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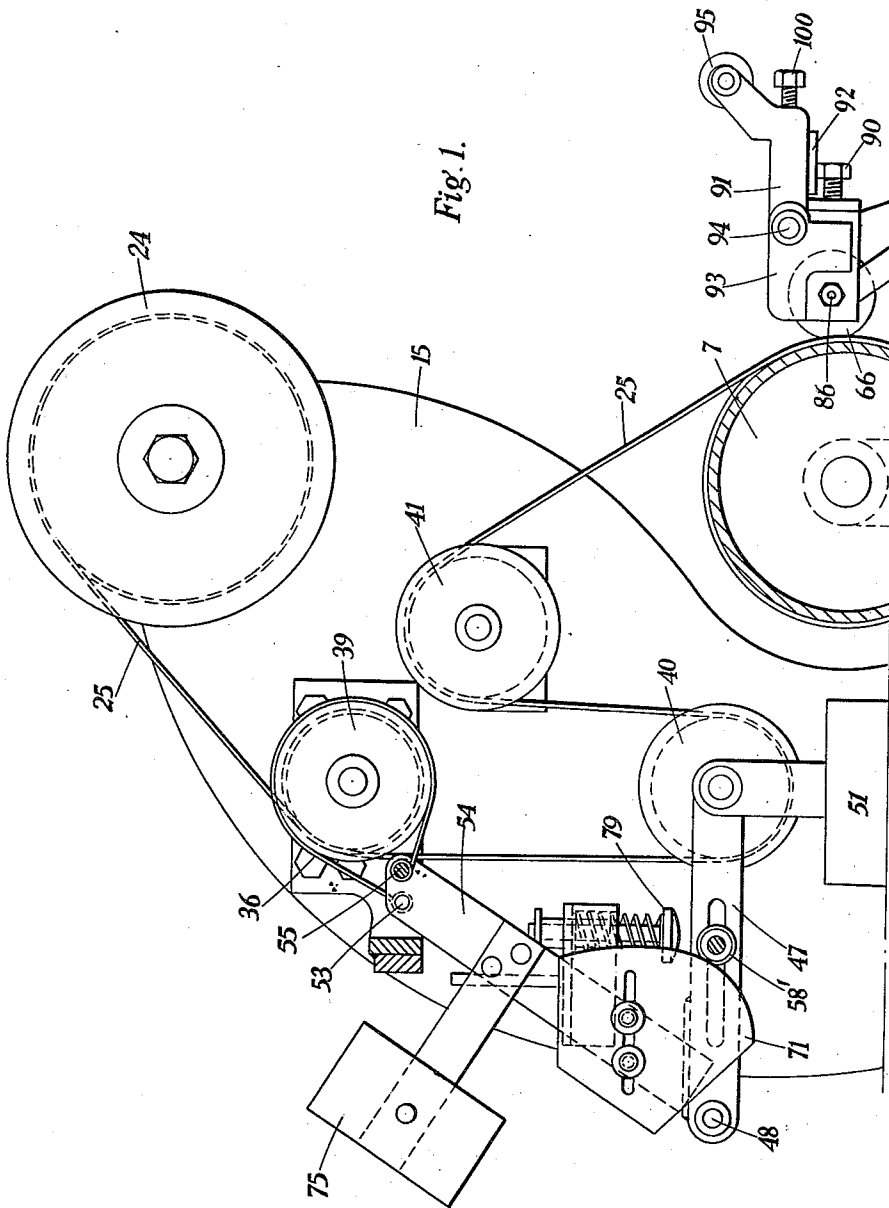
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2,331,371

MEANS FOR WRAPPING FILAMENTS AROUND TUBES OR CYLINDERS

Filed March 2, 1942

6 Sheets-Sheet 1



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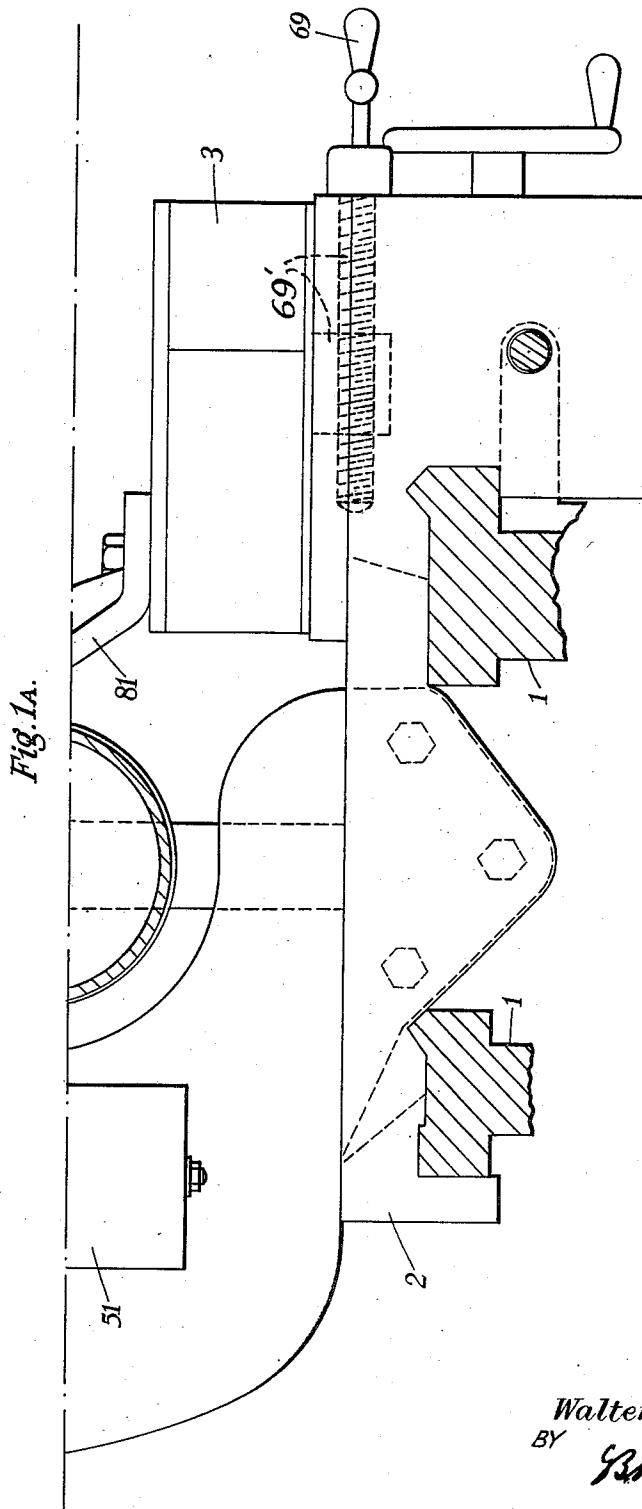
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MEANS FOR WRAPPING FILAMENTS AROUND TUBES OR CYLINDERS

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6 Sheets-Sheet 2



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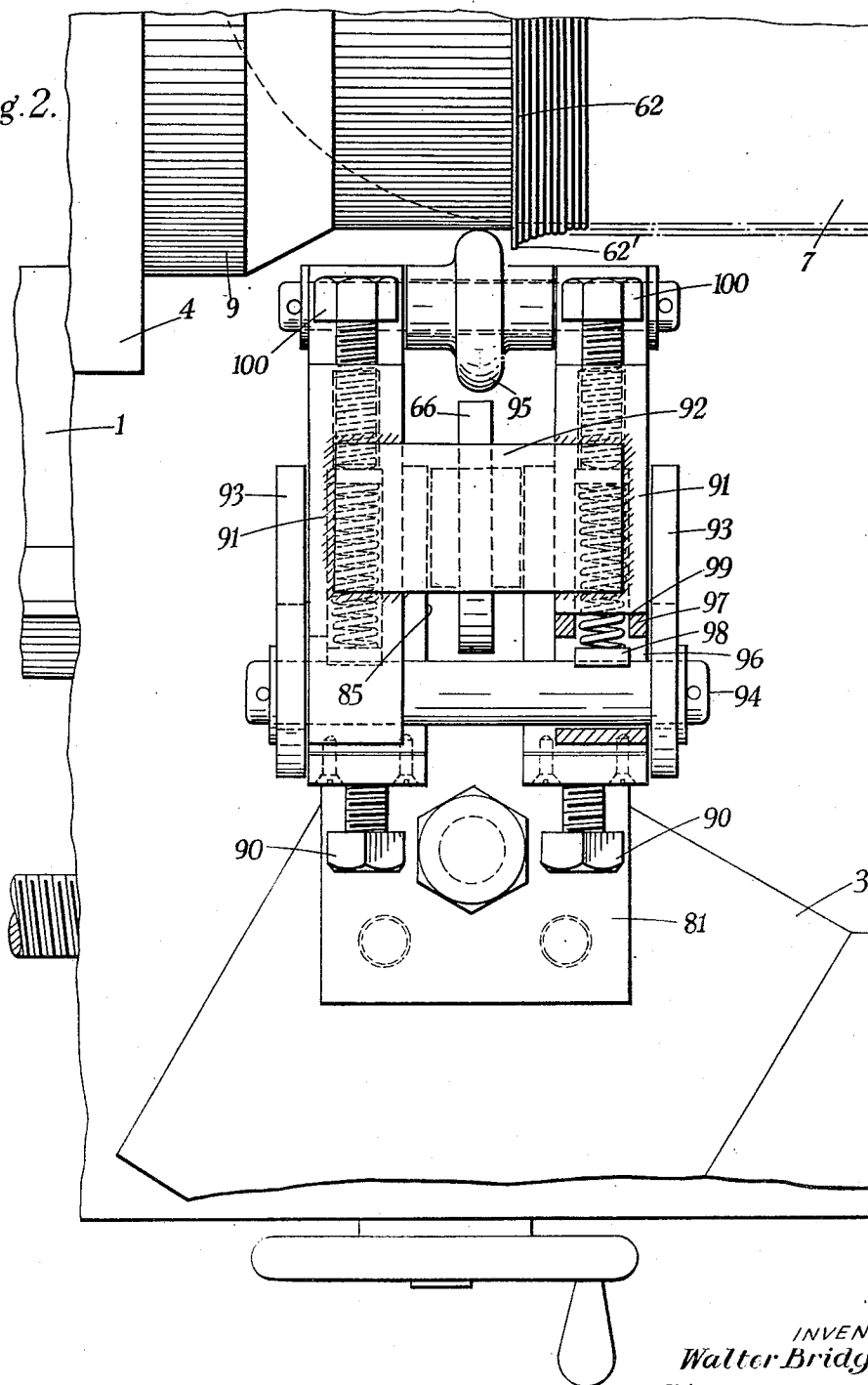
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Fig. 2.



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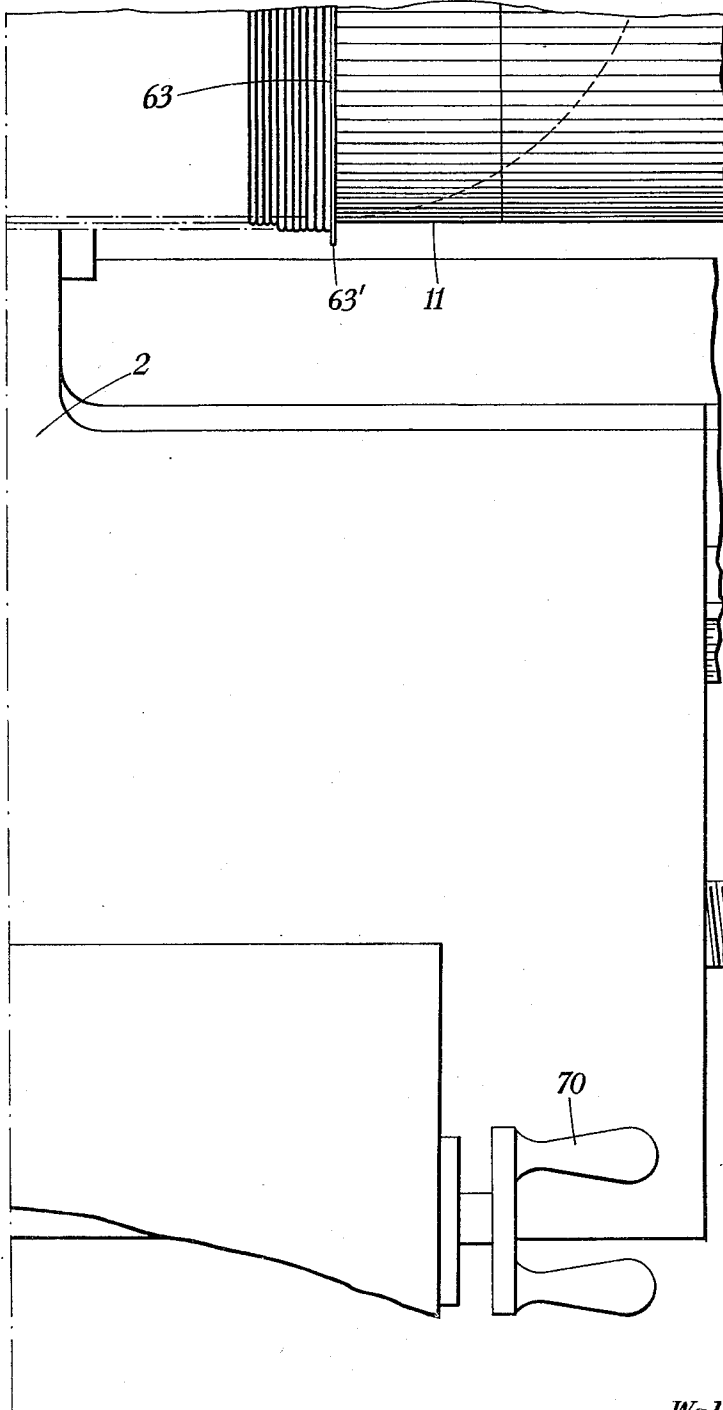
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6 Sheets-Sheet 4



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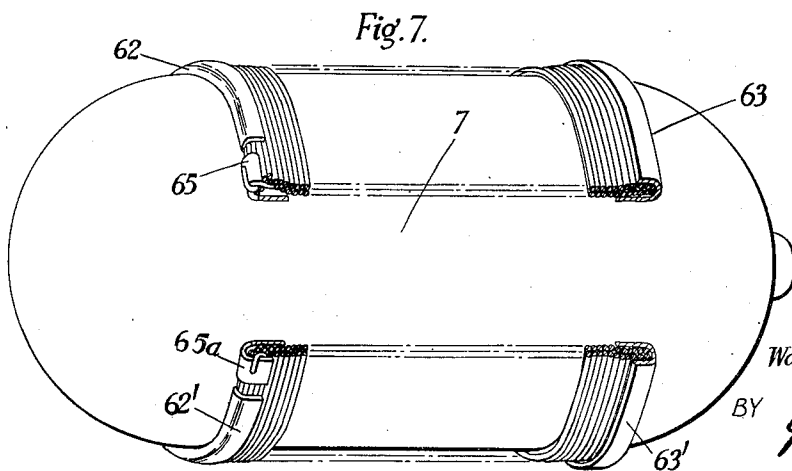
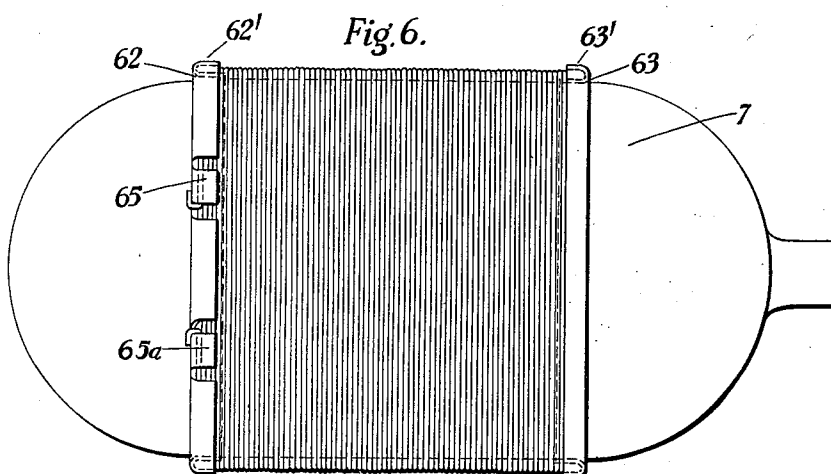
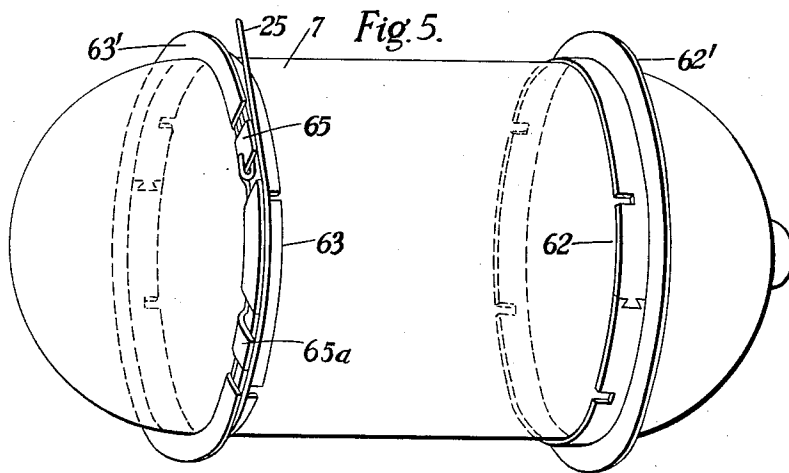
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MEANS FOR WRAPPING FILAMENTS AROUND TUBES OR CYLINDERS

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6 Sheets-Sheet 6



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UNITED STATES PATENT OFFICE

2,331,371

MEANS FOR WRAPPING FILAMENTS
AROUND TUBES OR CYLINDERS

Walter Bridges, Chelsea, London, England

Application March 2, 1942, Serial No. 433,096
In Great Britain October 6, 1941

9 Claims. (Cl. 242-7)

The present invention relates to improvements in or modifications of the apparatus for winding a filament on to a body disclosed in my prior co-pending application Serial No. 410,934 filed September 15, 1941, now Patent No. 2,313,618. The apparatus of this said prior application was primarily intended for the production of wire-wound cylinders or receptacles of the type disclosed and claimed in my co-pending application Serial No. 378,478 filed February 11, 1941, now Patent No. 2,280,471, according to which the wire is wound on the cylinder between two flanges and has its ends anchored to lugs on one or both of said flanges. The present invention is concerned with means for rolling down the said flanges or lugs so as to provide a neatly finished terminal edge to the winding. Therefore the invention provides an improvement in or modification of the apparatus forming the subject-matter of said co-pending application Serial No. 410,934, adapted to wind a filament on to a body having at least at one end of the area to be wound a filament-locating or anchoring flange or lug, which comprises a pressure member for making contact with said flange or lug during rotation of the body to turn said flange or lug down, and means for displacing said member to an inoperative position. Preferably but not necessarily this member consists of a roller or rollers so as to roll the flange or lug down.

The foregoing and other features of the invention set out in the appended claims are incorporated in the construction which will now be described in detail with reference to the accompanying drawings. In these drawings

Figures 1 and 1A together constitute a sectional elevation of a wire winding machine according to the said prior application Serial No. 410,934, but also modified according to my co-pending application Serial No. 433,097 filed March 2, 1942 and incorporating the present improvements or modifications.

Figures 2 and 2A together constitute a plan of the relevant portions thereof on a larger scale.

Figure 3 is an elevation, partly in section, and Figure 4 is a perspective view, of the aforesaid pressure member and the means for supporting it.

Figure 5 is a perspective view of the bottle to be wound, showing the two rings or flanges and illustrating the commencement of winding.

Figure 6 is an elevational view of the wound bottle, while

Figure 7 is a perspective view of the latter with

the winding partly broken away for the purposes of illustration.

According to the specification and drawings of the said prior application Serial No. 410,934, the wire winding machine resembles a lathe having a bed 1 along which a saddle 2 carrying a tool rest 3 is adapted to traverse. The bottle or other cylinder 7 to be wound exteriorly with wire is mounted between a chuck 9 attached to the face plate 4 of the lathe and chuck 11 mounted on the tailstock (not shown). The saddle 2 carries a superstructure 15 on which a wound bobbin or the like 24 of wire 25 is rotatably mounted. From the supply 24 the wire 25 runs round the drum of a band brake 39 (the band of which is indicated at 36), thence underneath a jockey pulley 40 supported on a pulley lever 47, and then over a pulley 41 to the rotating bottle 7. It will therefore be appreciated that as the saddle 2 traverses to and fro the wire 25 is wound on the bottle.

The mechanism shown in Fig. 1 is adapted to counteract fluctuations in tension of the wire. The pulley lever 47, pivoted at 48, also carries a biasing weight 51, and therefore, as the tension in the wire fluctuates the pulley 40 will rise or fall. These movements are communicated to brake lever 54 to vary the braking effort of the band brake 36, 39. For this purpose one end of the band 36 is anchored at the pivot 53 of the brake lever 54 and the other end is anchored to the brake lever at 55. It will therefore be seen that movement of the brake lever 54 about its pivot 53 tightens or slackens the brake band 36. According to said application Serial No. 410,934 the pulley lever 47 is provided with a pin or the like 58 engaging against the front edge of the brake lever 54 so as to form a connection between the two levers. According to my said concurrent application Serial No. 433,097 the lever 47 is provided with a cam follower 58' engaging the edge of a cam 71 attached to brake lever 54, the latter being biased by a weight 75 to apply the brake and excessive upward movement of the pulley lever 47 being snubbed by a spring-loaded buffer 79.

Reference to the specification and drawings of the application Serial No. 410,934 discloses a roller 66 for guiding the wire filament on to the cylinder to be wound, which roller is disposed at the back of the cylinder (the wire running onto the cylinder at the front thereof) and is mounted on spring arms 68 supported from the travelling saddle 2. According to the improvements or modifications provided by the present invention

these arms 68 are dispensed with. Instead a suitable support 81 is provided on the tool rest or the like 3 for supporting, at the front of the cylinder 7, the guide roller 66 and also a rolling-down roller 95. This support, in the form of any suitable upstanding bracket, carries at its upper end a block 83 pierced with a horizontal bore 84 parallel to the axis of rotation of the cylinder and cleft with a slot 85 at right angles to this bore. The roller 66 is received in the slot and works upon a spindle 86 which extends through the said bore 84. The bore 84 is made somewhat oversize in the horizontal direction so as to permit bodily movement of the spindle 86 towards and away from the cylinder 7, and the spindle 86 is spring pressed towards the cylinder so that the roller bears on the winding with a resilient pressure. To this end, in the material of the block 83 at each side of the slot, a horizontal hole or housing 87 (Fig. 3) is provided which houses a rubbing pad 88 bearing on the spindle 86 and a compression spring 89 for pressing this pad against the spindle. At the outer end (i. e. the end remote from the roller 66 and cylinder 7) of each said housing there is an adjustment screw 90 for adjusting the spring pressure.

Above the bracket just referred to there is an upper bracket 91, 92, comprising two side members 91 permanently united in spaced relation by a bridge piece 92 extending across the top. At its outer end this bracket is supported between two side plates 93 welded or otherwise formed on the block just mentioned and transfixed by a hinge pin 94. This upper bracket is movable about its hinge pin between two positions. One of these positions is an operative position (Figs. 2 and 3) in which the main part of the upper bracket 91, 92, lies flat on top of the block 83 (with the bridge piece 92 above the roller 66) and in which the forward ends of the two side members 91 aforesaid extend forwards and downwards one on each side of the roller 66 towards the periphery of the cylinder 7 to be wound. At the said forward ends these side members support between them a rolling-down roller 95 which is positioned in front of and slightly lower than, roller 66. The contour of the periphery of said rolling-down roller 95 is desirably semi-circular, and it is this roller 95 which serves to roll down the flange or lug. From its operative position the upper bracket 91, 92, may be swung upwards and rearwards to an inoperative position (Figs. 1 and 4) in which the rolling-down roller 95 is well away from the cylinder 7 and in which the roller 66 is exposed for use.

The rolling-down roller 95 is spring loaded to press on the work with a resilient pressure. To this end the bore 86 provided in the two said side members 91 for the hinge pin 94 is also slightly oversize in the horizontal direction, and each side member 91 is bored to form a housing 97 receiving a pad 98 bearing on the hinge pin 94 and a compression spring 99 pressing on the pad 98, and at the end of each said housing there is an adjustment screw 100 for adjusting the spring pressure.

The bottle 7 to be wound is provided with two spaced rings 62, 63 having flanges 62', 63' respectively. The wire is wound between these flanges. The flange 63' has lugs 65, 65a the first end of the wire is hooked around the lug 65 as shown in Figure 5 and the last wound end is hooked around the lug 65a. When winding is completed the flanges 62', 63' and lug 65a are

rolled down over the windings, it being preferred to bend down the lug 65 at the commencement of the windings so that subsequent windings are placed on it. During the winding operation the wire guiding roller 66 is in operation as shown in Fig. 1 to engage the just-wound wire and the bracket 91, 92 is swung away from the bottle 7 to the inoperative position. When, however, it is desired to roll down one of the flanges 62', 63', the tool rest 3 or equivalent part of the saddle is retracted by means of the handle 69 and screw means 69' (Fig. 1A) to permit the guide roller 66 to clear the said flange and to pass beyond it. This retraction is also sufficient to permit the bracket 91, 92 to be swung down to the operative position (Fig. 3) so that the roller 95 is positioned at the outer face of the flange (as illustrated in Fig. 2). While the cylinder or bottle 7 is still rotating the tool rest 3 is traversed sideways, either by means of the usual hand traversing arrangements provided for the saddle 2 or by means of a handle 70, Fig. 2A. The roller 95 therefore makes contact with the flange and gradually rolls it down, the springs 99 yielding to permit the roller to make the necessary slight resilient movement away from the cylinder. The other flange is rolled down in a like manner.

The lugs 65 and 65a may be bent down with a hammer or the like, the lug 65 being bent down as before stated at the commencement of the windings and the lug 65a being bent down when the last wound end has been hooked around it. Alternatively the lugs 65, 65a may be bent down at the appropriate times by the roller 95 in a manner similar to that employed for rolling over the flanges 62', 63'.

I claim:

1. Apparatus for winding a filament drawn from a supply thereof on to a rotating body having at least one end of the area to be wound a filament locating projection, having in combination means for rotatably mounting the body to be wound, a brake for tensioning the filament in its passage from the supply to the body, means supported by said filament in its passage for controlling the brake, a pressure member for making contact with said projection during rotation of the body to turn it down, and means for displacing said member between operative and inoperative positions.

2. Apparatus for winding a filament drawn from a supply thereof on to a rotating body having at least at one end of the area to be wound a filament locating projection, having in combination means for rotatably mounting the body to be wound, a brake for tensioning the filament in its passage from the supply to the body, means supported by said filament in its passage for controlling the brake, a roller for engaging the body, as winding proceeds, in the region whereat the filament runs onto the body, a pressure member for making contact with said projection during rotation of the body to turn down said projection, and means mounting said roller and pressure member for movement towards and from the winding.

3. Apparatus for winding a filament drawn from a supply thereof on to a rotating body having at least at one end of the area to be wound a filament locating projection, having in combination means for rotatably mounting the body to be wound, a brake for tensioning the filament in its passage from the supply to the body, means supported by said filament in its passage, for controlling the brake, a pressure

member for making contact with said projection during rotation of the body to turn it down, a resilient mounting for said member permitting the latter to move resiliently away from the axis of rotation of the body, and means for displacing said member at will between operative and inoperative positions.

4. Apparatus for winding a filament drawn from a supply thereof on to a rotating body having at least at one end of the area to be wound a filament locating flange, having in combination means for rotatably mounting the body to be wound, a brake for tensioning the filament in its passage from the supply to the body, means supported by said filament in its passage, for controlling the brake, a slide member movable towards and away from the axis of rotation of the body, manual means for effecting said movement, a roller mounted on the slide member for engaging the body, as winding proceeds, in the region whereat the filament runs on to the body and displaceable between operative and inoperative positions by said movement of the slide member, a pressure member for making contact with said flange during rotation of the body to turn said flange down, means mounting said pressure member on the slide member for displacement, on the latter, between operative and inoperative positions, and means for producing relative traverse between the body and the slide member in the direction of the length of said axis.

5. Apparatus for winding a filament drawn from a supply thereof on to a rotating body having a radial projection at least at one end of the area to be wound, comprising a bed, a saddle mounted for reciprocation therealong, means carried by said saddle for tensioning the filament in its passage to the body and for maintaining said tension substantially constant, means for mounting said body for rotation about an axis parallel with the line of reciprocation of the saddle, a rest mounted on the saddle for movement thereon transversely of said line, means for effecting said movement of the rest, and a pressure member mounted on the rest for making contact with the projection during rotation of the body to turn said projection down.

6. Apparatus according to claim 5, wherein the pressure member is a roller, and having a roller mounted on the rest to engage the body in the region whereat the filament runs on to it and capable of displacement away from the body by movement of the rest on the saddle, a bracket carrying the pressure roller, and means mounting said bracket pivotally on the rest for displacement of the pressure roller between operative and inoperative positions.

7. Apparatus according to claim 1 having a cleft bracket, a roller pivoted in the cleft and constituting the pressure member, pivot means for the bracket permitting of movement of the latter between operative and inoperative positions about an axis parallel to the axis of rotation of the body and affording a small bodily displacement of said bracket and roller, when in operative position, away from said axis, and spring means opposing said displacement.

8. In the combination recited in claim 2, a support for the roller, a cleft bracket, a pressure roller, constituting the aforesaid pressure member, pivoted in the cleft of the bracket for rotation about an axis parallel to the axis of rotation of the body, and means pivoting the bracket to the support for swinging movement about an axis parallel to the axis of rotation of the body, between an operative position in which the bracket is located above the first said roller and the pressure roller is presented to the body between the periphery of the latter and the first said roller and an inoperative position in which the bracket and pressure roller are swung away from the body and the first said roller is exposed to engage the body.

9. Apparatus for winding a filament drawn from a supply thereof on to a rotating body having a radial projection at least at one end of the area to be wound, comprising a bed, a saddle mounted thereon for rectilinear traverse to and fro along it, means for traversing said saddle, a rest mounted on the saddle for adjustment laterally of the line of traverse, means for effecting said adjustment, means for mounting the body for rotation about an axis parallel to the line of traverse, a support structure on the saddle, filament-supplying and tensioning means carried by the support structure and comprising a mounting for a filament supply, a drum for encirclement by the filament on its way from the supply to the pulley hereafter recited, a brake for said drum, a brake lever for controlling said brake to increase the braking effort as the pulley sinks, a pulley lever for moving the brake lever, and a rising and falling pulley, connected to the pulley lever, for support by the filament on its way from the drum to the body; a guide roller on the rest for engaging the periphery of the body in the region whereat the filament runs on to it, a rolling-down roller for rolling down said projection, and means for displacing the rolling-down roller on the rest between an operative position in which it is substituted for the guide roller and an inoperative position in which the guide roller is available for use.

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