July 29, 1941. L. G. HUNTER 2,250,957

WEB ROLLER

Filed Dec. 7, 1939

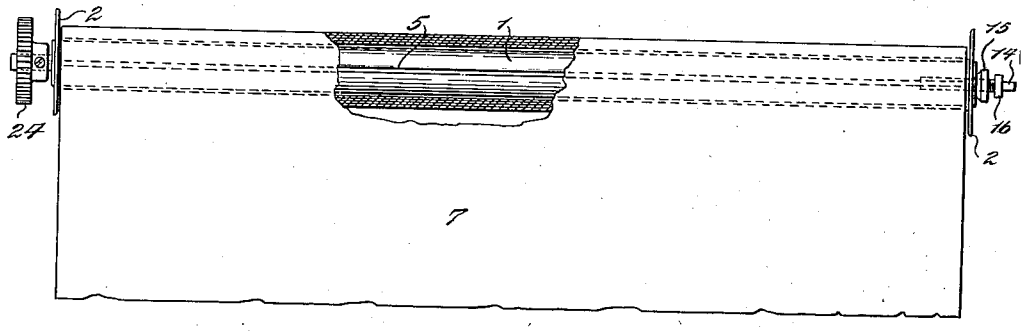


Fig. 1.

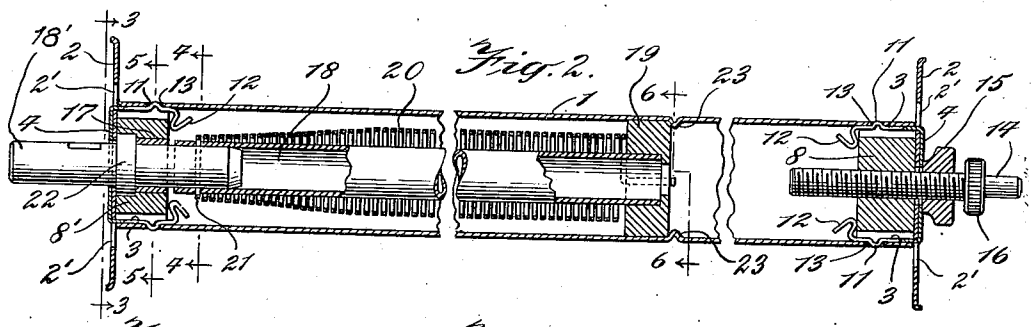


Fig. 2.

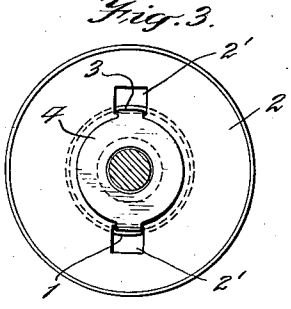


Fig. 3.

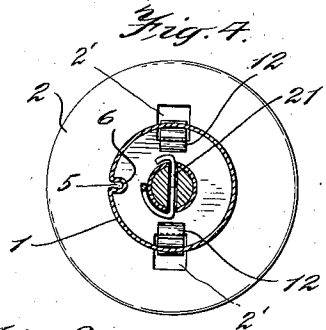


Fig. 4.

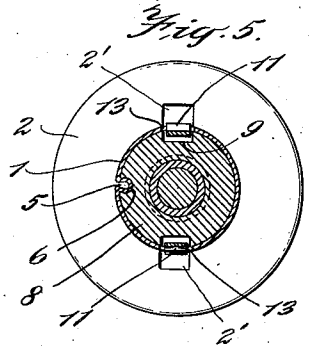


Fig. 5.

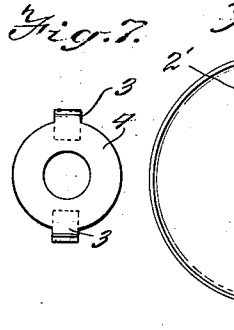


Fig. 7.

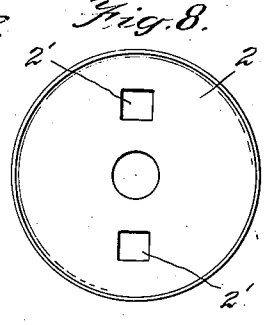


Fig. 8.

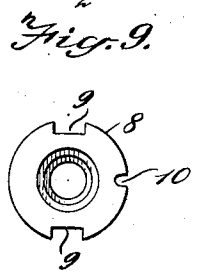


Fig. 9.

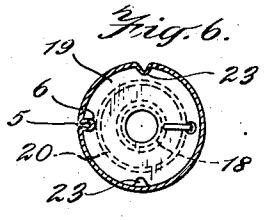


Fig. 6.

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UNITED STATES PATENT OFFICE

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WEB ROLLER

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Application December 7, 1939, Serial No. 308,016

5 Claims. (Cl. 156—36)

This invention relates to a novel and improved form of web roller, the novel features of which will be best understood from the following description and the annexed drawing, in which I have shown a selected embodiment of the invention and in which:

Fig. 1 is a view showing a selected embodiment of the roller with a web attached thereto, part of the web being broken away;

Fig. 2 is a longitudinal sectional view through the roller shown in Fig. 1;

Figs. 3, 4, 5, and 6 are views taken respectively on the lines 3—3, 4—4, 5—5, and 6—6 of Fig. 2;

Fig. 7 is a front elevation of the metal disk constituting a part of the flange and hub assembly;

Fig. 8 is a front elevation of the flange;

Fig. 9 is a front elevation of the hub.

According to my invention, I make the roller of a tube 1, which may be a continuous piece of tubing cut from extruded stock. Tubing of the desired cross section may be bought in lengths, say, of 25 feet, and then the desired length of tube for making a roller may be cut from the longer length.

Referring first to the right-hand end of Fig. 2 and also to Figs. 7 to 9, it will be seen that the end of the tube is closed by a flange 2, which may be formed of sheet metal, and that this flange is secured to the tube by spring arms 3 which extend within the tube. These spring arms, as best shown in Figs. 2 and 5, are conveniently formed as part of a small disk 4, and the arms extend through holes 2' in the flange. On the other hand, if found more convenient, the arms could be formed by striking out the material of the flange, but by the arrangement shown it is possible to use a different material for the spring arms, a material which will give more resiliency. It is also possible to thus form the arms of the desired length without relation to the diameter of the flange.

Preferably, the tube is formed with a groove 5 which extends throughout the length of the tube and which may be conveniently formed when the tubing is extruded by causing the wall of the tube to take the shape shown best in Figs. 4 and 5, thus forming the external groove 5 and at the same time forming a projection 6 on the inside of the tube. This groove may conveniently be used to attach the web 7 to the roller, for example by inserting a rod in the groove to hold the web therein.

Referring to the right-hand end of the tube, as seen in Fig. 2, the flange 2 has associated with it a hub 8, which is preferably provided with recesses 9 to receive the spring arms 3, and is also provided with a groove 10 (Fig. 9) to receive the projection 6 on the tube. It will be noted that the arms 3 have outwardly extending fingers 11 and inwardly extending fingers 12.

Now when the flange 2 is to be secured to the end of the tube 1, the hub 8 may first be inserted between the spring arms 3 by forcing apart the fingers 12 so that the arms will hold the hub and flange together. Preferably, the recesses 9 are provided so as to prevent relative rotation between the hub and flange. After the hub and flange are assembled, then the two may be secured to the tube by registering the groove 10 with the projection 6 and then shoving the assembly into the tube end until the fingers 11 snap into holes 13 in the wall of the tube. As shown in this embodiment, the hub 8 is used as a support for a threaded pivot pin 14 which may be locked in desired position by a suitable lock nut 15. The pin may also be provided with a head or flange 16 to hold the roller against longitudinal movement in the adjusted position of the pin 14, by engaging the frame on which the roller is supported.

At the other or left-hand end of the roller is shown a similar hub and flange arrangement to the one just described, and similar numerals have been applied to certain parts thereof which are identical with the parts just described in connection with the right-hand end of the roller. In this instance, however, the hub 8' has therein a bearing 17 to rotatably support a tubular shaft 18 which extends lengthwise of the tube and which is rotatably supported at its innermost end in a bearing member 19 by a spear 18'. Surrounding the shaft 18 is a coil spring 20 which has one end secured to the bearing member 19 and the other end secured to the shaft 18, as shown at 21.

The bearing member 19, as well as the hub 8', has a groove adapted to engage the projection 6, such groove being shown in Fig. 6. In assembling the parts, the hub 8' may be assembled with its flange 2 in the same manner as described above, and then the hub is slipped over the spear 18', the collar 22 on the spear holding the spear and hub against longitudinal displacement. Then the spear is pressed into the tubular shaft 18, the spring 20 is slipped over that shaft, and its left-hand end passed through holes in the shaft 18 and spear 18', thus locking together the spring, shaft, and spear. Then the member 19 is slipped over the right-

hand end of the shaft and the other end of the spring is passed through a hole in that member.

Then the completed assembly is slid into place in the tube, the hub 8' and the bearing member 19 being guided and held in place by engagement of their respective grooves with the projection 6, this projection thus holding these two elements against rotation in the tube while permitting them to slide freely lengthwise of the tube. The member 19 will engage stops 23 formed by bending inwardly part of the tube wall, these stops of course being properly placed for the full length of the shaft 18. When the fingers 11 of the spring arms enter the holes 13 at the left end of the tube, the shaft and spring assembly will thus be held in correct operative position. The spear 18', which is actually a continuation of the shaft, of course, projects outwardly at the left end of the tube and will normally have a gear or pinion 24 secured thereto, although, of course, the shaft may be rotated by a handle or any other means, rotation of the shaft being transmitted to the roller through the spring 20 and bearing member 19.

By the above arrangement it will be seen that the roller may be made from tubing which may be cut off into any desired length, after which all that is necessary is to form the holes 13 and the stops 23. Then the other parts may be easily assembled with the tube and, in case of repair, they may be easily disassembled. To disassemble, the flanges and hubs may be pulled out from the tube ends, the resiliency of the spring arms permitting such motion and the grooves 9 permitting inward movement of the spring arms for that purpose. If desired to remove a hub from its associated flange, that may be easily done by forcing one or both of the spring arms outwardly by a suitable tool or with the fingers of a person. The hub 8' may then be removed from the shaft and in fact all parts may be easily disassembled for repair or replacement.

While I have shown the invention as embodied in a specific form, it is to be understood that various changes in details may be made without departing from the scope of the invention as defined by the appended claims.

I claim:

1. A web roller comprising a tube having holes in the wall thereof, a flange across one end of said tube, and spring arms secured to said flange and extending lengthwise of the tube and having yielding fingers resiliently engaging in said holes in the wall of said tube to detachably hold the flange on the tube.

2. A web roller comprising a tube, a flange across one end of said tube, a hub disposed in the same end of the tube, and spring arms secured to said flange and extending into the tube between the hub and the wall of the tube and having fingers yieldingly and detachably engaging both the hub and the tube to hold together the flange, tube, and hub.

3. A web roller comprising a tube having holes in the wall thereof, a flange across one end of said tube, a hub disposed in the same end of the tube, and spring arms secured to said flange and extending into the tube between the hub and the wall of the tube, said arms having fingers extending into said holes and other fingers engaging said hub.

4. A web roller comprising a tube, a flange across one end of said tube, a hub disposed in the same end of the tube, spring arms secured to said flange and extending into the tube between the hub and the wall of the tube and having fingers yieldingly and detachably engaging both the hub and the tube to hold together the flange, tube, and hub, a shaft extending through said flange and hub and having a bearing in said hub, a bearing member spaced from said hub and located at the other end of said shaft and rotatably supporting the shaft within the tube, a coil spring surrounding the shaft between said hub and bearing member and having its opposite ends respectively secured to said member and to said shaft, and means preventing rotation of said bearing member in the tube.

5. A web roller comprising a tube having a projection on the inner surface of the tube wall and extending lengthwise of the tube, a shaft extending inwardly from one end of the tube, a bearing member rotatably supporting the inner end of the shaft and a hub spaced from the bearing member and rotatably supporting the other end of the shaft, a flange detachably secured to said hub and to the end of the tube, said member and said hub having grooves slidably receiving said projection, whereby the shaft with the member and hub may be slid into and out of place in the tube.

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