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3,104,848

FILM REEL

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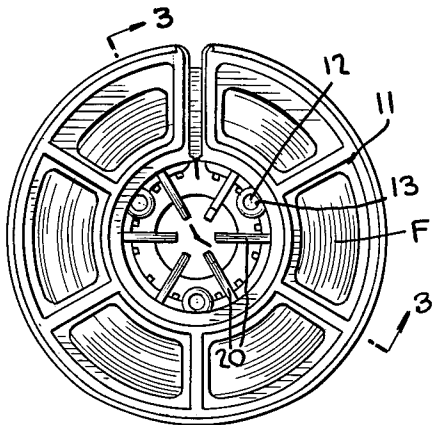


Fig. 1.

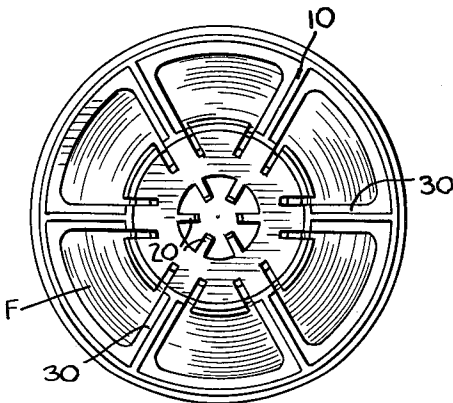


Fig. 2.

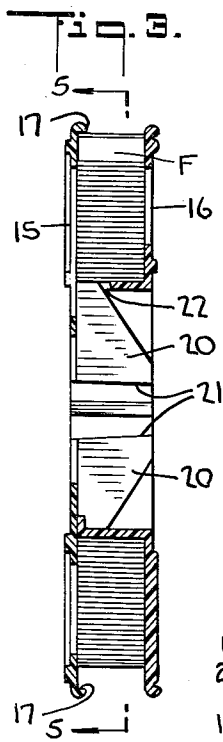


Fig. 3.

Fig. 5.

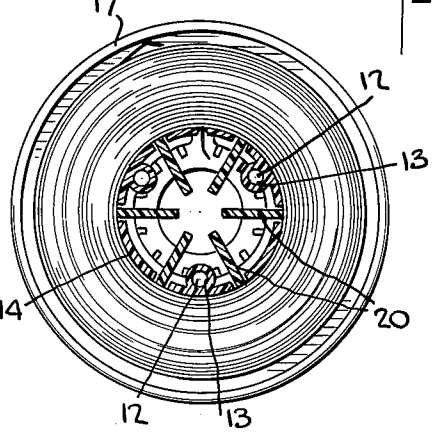


Fig. 4.

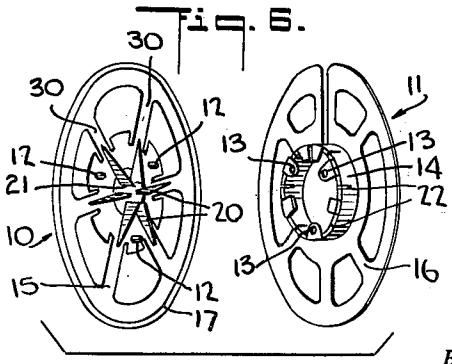
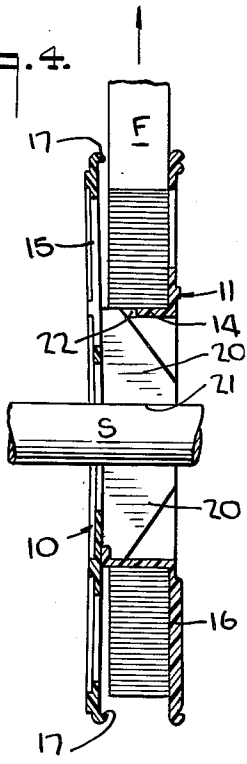


Fig. 6.

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3,104,848
FILM REEL

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This invention relates to a reel for the winding of tape, film and the like. Those skilled in the art are fully aware of the fact that many attempts have been made to develop a reel that will retain the tape or film that is wound thereon without requiring added fastening means such as a rubber band or the like. As far as I am aware, no successful reel has as yet been developed for the simple reason that the tape or film retaining means heretofore conceived generally present resistance to the easy winding of the film on the reel, as well as the unwinding of the film from the reel.

Thus, it has been suggested heretofore that a yielding rim be formed on one or both of the flanges of a reel. The winding of the film on the reel is adapted to flex the retaining rims to one side so that the film may be wound as required. Thereafter, the rims will retain the film against unwinding. As it happens, however, the resistance to the movement of the film past the rims is quite considerable, so that unless the film is wound in a particular predetermined line and with predetermined force, it will not enter into position between the flanges of the reel.

I believe that I have conceived an entirely novel contribution to the art in that I provide a reel in which the flanges are automatically spread for the entry of the film when the reel is applied to a shaft for rotation to wind or unwind film. When not spread, the flanges cooperate to hold the film against unwinding through use of a rim on one flange, that rim overlying the space between the flanges.

As a feature of my invention I utilize a reel having means that yield when the reel is applied to a shaft, the yielding of the means flexing the flanges of the reel relatively to one another to widen the space therebetween. More particularly, I form the reel with a bearing for co-action with a shaft or the like, the bearing being so formed as to yield or flex when applied to a shaft, and thereby to separate the flanges at the rims thereof.

Even more particularly, I utilize a molded plastic reel having a series of protuberances or cams that together preferably form a bearing. The cams are so shaped that application to a shaft effects the spreading or flexing thereof, and the consequent flexing of the two flanges to permit easy entry or removal of a tape, film or the like. Naturally, the cams could be additional to a usual hub or bearing, but I do prefer the structure herein shown and described.

I have thus outlined rather broadly the more important features of my invention in order that the detailed description thereof that follows may be better understood, and in order that my contribution to the art may be better appreciated. There are, of course, additional features of my invention that will be described hereinafter and which will form the subject of the claims appended hereto. Those skilled in the art will appreciate that the conception on which my disclosure is based may readily be utilized as a basis for the designing of other structures for carrying out the several purposes of my invention. It is important, therefore, that the claims be regarded as including such equivalent constructions as do not depart from the spirit and scope of my invention, in order to prevent the appropriation of my invention by those skilled in the art.

Referring now to the drawings,

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FIGURE 1 is a front elevation of the reel of my invention while

FIGURE 2 is a rear elevation thereof;

FIGURE 3 is a section taken along line 3—3 of FIGURE 1 showing the film in place and wound on the reel;

FIGURE 4 shows the reel applied to a shaft, the shaft acting through the bearing means of the reel to spread the flanges;

FIGURE 5 is a section along line 5—5 of FIGURE 3;

FIGURE 6 is a perspective exploded view showing the two parts of the reel prior to their assembly.

Referring now more particularly to the drawings, the reel of my invention comprises a part designated by reference numeral 10, and a second part 11. The two parts are of molded plastic adapted to be assembled by the entry of the short pins 12 of the part 10 into the three holes 13 formed in lugs formed at the end of hub 14 of the part 11. It will be noted that there are several of these lugs, but that holes 13 are formed in only three of the lugs. Thereafter, the two parts 10 and 11 are adhered to one another by a suitable adhesive, to form, in effect, a single integral reel equipped with hub 14 on which a film F may be wound. This film will be guided by the flange 15 of the part 10 and flange 16 of part 11. Flange 15 is equipped with an inwardly turned peripheral rim 17 which functions, as is probably best seen in FIGURE 3, to retain the film F against unwinding. This is accomplished by restricting the opening at the peripheries of the two flanges 15, 16.

Part 10 of the reel is also formed with a series of rib shaped protuberances or cams, each designated by reference numeral 20, and each having a tapered bearing surface 21. The several ribs or protuberances 20 form, in effect, a bearing whereby the reel may be mounted on a shaft S or the like, one form of shaft being shown diagrammatically in FIGURE 4. It is well to note further that each of the ribs or cams 20 extending from the part 10 lies in a notch 22 formed on part 11, there being one notch for each part 20. It will also be further noted that each of the protuberances or cams 20 extends outwardly from a spoke 30 forming a portion of the flange 15 of the part 10, there being the same number of spokes 30 as cams or ribs 20. Further, it will also be well to note that the spokes 30 are not adhered to the part 11, there being a series of spaces formed on the end surface of hub 14 of part 11 from which lead the notches 22. These spaces, which are between the lugs on hub 14 in some of which are formed holes 13 for pins 12, are of sufficient width to permit the spokes 30 to be completely unadhered to the part 11 at hub 14 so as to flex relatively thereto.

When a reel on which has been wound a film, as shown in FIGURE 3, is applied to a shaft S, as shown in FIGURE 4, the tapered surfaces 21 of the ribs or protuberances 20 will yield or flex, as is well illustrated in FIGURE 4, with the surfaces 21 aligning themselves with the periphery of the shaft S. Since each rib or protuberance 20 is integral with a spoke 30, the ribs and spokes will flex outwardly together, flexing the flange 15 and moving the retaining rim 17 from the position of FIGURE 3 to the position of FIGURE 4. Obviously, it will now be possible to unwind the film F from the reel without any resistance from the retaining rim 17. Similarly, it will be easy to wind the film without resistance from the retaining rim 17. Obviously also, removal of the reel from the shaft S, will restore the parts to the position of FIGURE 3 with the retaining rim 17 then holding the film F against unwinding.

I do believe that the scope of the contribution I have made to the art will now be clearly understood.

I now claim:

1. In a reel of the class described, a pair of opposed

flanges, a central bearing portion integral with said flanges and having bearing means formed with an opening whereby to be mounted on a shaft, the outer peripheral portion of at least one of said flanges having a retaining surface normally constricting the span between the flanges to retain film or the like from unwinding from said reel, said bearing portion and bearing means being so secured relatively to said flanges and being formed so that the pressure between said bearing means and a shaft larger than the said opening acts through said bearing means to flex said flanges in a manner separating the circumferential peripheries thereof relatively to one another when said reel is applied to a shaft larger than said opening whereby to enlarge the span at said retaining surface to facilitate winding and unwinding a film or the like relatively to said reel.

2. In a reel of the class described, a pair of opposed flanges, a central hub defining a central opening, with film or the like to be wound on said hub and between the flanges, the outer peripheral edge of at least one of the flanges having a retaining rim constricting the span between the flanges to retain film or the like against unwinding from said hub, means secured relatively to said flanges and extending into said central opening to engage a shaft for mounting said reel on said shaft for winding and unwinding, and said means being formed for movement by said shaft for flexing the flanges to enlarge the span at said retaining rim to facilitate winding and unwinding of a film or the like.

3. In a reel of the class described, a pair of opposed flanges, a central hub defining a central opening, with film or the like to be wound on said hub and between the flanges, the outer peripheral portion of at least one of said flanges having a retaining surface normally constricting the span between the flanges to retain film or the like from unwinding from said reel, and means secured relatively to said flanges, and extending into said central opening to engage a shaft when said hub is inserted over said shaft for winding and unwinding, said means being so secured relatively to said flanges as to flex the flanges to enlarge the span at said retaining surface whereby to facilitate winding and unwinding of a film or the like.

4. In a reel of the class described, a pair of opposed flanges, a central hub on which a film or the like may be wound between the flanges, the outer peripheral edge of at least one of the flanges having a retaining rim constricting the span between the flanges to retain the film or the like against unwinding, a series of protuberances extending into a central opening of said hub and defining a bearing through which said reel may be mounted on a shaft, said protuberances yielding when said reel is moved onto a shaft larger than said bearing, and said protuberances being so secured relatively to at least one of said flanges that said yielding thereof flexes the rims of said flanges apart to enlarge the space at said retaining rim to permit free winding and unwinding of a film or the like.

5. In a reel of the class described, a pair of opposed flanges non-rigidly secured relatively to one another to define a space therebetween within which a film is to be wound, together with a hub on which the film is to be wound, the non-rigid securing of said flanges relatively to one another being such as to allow flexing of said flanges relatively to one another, the outer peripheral portion of at least one of said flanges having a retaining surface normally constricting the span between the flanges to retain film or the like from unwinding from said reel, means secured to at least one of said flanges for engaging a shaft to which said reel is applied for winding and unwinding a film relatively to said reel, said means defining an opening smaller diametrically than said shaft whereby said means are moved by said shaft when applied to a shaft and through said movement flexing said opposed flanges relatively to one another in a manner

to enlarge the span at said retaining surface to facilitate winding and unwinding of a film.

6. In a reel of the class described, a pair of flanges secured to one another to form an integral reel, the outer peripheral portion of at least one of said flanges having a retaining surface normally constricting the span between the flanges to retain film or the like from unwinding from said reel, a series of protuberances extending from at least one of said flanges and substantially rigid relatively to said flange, said protuberances forming a bearing opening to mount said reel on a shaft for the winding and unwinding of a film between said flanges, said opening defined by said protuberances being smaller than said shaft whereby said protuberances spread outwardly of said shaft as they engage the shaft and thereby flex said flanges relatively to one another to enlarge the span at said retaining surface to facilitate winding and unwinding a film or the like to said reel.

7. In a reel of the class described, a pair of opposed flanges, a central hub secured between said flanges and defining a central opening, with film or the like to be wound on said hub and between the flanges, said flanges being so secured as to permit flexing of said flanges relatively to one another, said flanges being formed so that the outer peripheral edges thereof normally define a span between the flanges for retaining film or the like against unwinding from said hub, means secured relatively to said flanges and extending into said central opening to engage a shaft for mounting said reel on said shaft for winding and unwinding film on said reel, and said means being formed for forceful movement by said shaft when applied to said shaft whereby to flex the flanges relatively to one another through said forceful movement so as to enlarge the span at said peripheral edges to facilitate winding and unwinding of a film or the like.

8. A reel of the class described comprising a pair of opposed flanges, a central hub between said flanges defining a central opening, with film or the like to be wound on said hub and between the flanges, the said flanges being formed so that the outer peripheral edges thereof define a span between the flanges for retaining film or the like against unwinding from said hub, means secured to at least one of said flanges and extending into said central opening to engage a shaft for mounting said reel on said shaft for winding and unwinding, and said means being spaced radially of said shaft so that contact with said shaft effects spreading movement of said means by said shaft for flexing the flanges relatively to one another to enlarge the span at said peripheral edges to facilitate winding and unwinding of a film or the like.

9. A reel of the class described comprising a pair of opposed flanges and a central hub with film or the like to be wound on said hub and between the flanges, the outer peripheral edges of said flanges being formed whereby to define a span between the flanges for retaining film or the like against unwinding from said hub, means secured relatively to said flanges to engage a shaft for mounting said reel on said shaft for winding and unwinding, and portions of said means spaced radially of said shaft so that contact with said shaft effects spreading movement of said means by said shaft for flexing the flanges relatively to one another to enlarge the span at said peripheral edges to facilitate winding and unwinding of a film or the like.

10. In a reel of the class described, a pair of flanges secured to one another to form an integral reel, a series of protuberances extending from at least one of said flanges and substantially rigid relatively to said flange, said protuberances forming an opening to apply said reel to a shaft for the winding and unwinding of a film between said flanges, said opening defined by said protuberances being smaller than said shaft at a point offset to the plane of said one of said flanges with which said protuberances are substantially rigid, whereby the spreading of said

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protuberances by said shaft effects the flexing of said flanges relatively to one another by said spreading protuberances for separating the circumferential peripheries thereof.

11. In a reel of the class described, a pair of flanges secured to one another to form an integral reel, at least one of said flanges having a film retaining rim, a series of protuberances extending from at least one of said flanges and substantially rigid relatively to said flange, said protuberances forming an opening to apply said reel to a shaft for the winding and unwinding of a film between said flanges, said opening defined by said protuberances being smaller than said shaft at a point offset to the plane of said one of said flanges with which said protuberances are substantially rigid, whereby the spreading of said protuberances by said shaft effects the flexing of said flanges relatively to one another by said spreading protuberances to enlarge the span at said retaining rim.

12. In a reel of the class described, a pair of flanges secured to one another to form an integral reel, said flanges being formed so that the peripheral edges thereof define a span between the flanges for retaining film against unwinding from the space between said flanges, a series of protuberances extending from at least one of said flanges and substantially rigid relatively to said flange, said protuberances forming an opening to apply said reel to a shaft for the winding and unwinding of a film between said flanges, said opening defined by said protuberances being smaller than said shaft at a point offset to the plane of said one of said flanges with which said protuberances are substantially rigid, whereby the

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spreading of said protuberances by said shaft effects the flexing of said flanges relatively to one another by said spreading protuberances to enlarge the span at said peripheral edges.

13. In a reel of the class described, a pair of opposed flanges defining therebetween a space for the winding and unwinding of film, the outer peripheries of said flanges being formed to define therebetween a span adapted normally to retain film or the like from unwinding from said reel, a series of protuberances integral with at least one of said flanges and extending from at least said one flange to form a central bearing opening for engaging a shaft, said protuberances being dimensioned for outer flexing to enlarge said bearing opening when the protuberances are applied to a shaft greater in size than said central bearing opening of said protuberances, the outer flexing of said protuberances by said shaft flexing also one of said flanges relatively to the other of said flanges, whereby to enlarge the span between the said flanges at the peripheries thereof to permit free winding and unwinding of a film or the like relatively to said reel.

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