Sept. 9, 1941. H. E. MARVEL 2,255,180

CONCEALED HOSE DISPENSING APPARATUS

Filed Nov. 26, 1938 2 Sheets-Sheet 1

FIG. 1

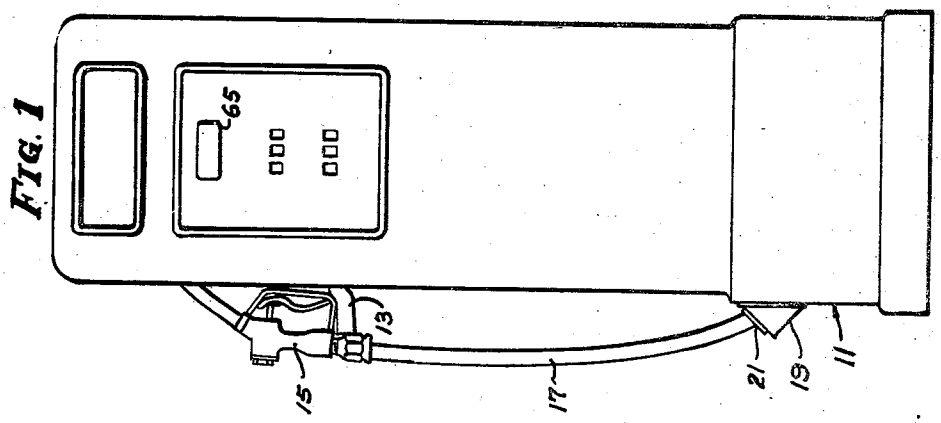


FIG. 4

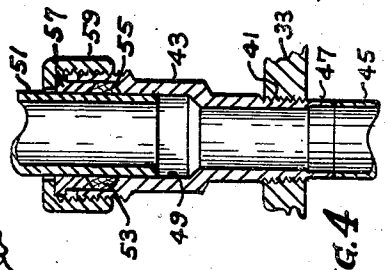


FIG. 3

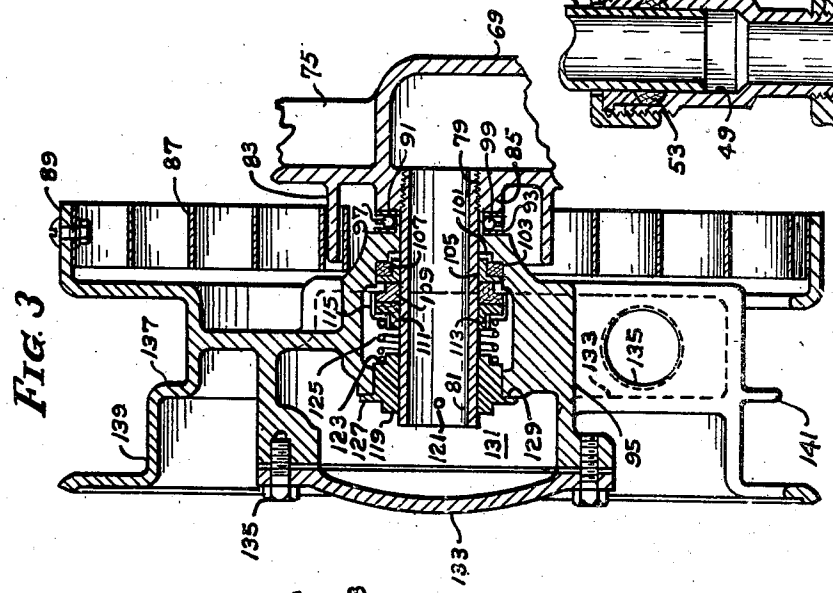
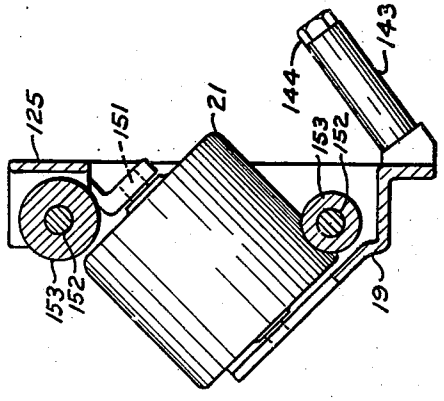


FIG. 7



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CONCEALED HOSE DISPENSING APPARATUS

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FIG. 2

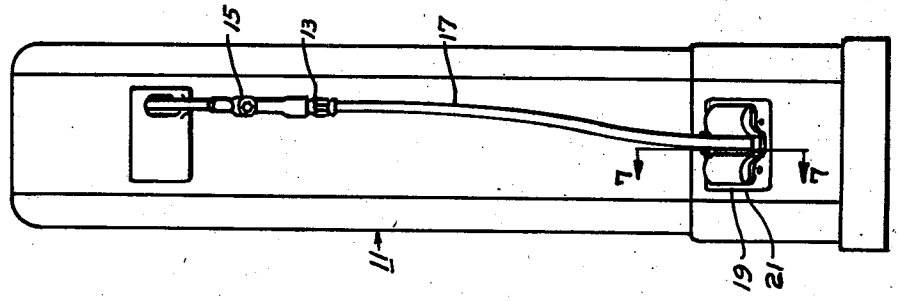


FIG. 5

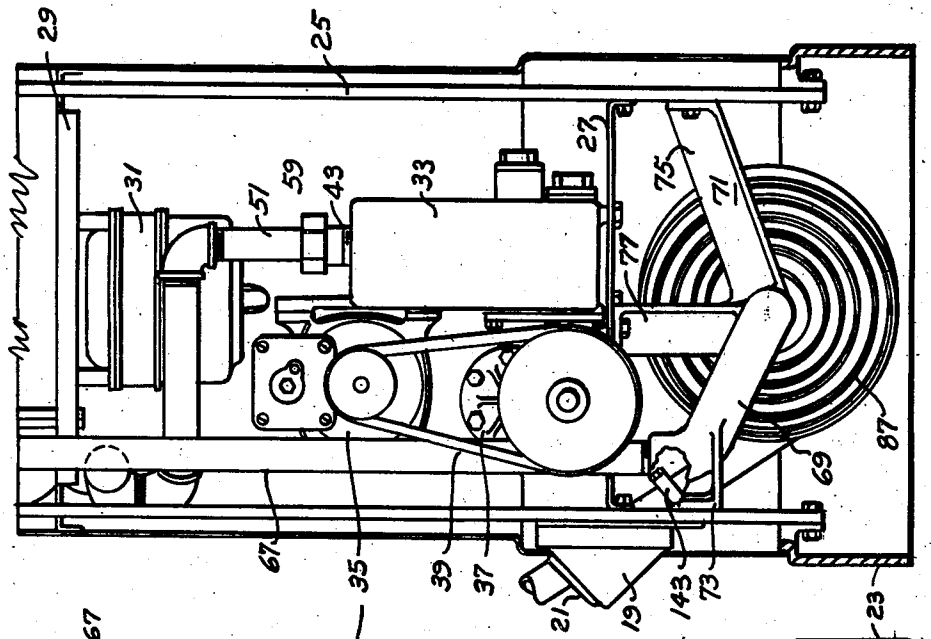
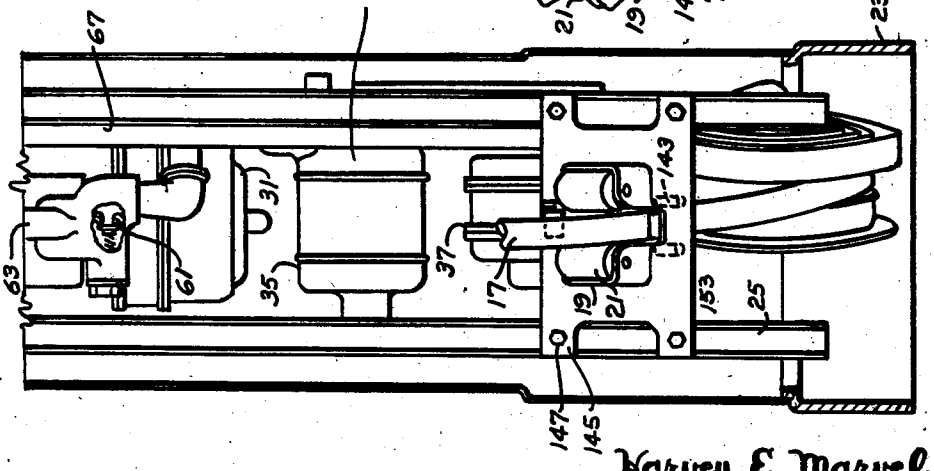


FIG. 6



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Patented Sept. 9, 1941 2,255,180

UNITED STATES PATENT OFFICE

2,255,180

CONCEALED HOSE DISPENSING APPARATUS

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Application November 26, 1938, Serial No. 242,553

6 Claims. (Cl. 242—86)

This invention relates to liquid dispensing apparatus of the concealed hose type in which the greater portion of the dispensing hose is contained within the housing of the apparatus on a hose reel.

While the broad idea of storing the hose in this manner is old, as shown by Carroll Patent Number 2,113,676, issued April 12, 1938, certain difficulties have been encountered in attempting to fit a hose reel in a housing of the usual size.

In attempting to do this, it has been found necessary to resort to the use of a reel of small diameter having the hose wound thereon in laterally adjacent courses or convolutions, and this brought with it the problems of guiding the hose on to the reel so that it would wind properly upon the reel without jamming.

Some difficulty was also encountered in securing a free operation of the reel itself, since the combined resistance of the retrieving spring and rotary seal constituted a considerable load.

Accordingly, it is an object of the invention to provide, in a dispensing apparatus, a free running and sure winding hose reel.

Another object of the invention is to provide a hose reel adapted to store the hose in laterally adjacent courses together with means for guiding the hose into proper position thereon.

Yet another object of the invention is to provide a system of rollers for guiding the hose into proper position on the hose reel.

Still another object of the invention is to provide a hose reel which will assist in directing the hose to proper position thereon.

It is another object of the invention to provide a hose reel having a free running liquid seal.

Other objects will become apparent from a study of the following specification and the accompanying drawings in which:

Figure 1 is a side elevation of a dispensing pump showing the hose in retrieved position.

Figure 2 is an end elevation of the apparatus of Figure 1.

Figure 3 is a vertical section of the hose reel, rotary seal and retrieving spring.

Figure 4 is a vertical section showing the sliding connection between the air release and the dispensing line.

Figure 5 is a side elevation of the lower portion of the dispensing apparatus with the housing removed.

Figure 6 is a vertical end elevation of the mechanism of Figure 5.

Figure 7 is a section taken on the line 7—7 of Figure 2 showing the arrangement of the rollers.

Numeral 11 in Figure 1 represents, generally, a dispensing apparatus which is provided with a hose hook 13 which is adapted to supporting nozzle 15, which is attached to the dispensing hose 17.

The lower portion of the apparatus is provided with a bracket 19 which supports a primary guiding roll 21 at an angle of about 45 degrees from the vertical.

As shown in Figure 5, the apparatus 11 comprises a base member 23 to which is affixed a plurality of vertical columns 25, which, together with cross members 27 and 29, form the frame of the apparatus.

A meter 31, of any desired type but preferably like that disclosed in the patent to Blum 1,977,424, is suspended from a cross member 29, while an air release 33 is mounted upon the upper side of bracket 27. A motor 35 and a pump 37 are mounted upon the air release 33 and are connected by a belt 39.

An opening 41 (Figure 4) is provided in the upper wall of the air release, and is internally threaded to receive a threaded nipple 43. Before the nipple is screwed into the opening, a piece of pipe 45, which is of sufficient length to reach to a point adjacent to the bottom of the air release is welded to the lower end 47 of the nipple. The nipple is counterbored at 49 to receive the lower end of a pipe 51, which forms a portion of a dispensing line which is connected with the meter 31. Another counterbore 53 is formed in the upper end of the nipple and is adapted to receive packing 55 and a packing gland 57. This end of the nipple is also threaded externally to receive a packing nut 59.

This arrangement is necessary because of the fact that the hose reel and air separator are both rigidly mounted on the platform 27 and are connected by piping to the meter, so that unless some provision is made in one or the other of the pipe lines to take care of inaccuracies of manufacture and assembly, one or more of the units would be unduly strained and this would lead to trouble. In view of the fact that it is sometimes necessary to replace the separator, the slip connection, which is a separable one, is located at the separator so that replacement of the separator may be made without disturbing the hose reel mechanism. On the other hand, since the hose reel is disposed down stream of the separator and meter, it may be readily replaced without disturbing either of these elements.

The pipe 51 is connected to the meter 31

through a combined check and relief valve 61. This valve is preferably of the composition type and occupies a horizontal position. It is adapted to open with the flow of liquid from the air release to the meter against the pressure of a light spring which is adapted to urge the valve toward a closed position so that it will seat readily when the pump is shut down. The valve contains a small relief valve (not shown) which is adapted to open with the flow of liquid from the meter to the air release, which may occur when the pressure in the system above the check valve increases due to rising temperatures.

From the meter, the liquid being pumped passes through a pipe 63 to the sight glasses 65 (Figure 1) and then downwardly through a pipe 67 to the inlet conduit 69 which leads to the hose reel. This conduit forms a part of a supporting member 71, which is fixed to the columns 25 by means of supporting lugs 73 on conduit 69 and similar lugs on an arm 75.

The member 71 also comprises a vertical arm 77 which is attached to the cross member 27. The conduit 69 is formed with a tapered opening 79 which is adapted to receive a hollow axle member 81, which is adapted to support the hose reel. Two concentric flanges 83 and 85 are formed about the axle 81 and the outer one of these serves to anchor one end of the retrieving spring 87 which is fixed at its other end to an inwardly directed flange 89 on the reel. The other flange 85 serves to limit the inward movement of the reel on said shaft.

A hardened ring 91 abuts the flange 85, while a similar ring 93 abuts the hub 95 of the hose reel. A perforated ring 97 lies between rings 91 and 93 and carries roller bearings 99. These elements form a thrust bearing which assumes the axial load which is imposed on the reel.

The inner portion of the hub adjacent the axle 81 is provided with an annular recess 101, which is counterbored at 103 to receive one part 105 of the thrust bearing, which is formed of stainless steel or bronze and which is provided with a radial flange. Said flange serves to compress a "Corprene" or other packing ring 107 against the axle and the walls of the counterbore.

A carbon ring 109 forms the other part of the thrust bearing and is disposed on the axle adjacent the element 105. A packing ring 111, of "Corprene" or other suitable material, having a radial and an axial flange is disposed on the axle adjacent the carbon ring. A metal ring 113 surrounds the axial flange, while a cupped ring 115 encloses the radial flange. The ring 115 serves as seat for spring 125.

A retaining element 119 is pinned to the axle 81 by means of a pin 121 and is provided with a seat 123 which is adapted to receive one end of the spring 125 of the rotary seal. A flange 127 on the retaining element 119 abuts the face 129 on the hose reel and serves to retain it against axial motion on the shaft.

A chamber 131 is formed in the hose reel at the side opposite spring 87 and a cap 133 is attached to the hose reel as by cap screws 135 so as to form a discharge chamber into which conduit 69 will empty by way of the hollow axle 81.

Chamber 131 is connected by a channel 133 to a hose connection 135 which is disposed in a radial plane of the hose reel. The hose reel is formed with a groove or depression 137 which is adapted to receive the coil of hose which carries the hose connection. A second groove 139 is formed adjacent groove 137, and at the point nearest the connection 135, the groove 137 is considerably deeper than groove 139. The depth of groove 137 becomes less as the distance from the connection 135 increases, and after the angular distance of 360 degrees is covered, the two grooves 137 and 139 are of equal depth and are defined by a rib or flange 141. This rib is interrupted at a point less than 360 degrees from the connection 135 so that the hose may cross from groove 137 into groove 139 after about one revolution has been made, and groove 139 will take up the hose remaining to be retrieved.

As shown in Figure 6, the hose reel is disposed at one side of a plane running centrally through the dispensing unit in a transverse direction. Since the hose should preferably issue on the line of intersection of this plane and the side of the pump, it is necessary that the reel axle be rotated slightly in a horizontal plane, so that its axis is inclined from a perpendicular to said central plane and so as to direct the hose toward the desired outlet point.

A planar element 145 is attached to columns 25 by means of screw fastenings 147 and supports the bracket 19 heretofore referred to.

The bracket 19 is provided with a pair of rolls 143 which are mounted upon axles 144, one on each side of a plane passing centrally and edgewise through the dispensing unit. The right hand roll 143 (Figure 6) is disposed at a greater distance from the central plane than is the left hand roll, so that the hose 17 will be deflected toward the right of the plane as it enters the unit, and thus is biased toward the hose reel. The rolls 143 are inclined so that their respective axes extend at about 37 degrees upwardly from the horizontal, the object of this being to maintain the axes of the rolls at substantially 90 degrees to the direction taken by the axis of the hose so as to eliminate, as far as possible, any friction between the metal roll and rubber hose.

The bracket 19 carries axles 151 upon which are rotatably mounted the rolls 21 which are of large diameter. Applicant prefers to use rolls of at least three inches diameter where a synthetic, lined hose of about $1\frac{5}{8}$" outside diameter is used although this roll dimension is not the only one which will serve the purpose. The object of utilizing large diameter rolls is to reduce friction between the roll and hose, and to prevent sharply kinking the hose as it is withdrawn from the housing. Kinking leads not only to undue wear on the hose but also tends to cause breakage of the ground wires which are usually embedded in the hose and which connect the fittings on each end of the hose.

The axles of these rolls are disposed at an angle of about 45 degrees from the horizontal and are inclined upwardly and to the right as shown in Figures 1, 5 and 7. The object of tilting the rollers is to secure, as nearly as possible, true rolling contact between the hose and the rolls; and this, of course, is accomplished only when the axes of the rolls are disposed substantially perpendicular to the axis of the hose.

The reel and sets of rolls 21 and 143 are so disposed that a plane containing the center lines of the sets will also contain the inner flange 141.

The bearing bracket 19 also supports horizontal axles 152 upon which are mounted rolls 153. These rolls are disposed above and below rolls 21 and serve merely to prevent the hose from coming in contact with sharp corners or edges of the housing.

Operation

In operating this device, the station attendant will first remove the hose nozzle 15 from the hose hook 13 and carry it to the tank which is to be filled. If more hose than that which extends between the rollers 21 and the nozzle is required, the operator will simply pull on the hose from the position which he occupies and additional hose will be supplied by the unreeling of the hose reel and the paying out of hose through the rollers 143, 21 and 153.

After dispensing is complete, it is necessary merely to relax tension on the hose and the retrieving spring 87 which was energized during the withdrawal of the hose will rotate the reel in a direction to retrieve the hose. The rolls 21 and 143 are so directed that they tend to urge the hose into the groove formed by the flanges 141 and the outer flange. However, the depth of groove 137 prevents the hose from passing over at the start of rewinding; and as the groove 137 diminishes in depth, the flange 141 increases in height, so that there is always enough of a wall to prevent the hose from passing over toward the outer flange. However, as soon as the interruption in the flange is reached, as shown in Figure 6, the hose will cross over and will wind up in the second course.

It is quite obvious that the tendency of the rollers to urge the hose toward the outer flange must be limited to prevent the hose from leaving the groove which is provided to receive the first course. As the hose is wound up on the reel it will first occupy the groove 137 until a little more than one revolution has been completed, whereupon the hose will cross over into the groove 139 where the remainder of it will be taken up. The rollers 21 and 143 are so disposed as to tend to guide the hose toward the groove 139.

The hose is prevented from going into this groove first by reason of the difference in depth of the groove, and as this difference in depth approaches zero, the hose is prevented from crossing by means of the flange 141; however, at the point where this flange terminates, the hose will be free to cross over into groove 139 and be taken up in that groove. It is to be noted that the effect of the rollers must be such as to urge the hose toward groove 139 but it must not be sufficient to force the hose into this groove in spite of the depth of groove 137 or the flange 141.

It has been found that the rollers 21 must be of substantial length and diameter, and spaced from rolls 143, so that bending of the hose in the retrieving operation will not be so severe as to either prevent it from crossing into groove 139 at the proper time or to compel it to cross over into said groove before the proper time.

Inasmuch as the hose reel occupies a position below the air release and pumping structure, it is necessary to remove air free liquid from the air release by means of a pipe extending down into the air free liquid chamber from the top thereof.

Since the pipe conecting the meter with the air release is connected first to the meter, it is necessary to provide some means for variation in the piping structure. In view of the fact that part of the hose controlling rolls are carried by the frame while the hose reel is supported by cross member 27, it is not feasible to adjust member 27 up or down to take care of this variable; consequently, applicant has resorted to the provision of the slidable air release discharge pipe and the packing gland shown in Figure 4.

The pipe 51, before it is fixed to the other pipe, can be provided with the packing gland 57 and nut 59 and be dropped down into the nipple 43. After the pipe 51 is connected with the rest of the pipe, the packing 55 can be supplied and the packing gland can be drawn down by nut 59 to make a tight joint at this point. The air release and pumping assembly can be readily removed by reversing the process.

It is obvious that various changes may be made in the form, structure and arrangement of parts without departing from the spirit of the invention. Accordingly, applicant does not desire to be limited to the specific embodiment disclosed herein primarily for purposes of illustration; but instead, he desires protection falling fairly within the scope of the appended claims.

What I consider to be new and desire to protect by Letters Patent of the United States is:

1. In a liquid dispensing apparatus comprising a housing, a hose reel supported in said housing to one side of a central plane therethrough, a hose stored on said reel, an opening in said housing adapted to permit withdrawal of the hose from said reel, and disposed so as to be substantially bisected by said plane, a set of substantially cylindrical rolls having large diameters mounted at the upright edges of said opening, and a set of substantially cylindrical rolls disposed between said opening and said reel and displaced from a central position with respect to said plane toward the hose reel side thereof.

2. In a liquid dispensing apparatus comprising a housing, an axle, a hose reel supported on said axle, in said housing and to one side of a central plane therethrough, an opening in said housing disposed to be substantially bisected by said plane and adapted to permit withdrawal from or return of the hose to said reel, a set of rolls disposed about said opening to prevent contact of the edges thereof with the hose, means for mounting said axle in said housing at an angle to said central plane so that the hose receiving portion of said reel is directed toward said opening, and additional rolls cooperating with said first set for guiding said hose from said first set to said reel.

3. In a liquid dispensing apparatus comprising a housing, a hose reel mounted for rotation in said housing for yielding or retrieving a hose, said reel being adapted to receive the hose in two laterally adjacent courses, said housing having an opening therein, a plurality of groups of rolls for guiding said hose through said opening and toward said reel, means for mounting said groups of rolls in spaced relation along the hose so that bending the hose outside of the housing will not disturb the alignment of the hose with respect to the particular course in which it is being wound on the reel, and for mounting said groups of rolls laterally with respect to each other to lightly urge said hose toward the second course position.

4. In a liquid dispensing apparatus comprising a housing, a hose reel mounted for rotation in said housing for yielding or retrieving a hose, said reel being adapted to receive the hose in two laterally adjacent courses and comprising means for segregating said courses, said housing having an opening therein, exterior and interior sets of rolls for guiding said hose through said opening and toward said reel, means for mounting said sets of rolls in spaced relation

along the hose so that bending the hose outside of the housing will not disturb the alignment of the hose with respect to the particular course in which it is being wound on the reel, and for mounting said interior set of rolls laterally of a line joining said first set with the first course of said reel so as to lightly urge said hose toward the second course position, and means including said segregating means for preventing movement of said hose into its second course position prior to completion of winding of said first course.

5. In a liquid dispensing apparatus comprising a housing, a hose reel mounted for rotation in said housing for yielding or retrieving a hose, said reel comprising a groove of diminishing depth adapted to receive a first course of said hose, and means comprising an outer flange disposed laterally adjacent said first groove and an interrupted inner flange adapted to form with said outer flange a second groove which is adapted to receive a second course of said hose, means comprising roll sets adapted to engage said hose, means for mounting said roll sets in positions to urge said hose toward said second course, said groove and interrupted flange serving to prevent the hose from crossing to the second course position until winding of the first course is completed.

6. In a liquid dispensing apparatus comprising a housing, a hose reel supported in said housing, having a hose stored thereon, an opening in said housing to permit withdrawal of said hose therefrom, the axis of said hose reel being disposed at a level below that of the opening, a pair of large diametered rolls having their axes disposed in substantially parallel vertical planes, one on either side of said opening, the axes of said rolls being also disposed in a plane which is substantially perpendicular to the axis of said hose as it passes from the bottom of said reel through said opening and between said rolls.

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