. The ridge **38** extends radially outwardly past the enlarged head **37** to provide a projection **39** which is received within an arcuate slot **40** formed in cover **2**. Said slot **40** extends for less than 180° and its ends provide stops for the projection **39** thus limiting the rotation of the locking member to about half a turn. It will be apparent from FIGS. 7, 8 that when the locking member is turned from the unlocked

position of FIG. 7 toward the locked position of FIG. 8 the inner end **27** of the locking member **26** will extend into the bore **24** in case portion **1** thus preventing any relative rotational movement between the portions of the carrying case.

The above described lock structure lends itself to manufacture by injection molding and the two piece construction of the locking member **26** simplifies the design of the locking means and at the same time makes assembly an easy matter.

The gasket of the present invention is best seen in FIGS. 2, 4, 6 and 10 and comprises an elongated length of an elastomer such as rubber which, in cross section, is provided with a pair of inner and outer flanges **41**, **42** connected along their corresponding side edges by a connecting piece **43**. The cover **2** is provided with a circular wall **44** the inner side of which defines the maximum diameter of the gasket when the latter is bent to the required circular shape. Thus the outer edge of flange **41** abuts the circular wall **44** of the cover and a small annular projection **45** is formed integral with cover **2** providing an annular space between the wall **44** and projection **45** within which is received the flange **41** of the gasket.

Although the gasket may be said to be generally U-shaped in cross section it is preferable that the free flange **42** slant outwardly from the connecting piece **43** away from the opposed flange **41** as best seen in FIG. 6. When the cover and case are assembled as seen in FIG. 4 and axial movement of cover and case is effected by relative rotation the circular wall **46** of the case **1** engages flange **42** of the gasket and urges it toward flange **41** to the position of FIG. 4. By this construction it will be seen that the resistance of the gasket to deformation is not great so that an inordinate amount of torque is not required to effect the closing movement. However, the configuration of the gasket as best seen in FIG. 4 when the case is closed is such that any air attempting to enter from the outside between walls **44** and **46** in the cover and case respectively will tend to spread the flanges **41**, **42** apart thereby enhancing the sealing effect. It will be understood in this connection that as the circular portion wall **46** of the case portion is rotated relative to the wall **44** of the cover, such rotation will result in a sliding action between the free end of the wall **46** and the outer flange **42** of the gasket. Such sliding action against the resiliency of the flange **42** tends to improve the seal.

When the length of gasket material is cut to the correct dimension the ends may be joined together by fitting the flanges **41**, **42** over a straight rail **50** of nylon or the like and applying adhesive **51** to the ends of the gasket. By coating the rail **50** with silicone or similar material the tendency of the adhesive to adhere to said rail can be minimized in this operation.

It will be noted that the flange **42** is preferably slightly shorter than flange **41** so that the free end of flange **42** does not interfere with the wall **44** thus insuring that the circular wall **46** of the case engages the flange **42** at all points along the circumference of the latter.

The reel generally designated **52** in FIGS. 4 and 5 is positioned in the case with the central opening **53** of the reel received around inwardly extending bosses **54**, **55** integral with case portion **1** and cover portion **2** respectively. To facilitate proper orientation of the two portions of the case at assembly boss **55** is preferably provided with an axially projecting extension **56** which is received within a complementarily formed hole **57** in boss **54**. For this same purpose it is preferable that the bosses **54**, **55** be generally frustoconical in shape as shown in FIG. 5.

Although the bosses **54**, **55** may be formed so as to engage the reel **52** at the central opening of the latter it is preferable that the reel be in engagement with the peripheral portion of the case so as to reduce the likelihood of breaking the bosses **54**, **55** in the event the filled case is subjected to a sudden shock. To this end it is preferable to provide a plurality of spaced projections **60** (FIG. 3)

integral with the circular wall **46** of case portion **1** so that the outer periphery of the reel **52** is very slightly spaced apart from the inner surface **61** of the projection **60**.

Any tendency of the reel **52** to shift relative to the carrying case is further minimized by the presence of the gasket **40**. Thus, as best seen in FIGS. 4, 6, the connecting piece **43** of the gasket **40** is positioned so that the outer periphery of the reel **52** engages the gasket at the connecting piece **43** when the case is closed. This of course sets up a relatively large frictional resistance to any movement of the reel **52** relative to the carrying case in transit.

Although the carrying case of the present invention is most advantageous for storing relatively large reels of film it lends itself to storage of small reels such as 100' and 200' reels. The above described case may be converted to use with a plurality of small reels by providing a generally cylindrical cushion **65** of foam plastic or the like which is of a size to be received within the cylindrical space defined by side wall **46** of the case portion. Said cushion **65** may be formed with a plurality of holes **66** each of which may receive therein a reel **67** of relatively small size compared to the large reel for which the case is primarily designed. Not only does the cushion **65** afford good protection for the reel **67** but its presence also helps to exclude light and air and foreign matter that might injure the film.

It will be understood that the above specific description of the preferred form of the invention is given with emphasis on those innovations not found in Patent No. 3,169,682 and those details of the construction not described above may be found in said patent.

The very specific description given above is not to be taken as restrictive of the invention as it will be apparent that various modifications in design may be resorted to by those skilled in the art without departing from the scope of the following claims.

We claim:

1. In combination with a pair of members mounted for combined rotational and axial movement relative to each other between an open and a closed position and vice versa, a closure seal comprising:

an annular gasket formed with a pair of flanges connected together at a circular juncture along one of their corresponding side edges and spaced apart at their other corresponding side edges,

means retaining one of said flanges on one of said members,

the other of said members being provided with a circular projection having a free circular edge adapted to engage the other of said flanges and urging said other flange toward said one flange upon movement of said members toward closed position.

2. A structure according to claim **1** wherein said pair of members define a container for an article and said flanges extend divergently radially outwardly from said juncture toward the exterior of said container.

3. In a container provided with a container body and a closure, and with cooperating means on said body and closure permitting combined rotational and axial movement relative to each other between an open and a closed position and vice versa, a closure seal for preventing leakage into said body and for minimizing the torque required to overcome frictional resistance to closing, said seal comprising:

an annular gasket formed with a pair of annular flanges connected together at a circular juncture along their inner side edges and spaced apart at their opposite side edges,

a seat formed on said body for retaining one flange of said pair thereon,

said closure being provided with an axially extending circular projection having a free circular edge in engagement with the other of said pair of flanges and

adapted to urge said other flange toward said one flange upon rotational and axial movement of said closure toward closed position.

4. A structure according to claim **3** wherein said seat is defined by a pair of radially spaced inner and outer axially extending elements, said one flange being received between said elements and said other flange being of a width to clear said outer element when in closed position.

5. A locking device for preventing movement between a pair of parts supported for relative movement comprising:

a bore formed in one of said parts,

a locking member mounted within said bore and formed with an inner locking end portion and an outer portion adapted to be engaged by the fingers of a user,

the other of said pair of parts being formed with an opening adapted to receive said inner end of said member therein for locking said parts together,

a pair of stops on said one part circumferentially spaced relative to said bore and adapted to engage said member for limiting rotation of said member between open and closed positions less than 360° apart,

a helical cam track integrally formed on said one part and projecting inwardly of said bore,

said member being formed with a pair of axially spaced shoulders respectively positioned on opposite sides of said track,

said member being transversely split between said shoulders to permit the opposite ends thereof to be secured together at assembly with said one part, and

means for so securing said ends together at assembly.

6. A structure according to claim **5** wherein said one part is molded and said cam track and stops are integral with said one part.

7. A structure according to claim **6** wherein said member is formed at said outer portion with a radially outwardly projecting extension, and wherein said one part is formed with an arcuate slot terminating at its opposite ends in shoulders constituting said stops, said extension being received in said slot.

8. A carrying case for a generally flat cylindrical article such as a reel of movie film comprising:

a case portion including a side and an integral circular wall at right angles to said side defining a cylindrical space adapted to receive said article therein,

a cover including a circular flange radially outwardly of said wall,

first bayonet joint elements integral with said case portion radially outwardly of said wall and second bayonet joint elements integral with said flange for securing said case portion and cover together upon relative rotation thereof,

an annular gasket carried by said cover closely adjacent said flange and adapted to be engaged by the free edge of said circular wall for forming a seal between said case portion and cover,

each of said bayonet joint elements comprising a plurality of bayonet joint segments circumferentially spaced apart to provide a space therebetween, and

said case portion and cover being formed on their opposed sides with arcuate slots in registration with said segments, whereby said opposed sides are continuous throughout the portions between said slots corresponding to the spaces between said segments of said bayonet joint elements.

9. In a storage case for a relatively large diameter generally cylindrical article such as a reel of film,

means on said case defining a generally cylindrical space for receiving such a cylindrical article therein,

a generally cylindrical removable filler member received in said space and formed to provide a plurality of cavities for receiving a plurality of such similar articles therein.

10. A storage case according to claim 9 wherein the the depth of said cavity is at least equal to the thickness of said similar articles.

11. A storage case according to claim 9 wherein the opposite sides of said case at said cylindrical space are spaced apart a distance substantially equal to the thickness of said filler member.

12. A storage case according to claim 9 wherein said filler member is snugly received in said space and is formed with a circular row of openings concentric with the central axis of said space defining a circular row of cavities for receiving a plurality of such similar articles therein.

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