

(19)



Europäisches Patentamt
European Patent Office
Office européen des brevets



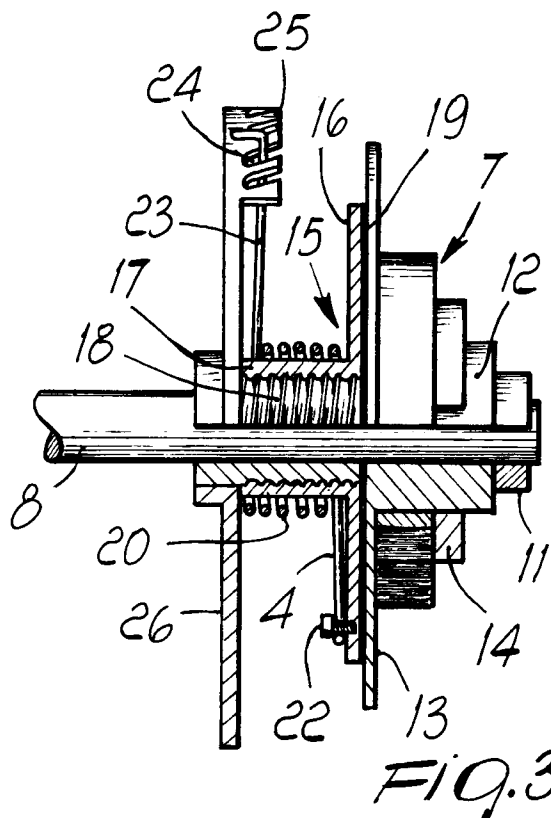
(11) Publication number:

0 513 797 A2

(12)

EUROPEAN PATENT APPLICATION(21) Application number: **92108173.3**(51) Int. Cl.⁵: **H01B 13/10, H01B 13/26**(22) Date of filing: **14.05.92**(30) Priority: **17.05.91 IT PD910045 U**(43) Date of publication of application:
19.11.92 Bulletin 92/47(84) Designated Contracting States:
DE ES FR GB IT(71) Applicant: **TECNOPROGET DI ZANETTIN B. & C. S.a.s.**
Via dell'Industria 5
I-35023 Bagnoli di Sopra (Padova)(IT)(72) Inventor: **Palmarin, Mario**
Via Nespollari, 9
I-35020 Carrara Santo Stefano (Padova)(IT)(74) Representative: **Modiano, Guido et al**
c/o Modiano & Associati S.r.l. Via Meravigli,
16
I-20123 Milano(IT)(54) **Device for covering cables or the like, by longitudinal lapping with tapes, under constant tension.**

(57) Device for keeping constant the tension of a covering tape in machines for continuously covering cables or the like which includes a flexible funnel-shaped element in which a cable (wire or cord or the like) under tension is caused to slide and in which a covering tape is also conveyed, the covering tape wrapping around the cable in a cigarette-like fashion. The device comprises a friction element (15) which acts against a freely rotating feeder support (7) on which the tape is wound. The friction disk is coupled to a helical guide (18) which is coaxial thereto and to elastic pusher means (20).

**EP 0 513 797 A2**

The present invention relates to a device for keeping constant the tension of a covering tape in machines for continuously covering cables or the like with tapes wrapped thereon in a cigarette-like fashion.

Among the many types of cables commercially available, there are particular types, for example coaxial electric ones, which have so-called "cigarette" coverings.

This type of covering uses machines in which a cable subjected to tension is made to advance continuously inside an element which is shaped like an elongated funnel and is defined by a spiral-shaped metallic wire, inside which a covering tape is also conveyed parallel to the cable and wraps around the cable itself.

The considerable problem of these machines is that the tension of the covering tape must be kept at a preset constant value so that said tape can advance without problems in the funnel-shaped element and consequently wrap around the cable with no risk of breakage.

Various attempts have been made so far to keep the tension of the tape constant, but they all have failed to solve the problem.

The aim of the present invention is indeed to provide a device for keeping constant the tension of a covering tape in machines for continuously covering cables or the like with tapes wrapped thereon in a cigarette-like fashion, which truly keeps the tension of the tape constant.

A consequent primary object is to provide a device which is simple in operation and easy to assemble.

Another important object is to provide a device which can be applied on new machines as well as on those currently in use.

Not least object is to provide a device which is simple to manufacture and has a low cost.

This aim, these objects and others which will become apparent hereinafter are achieved by a device as defined in the appended claims.

Further characteristics and advantages of the invention will become apparent from the detailed description of an embodiment thereof, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

figure 1 is a perspective view of a part of a machine for continuously covering cables or the like, equipped with the device according to the invention;

figure 2 is a perspective view of a detail of the region in which covering occurs;

figure 3 is a partial sectional view of the device for keeping constant the tension of the covering tape;

figure 4 is an exploded perspective view of the device of figure 3.

With reference to the above figures, a machine for continuously covering cables or the like with tapes wrapped thereon in a cigarette-like fashion comprises a motorized winding spool and a feeder spool, both of which are not illustrated, between which the cable to be covered is kept under tension.

Said cable 1 is caused to slide in an element 2 shaped like an elongated funnel which is defined by a flexible metallic wire which is wound in a spiral around an ideal conical surface.

Said funnel-shaped element 2 is fixed radially to a wing 3 which is in turn adjustably fixed by means of bolts to a support 4 which is provided with a slotted guiding hole 5 which is parallel to the cable 1.

Said funnel-shaped element 2 is thus flexible so as to prevent the cable 1, if it has kinks, from jamming therein during sliding.

A covering tape 6 is also conveyed in said funnel-shaped element 2, is unwound from a spool 7 which can freely rotate about a shaft 8, and is redirected by a guiding element 9 so that it is arranged parallel to the cable 1 upstream of the funnel-shaped element 2.

Said guiding element 9 is also fixed to the support 4 by means of bolts and its position can be adjusted by guiding it at the hole 5.

Said shaft 8, which is perpendicular to the axis of the cable 1, is fixed and carried by a support 10 which is supported by the structure of the machine together with the support 4.

Said spool 7, which abuts on an axial retention ring 11 and which is fixed to the shaft 8, is composed of a bush 12 and of a disk-like flange 13 which extends from said bush.

The tape 6 is wound in a reel on the bush 12 and is kept against the flange 13 by an abutment ring 14.

A friction element 15 is arranged against said flange 13, on the opposite side of the reel of tape 6, and is composed of a disk 16 which extends from an internally threaded bush 17.

Said bush 17 is screwed on an externally threaded bush 18 which is fixed on the shaft 8.

The threads conveniently have a square cross-section (or another cross-section with one or more starts) and extend so that rotation of the friction element 15 in the same direction as the spool 7 causes the spacing of the disk 16 from the flange 13.

A disk-like element 19 made of felt or equivalent or other braking materials is interposed between the disk 16 and the flange 13.

A cylindrical helical spring 20 is arranged coaxially on the outside of said bush 17; a first radial end 21 of said spring is ring-shaped and is fixed to the disk 16 by means of a screw 22.

A second radial end 23 of the spring 20 can conveniently be arranged in a notch 24 of a series defined on a toothed sector 25 which extends at right angles at the periphery of a disk-like element 26 which is keyed on the shaft 8.

The turns of said spring 20 are such that rotation of the disk 16 in the same direction as the flange 13 causes its loading.

A certain degree of pre-loading, which is required in order to push the disk 16 against the flange 13, is produced by the arrangement of the second radial end 23 of the spring 20 on the toothed element 25.

The operation of the device is as follows: the covering tape 6, which is pulled together with the cable 1, unwinds from the spool 7 and makes it turn.

The spool 7 consequently rotates the disk 16, but since said disk is coupled to the threaded bush 18, it is forced to move apart in contrast with the action of the spring 20.

Said spring, on the other hand, pushes it so that it tends to return to its original position.

The result is continuous friction to which the spool 7 is subjected and continuous tension to which the tape 6 is subjected.

Said tension is constant in time, since any variations thereof are immediately reflected by variations in the friction to which the spool 7 is subjected.

In practice it has thus been observed that the above described device has achieved the intended aim and objects of the present invention.

In practice, the materials employed, so long as compatible with the contingent use, as well as the dimensions, may be any according to the requirements.

Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the scope of each element identified by way of example by such reference signs.

Claims

1. Device for machines for covering cables or the like with tapes wrapped thereon in a cigarette-like fashion which comprise a flexible funnel-shaped element (2) inside which a cable (1) or the like subjected to tension is caused to advance and in which a covering tape (6) is also conveyed, said covering tape wrapping around said cable in a cigarette-like fashion, said device comprising a friction element (15) which acts against a freely rotating feeder support (7)

on which said tape is wound, said friction element being coupled to a helical guide (18) which is coaxial thereto and to elastic pusher means (20).

2. Device according to claim 1, characterized in that said funnel-shaped element is constituted by a flexible metallic wire (2) which is wound in a spiral shape around an ideal conical surface.
3. Device according to claim 1, characterized in that said freely rotating feeder support is coupled to a supporting shaft (8) so as to be able to rotate and is constituted by a spool (7) which comprises a bush (12) and a disk-like flange (13) which extends from said bush, said covering tape being wound in a reel on said bush.
4. Device according to claims 1 and 2, characterized in that said friction element (15) is constituted by a disk (16) which extends from a bush (17) which is internally provided with means for coupling to said helical guide (18), said disk being pushed against said flange of said spool.
5. Device according to one or more of the preceding claims, characterized in that a disk-like element (19), made of felt or equivalent or other braking material, is interposed between said friction element (16) and said spool (7).
6. Device according to one or more of the preceding claims, characterized in that said helical guide is constituted by a helical thread with a square cross-section (or with another cross-section, with one or more starts) which is provided externally on a bush (18) which is fixed on said shaft, a corresponding internal thread, with which said bush of said friction element is provided, engaging on said thread, said thread extending so that rotation of said friction element in the same direction as said spool causes its spacing therefrom.
7. Device according to one or more of the preceding claims, characterized in that said pusher means are constituted by a cylindrical helical spring (20), a first end (21) of which is fixed to said disk of said friction element, the other end (23) being fixed to said shaft, the turns of said spring being arranged so that rotation of said friction element in the same direction as said spool causes its loading.
8. Device according to one or more of the preceding claims, characterized in that the second end of said spring extends radially and is in-

serted in a notch (24) of a series defined in a toothed sector (25) which extends at right angles at the periphery of a disk-like element which is keyed on said shaft, the various positions corresponding to different pre-loadings for said spring. 5

9. Device according to claim 1 and claims 3 to 6, characterized in that said pusher means are constituted by pneumatic or hydraulic pistons, electric, magnetic, electromagnetic or equivalent devices. 10

15

20

25

30

35

40

45

50

55

