

June 2, 1936.

W. SIEGENTHALER

2,042,968

HOLDER FOR TUBULAR SUPPORTS FOR COILS OF STRAND MATERIALS

Filed March 28, 1935

2 Sheets-Sheet 1

FIG. 1

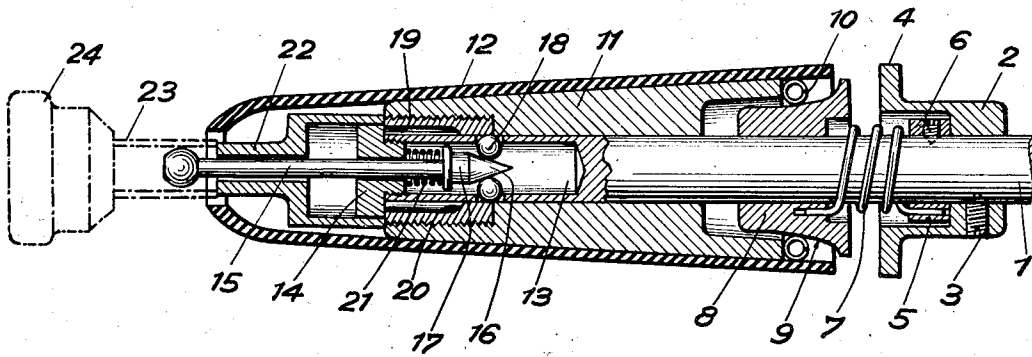
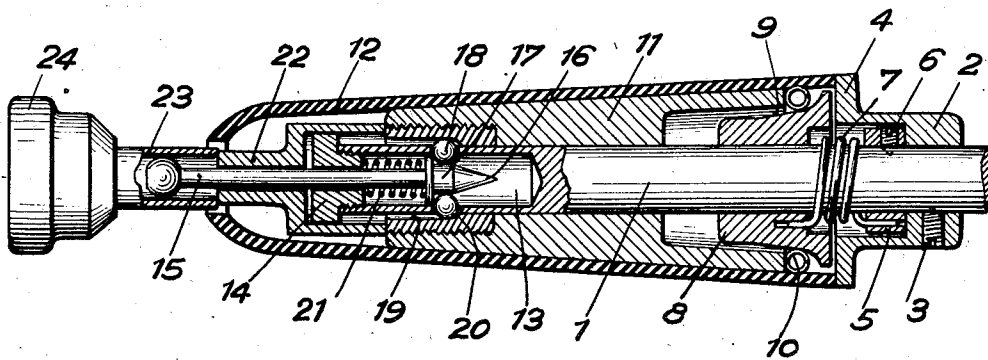


FIG. 2



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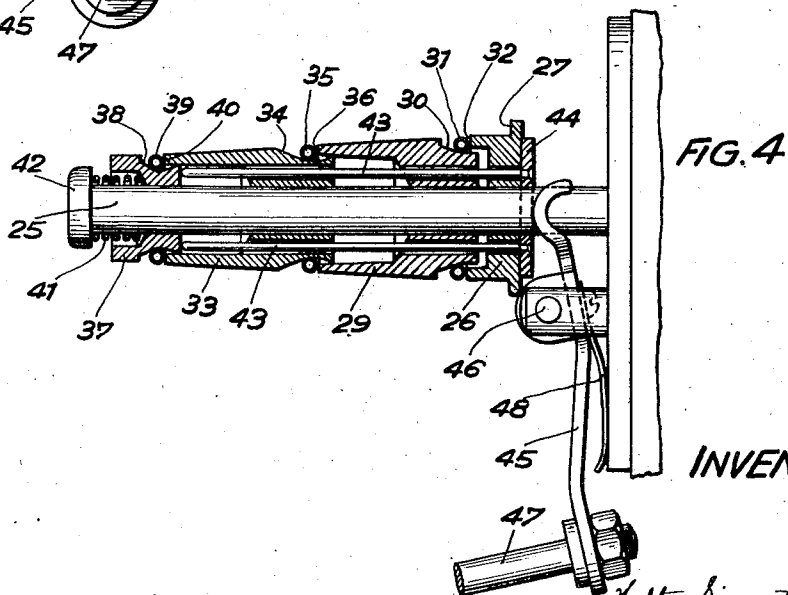
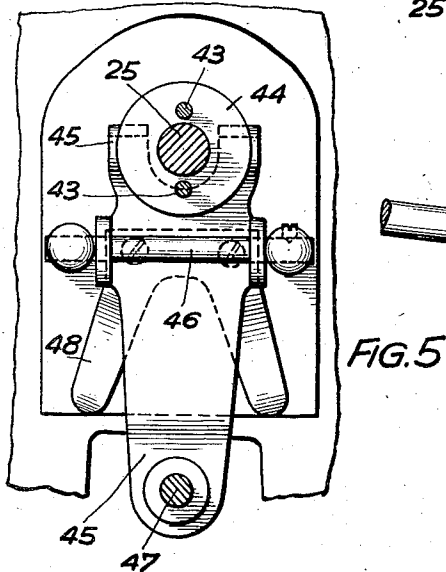
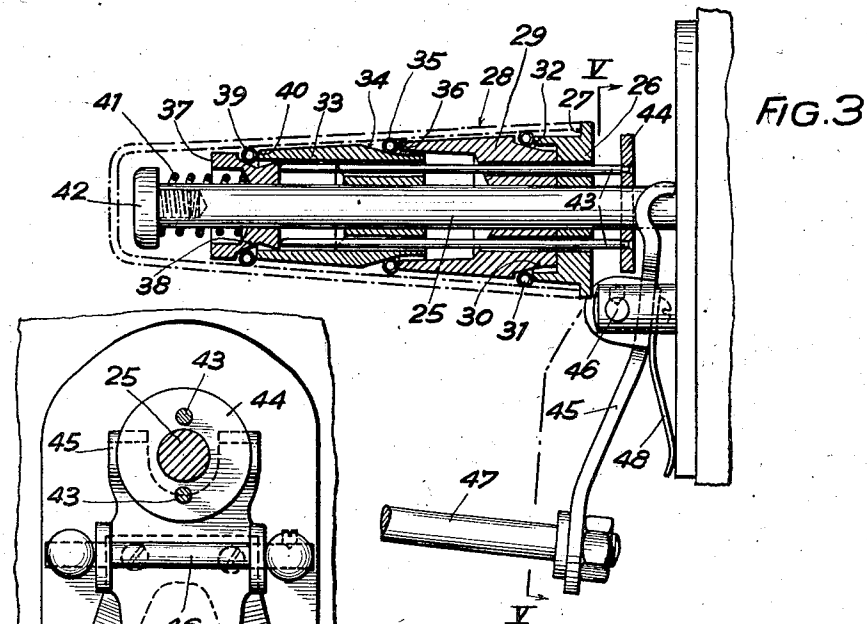
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UNITED STATES PATENT OFFICE

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HOLDER FOR TUBULAR SUPPORTS FOR
COILS OF STRAND MATERIALSWalter Siegenthaler, Erlenbach, Switzerland,
assignor to the firm Scharer-Nussbaumer &
Co., Erlenbach, SwitzerlandApplication March 28, 1935, Serial No. 13,581
In Switzerland April 21, 1934

3 Claims. (Cl. 242—46.3)

This invention relates to holders for tubular supports which are to be wound with strand materials and which are held in position by action of springy annular retaining means on the inner surface of the supports.

It is known to arrange the mounting for the retaining spring in fixed manner on the supporting or driving shaft of the holder. But, since the tubular supports for the coils differ in regard to the diameter of their bore and, consequently, the retaining spring shifts on the mounting thereof more or less while a coil support is pushed on the holder the windings are spaced apart different distances from the respective edge of the tube during the operation of winding the coil support. Thus, the coils occupy different relative positions on the definitely wound tubes which fact involves certain inconveniences when the tubes are subsequently set in place in other machines and the coils are subjected to an after-treatment.

According to this invention, this drawback is eliminated in the holder by providing an abutment for the tubular coil support and arranging the mounting of the annular retaining spring to be axially displaceable. The coil support bears against the abutment so that the retaining spring, due to cooperation with the mounting, is forced outwards against the coil tube for the purpose of obtaining a uniform disposition of the coils on the tubes that are wound in one and the same machine. A further feature of the invention consists in the provision of arranging several annular retaining springs in an axial row and correlating to each spring a separate axially displaceable mounting which on the coil tube entering into bearing engagement with the abutment provided therefor forces the corresponding retaining spring outwards. Thus the coil tubes are safely retained even with the diameter of their bores differing.

In the drawings two constructional forms of the invention are illustrated by way of example only, in which

Fig. 1 shows in a longitudinal section a first example of the holder prior to a coil tube being set in place thereon;

Fig. 2 shows the same longitudinal section but after a coil tube has been mounted thereon, viz. in the operative condition of the holder;

Fig. 3 shows in a longitudinal section a second example of the holder in the operative condition thereof;

Fig. 4 shows the same longitudinal section in

the condition of the individual parts of the holder permitting mounting or dismounting a coil tube, and

Fig. 5 is a cross-section on the line V—V in Fig. 3.

In the first constructional example of the invention, as shown in the Figs. 1 and 2, 1 designates a supporting or driving spindle which may be assumed to be the winding spindle of a winding machine. On the spindle 1 is arranged an abutment 2 to be axially adjustable by means of screws 3, the abutment being provided with an engagement face 4. Within a recess of the abutment 2 the spindle 1 carries an adjusting ring 5 to be displaceable thereon with the aid of a set screw 6. A coiled unlocking spring 7 is secured to said ring with one end, while the other end of this spring is fastened to a mounting 8 which is axially displaceable relatively to the spindle 1. The mounting 8 is provided with a conical circumferential portion 9 and carries a contractile retaining spring 10 which is formed by a ring shaped helical spring. A backing sleeve 11 slid on the spindle 1 serves for receiving the tubular support or cop tube 12 to be wound with a strand material. The tube may for example consist of cardboard and be conically shaped conforming to the circumference of the backing sleeve 11.

The end of the spindle 1 remote from the winding machine is provided with a bore 13 and a guide plug 14 for a sliding pin 15 which is freely accessible from outside. This sliding pin 15 is formed at its end situated inside the bore 13 of the spindle 1 with a conical head 16 which merges with a cylindrical portion 17. This conical head 16 and the cylindrical portion 17 of the pin 15 cooperate with friction balls 18 which are located in recesses of the thickness of material surrounding the bore 13. The friction balls 18 are associated with the backing sleeve 11 which is provided with a recess 19 serving for cooperation with the friction balls and being limited at one end by a rounded shoulder 20. The parts 11, 18, 1 and 15 form together a friction ball locking device the sliding pin 15 of which is influenced by a compression spring 21. On the sliding pin 15 a socket 22 is displaceably arranged which overlaps the guide plug 14 with its respective end, so as to be adapted to cooperate with the backing sleeve, when pressure is exerted on the exterior end of the socket 22 by means of a tubular piece 23 having a handle 24.

In Fig. 1 the friction balls 18 are shown to be moved past the inner end of the recess 19 of the

backing sleeve 11 and to rest on the conical head 16 of the sliding pin 15 which is pulled outwards against the action of the compression spring 21. The backing sleeve 11 is urged by the compression spring 7 against a flange of the plug 14. This spring 7 acts on the mounting 8, through the intermediary of the retaining spring 10 mounted on the conical circumferential portion 9. A cop tube 12 is loosely mounted on the backing sleeve 11.

In order to secure the cop tube 12 on the holder, the handle 24 of the tubular piece 23 is gripped and pressure is exerted on the socket 22 by means of said piece, the socket in turn acts on the backing sleeve 11 to shift the same in the axial direction. During this shifting movement of the backing sleeve 11 the retaining spring 10 is displaced on the conical circumferential portion 9 of the mounting 8 and thus tensioned, whereby this spring is firmly pressed against the interior surface of the cop tube 12 and the latter is retained in position.

Thereupon the backing sleeve 11 shifts together with the mounting 8 against the influence of the compression spring 7 until the end of the cop tube 12 bears on the engagement face 4 of the rigid abutment 2. During the axial shifting movement of the backing sleeve 11 the recess 19 thereof cooperates with the friction balls 18, when the latter enter into the recess 19 by being forced outwardly by the conical head 16 of the sliding pin 15 which is then correspondingly axially displaced by the compression spring 21 correlated thereto. Consequently the friction balls come to bear against the cylindrical portion 17 of the sliding pin 15 and are thus secured in locking position, so that also the holder as such is locked in position of operation.

On the cop tube 12 being completely wound, the sliding pin 15, the outer end of which is freely accessible after the removal of the tubular piece 23, is pulled outwards by hand against the action of the compression spring 21. At the same time the mounting 8 and the backing sleeve 11 are axially displaced by action of the spring 7 in the direction opposite to the previous axial shifting movement of these parts, the backing sleeve 11 urges the friction balls 18 radially inwards by means of its rounded shoulder 20, in accordance with the displacements of the sliding pin 15.

The backing sleeve 11 returns during this axial resetting movement into a position in which it bears again on the flange of the guide plug 14. The retaining spring 10 follows this resetting movement of the backing sleeve by effect of its tendency to contract elastically until it re-assumes the position on the conical circumferential portion 9 of the mounting 8 shown in Fig. 1. The cop tube 12 i. e. the definitely wound cop mounted on the backing sleeve 11 thus being cleared by the retaining spring 10 can now be readily removed from the holder by hand without any further manipulations being required. At the same time the holder is again in condition for receiving a fresh cop tube to be wound which is then mounted and secured thereon in the same manner as previously described. Due to the fact that during winding the cop tube bears against an abutment so that cops are obtained on one and the same machine having windings of a uniform disposition relatively to the supporting tubes throughout.

In the constructional example shown in the Figs. 3 to 5 the supporting and driving spindle 25 carries an abutment 26 which is provided with

an engagement face 27 for bearing against a cop tube 28. An axially displaceable mounting 29, which projects to some extent into a recess of the abutment 26, is provided with a conical circumferential portion 30 which is in bearing contact with a retaining spring 31 which rests against an engagement face 32 of the abutment 26. A second axially displaceable mounting 33, which enters to some extent into a recess of the mounting 29, is of a shape similar to the mounting 29, a conical circumferential portion 34 being provided thereon which is in bearing contact with an annular retaining spring 35 resting against an engagement face 36 of the mounting 29. In a like manner a third axially displaceable mounting 37 projects partially into a recess of the mounting 33 and is provided with a conical circumferential portion 38 for the reception of an annular retaining spring 39 which bears rearwardly against an abutment face 40 of the mounting 33. A helical spring 41 serving for axially displacing the mounting 33 enters with one of its ends into a depression of the mounting 37, whereas the other end of this spring bears against the head of a screw 42 screwed into the free end of the spindle 25. For displacing the mounting 37 against the pressure of the spring 41, two rods 43 are provided which are passed through holes in the mountings 33 and 29 and in the abutment 26. These rods are secured to a displaceable ring 44 which cooperates with a forked adjusting member 45 mounted on a pivot 46 and is adapted to be rocked against the action of a spring 48 by means of a bar 47 of an actuating mechanism not shown in the drawings.

In the operative condition of the holder (Fig. 3) the annular retaining spring 39 is displaced so far to the left on the conical circumferential portion 38 of the mounting 37 that this spring is tensioned in cooperation with the spring 41 acting on the mounting 37 and thus is forced against the inner surface of the cop tube 28. The spring 39 is adapted at the same time to exert pressure on the engagement face 40 of the mounting 33, so that the annular retaining spring 35 is maintained in tensioned condition on the circumferential portion 34. The latter spring is adapted to exert pressure on the inner surface of the cop tube 28 in a like manner as the annular spring 39 and on the engagement face 36 of the mounting 29.

By effect of this pressure exertion on the mounting 29 again in a like manner the annular spring 31 correlated to this mounting is maintained in tensioned condition on the conical circumferential portion 30 and thus is urged on the inner side of the cop tube 28, while bearing at the same time against the engagement face 27 of the abutment 26. Consequently, in this construction of the holder all the annular retaining springs are uniformly tensioned, so that even with the inner diameters of the various cop tubes differing the tubes are safely retained in position.

In order to don a cop tube in position on the holder or to doff a tube, by means of the adjusting member 45 the ring 44 is shifted from the position shown in Fig. 3 into that shown in Fig. 4. In this way the mounting 37 is displaced by means of the rods 43 against the pressure of the spring 41, thus permitting the annular spring 39 on the conical circumferential portion 38 to release. At the same time the mountings 33 and 29 follow the shifting movement of the mounting 37, thus also permitting the annular springs 35 and 31 to bear on the correlated conical circum-

ferential portions with reduced pressure. The thus released annular springs are prevented from bearing on the inner surface of a cop tube 28 which is mounted on the holder so as to rest against the engagement face 27.

Instead of transmitting motion from the ring 44 to the mounting 37 through the rods 43 another construction may be used in which the transmission members comprise, for example, a sleeve which is mounted on the spindle 25 and is caused to abut against the mounting 37, this sleeve carrying the mountings 29 and 33 in displaceable manner and being connected with the ring 44 by means of rods passed through the abutment 26.

I do not limit myself to the particular size, shape, number or arrangement of parts as shown and described, all of which may be varied without going beyond the scope of my invention as shown, described and claimed.

What I claim is:

1. In a holder for tubular supports for coils of strand materials, the combination with several annular retaining springs arranged in an axial row for engaging the inner surface of a tubular coil support, a rotatable driving spindle for said coil support, and separate mountings axially displaceably arranged on said driving spindle for cooperation with each of said springs, of an abutment for said tubular coil support whereby each mounting forces the correlated spring outwards into engagement with said support to retain the latter safely in position on said driving spindle by bearing on said support notwithstanding the inner diameters of the various coil supports differing.

2. In a holder for tubular supports for coils of strand materials, the combination with several annular retaining springs arranged in an axial row for engaging the inner surface of a tubular coil support, a rotatable driving spindle for said coil support, separate mountings axially displaceably arranged on said driving spindle for cooperation with each of said annular springs, a conical rearwardly tapering portion on each of said

mountings for cooperation with the correlated annular spring, a front abutment face on each of said mountings for the annular spring on the preceding mounting, and a holding spring acting axially rearwardly in the foremost mounting, of an abutment for said tubular coil support adapted to bear against the annular spring on the rearmost mounting whereby each of said mountings forces the correlated annular spring outwards into engagement with said support, while the axial displacement of said foremost mounting effected by said holding spring is transmitted to the other mountings, thus forcing all said annular springs uniformly against said inner surface of said support.

3. In a holder for tubular supports for coils of strand materials, the combination with several annular retaining springs arranged in an axial row for engaging the inner surface of a tubular coil support, a rotatable driving spindle for said coil support, separate mountings axially displaceably arranged on said driving spindle for cooperation with each of said annular springs, a conical rearwardly tapering portion on each of said mountings for cooperation with the correlated annular spring, a front abutment face on each of said mountings for the annular spring on the preceding mounting, a holding spring acting axially rearwardly on the foremost mounting, thrust transmission means for axially displacing said foremost mounting against the action of said holding spring, an axially displaceable ring connected with said transmission means, and a forked adjusting member cooperating with said ring, of an abutment for said tubular coil support adapted to bear against the annular spring on the rearmost mounting whereby each of said mountings forces the correlated annular spring outwards into engagement with said support, while during donning and doffing the supports said foremost mounting is displaced forwardly by said adjusting member for releasing said annular springs.

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