

A ROLLER FOR CABLE INSTALLATION

This invention relates to a roller for cable installation more particularly but not exclusively for the installation of electric cables in preformed buried concrete troughs.

Electricity can be transmitted at extra high voltage via insulated cables buried in the ground. These cables form part of a network of main transmission links from a power station where the electricity is generated to the central supply points in towns and cities where the electricity is eventually distributed via smaller cables to consumers.

The traditional installation method for these high voltage cables had been to excavate a trench to a depth of approximately 1500 mm, lay the cables, cover them with sand, install a concrete cover slab on top of the sand and backfill to ground level. As part of the installation equipment, a cable roller is mounted on a custom-built wooden support and is placed in the excavated trench to assist with cable pulling.

As the security of these electrical transmission links is of primary importance, a new method of installation has been proposed for such circuit in urban locations in which the cables are installed in substantial concrete troughs with a reinforced concrete cover. However, known cable rollers are unsuitable for use in such concrete troughs.

It is an object of the invention to provide an improved cable installation roller apparatus.

According to the invention there is provided roller apparatus for pulling a cable, the apparatus comprising a support and a roller connected to the support, the position of the roller and/or the support being adjustable.

Preferably the support is in the form of a frame and is connectable to opposed walls of a receptacle for the cable. Although a single roller rotatable about a horizontal axis may be used for supporting the cable, preferably first and second rollers rotatable about a vertical axis are used, the rollers each having a concave cable engaging surface with the cable being threaded therebetween. Furthermore, the support preferably has means for connection to the receptacle, the position of the connection means being adjustable and the rollers and connection means preferably being connected to the support by connectors which are slidably received on the support and include quick-release means which allow the unit to be easily dismantled and removed after all the cables are installed.

Since the position of the roller(s) and/or the support is adjustable, the position of the roller apparatus and the roller(s) in the receptacle may be selected so that the apparatus may be securely disposed relative to the receptacle and/or the cable position may be selected so that perfect radius bends can be formed in the cable when the trough changes direction thus preventing excessive side pressures on the cable which could result in damage.

In the described embodiments of the invention, adjustably positionable roller apparatus for use in a concrete trough and in a conventional trench are disclosed.

Further preferred features of the invention may be found in the appendant claims.

Embodiments of the invention will now be described with reference to the accompanying drawings in which:

Figure 1 is a front view of a first embodiment of the invention;

Figure 2 is a sectional view in a direction of A - A of Figure 1;

Figure 3 is a plan view in the direction of B of Figure 1;

Figures 4, 5 and 6 are views similar to Figures 1, 2 and 3 but illustrating a second embodiment of the invention.

With reference to Figures 1- 3 the first embodiment of the invention is shown which comprises a support frame generally designated 10 to which two opposed roller assemblies 50, 52 are attached.

The roller assemblies 50, 52 are mirror images of each other and will be described with reference to assembly 52 which comprises a rubber roller 60 rotatably mounted on an axle 62, the axle being connected to a support chassis 64. The axle is received in roller bearings 66 mounted in the roller 60 and is secured to chassis 64 by means of bolts 68. A plate 70 is connected to the chassis 64 and is provide with four quick-release connectors 22 for attachment to support 10.

Each connector 22 includes a base member 26 having a cylindrical clamping surface 28 and a pivotal clamping member 30. The clamping member 30 is secured to the base 26 by means of a bolt 32 pivotally connected to the base 26 which it is engaged by a nut 34 which mates against a securing surface 36 of the member 30.

The frame 10 includes first and second lateral members 12, 14 formed from hollow cylindrical steel pipes which are connected at each end to a concrete wall clamp formed from two jaws 15, 16; 17, 18.

The jaws are of the same basic construction. Jaw 18, by way of example, includes a L-shape bracket 20 at opposed ends of which are mounted quick-release connectors 22. The connectors 22 are held in placed on the bracket 20 by welding.

The adjustable position of the jaws allows the jaws to engage snugly on either side of any concrete wall 100 as shown in Figure 1 so that the roller apparatus may be supported in varying dimensions of concrete trough.

In use, the wall clamps 15 - 18 are adjusted so as to fit over the opposed concrete walls 100 of a power cable trough so that the roller assemblies 50, 52 are suspended in the conduit. The spacing of the roller assemblies 50, 52 is then adjusted to match the diameter D of the cable to be supported and the lateral position of the assemblies 50, 52 adjusted according to the desired location of the cable within the trough. Several roller apparatuses are positioned at spaced location in the trough so that the cable may be pulled through the complete trough in one go. Once in placed, the roller assemblies 50, 52 are released from the support 10 so that the cable may be lowered into the trough and the wall clamps 15 - 18 released to allow removal of the roller apparatus from the trough.

A further embodiment of the invention is shown in Figures 4 - 6 in which like components to the embodiment of Figure 1 are represented by like reference numerals with the addition of 100. In the second embodiment each wall clamp is replaced by a single U-shaped leg 180 which is welded to an L-shape bracket 182 to which quick-release connectors 122 are welded. The L-shape brackets 182 are connected together by means of a turnbuckle 184 and adjustable strut 186 to give added support. The second embodiment is particularly suitable for use in open excavated trenches which the legs 180 supporting the rollers in the trench.



Claims

1. Roller apparatus for supporting a cable to be pulled comprising a support and a roller connected to the support, the position of the roller and/or the support being adjustable.
2. Apparatus as claimed in claim 1 in which the support includes a clamp for engaging a wall of a cable receptacle.
3. Apparatus as claimed in claim 2 wherein the position of the clamp is adjustable.
4. Apparatus as claimed in claim 3 wherein the clamp comprises two jaws, the relative position of the jaws being adjustable.
5. Apparatus as claimed in any one of claims 2 to 4 wherein two said clamps are provided at opposed ends of the support.
6. Apparatus as claimed in any one of claims 2 to 5 wherein the support includes first and second parallel members, the or each clamp being connected between the members.
7. Apparatus as claimed in claim 1 wherein the support includes a leg for supporting the roller.
8. Apparatus as claimed in claim 7 wherein the position of the leg is adjustable.
9. Apparatus as claimed in claim 7 or claim 8 wherein the leg is U-shaped.



10 Apparatus as claimed in any one of claims 7 to 9 comprising two said legs provided at opposed ends of the support.

11 Apparatus as claimed in any one of claims 7 to 10 wherein the support includes first and second parallel members, the or each leg being connected between the members.

12 Apparatus as claimed in any one of the preceding claims wherein the support suspends the roller

13 Apparatus as claimed in any one of the preceding claims comprising two spaced said rollers.

14 Apparatus as claimed in claim 13 wherein the rollers are rotatable about parallel axes.

15 Apparatus as claimed in claim 13 or claim 14 wherein the position of both rollers relative to the support is adjustable.

16 Apparatus as claimed in any one of the preceding claims wherein the or each roller has a concave cable-engaging surface.

17 Apparatus as claimed in any one of the preceding claims wherein the or each roller is coupled to the support via a quick-release connector.