

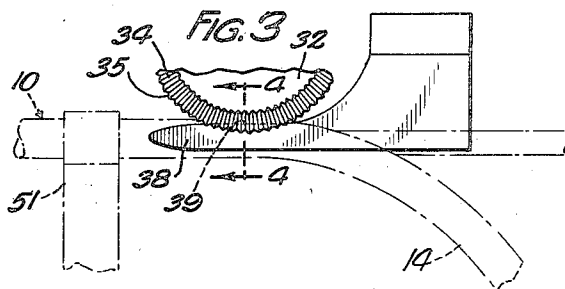
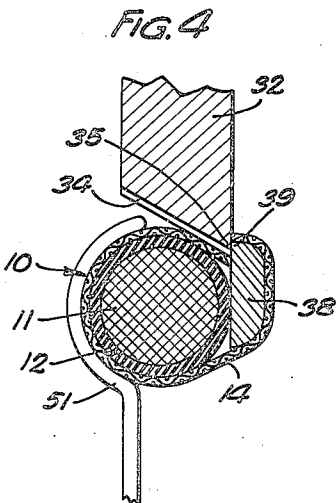
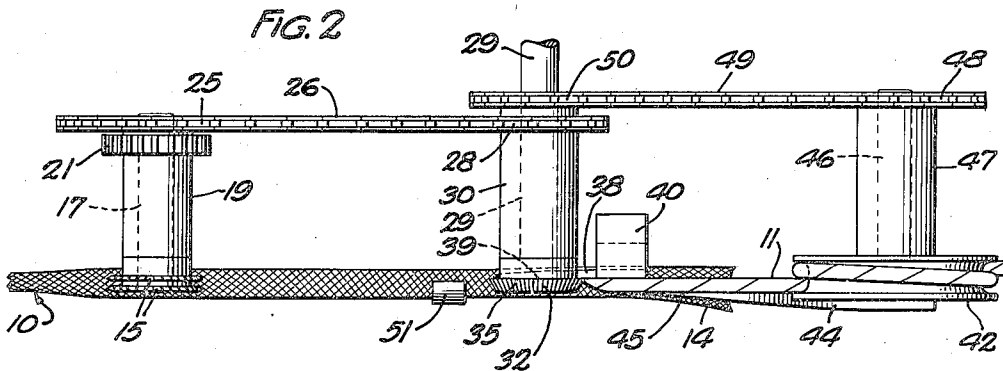
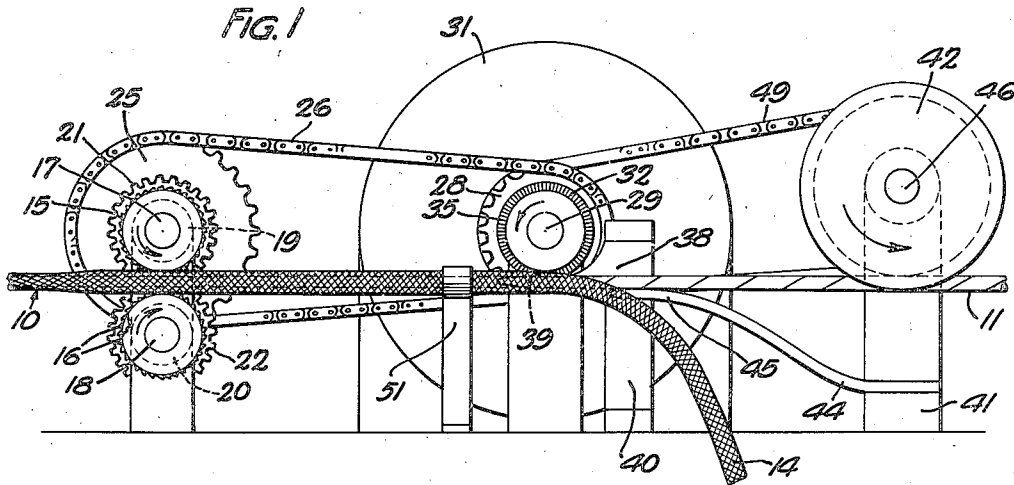
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APPARATUS FOR STRIPPING MATERIAL

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APPARATUS FOR STRIPPING MATERIAL

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This invention relates to an apparatus for stripping material, and more particularly to an apparatus for cutting and stripping wire braids from shielded cables.

In the manufacture of shielded cables the braided shields are occasionally found to be defective for various reasons. It then becomes desirable to remove the defective shields from the insulated cores so that the latter may be covered with new shields without being scrapped. In the removal of the defective shields it is essential that care be taken to prevent the insulated cores from being damaged. Apparatus heretofore used for this purpose has been unsatisfactory, since it often damages the insulation on the cores and is extremely slow, both of which disadvantages greatly increase the waste of vital materials and labor.

It is an object of this invention to provide new and improved methods of and apparatus for stripping material.

With the above and other objects in view, the invention may be embodied in an apparatus comprising a capstan for advancing an insulated cable core covered with a braid at a given rate of speed, a pair of toothed discs engaging the braid and rotating at a speed slower than that of the cable being advanced therebetween whereby the braid is loosened and pushed back upon the cable core, cutters for shearing the loosened braid, and a finger for disengaging the cut braid from the conductor.

A complete understanding of the invention may be obtained from the following detailed description taken in conjunction with the annexed drawing, in which

Fig. 1 is a front elevation of an apparatus embodying the invention;

Fig. 2 is a fragmentary plan view of the apparatus shown in Fig. 1;

Fig. 3 is an enlarged fragmentary front elevation of cutting tools forming part of the apparatus, and

Fig. 4 is a vertical sectional view taken along the lines 4—4 of Fig. 3.

Referring now to the drawing, there is shown in Fig. 4 a cross section of a shielded, insulated cable 10 from which a shielding braid is to be stripped. The cable 10 comprises a core 11 having insulation 12 thereon and a wire braid shield 14 covering the insulation 12 (Fig. 4). The cable is drawn between vertically aligned, toothed, braid retarding discs 15—15 and 16—16 mounted on shafts 17 and 18, respectively. Shaft 17 is rotatably mounted in a bearing 19 and shaft 18 is

rotatably mounted parallel thereto in a similar bearing 20. Shafts 17 and 18 are geared together by intermeshing gears 21 and 22 mounted thereon. A sprocket 25 keyed to the shaft 17 is designed to be driven in a counterclockwise direction, as indicated by the arrow in Fig. 1, by a chain 26 driven by a sprocket 28 keyed to a shaft 29.

The shaft 29 is mounted in a bearing 30 (Fig. 2) and is rotated in a counterclockwise direction (as viewed in Fig. 1) by an electric motor 31. A cutting disc 32 secured to the shaft 29 has a bevelled, serrated periphery 34 which forms an undulating cutting edge 35 at one edge thereof. An elongated tapered cutting blade 36 having a cutting edge 38 formed thereon is rigidly mounted on an upright 40. A guide 51 is positioned near the cutting disc 32 and the blade 38 to guide the conductor 10 as it is drawn toward the blade 38. The blade 38 is adapted to have the braid 14 drawn past it in engagement with the cutting edge 38 thereon which cooperates with the cutting edge 35 on the disc 32 to sever the braid longitudinally as the cable 10 is drawn therepast by a capstan 42, around which the conductor 10 is wound before being advanced to a suitable take-up means (not shown). A stripper 44 is mounted on a support 41 and is positioned so that its free end 45 lies adjacent to the insulation 12 inside the severed braid 14 to separate the severed braid 14 therefrom as both the braid and the conductor move beyond the cooperating portions of the cutting edges 35 and 38.

The capstan 42 is secured to a shaft 46 mounted in a bearing 47 and is driven by a sprocket 48 secured on the shaft 46. The sprocket 48 is driven by a chain 49 driven by a sprocket 50 keyed to the shaft 29. The means driving the capstan 42 just described and the means driving the discs 15—15 and 16—16 and the cutting disc 32 hereinbefore described are so designed that the periphery of the capstan 42 moves at a rate of speed greater than do the peripheries of the discs 15—15, 16—16 and the cutting edge 35 on the disc 32.

The toothed peripheries of the discs 15—15 and 16—16 are spaced apart a distance so that the teeth thereon will engage and retard the advancement of the braid 14. This retarding action bunches the braid behind the discs 15—15 and 16—16, causing it to expand and free itself from the periphery of the insulation 12 in that portion of the cable to the left of the discs 15—15 and 16—16 as viewed in Fig. 1 of the drawing. How-

ever, the toothed peripheries of the discs 15-15 and 16-16 are spaced apart a sufficient distance to prevent the teeth thereon from engaging and damaging the insulation 12.

In the operation of the apparatus, the operator with the aid of suitable manual cutting tools removes a sufficient length of the braid 14 from the end of the cable 10 to permit the bared end of the cable 10 to be inserted between the discs 15-15 and 16-16, wrapped once around the capstan 42 and secured to the takeup means (not shown). The end of the braid 14 remaining on the conductor 10 should then be to the left of the discs 15-15 and 16-16 as seen in Fig. 1. The operator then starts the motor 31 and the takeup means so that the capstan 42 draws the cable through the apparatus. The braid is carried to the braid retarding discs 15-15 and 16-16 and is engaged by the teeth on the peripheries thereof. Since the periphery of the capstan 42 travels at a greater rate of speed than do the teeth on the braid retarding discs, the core 11, insulation 12 and the close fitting braid 14 thereon will be advanced to the teeth of the discs 15-15 and 16-16 by the capstan 42 at a greater rate of speed than that at which the more slowly moving teeth will permit the braid 14 engaged thereby to move therepast. The braid 14 at a distance to the left of the discs 15-15 and 16-16 travels at the same speed as the core and insulation thereon. The thrust caused by the movement of the braid and the engagement therewith by the more slowly moving retarding discs will cause the braid to bunch up and expand as it is engaged by and passes beyond the teeth of the discs 15-15 and 16-16, thus enlarging the diameter of the braid and loosening it on the insulation 12. When the end of the loosened braid approaches the end of the tapered cutting blade 38, the operator guides the loosened braid and the insulated core into engagement with the guide 51 and over the blade 38, which blade will then lie between the tubular braid 14 and the insulation 12. As the machine continues to operate, the braid is forced between the overlapping cutting edges 35 and 39, which sever it along a line parallel to the longitudinal axis thereof. As the severed portion of the braid is fed forward beyond the cutting edges 35 and 39, it will be drawn off the conductor by the end 45 of the stripper 44, which lies against the insulation 12. Meanwhile, the insulated core and the braid 14 are continuously advanced and the teeth of the discs 15-15 and 16-16 will continue to engage longitudinally and expand the braid 14 so that it can be continuously cut by the edges 35 and 39 and stripped by the stripper 44 from the insulated core. The insulated core is drawn around the capstan 42 and upon suitable takeup means. This operation may be continued until the supply of the braided conductor is exhausted, or until the operator for some other reason desires to stop the machine.

The exact ratio of the speed of the periphery of the capstan 42 with respect to the peripheral speed of the discs 15-15 and 16-16 and the cutting disc 32 may be varied to suit the size of the cable, the pitch and the material forming the braided sheath thereon. For example, the ratio of the peripheral speeds suitable for cutting and stripping loosely braided sheaths of steel wire upon a cable having a diameter of about a quarter of an inch has been found to be about 2.8 to 1. However, any ratio between about 2 to 1 and 4 to 1 may be used with satisfactory results.

The apparatus embodying the invention is suitable for rapidly and efficiently cutting any expandable braid, and will strip the braid for salvage with a minimum expenditure of time and effort by the operator and without damage to the insulation beneath the braid.

What is claimed is:

1. A device for cutting tubular braids on elongated members, which comprises means for advancing an elongated member having a flexible braided tubular covering thereon, means for longitudinally compressing and thereby expanding the covering laterally on the elongated member to loosen the covering thereon, and means for cutting the expanded portion of the covering parallel to the longitudinal axis thereof as it and the member are advanced therepast.
2. A device for cutting tubular braids on elongated members, which comprises means for advancing an elongated member having a tubular braid thereon, a plurality of rotatable discs having serrations on the periphery thereof for retarding the braid parallel to the longitudinal axis thereof and thereby expanding it laterally upon the elongated member as the braid and the member are advanced therepast.
3. A device for cutting braided tubular coverings on elongated cores, which comprises means for advancing an elongated core having a close fitting wire braid thereon at a given rate of speed, means for engaging the braid for retarding and thereby compressing it longitudinally to expand the same laterally, an elongated cutting blade adapted to enter the expanded portion of the braid as it is advanced therepast, and a cutting member movable with respect to the cutting blade to cooperate therewith for cutting the braid parallel to the longitudinal axis thereof.
4. A device for cutting braided tubular coverings on elongated cores, which comprises means for advancing an elongated core having a tubular metallic braid thereon, a plurality of rotatable discs having serrations on the periphery thereof for retarding and thereby compressing the braid longitudinally to expand the tubular braid laterally on the core as the braid and the core are advanced therepast, an elongated cutting blade adapted to enter the expanded portion of the braid as it is advanced therepast, and a cutting member movable with respect to the cutting blade to cooperate therewith for cutting the expanded portion of the braid parallel to the longitudinal axis thereof.
5. A device for cutting braided tubular coverings on elongated cores, which comprises means for advancing an elongated core having a close fitting tubular braid thereon at a given rate of speed, means for engaging the braid for retarding and thereby longitudinally compressing and laterally expanding the same, and means for cutting the expanded portion of the braid parallel to the longitudinal axis thereof as it and the core are advanced therepast.
6. A device for cutting braided tubular coverings on elongated cores, which comprises means for advancing an elongated core having a close fitting, tubular metallic braid thereon at a given rate of speed, a plurality of serrated discs for engaging the braid as it is advanced therepast, means for rotating the discs at a slower rate of speed than that of the advancing means to retard the braid with respect to the core and thereby longitudinally compress and laterally expand the braid upon the core, and means for cutting the expanded portion of the braid parallel to the

longitudinal axis thereof as it and the core are advanced therepast.

7. A device for cutting braided tubular coverings on elongated cores, which comprises means for advancing an elongated core having a close fitting, metallic, tubular braid thereon at a given rate of speed, a plurality of serrated discs for engaging the braid as it is advanced therepast, means for rotating the discs at a slower rate of speed than that of the advancing means to retard the braid with respect to the core and thereby loosen it on the core, means for cutting the loosened portion of the braid parallel to the longitudinal axis thereof as it and the core are advanced therepast, and means for stripping the cut portion of the braid from the member.

8. A device for cutting braided tubular coverings on elongated cores, which comprises means for advancing an elongated core having a close fitting tubular metallic braid thereon at a given rate of speed, means for engaging the braid to retard and thereby expand the same laterally, an elongated cutting blade adapted to enter the expanded portion of the braid as it is advanced therepast, a cutting disc having a bevelled, serrated periphery forming a cutting edge thereon for cooperating with the blade to sever the braid parallel to the longitudinal axis thereof as it is advanced thereby, and means for rotating the cutting disc.

9. A device for cutting braided tubular coverings on elongated cores, which comprises means for advancing an elongated core having a close fitting tubular metallic braid thereon at a given rate of speed, means for engaging the braid to retard and thereby expand the same laterally, an elongated cutting blade adapted to enter the expanded portion of the braid as it is advanced therepast, a cutting disc having a bevelled, serrated periphery forming a cutting edge thereon for cooperating with the blade to sever the braid parallel to the longitudinal axis thereof as it is advanced thereby, means for rotating the cutting disc, and means for stripping the cut portion of the braid from the core.

10. A device for cutting braided tubular coverings on insulated conductors, which comprises means for advancing an insulated conductor with a close fitting, loosely braided wire braid thereon at a given rate of speed, a plurality of serrated discs for engaging the braid as it is advanced therepast, means for rotating the discs at a slower rate of speed than the advancing means to retard the braid engaged thereby and thereby loosen it on the conductor, an elongated cutting blade adapted to enter the loosened portion of the braid as it is advanced therepast, a cutting disc having a bevelled, serrated periphery forming a cutting edge thereon for cooperating with the blade to sever the loosened portion of the braid parallel to the longitudinal axis thereof as it is advanced thereby, and means for rotating the cutting disc.

11. A device for cutting braided tubular coverings on insulated conductors, which comprises means for advancing an insulated conductor with a close fitting braided metallic sheath thereon at a given rate of speed, means for engaging the sheath to retard and thereby expand the same

laterally, an elongated cutting blade adapted to enter the expanded portion of the sheath as it is advanced therepast, a cutting disc having a bevelled, serrated periphery forming a cutting edge thereon for cooperating with the blade to sever the expanded portion of the sheath parallel to the longitudinal axis thereof as it is advanced therepast, and means for rotating the cutting disc.

12. A device for cutting braided tubular coverings on insulated conductors, which comprises means for advancing an elongated core with a close fitting braided metallic sheath thereon at a given rate of speed, a plurality of serrated discs for engaging the sheath as it is advanced therepast, means for rotating the discs at a slower rate of speed than the advancing means to retard the sheath and thereby expand it laterally on the core, an elongated cutting blade adapted to enter the expanded portion of the sheath as it is advanced therepast, a cutting disc having a bevelled, serrated periphery forming a cutting edge thereon for cooperating with the blade to sever the sheath parallel to the longitudinal axis thereof as it is advanced therepast, and means for rotating the cutting disc.

13. A device for stripping wire braids from shield insulated cables, which comprises a capstan for advancing a cable core having a close fitting wire braid thereon at a given rate of speed, a plurality of pairs of opposed toothed discs for engaging the braid, means for rotating the discs at a slower rate of speed than that at which the conductor is advanced by the capstan so that the toothed discs retard the braid to loosen it on the core, an elongated cutting blade adapted to enter the loosened braid as it is advanced therepast, a cutting disc having a cutting edge thereon for cooperating with the blade to sever the braid along the longitudinal axis thereof as it is advanced thereby, means for rotating the disc, a guide adjacent to the blade and the disc to prevent whipping of the core and the braid as they are advanced to the blade and the disc, and an elongated stripper lying against the core for forcing the severed braid therefrom.

14. A device for loosening a braided covering upon an elongated member, which comprises means for advancing an elongated member having a braided covering thereon at a given rate of speed, opposed serrated discs for engaging the covering, and means to rotate the discs at a slower rate of speed than that at which the conductor is advanced therebetween whereby the covering is longitudinally compressed and radially expanded upon the member.

15. A device for cutting tubular coverings on elongated members, which comprises means for advancing an elongated member having a flexible tubular covering thereon, means for longitudinally compressing and thereby expanding the tubular covering laterally on the elongated member to loosen the covering thereon, and means for cutting the expanded portion of the covering parallel to the longitudinal axis thereof as it and the member are advanced therepast.

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