Dec. 22, 1953 J. F. HERRMANN ET AL 2,663,513

FILM REEL CONSTRUCTION

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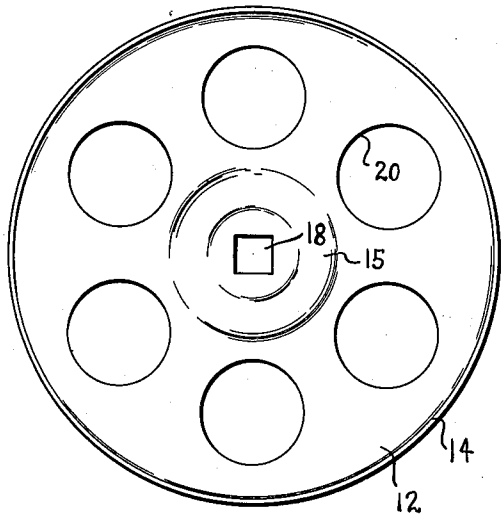

Fig. 2

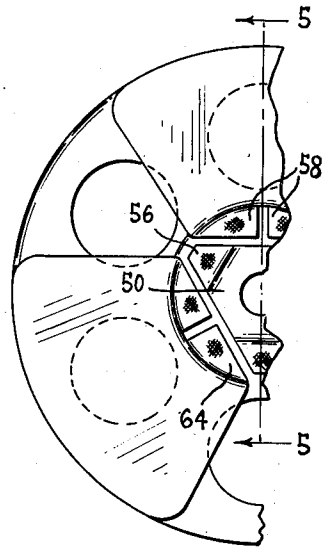

Fig. 4

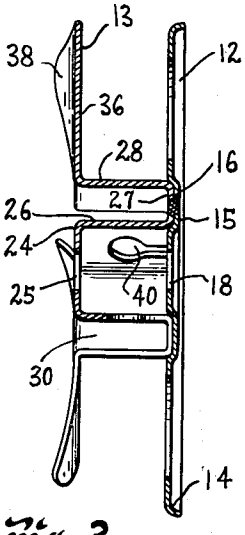

Fig. 3

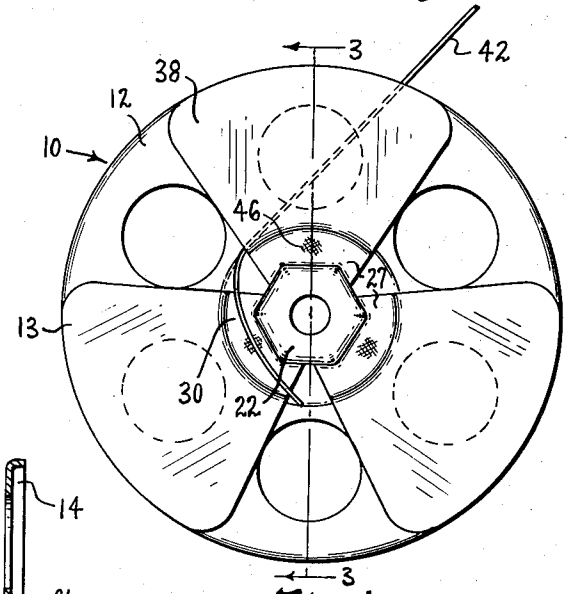

Fig. 1

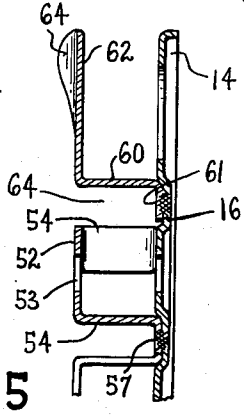

Fig. 5

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FILM REEL CONSTRUCTION

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7 Claims. (Cl. 242—70)

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This invention relates to photographic film winding reels and the like, and more particularly to reels of a type which may be easily and quickly loaded by insertion of the film into the reel from one side thereof.

Certain advantages may be had by the use of such quick-loading reels, as compared to reels of conventional type. In such quick-loading reels of earlier construction, however, there has been employed in place of one of the usual side plates of the reel spaced segmental sections so as to provide free access between the sections for strip film being inserted from a side of the reel into an anchoring slot in the hub portion thereof. In this manner one end of the strip film could be quickly anchored in the reel merely by wrapping the film once around the hub. In order to provide sufficient structural strength in reels provided with such anchoring slots, it has been necessary heretofor to make the parts of the reels relatively thick and heavy, but such weight at times during use of the reels has been found to be a very troublesome factor. For example, a reel having considerable mass has high inertia characteristics with the results that the reel resists quick starting and as quick stopping during use thereof in a conventional film reader or the like.

It is, accordingly, an object of the present invention to provide a quick-loading film winding reel which is formed entirely of light weight inexpensive material and parts and which parts may be easily secured together to provide a sturdy, durable and economical reel construction.

Other objects and advantages of the invention will become apparent from the detailed description which follows when taken in conjunction with the accompanying drawing in which:

Fig. 1 is a side view of a quick-loading reel embodying the present invention;

Fig. 2 is a view of the reel of Fig. 1 but as seen from the opposite side thereof;

Fig. 3 is a sectional view taken substantially upon section line 3—3 of Fig. 1 and looking in the direction of the arrows;

Fig. 4 is a fragmentary side view of a modified form of quick-loading reel; and

Fig. 5 is a sectional view taken substantially upon section line 5—5 of Fig. 4 and looking in the direction of the arrows.

Referring to the drawing in detail and particularly Figs. 1, 2 and 3, it will be seen that a preferred form of the invention comprises a reel 10 which may be formed of only two parts, a first member in the form of a disc-like side plate 12 and a second member 13 of special shape. These

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two members are of such form that they may be rapidly formed of inexpensive material and may be easily and accurately secured together to form reels of sturdy, light weight and durable construction. Both members are preferably formed of relatively thin sheet metal by one or several stamping and forming operations.

The outer peripheral edge of the member 12 may be flanged as shown at 14 for stiffening purposes and this flange is turned outwardly to aid in receiving the strip film being wound upon the reel, particularly in cases wherein the film supply may not be exactly in line with the reel. The member 12 is also provided with an outwardly protruding portion 15 providing annular recess 16 surrounding a central squared sprocket opening 18. The disc for forming the member 12, the flanged edge 14, the recess 16 and opening 18 may all be formed simultaneously or in successive steps if desired. Also since it is desirable to reduce the weight and inertia of the reels as much as conveniently possible, a plurality of circumferentially spaced openings 20 may be stamped in the member 12 at the same time.

The specially shaped member 13 is of somewhat more complex form and the reason for this is that this member not only provides supporting means for the strip film to be wound thereon and outer side portions for guiding and retaining the wound-up film, but also a hub portion for engaging a driving sprocket on the film reader or the like, and this hub portion together with the film supporting portions form slot-like regions for receiving and anchoring the end of the film. The hub portion, designated by the numeral 22, is in the form of a hollow cap formed by a central web portion 24 having a central sprocket opening 25 and side portions extending generally at right angles thereto so as to form leg portions 26. The inner end of each leg portion, in turn, is provided with a foot portion 27 which extends outwardly in a direction generally parallel to the web portion and each foot portion is made of such size and partially circular so as to fit closely within the annular recess 16 formed in the member 12. A film supporting portion 28 is attached to and extends outwardly from each foot portion 27 and in spaced and generally parallel relation to the adjacent leg portion 26. In this manner a slot-like region 30 is formed for receiving and anchoring the end of strip film between each leg 26 and supporting portion 28. At the outer end of each supporting portion segmental side portions 36 are carried and arranged to extend outwardly so as to be generally parallel to disc-like member 12. Outer corner

portions of each segmental portion may be flared slightly if desired as shown at 38.

In the preferred construction shown it has been found desirable to provide three anchoring slots and to form the hub in hexagonal shape. This may be accomplished in an economical fashion by a forming operation by providing in effect a keyhole slot 40 between each adjacent pair of leg portions 26. The space between adjacent segmental sides is such that ample room is provided as shown in Fig. 1 for the end of strip film 42 being anchored to the reel in preparation to wind same thereon. The keyhole slots 40 also reduce the amount of "draw" of the metal required during the forming of the web and leg portions. The attaching foot portions 27, it will be noted, are likewise spaced from each other somewhat but since same are substantially completely contained within the recessed portion 16 of the member 12 when assembled they will not interfere with the film anchored in the slot-like region 30. The annular recess 16 enables the member 13 to be readily and accurately centered by the foot portions 27 fitting closely therein during assembly of the members. It has been found desirable to form the disc-like portion 12 and the specially shaped film supporting and guiding member 13 of sheet metal by bending and forming operations so that the complete reel will comprise only two preshaped members. When these members 12 and 13 are assembled together with the foot portions 27 disposed within and centered by the annular recess 16, it is a very simple matter to secure the members firmly together preferably by spot-welding as indicated at 46.

Since the film-supporting portions 28 are of semi-circular shape in cross-section they provide substantial resistance to any bending action when pressure is applied to a side of the segmental portions 36, and since these portions 28 are in turn integral with the foot portions 27 and the foot portions are strengthened by being welded to the annular recessed portion 16 of member 12 considerable strength is provided the finished assembled reel. Furthermore, because of this sturdy construction, material of lighter weight or gauge may be employed as the stock from which the members 12 and 13 are made. If desired these members may be conditioned or deburred by a tumbling operation, preferably before assembly, in known manner, after which it is only necessary to spot-weld the members in the three areas indicated to provide an integral construction.

In Figs. 4 and 5 it will be seen a slightly different construction is provided, but nevertheless certain advantageous features of construction similar to those employed in Fig. 1 are retained so that a light weight, sturdy, quick-loading type film supporting reel results. This reel is constructed by forming the hub portion 50 of the reel from a piece of sheet metal, or the like, in such a manner as to provide a central web portion 52 apertured at 53 and having preferably six sides. To three alternate sides are integrally secured leg portions 54 disposed generally at right angles to the web portion and each having substantially triangularly shaped foot portions 56 arranged to be individually secured, preferably by spot-welding as indicated at 57 to the annular recessed portion 16 of the disc-like member 12. Adjacent each of the other three spaced sides of the central web 52 and also fitting into the annular recess 16 in the disc-like member 12, is a pair of inwardly bent attaching flanges 58 integral with film supporting and guiding walls 60 formed of relatively thin sheet material and extending preferably outwardly at right angles to the general plane of the disc-like member 12. These spaced walls 60 provide supporting means for spaced segmental portions 62, of much the same shape as the portions 36 in the reel construction shown by Fig. 1, and may be attached to the disc-like member 12 by spot-welding or the like as indicated at 61.

In this construction there will be, accordingly, formed between each film supporting wall portion 60 and an adjacent side of the central hub member 50, a partially circular recess 64 through which a length of strip film may be drawn for anchoring same when the strip film is to be wound about the reel. The segmental portions 62 are in a manner like that described in the preferred construction of Fig. 1 provided with flared outer corners 64 for facilitating the reeling and guiding of the film as it is deposited upon or taken from the reel.

It should be readily appreciated that in both reel constructions shown by the drawings a quick-loading reel is provided in which film may be easily anchored in the reel for winding purposes by merely threading or inserting a free end into the slot 30 or 64 as the case may be and by turning of the reel. Each reel it will be seen is of light weight but sturdy construction, and since it is preferably formed of sheet metal it may be readily formed by stamping, bending and spot-welding operations. The reel construction shown by Figs. 1, 2 and 3 is preferred over that shown by Figs. 4 and 5 since less time is required in the assembly and securing of the parts together to form the completed reel. Also fewer spot-welding points are required for securing two parts in Fig. 1 rather than the five parts shown by Figs. 4 and 5. In operation the finished reels of both modifications will function substantially equally well since both are of rigid construction, easy to load, and of exceedingly light weight enabling fast starting and stopping when required during use.

Having described our invention we claim:

1. A winding reel for receiving and supporting photographic strip film or the like, said reel comprising a disc member formed of relatively thin sheet material and having a sprocket opening located centrally therein, hub-forming means formed of relatively thin sheet material and comprising a web portion having a sprocket opening located centrally therein and a plurality of leg portions of appreciable length extending laterally therefrom, means fixedly securing said leg portions to said disc member with said web portion disposed in generally parallel relation to said disc member and with said second sprocket opening in spaced aligned relation to said first sprocket opening, a plurality of film supporting portions formed of relatively thin sheet material and arranged in spaced relation to each other and secured to said disc member outwardly of said leg portions, said film supporting portions extending outwardly from said disc member in spaced generally parallel relation to said leg portions so as to form a slot between said hub-forming means and each film supporting portion which is open at one side of the reel for receiving strip film being inserted laterally therein, and a segmental portion formed of relatively thin sheet material carried on the outer part of each of said film supporting portions, said segmental portions being in spaced relation to each other and each segmental portion extending outwardly in a direction generally parallel to said disc

member and in such spaced relation thereto as to receive said strip film as it extends out of said slot and is wound about said film supporting portions.

2. A winding reel for receiving and supporting photographic strip film or the like, said reel comprising a disc member formed of relatively thin sheet material and having a sprocket opening located centrally therein and an annular shallow recess concentric therewith, hub-forming means formed of relatively thin sheet material and comprising a web portion having a sprocket opening located centrally therein and a plurality of leg portions of appreciable length extending laterally therefrom, means fixedly securing said leg portions in said annular recess to said disc member with said web portion disposed in generally parallel relation to said disc member and with said second sprocket opening in spaced aligned relation to said first sprocket opening, a plurality of film supporting portions formed of relatively thin sheet material and arranged in spaced relation to each other and secured within said annular recess to said disc member outwardly of said leg portions, said film supporting portions extending outwardly from said disc member in spaced generally parallel relation to said leg portions so as to form a slot between said hub-forming means and each film supporting portion which is open at one side of the reel for receiving strip film being inserted laterally therein, and a segmental portion formed of relatively thin sheet material carried on the outer part of each of said film supporting portions, said segmental portions being in spaced relation to each other and each segmental portion extending outwardly in a direction generally parallel to said disc member and in such spaced relation thereto as to receive said strip film as it extends out of said slot and is wound about said film supporting portions.

3. A winding reel for receiving and supporting photographic strip film or the like, said reel comprising a disc member formed of relatively thin sheet material and having a sprocket opening located centrally therein, hub-forming means formed of relatively thin sheet material and comprising a web portion having a sprocket opening located centrally therein and a plurality of leg portions of appreciable length extending laterally therefrom, each leg portion having a foot portion integral therewith and turned outwardly adjacent said disc member so as to provide an attachment area, means fixedly securing said attachment areas to said disc member with said web portion disposed in generally parallel relation to said disc member and with said second sprocket opening in spaced aligned relation to said first sprocket opening, a film supporting portion formed integrally with each of said foot portions and extending outwardly from said disc member outwardly of and in spaced generally parallel relation to an adjacent leg portion so as to form a slot between said hub-forming means and each film supporting portion which is open at one side of the reel for receiving strip film being inserted laterally therein, and a segmental portion integrally carried on the outer part of each of said film supporting portions, said segmental portions being in spaced relation to each other and each segmental portion extending outwardly in a direction generally parallel to said disc member and in such spaced relation thereto as to receive said strip film as it extends out of said slot and is wound about said film supporting portions.

4. A winding reel for receiving and supporting photographic strip film or the like, said reel comprising a disc member formed of relatively thin sheet material and having a sprocket opening located centrally therein and an annular shallow recess concentric therewith, hub-forming means formed of relatively thin sheet material and comprising a web portion having a sprocket opening located centrally therein and a plurality of leg portions of appreciable length extending laterally therefrom, each leg portion having a foot portion integral therewith and turned outwardly adjacent said annular recess in said disc member so as to fit within said recess and provide an attachment area, means fixedly securing said attachment areas within said recess to said disc member with said web portion disposed in generally parallel relation to said disc member and with said second sprocket opening in spaced aligned relation to said first sprocket opening, a film supporting portion formed integrally with each of said foot portions and extending outwardly from said disc member outwardly of and in spaced generally parallel relation to an adjacent leg portion so as to form a slot between said hub-forming means and each film supporting portion which is open at one side of the reel for receiving strip film being inserted laterally therein, and a segmental portion integrally carried on the outer part of each of said film supporting portions, said segmental portions being in spaced relation to each other and each segmental portion extending outwardly in a direction generally parallel to said disc member and in such spaced relation thereto as to receive said strip film as it extends out of said slot and is wound about said film supporting portions.

5. A winding reel for receiving and supporting photographic strip film or the like, said reel comprising a disc member formed of relatively thin sheet material and having a sprocket opening located centrally therein, hub-forming means formed of relatively thin sheet material and comprising a web portion having a sprocket opening located centrally therein and a plurality of leg portions of appreciable length extending laterally therefrom, a foot portion integrally carried by each leg portion and bent outwardly so as to form an attachment area adjacent said disc member, means fixedly securing said foot portions to said disc member with said web portion disposed in generally parallel relation to said disc member and with said second sprocket opening in spaced aligned relation to said first sprocket opening, a plurality of film supporting portions formed of relatively thin sheet material and arranged in spaced relation to each other and each having flange means integrally carried thereby and bent inwardly so as to form attachment areas adjacent said disc member, means fixedly securing said last mentioned attachment areas to said disc member outwardly of said hub-forming means and so that said film supporting portions will extend normally outwardly from said disc member in spaced relation to said hub-forming means so as to form a slot between said hub-forming means and each film supporting portion which is open at one side of the reel for receiving strip film being inserted laterally therein, and a segmental portion formed of relatively thin sheet material integrally carried by the outer part of each of said film supporting portions, said segmental portions being in spaced relation

to each other and each segmental portion extending outwardly in a direction generally parallel to said disc member and in such spaced relation thereto as to receive said strip film as it extends out of said slot and is wound about said film supporting portions.

6. A winding reel for receiving and supporting photographic strip film or the like, said reel comprising a disc member formed of relatively thin sheet material and having a sprocket opening located centrally therein and an annular shallow recess concentric therewith, hub-forming means formed of relatively thin sheet material and comprising a web portion having a sprocket opening located centrally therein and a plurality of leg portions of appreciable length extending laterally therefrom, a foot portion integrally carried by each leg portion and turned outwardly adjacent said annular recess in said disc member so as to fit within said recess and provide an attachment area, means fixedly securing said foot portions in said annular recess to said disc member with said web portion disposed in generally parallel relation to said disc member and with said second sprocket opening in spaced aligned relation to said first sprocket opening, a plurality of film supporting portions formed of relatively thin sheet material and arranged in spaced relation to each other, each of said film supporting portions having flange means integrally carried thereby and bent inwardly so as to form attachment areas fitting within said annular recess, means fixedly securing said last mentioned attachment areas within said annular recess to said disc member with said film supporting portions extending normally outwardly from said disc member in spaced relation to said hub-forming means so as to form a slot between said hub-forming means and each film supporting portion which is open at one side of the reel for receiving strip film being inserted laterally therein, and a segmental portion formed of relatively thin sheet material integrally carried on the outer part of each of said film supporting portions, said segmental portion extending outwardly in a direction generally parallel to said disc member and in such spaced relation thereto as to receive said strip film wound about said film supporting portions.

7. A winding reel for receiving and supporting photographic strip film or the like, said reel comprising a disc member formed of relatively thin sheet material and having a sprocket opening located centrally therein, said disc member having an outwardly directed peripheral flange and an outwardly projecting annular recess concentric with said sprocket opening, said annular recess having a depth at least equal to the thickness of said sheet material, hub-forming means formed of similar relatively thin sheet material and comprising a web portion having a sprocket opening located centrally therein and a plurality of leg portions extending laterally therefrom, each leg portion having a foot portion integral therewith and turned outwardly adjacent said annular recess so as to fit within said recess and provide an attachment area, means fixedly securing said attachment areas within said recess to said disc member with said web portion disposed in generally parallel relation to said disc member and with said second sprocket opening in spaced aligned relation to said first sprocket opening, a plurality of film supporting portions formed of similar relatively thin sheet material and arranged in spaced relation to each other and secured within said annular recess to said disc member, said film supporting portions extending outwardly from said disc member in spaced generally parallel relation to said leg portions so as to form a slot between said hub-forming means and each film supporting portion which is open at one side of the reel for receiving strip film being inserted laterally therein, and a segmental portion formed of similar relatively thin sheet material carried on the outer part of each of said film supporting portions, said segmental portions being in spaced relation to each other and each segmental portion extending outwardly in a direction generally parallel to said disc member and in such spaced relation thereto as to receive said strip film as it extends out of one of said slots and is wound about said film supporting portions.

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