March 21, 1967 G. M. DENNEY 3,309,947

APPARATUS FOR REMOVING A COVERING FROM CORE MATERIAL

Filed Aug. 16, 1965

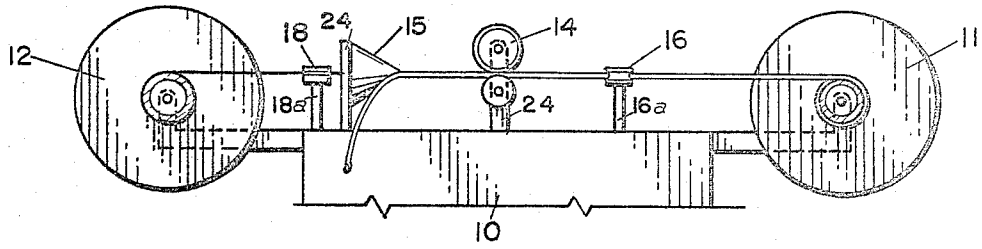


FIG. 1

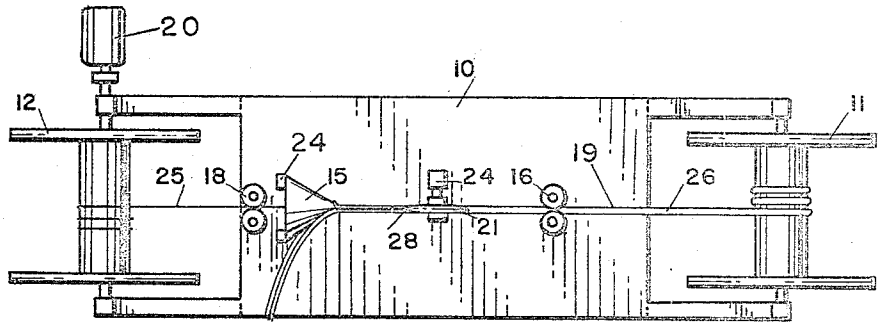


FIG. 2

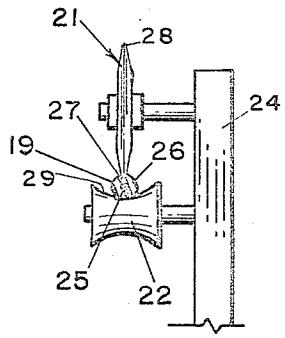


FIG. 3

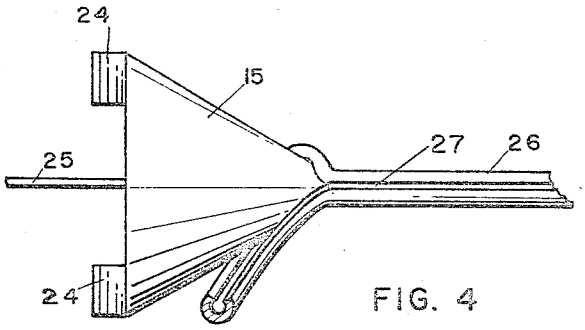


FIG. 4

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APPARATUS FOR REMOVING A COVERING FROM CORE MATERIAL

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This invention relates generally to an apparatus for removing a covering from a core material and more particularly, to an apparatus for stripping a covering from a core material by forming in the covering a strained or weakened area in which the covering splits or tears as the covering is forced away from the core material.

In the manufacture of a product having a core material with a covering therearound, it is often necessary that damaged or improper covering be stripped from the core material in order that the core material be reclaimed for further use. Numerous devices and methods have been used in the past for this purpose. These previous devices and methods have usually stripped a covering from a core material by cutting the covering and subsequently separating the covering from around the core material with a conventional stripping cone. As a cut has been made in the covering, the covering has been frequently pierced to such an extent that the cutting tool has scratched, scarred or otherwise damaged the core material.

This difficulty can be avoided with previous devices and methods only by careful control of the depth to which the covering is cut. Such control is difficult to achieve where a soft covering, such as rubber, plastic or polyethylene insulation, is being removed from relatively stiff core material such as metal rod or wire. This is because bends or kinks in such core material are not easily straightened and result in the covering being penetrated to various depths, including those depths at which the cutting tool completely pierces the covering and damages the core material.

The invention disclosed herein overcomes these and other difficulties previously encountered in removing a covering from a core material in that with the device and method of the invention, the covering is not cut at all. Rather an edge too dull to cut, or otherwise pierce the covering is forced against the covering so as to form a weakened or strained area in the covering. Since the edge is dull, the edge simply forces bends and kinks from the core material without piercing the covering as the covering moves relative to the edge. This eliminates the careful control necessary with previous devices and methods in order to prevent the scratching, scarring or otherwise damaging of core material by a tool which pierces a covering as it cuts the covering.

Once an area of the covering is weakened or strained, a stripping cone or other means for forcing the covering away from the core material will readily split or tear the covering in the weakened strained area since this area has less strength than the remainder of the covering. The split covering is easily removed or separated for the core material. Thus, the invention permits core material to be reclaimed in an unscratched and unscarred condition so that it may be readily reused.

These and other features and advantages of the invention will become more apparent upon consideration of the following specification taken in conjunction with the accompanying drawings wherein like characters of reference designate corresponding parts throughout and in which:

FIG. 1 is a side elevational view of one embodiment of the invention;

FIG. 2 is a top plan view of the embodiment of the invention shown in FIG. 1;

FIG. 3 is an enlarged view of a deforming tool for forming a weakened or strained area in a covering;

FIG. 4 is an enlarged view of a stripping cone for splitting the covering in a weakened or strained area and separating the covering for the core material.

These drawings and the following specification disclose one specific embodiment of the invention, however, it is to be understood that this embodiment is shown as means of illustrating the inventive concept and that the invention may be embodied in other equivalent forms without departing from the inventive concept disclosed herein.

Referring to FIG. 1, it is seen that the apparatus of the invention comprises a support **10** which at one end carries a rotatably mounted playoff reel **11**, and at the other end carried a rotatably mounted take-up reel **12**. Metal wire or other core material **25** enclosed within a covering **26**, such as rubber insulation, is carried by the playoff reel **11**, and the take-up reel **12** receives the core material **25** after the covering **26** has been separated from the core material **25**. Interposed between the playoff reel **11** and the take-up reel **12** is a deforming mechanism **14** for forming a weakened or strained area or strip along the length of the covering **26**. Interposed on the support **10** between the deforming mechanism **14** and the take-up reel **12** is a stripping cone **15**.

A first pair of positioning rolls **16** are positioned between the deforming mechanism **14** and the playoff reel **11**, and a second pair of positioning rolls **18** are positioned between the stripping cone **15** and the take-up reel **12**. The positioning rolls **16** are rotatably mounted on a support stanchion **16***a* and have grooved outer peripheries shaped to receive the covering **26** the core material **25** enclosed therein. The positioning rolls **18** are rotatably mounted on a support stanchion **18***a* and have grooved outer peripheries shaped to receive the core material **25** with the covering **26** removed. The positioning rolls **16** and **18** maintain the covering **26** and core material **25** in alignment with the deforming mechanism **14** and stripping cone **15** regardless of the position on the playoff reel **11** of the core material **25** and the covering **26** and regardless of the position of the core material **25** on the take-up reel **12**. This assures that the covering **26** will be properly removed from the core material **25**.

The take-up reel **12** is rotatably driven by a motor **20** and rotation of the take-up reel **12** serves to pull the core material **25** through the entire apparatus. Suitable braking means (not shown) is used to retard rotation of the playoff reel **11**. Thus, the core material **26** is maintained in tension between the playoff reel **11** and take-up reel **12**.

Referring to FIG. 3, the deforming mechanism **14** is seen to comprise generally a deforming tool **21** and a positioning roll **22** rotatably mounted on a support arm **24**. In the embodiment of the invention disclosed herein the tool **21** is a disk with a dull periphery **28**. It will be understood, however, that other tools may be used to carry out the inventive concept disclosed herein. Regardless of the embodiment used, the periphery **28** of the tool **21** is sufficiently broad or dull to not cut or tear the covering **26** when the periphery **28** is forced against the covering **26**.

The positioning roll **22** is positioned to receive the core material **25** and the covering **26** in a groove **29** during passage of the core material **25** from the positioning rolls **16** to the positioning rolls **18**. The groove **29** in the periphery of the positioning roll **22** is shaped so that the centerline of the core material **25** is maintained in a constant position with respect to the tool **21**. The tool **21** is positioned above the groove **29** so that the periphery **28** of the tool **21** is forced against the covering **26**. In order to vary the force applied by the tool **21** to a covering **26** and to accommodate different sizes of core material **25** and covering **26**, means (not shown) is provided

to adjust the position of the tool **21** with respect to the roll **22**.

Regardless of the size of the core material **25** and covering **26**, the position of the tool **21** is adjusted so that the covering **26** is deformed sufficiently to become permanently weakened or strained in that area or zone engaged by the periphery **28** of the tool **21**. In that embodiment of the invention disclosed herein, this action of the tool **21** and the motion of the covering **26** relative to the tool **21** results in a weakened or strained area or zone as indicated at **27** along the length of the covering **26**. This weakened area **27** has less strength than other portions of the covering **26**.

Referring to FIG. 4, it will be seen that the stripping cone **15** is carried by cone supports **24** attached to the support **10** and is of a type commonly used in stripping operations. The cone **15** has a passage therethrough (not shown) just large enough to receive the core material **25** and is positioned so that its vertex receives the core material **25** as it passes between the positioning rolls **16** and **18** after passage between the tool **21** and positioning roll **22**. Thus, the cone **15** is inserted between the core material **25** and the covering **26** as the core material **25** is pulled through the cone **15** toward the take-up reel **12**. The result is that the covering **26** is forced outwardly away from the core material **25**.

As the covering **26** is forced outwardly by the cone **15**, the covering **26** is stretched so that is splits or tears in the weakened or strained area **27** since the covering **26** is weaker in the area **27** than elsewhere. Once split, the covering **26** readily separates from the core material **25** by further movement relative to the cone **15**. This permits the core material **25** to pass alone and unscratched and unscarred to the take-up reel **12**.

Thus, it will be seen that with the invention, core material **25** having a covering **26** therearound is reclaimed by deforming the covering **26** to form a weakened or strained area **27** at which the covering **26** splits when forced away from the core material. The covering **26** is not pierced or otherwise cut by a cutting tool and as a result the core material is not scratched, scarred or otherwise damaged. Moreover, it will be seen that apparatus embodying the invention needs only one power means and that it efficiently and effectively strips the covering from a core material without the position of the tool **21** being closely controlled. Kinks and bends are simply forced from the core material **25** by the tool **21** without resulting damage to the core material **25**.

It is to be understood that numerous changes and modifications and the full use of equivalents may be resorted to without departing from the scope of the appended claims.

What is claimed as invention is:

1. Apparatus for removing the covering from around a core material comprising:

(a) support means;

(b) deforming means carried by said support means for forming a strained zone in the said covering by mechanically deforming said covering, said deforming means including a peripheral edge which is positioned to engage said covering and which is too dull to pierce said covering;

(c) separating means carried by said support means for forcing said covering outwardly away from said core material so that said covering splits in said strained zone; and

(d) means for moving said core material with respect to said deforming means and said separating means.

2. Apparatus for stripping the insulation from a length of insulated wire having a metal core comprising:

(a) support means;

(b) a first reel rotatably carried by said support means for carrying said insulated wire therearound;

(c) a second reel rotatably carried by said support means for receiving the said metal core thereon;

(d) means for rotating said second reel;

(e) a deforming means carried by said support means and positioned between said first reel and said second reel to engage said insulated wire with a dull peripheral edge, said peripheral edge being too dull to pierce said covering;

(f) a positioning roll rotatably carried by said support means and positioned to force said insulated wire against the said periphery of said deforming tool with sufficient force to form a strained zone in the said insulation;

(g) a stripping cone positioned on said support means to receive said insulated wire after passage between said deforming tool and said positioning roll and adapted to force the said insulation from the said metal core with sufficient force to tear said insulation in said strained zone.

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