

Nov. 17, 1953

A. H. STEUBER  
REWIND CORE HOLDER

2,659,542

Filed May 5, 1951

**Fig. 1**

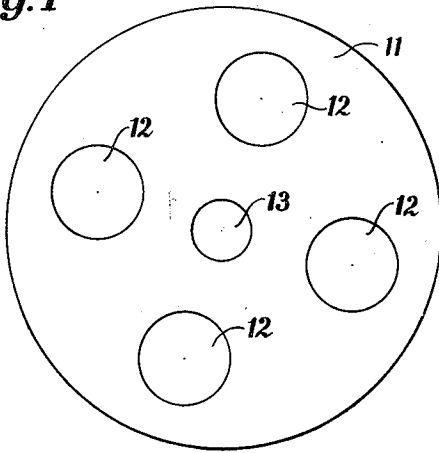


**Fig. 2**

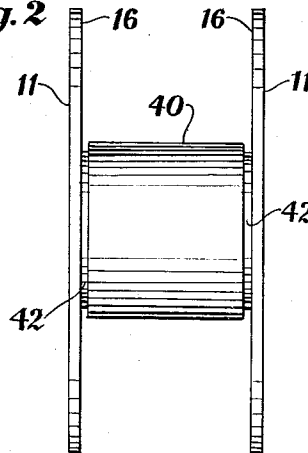
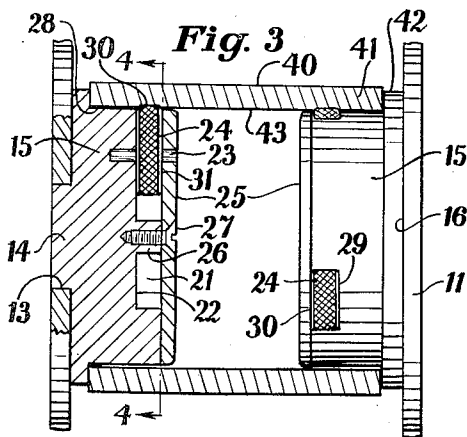


**Fig. 4**

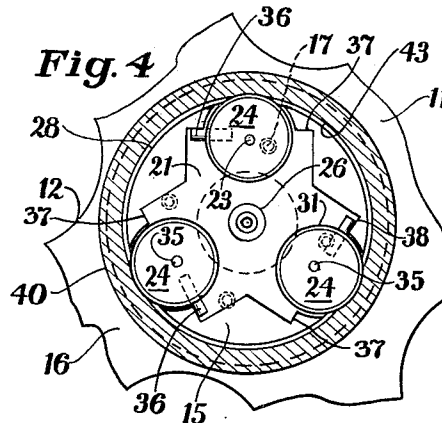


**Fig. 5**

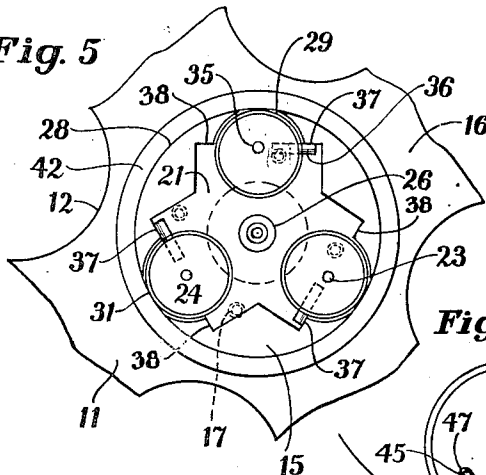


**Fig. 6**

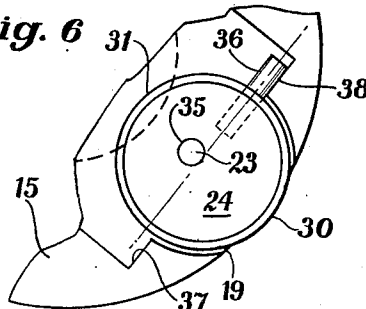
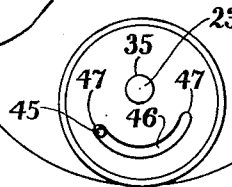


**Fig. 7**



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## UNITED STATES PATENT OFFICE

2,659,542

## REWIND CORE HOLDER

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Application May 5, 1951, Serial No. 224,689

10 Claims. (Cl. 242—70)

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The present invention relates to a wind-up reel, and more particularly to a novel arrangement for connecting the parts in a releasable manner.

Such a reel usually comprises a pair of spaced parallel side flanges which are connected by a cylindrical, or suitably shaped, core on which a long web of paper or sheet material may be wound. After such winding it may be desirable or necessary to store the wound web. For reasons of cost, as well as space consideration, it is desirable to store the wound web only with the supporting core and not with the side flanges. Therefore, it is desirable to design the reel so that the end flanges may be detached from the core and the latter with its wound web may then be stored. The flanges may then be connected to a new core for further winding operations. By means of this arrangement, a single pair of flanges may be employed to wind up a plurality of strips on separate cores. Also, the flanges may be used with cores of different lengths to wind up webs of different widths, the advantages of which are deemed apparent.

To secure these advantages, the present invention provides a new and highly improved arrangement for supporting the core on the flanges and for connecting the core detachably to the flanges so as to rotate as a unit therewith during the winding operation. However, at the completion of such winding, the core may be disconnected from the flanges so that the core and wound web may be handled and stored separately from the flanges. To this end, each flange is formed with an inwardly extending boss or hub on which are eccentrically mounted a plurality of rollers, preferably metal. In their operative position the peripheries of the rollers are positioned relative to the surface of the bosses so as to permit the ends of a hollow, tubular core to be slipped over the bosses and engage lightly the peripheries of the rollers. Now, when the core is rotated relative to the bosses, the inner surface of the core, which lightly engages the rollers, imparts a rotation of the latter. Due to the eccentric mounting of the rollers, such rotation causes the peripheries of the rollers to move outwardly radially and into gripping and holding relation with the inner surface of the core to connect the latter to the flanges so as to rotate as a unit therewith during the winding operation. However, after winding has been completed, the core is rotated in the opposite direction to impart a reverse rotation to the rollers to move the peripheries thereof inwardly, radially and out of holding relation with the inner

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surface of the core to release the latter. The wound core may then be slid off the bosses and disconnected from the flanges so that the core with its wound web may then be handled separately from the flanges. Cooperating means on each roller and its supporting boss serve to limit rotation of each roller relative to its boss to position the rollers in either their holding or releasing position.

The invention has as its principal object a new and effective means for connecting a core detachably to the end flanges of a reel.

Another object of the invention is the provision of such a connecting means which connect the core to the flanges for unitary rotation therewith, yet enables the core to be easily, quickly and completely detached from the flanges, when desired.

Yet another object of the invention is the provision of means for limiting the rotative movement of the rollers to insure the proper positioning of the latter relative to the core.

And a further object of the invention is the provision of an adjustable connecting means which is simple in structure, comprises few parts of rugged construction, simple and easy to operate, and highly effective in use.

To these and other ends, the inventive idea resides in certain improvements and combinations of parts, all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawings:

Fig. 1 is a side elevation view of a reel constructed in accordance with the present invention;

Fig. 2 is a front elevation view of the reel illustrated in Fig. 1, showing the relation of the detachable core and the side flanges;

Fig. 3 is a partial longitudinal or axial sectional view through the core and one of the reel hubs showing the relation of the adjustable rollers to the core;

Fig. 4 is a partial radial sectional view through one of the bosses, and taken substantially on line 4—4 of Fig. 3, showing the relation of the locking rollers to the bosses and the core, with the locking rollers in locking relation;

Fig. 5 is a view similar to Fig. 4 but showing the rollers in their core releasing position;

Fig. 6 is a view similar to Fig. 5, but on a larger scale than the latter, showing the position of one of the locking rollers when in locking position, and showing the means for positioning the roller; and

Fig. 7 is a view similar to Fig. 6, but showing

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a modified arrangement for limiting the rotation of the roller to position the latter relative to the core.

Similar reference numerals throughout the various views indicate the same parts.

The drawings show a reel primarily, although not necessarily, designed as a wind up reel to wind up a continuous web of developed photographic prints. The reel, in the preferred embodiment, comprises a pair of flat flanges 11 which are adapted to be arranged in spaced parallel relation, as shown in Fig. 2. To reduce weight, and for an additional reason to be later described, each flange 11 is provided with finger openings 12. In addition, each flange is provided with a central opening 13 in which is positioned a reduced portion 14 of a cylindrical boss or hub 15 which extends inwardly from the inner face 16 of its associated flange, as best shown in Figs. 2 and 3. The portion 14 serves to center the boss on its associated flange. Screws 17, or other suitable fastening means, may be used to secure each boss 15 in position on the inner face 16 of its flange 11.

Each boss is formed with a recess 21 of the shape best shown in Figs. 4 and 5. On the bottom or base 22 of each recess 21 is positioned a plurality of (in the present instance 3) axially extending pins 23 on which are eccentrically mounted metal rollers 24. To facilitate assembly of the rollers 24, each recess 21 is preferably open at its inner end, and the inner end is closed by a cover plate 25, which is secured to a central axially extending boss 26 by means of a screw 27, or other suitable fastening means, as best shown on the left of Fig. 3. If desired, the roller-supporting pins 23 may be extended so as to engage in registering openings in the cover plate 25, as also shown at the left of Fig. 3. The outer surface 28 of each boss 15 is formed with three axially aligned circumferentially spaced slots 29, which communicate with the recess 21 and through which a small arcuate portion 30 of the knurled peripheries 31 of the rollers 24 project, as clearly illustrated in Fig. 3.

Each roller 24 is provided with an eccentrically positioned aperture 35 for the reception of the supporting pin 23, so that each roller is eccentrically mounted on its associated boss 15, as best shown in Figs. 4 and 5. The result is that as the rollers are rotated, in a manner to be later described, about the pins 23, the peripheries 31 of the rollers will be moved radially varying amounts relative to the surface 28 of the boss depending upon the direction of rotation of the rollers, as is deemed apparent.

When the rollers are in the retracted position shown in Figs. 3 and 5, the peripheries 31 extend only a small distance above the surface 28 of the bosses 15, as shown at the left in Fig. 3. In this position, a radially extending pin 36 carried by each roller 24 engages a fixed shoulder or abutment 37 formed in recesses 21 to position the rollers relative to the bosses 15 to retain the rollers in their inner or lowermost position to permit the core to be slipped thereover, as is deemed apparent from an inspection of Fig. 3. However, when the rollers 24 are rotated clockwise, by means to be later described, to the position shown in Fig. 4, the peripheries of the rollers 31, due to their eccentric mounting, will be moved radially or outwardly and extend a greater distance above the surface 28 than when in the position shown in Fig. 5, the purpose of which arrangement will be subsequently pointed out. When

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the rollers have been rotated to the position illustrated in Fig. 4, the radially extending pins 36 will be moved into engagement with the fixed shoulders or abutments 37 in recesses 21 to limit the rotation of the rollers and to position the latter in their outward relation relative to the bosses 15.

The flanges 11 are connected and spaced by a core 40 which, in the present instance, is tubular in form and of such size that the ends 41 thereof will readily and easily slide over and be supported on the rollers 24 when the latter are in their lower or extracted position, see Figs. 3 and 5. In this lower position, the peripheries 31 of the rollers 24 project slightly above the surface 28 of the boss 15, as shown at the left in Fig. 3. The core 40 may be of a length equal to the spacing of the flanges so that the ends of the core may abut the inner faces 16 of the flanges 11. However, in the preferred form, each boss 15 is formed with an annular ring 42 adjacent the face 16 and against which the core 40 abuts as shown in Figs. 2 and 3. The engagement of the core with ring 42 serves to space the flanges 11 a slight distance from the ends of the core to provide a slight clearance therebetween to allow for any possible expansion or swelling of the web as it is being wound on the core, the advantages of which are deemed apparent.

The core 40, in the preferred embodiment, is made of cardboard or other suitable soft or deformable material, and has an inner diameter such as to easily slide over the bosses 15 and the slightly protruding rollers 24, when the latter are in their inner or lower position, as shown in Figs. 3 and 5. With the parts in the position shown in these figures, a clockwise movement of the core 40 relative to the left flange 11, Fig. 3, will cause the inner surface 43 of the core, adjacent the end 41, to grip the knurled slightly protruding peripheries 31 of the rollers 24 and impart a clockwise rotation thereto, as viewed in Figs. 4 and 5. Due to the eccentric mounting of the rollers, such clockwise rotation will cause the rollers to move from the position shown in Fig. 5 to that illustrated in Fig. 4, and such movement will cause the peripheries 31 to move radially outward to cause the knurled peripheries to dig in or grip the soft inner surface 43 of the core to connect the core to the left boss 15 and hence to the left flange 11 to form a unitary structure therewith. Thus, the mere rotation of the core 40 relative to the boss 15 will serve to rotate the rollers 24 to move the latter from their released to their clamping or holding position to connect the core to the base and hence to the flange.

To facilitate assembly, the rollers 24 in the two bosses are mounted for opposite rotation. The result is that when the core is positioned on the two bosses, as shown in Fig. 3, the fingers of the two hands of the operator may be inserted in finger holes 12 of the two flanges 11, and the two flanges rotated in opposite directions. Such opposite rotation will cause the rollers associated with the respective flanges to rotate in the proper direction and to move into gripping relation with the inner surface of opposite ends of the core to connect the latter in operative relation with the flanges. When the rollers 24 have thus been moved to clamping position, the pin 36 of each roller is finally moved into engagement with the abutment 37 to limit further rotation of the roller to retain the roller in core clamping position to securely hold the core in operative relation with the bosses and the flanges.

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After the desired amount of web has been wound on the core 40, the latter may be disconnected from the flanges 11 and the core with its wound web may be separately handled or stored. A fresh core may then be attached to the flanges, in the manner above described. In order to disconnect the wound core from the flanges, the latter are gripped by the fingers of the opposite hands and the two flanges are rotated oppositely relative to each other, but in directions opposite to that used in connecting the flanges to the core. Such opposite relative rotations of the flanges will cause the core to rotate the rollers in a counter-clockwise direction, as viewed in Figs. 4 and 5 to move the rollers from their gripping or holding position, as shown in Fig. 4, to their released position, as shown in Fig. 5. When the rollers reach this latter position, the pins 35 are moved into engagement with the abutments 37 to limit further rotation of the rollers. In this released position the rollers have been moved out of gripping relation with the core as shown in Fig. 3 and the core may then be slid off the bosses and disconnected from the flanges. Thus, by merely rotating the two flanges in opposite directions, the rollers 24 may be moved into and out of clamping relation with the core 40.

While in the preferred embodiment the core 40 is formed of cardboard and the rollers 24 are of metal, this is by way of illustration only. Other materials may be used so long as they provide the necessary gripping action between the rollers and the core so that the rotation of the latter will move the rollers to and from gripping or clamping position.

In the modification shown in Fig. 7, the pins 36 and shoulders 37 and 38 have been replaced by a single radially extending pin 45 on the bottom 22 of each recess 21. Each pin extends through a registering slot 46 in each roller 24. When the rollers have been moved to either position of adjustment, the pin 45 will engage an end 47 of slot 46 to limit movement of the roller 24 to position the latter accurately and positively. Otherwise, the rollers 24 of Fig. 7 operate in the same manner as above described.

The present invention thus provides a reel on which a web of material may be wound. The core of the reel is connected to the reel flanges for unitary rotation therewith during the winding operation. However, when the winding is completed, the core with its wound web may be disconnected from the flanges and the latter may then be used with another empty core to wind additional webs thereon. The full core may then be stored and handled as a unit separate from the flanges.

While certain embodiments of the invention have been disclosed, it is apparent that the inventive idea may be carried out in a number of ways. Therefore, this application is not to be limited to the precise details disclosed but is intended to cover all variations and modifications thereof falling within the scope of the appended claims.

What I claim and desire to secure by Letters Patent of the United States is:

1. A reel comprising, in combination, a pair of flanges adapted to be arranged in spaced parallel relation, a core open at its ends, means on said flanges to receive and support said ends to position said core between said flanges, radially adjustable pivoted elements carried by said means, and means on said ends directly engaging said

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elements to adjust the latter radially by a relative rotation of the flanges and core to connect said core releasably to said first means.

2. A reel comprising, in combination, a pair of flanges adapted to be arranged in spaced parallel relation, a core open at its ends, means on said flanges to receive and support said ends to position said core between said flanges, radially adjustable rotatable elements carried by said means, and portions of said ends engaging said elements and adapted to rotate the latter to vary the radial positions thereof to move said elements into frictional engagement with said ends to connect said core releasably to said means.

3. A reel comprising, in combination, a pair of flanges adapted to be arranged in spaced parallel relation, a core open at its ends, means on said flanges to receive and support said ends to position said core between said flanges, eccentrically mounted rollers carried by said means, and portions of said ends engaging the peripheries of said rollers and adapted to rotate the latter to vary the positions thereof to cause said rollers to engage said portions frictionally to connect said core releasably to said means.

4. A reel comprising, in combination, a pair of flanges adapted to be arranged in spaced parallel relation, a core open at its ends, means on said flanges to receive and support said ends to position said core between said flanges, eccentrically mounted rollers carried by said means, and portions of said ends overlying and engaging the peripheries of said rollers, rotation of said core in one direction relative to said flanges, serving to impart a similar rotation to said rollers to move said peripheries radially outward and into frictional contact with said portions to connect said core to said flanges, rotation of said core in the opposite direction imparts a similar rotation to said rollers to move said peripheries radially inward to move said rollers out of holding engagement with said core to permit the latter to be disconnected from said flanges.

5. A reel comprising, in combination, a pair of flanges adapted to be arranged in spaced parallel relation, a core open at its ends, means on said flanges to receive and support said ends to position said core between said flanges, eccentrically mounted rollers carried by said means, portions of said ends engaging the peripheries of said rollers and adapted to rotate the latter to vary the positions thereof to cause said rollers to engage said portions frictionally to connect said core releasably to said first means, and cooperating means on said first means and said rollers for limiting the rotation of said rollers to position the latter.

6. A reel comprising, in combination, a pair of flanges adapted to be arranged in spaced parallel relation, a core open at its ends, means on said flanges to receive and support said ends to position said core between said flanges, eccentrically mounted rollers carried by said means, portions of said ends overlying and engaging the peripheries of said rollers, rotation of said core in one direction relative to said flanges, serving to impart a similar rotation to said rollers to move said peripheries radially outward and into frictional contact with said portions to connect said core to said flanges, rotation of said core in the opposite direction imparts a similar rotation to said rollers to move said peripheries radially inward to move said rollers out of holding engagement with said core to permit the latter to be disconnected from said flanges, and cooperating

means on said first means and said rollers to limit the rotation of said rollers in both directions to position said rollers relative to said portions.

7. A reel comprising, in combination, a pair of flanges adapted to be arranged in spaced parallel relation, a core open at its ends, an inwardly extending hollow boss formed on each flange and adapted to receive and support said ends to position said core on and between said flanges, and a plurality of eccentrically mounted rollers positioned in each of said bosses, each roller being arranged with its periphery projecting through a registering slot formed in the boss and adapted to engage the inner surface of one of said ends when the core is positioned on said boss, the rotation of said core in one direction serving to impart a rotation to said rollers to move said peripheries radially outward through said slots to cause said peripheries to engage said inner surfaces frictionally to connect said core to said flanges, the rotation of said core in the opposite direction serving to rotate said rollers to move said peripheries radially inward and out of holding relation with said core to permit the removal of the latter from said bosses to disconnect the core from said flanges.

8. A reel comprising, in combination, a pair of flanges adapted to be arranged in spaced parallel relation, a core open at its ends, an inwardly extending hollow boss formed on each flange and adapted to receive and support said ends to position said core on and between said flanges, a plurality of eccentrically mounted rollers positioned in each of said bosses, each roller being arranged with its periphery projecting through a registering slot formed in the boss and adapted to engage the inner surface of one of said ends when the core is positioned on said boss, the rotation of said core in one direction serving to impart a rotation to said rollers to move said peripheries radially outward through said slots to cause said peripheries to engage said inner surface frictionally to connect said core to said flanges, the rotation of said core in the opposite direction serving to rotate said rollers to move said peripheries radially inward and out of holding relation with said core to permit the removal of the latter from said bosses to disconnect the core from said flanges, and cooperating means on said bosses and each of said rollers to limit the rotation of said rollers to position the latter relative to said ends.

9. A reel comprising, in combination, a pair of flanges adapted to be arranged in spaced parallel relation, a tubular core, an inwardly extending hollow boss on each of said flanges, each of said bosses being formed with radially extending circumferentially arranged slots, rollers positioned within said bosses with the peripheries of the rollers extending radially through said

slots, and means of eccentrically mounting said rollers on said bosses, said rollers being positioned to permit the ends of said core to be slipped over the projecting rollers so that the latter serve to support said ends, the rotation of said core in one direction relative to said bosses serving to rotate said rollers in one direction to cause said peripheries to extend a greater distance radially through said slots to engage said ends frictionally to support said core and to connect the latter to said flanges, the rotation of said core in the opposite direction relative to said bosses serving to rotate said rollers to cause the peripheries to move inwardly radially in said slots and out of holding relation with said ends to permit said core to be slid off said rollers to disconnect said core from said flanges.

10. A reel comprising, in combination, a pair of flanges adapted to be arranged in spaced parallel relation, a tubular core, an inwardly extending hollow boss on each of said flanges, each of said bosses being formed with radially extending circumferentially arranged slots, rollers positioned within said bosses with the peripheries of the rollers extending radially through said slots, means of eccentrically mounting said rollers on said bosses, said rollers being positioned to permit the ends of said core to be slipped over the projecting rollers so that the latter serve to support said ends, the rotation of said core in one direction relative to said bosses serving to rotate said rollers in one direction to cause said peripheries to extend a greater distance radially through said slots to engage said ends frictionally to support said core and to connect the latter to said flanges, the rotation of said core in the opposite direction relative to said bosses serving to rotate said rollers to cause the peripheries to move inwardly radially in said slots and out of holding relation with said ends to permit said core to be slid off said rollers to disconnect said core from said flanges, a radially projecting pin carried by each roller, and shoulders formed on said bosses adapted to be engaged by said pins when said rollers are rotated to limit said rotation to position said peripheries relative to said bosses.

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#### References Cited in the file of this patent

##### UNITED STATES PATENTS

| Number    | Name              | Date          |
|-----------|-------------------|---------------|
| 1,503,896 | Harris            | Aug. 5, 1924  |
| 1,687,157 | Flanigan          | Oct. 9, 1928  |
| 2,053,815 | De Panthou et al. | Sept. 8, 1936 |

##### FOREIGN PATENTS

| Number  | Country | Date          |
|---------|---------|---------------|
| 252,547 | Italy   | Mar. 24, 1927 |