Dec. 26, 1933. L. NÜNNINGHOFF 1,941,364

APPARATUS FOR REMOVING THE LEAD COVERING OF ELECTRICAL CABLE

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Fig. 1.

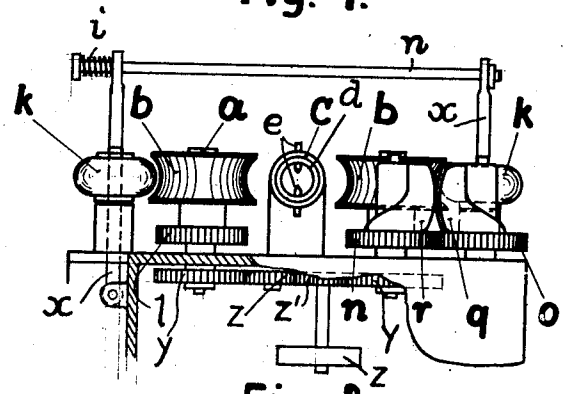


Fig. 2.

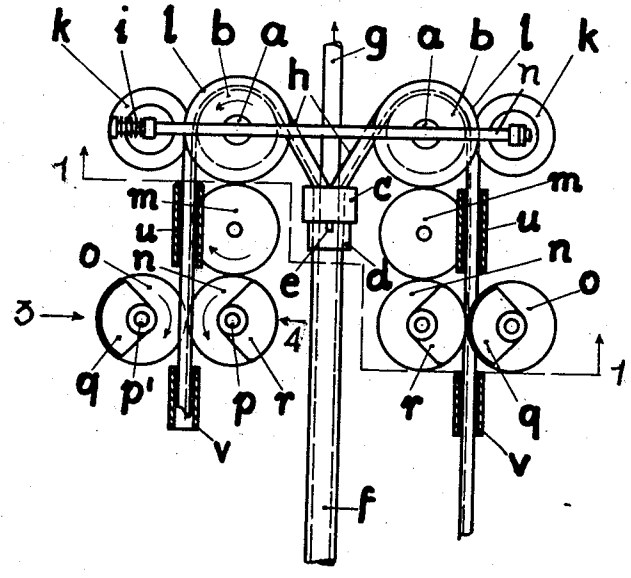


Fig. 3.

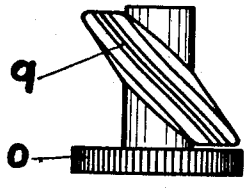
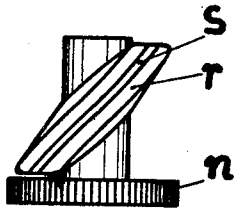


Fig. 4.



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APPARATUS FOR REMOVING THE LEAD COVERING OF ELECTRICAL CABLE

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5 Claims. (Cl. 164—36)

For removing the lead covering of electrical cable an apparatus is already known, in which the lead covering is moved longitudinally in the direction of the cable through a bush provided with cutting elements and is cut into two halves, so that the tension necessary for moving the cable and for removing the lead covering is applied only to the parts of the lead covering released from the cable core behind the cutting device, and the cable core experiences no direct or indirect tensile stress. The strips of lead covering thus obtained are cut up by hand by means of shears, into suitable lengths for putting into the lead melting furnace.

This invention relates to an improvement in this apparatus and consists in this that the lead bands are automatically and continuously cut up into suitable lengths by a cutting device, provided on the removing apparatus and coupled with it. Care is taken that the cutting tools, for cutting up the strips of lead covering, move with the same velocity forwards as the strips coming from the machine, because otherwise during the cut, which is effected transversely to the cable, there would be an accumulation of the lead bands in the machine, also that they would escape the cutting tool sideways. In order not to check the movement of the halves of the lead covering coming from the removal apparatus, the cutting of the lead bands is effected not along the shortest cutting line but diagonally. The bands are moved simultaneously and uniformly through the cutting devices. In view of the steady movement of the machine, the cutting of the bands is, however, preferably not carried out simultaneously but in such a manner that the two halves of the lead sheathing taken from the cable core are cut off alternately. The cutting tools of the cutting device used for this purpose may be slightly accelerated over the movement of the halves of the lead covering (in the removal apparatus) because in the progressive cut the cutting gap in lead becomes wider and makes the cutting easier.

The drawing illustrates an example of an apparatus for carrying out the method according to the invention.

Fig. 1 illustrates the apparatus in the direction in which the lead covering is withdrawn.

Fig. 2 shows the arrangement seen from above. For the sake of clearness, the elevation of the device in Fig. 1 is shown in section on the line 1—1 of Fig. 2.

In Fig. 3 a single cutting knife is illustrated.

Fig. 4 shows a rotatably arranged holder of the cutting device.

The axles *a* with the rollers *b* are driven through the train of gears *y*, *y*, *z*, *z'*. On the shaft of the toothed wheel *z'* there is secured a belt pulley Z which is connected with the driving motor or with a transmission (not shown in the drawing). In the box *c* are placed bushes *d* corresponding to the diameter of the cable with inwardly projecting adjustable knives *e*, which cut above and below into the lead covering *f* of the cable *g*, passing through the bushes in the direction of the rollers. The two halves *h* of the lead sheathing thus obtained are separated from the cable core which is behind the bush *d* and placed round the rollers *b* which are grooved at the circumference and against which they are pressed by means of the counter rollers *k*. These rollers *k* are rotatable about the axles *x* which are hingedly secured to the base of the machine and are pressed against the rollers *b* by springs *i* arranged on the rod *w* and engaging with the axles *x*. When the machine is set in motion the two halves of the lead covering are carried along by the rollers *b* and so the cable is drawn through the bush *d*. The core, from which the lead covering has been removed, passes freely between the rollers and can be wound by hand or mechanically on a reel for further treatment without being subjected to any tension or undesirable bending.

l is a toothed wheel keyed on to the axle *a* which engages in an intermediate wheel *m* by means of which the rotary movement is transmitted to the toothed wheel *n* of the cutting device which is rotatably mounted on the axle *p*. With this toothed wheel *n* is coupled the toothed wheel *o*, also belonging to the cutting device, which is rotatable about the axle *p'*. On the extended nave of the wheel *o* a helical cutter *q* is secured along a part of its circumference. Correspondingly on the extended nave of the wheel *n*, opposite the cutter *q*, is arranged a helical holder *r* of equal pitch but running in the opposite sense to the cutter *q*, which, during the running of the machine, serves as a support for the cutter *q* in cutting up the strips of lead covering. The toothed wheel *o* with the cutter *q* arranged on its extended nave is illustrated on a larger scale in Fig. 3 (in elevation corresponding to the direction of the arrow 3 in Fig. 2). The construction of the holder *r* of the cutting device is also shown on a larger scale in Fig. 4 (in elevation corresponding to the direction of the arrow 4 in Fig. 2). The holders *r* are preferably provided with a lining *s* of softer material.

The pitch of the helix of the knife and the

holder must be such that the component of the cutting velocity in the direction of the lead bands is equal to or greater than the velocity with which the bands of lead covering are withdrawn.

For guiding the lead bands before entering the cutting device and after leaving the same guiding tubes *u* and *v* are employed. Since each cutter only extends over a part of the circumference of the nave like a worm thread, when the machine is set in motion, a lead band *h* running away can pass unhindered between the naves of the wheels *n* and *o*, during the period in which the cutter *q* and the holder *r* are turned away from the lead band (position shown on the left in Fig. 2) with the direction of rotation of the wheels *n* and *o*, shown in the left hand part of Fig. 2. The cut begins as soon as the one corner of the cutter *q* touches the lead band until the other edge leaves it. During the time thus determined the lead band can pass unhindered between the naves. The length of the pieces cut off is determined by this period and the feed velocity of the lead band. During the cut the lead band is engaged by the end of the cutter which is overtaking the withdrawal motion, pressed against the holder *r* and the cut runs obliquely to the withdrawal direction to the other edge of the lead band. The following lead band passes freely between the naves of the two wheels, which are for a time, turned away. The guiding may be such that the point of the following piece has passed into the tube *v* before the preceding piece is completely cut off. In this or a similar way the safe guiding of the lead band is ensured. The pieces cut off may slide in the transport boxes over inclines not illustrated, or may be taken up by conveyor bands or similar arrangements and carried to the melting furnace.

What I claim is:

1. Apparatus for removing the lead covering of electrical cable, comprising cable stripping means, rotatable helically curved cutters, arranged directly beside the strips of lead covering which are removed, axles carrying the cutters, the cutters extending over only a part of the circumference of the axles, and transmission gear connecting the axles with the drive of the cable stripping means.

2. Apparatus for removing the lead covering of electrical cable, comprising cable stripping means, rotatable helically curved cutters, arranged directly beside the strips of lead covering which are removed, holders arranged symmetrically to the cutters with respect to the lead bands, axles carrying the cutters, the cutters extending over only a part of the circumference of the axles, and transmission gear connecting the axles with the drive of the cable stripping means.

3. Apparatus for removing the lead covering of electrical cable, comprising cable stripping means, rotatable helically curved cutters, arranged directly beside the strips of lead covering which are removed, helical holders arranged symmetrically to the cutters with respect to the lead bands, axles carrying the cutters and the holders, the cutters and holders extending over only a part of the circumference of the axles, and transmission gear connecting the axles with the drive of the cable stripping means.

4. Apparatus for removing the lead covering of electrical cable, comprising cable stripping means, rotatable helically curved cutters, arranged symmetrically with respect to the strips of lead covering which are removed, axles carrying the cutters, the cutters extending over only a part of the circumference of the axles, and transmission gear connecting the axles with the drive of the cable stripping means.

5. Apparatus for removing the lead covering of electrical cable, comprising cable stripping means, means for cutting up the strips of lead covering which are removed positively coupled with the drive of the cable stripping means having rotatable helically curved cutters, and guiding tubes for the strips of lead covering, arranged before the point of entry to and after the point of leaving the means for cutting the lead strips.

LUDWIG NÜNNINGHOFF.