May 28, 1963 H. L. HEARNS 3,091,411

CUTOFF MECHANISM FOR A FILM REWINDER

Filed March 21, 1960 2 Sheets-Sheet 1

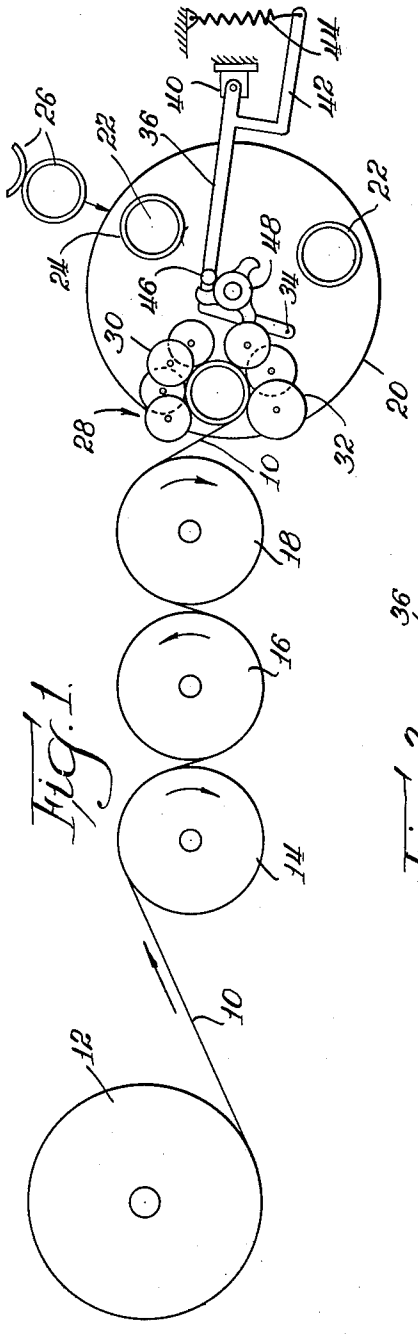


Fig. 1

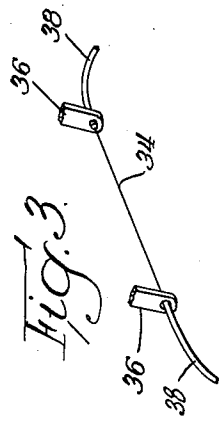


Fig. 3

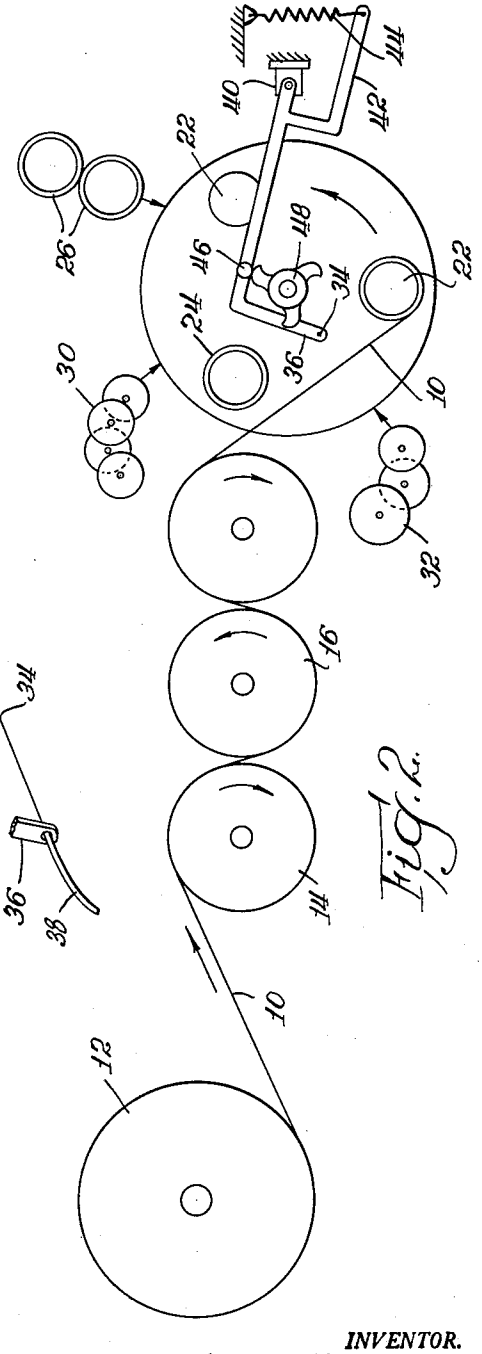


Fig. 2

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CUTOFF MECHANISM FOR A FILM REWINDER

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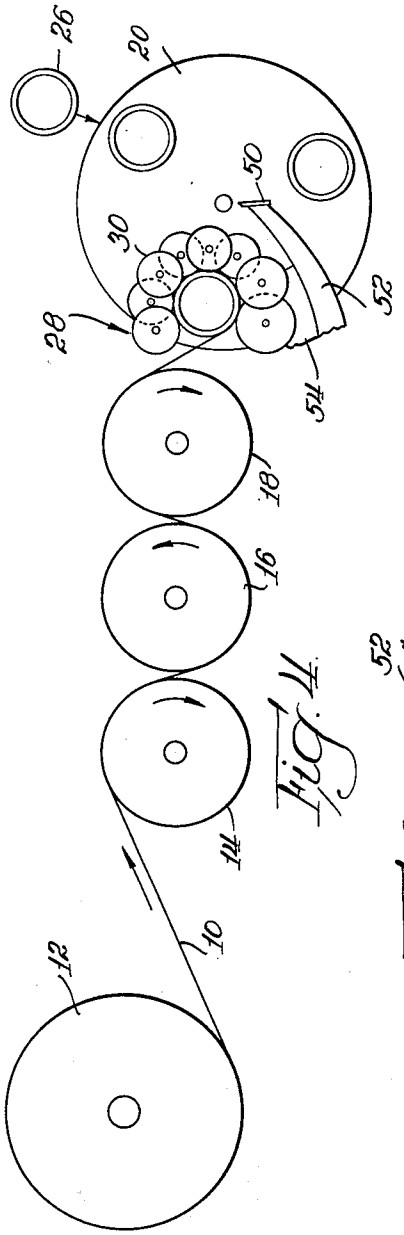


Fig. 4

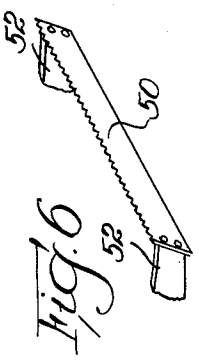


Fig. 6

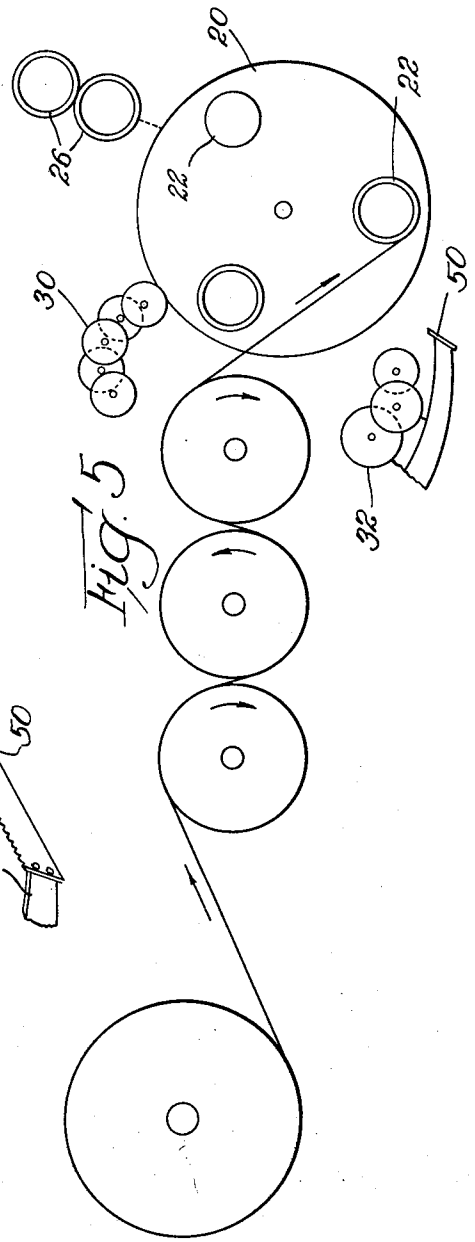


Fig. 5

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CUTOFF MECHANISM FOR A FILM REWINDER

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2 Claims. (Cl. 242—56)

This invention relates to a film rewind machine and more particularly to a method and means for cutting off thin and limp film in a manner to conveniently allow start of the cut film on a core to be wound in said machine.

In the conventional type of rewind machine, the film is cut off somewhat near the last metering roll, and is generally stiff enough to be pushed ahead into the feed rollers, for winding upon an empty core encased by the rollers. When the rewind machine is handling a thin and limp film it cannot be pushed ahead due to the lack of stiffness.

The method and means of the present invention solves the problem of starting a thin and limp film upon a core after it has been cut off. Two embodiments are disclosed, the first of which will be termed the "hot wire" method, the second of which will be termed the "saw-tooth cutter" method. Either one of the two embodiments will be found to operate quite satisfactorily in starting a thin and limp film upon a core in a rewind machine.

The main object of this invention is to provide a method and means for handling thin and limp film in a rewind machine.

A more specific object of this invention is to provide a method and means for starting a thin and limp film on a core in a rewind machine.

Another object of this invention is to provide a method and means for cutoff of a thin and limp film in a rewind machine, and starting the cut film on a core in a satisfactory and reliable manner.

Other objects and features of the invention will become more apparent from the following description and accompanying drawings wherein:

FIG. 1 is a schematic illustration showing the hot wire method of the invention as applied on a film rewind machine, and showing the relative position of various parts after film cutoff and at commencement of core windup;

FIG. 2 is the same as FIG. 1 but showing the relative location of the various parts at completion of winding of film on a core and just prior to cutoff of the film;

FIG. 3 is a fragmentary perspective view illustrating the arrangement of a hot wire used in the assemblage of FIG. 1;

FIG. 4 is a schematic illustration showing the saw-tooth cutter method of the invention and showing the relative position of the parts during winding of a core;

FIG. 5 is the same as FIG. 4 but showing the relative position of the parts upon completion of a winding operation and just prior to cutoff of the film; and

FIG. 6 is the fragmentary perspective view illustrating a saw-tooth cutter used in the assemblage of FIG. 4.

Referring now to the drawings and more particularly to FIGS. 1 to 3, the numeral **10** identifies a web, or film of material, which is being unwound from a mill-roll **12**, and directed over a plurality of supporting, or metering rolls **14**, **16** and **18** for winding upon a core supported by a reel assembly **20**. The latter is arranged for rotary movement and is provided with a plurality of spindles **22** adapted for receiving an unwound core **24** from a supply of unwound cores **26**, which unwound core is supported at each end of a spindle **22**, moving an unwound core into winding position, and moving the wound core into ejecting position, which operations are performed in an intermittent and sequential manner. A cage assembly **28**, consisting of a plurality of disc members longitudinally spaced on parallel rods, is arranged to form an upper cage assembly **30**, and a lower cage assembly **32**. When in closed position (FIG. 1), the cage assemblies **30** and **32** snugly engage a core along its length so that the film being wound thereon is wrapped in a snug and smooth manner. The arrangement so far described is part of the prior art and is familiar to those skilled in the art of rewind machines. For example, reference may be had to the patent of R. H. Schultz et al., 1,966,525, for a showing in greater detail of the type of rewind machine under consideration herein.

The film cutoff means of the invention includes a hot wire **34** supported by arms **36** which are spaced apart a distance somewhat greater than the width of the film to be cut. The wire **34** is connected by a wire **38** to a source of electrical energy whereby the wire may be heated to a temperature necessary for severing or cutting the film. The arms **36** are supported at one end by a bracket means **40** which have extensions **42** connected to tension springs **44**. A cross rod **46** is arranged at some distance from the pivoted end of the arms **36**, and is adapted to ride upon a three lobe cam **48**. Cam **48** is arranged to turn with the reel as the later rotates toward indexing positions so that the cores are loaded on the spindles, wound with film, and ejected after winding. It will be seen that the tension spring **44** maintains the cross rod **46** in engagement with the surface of the cam **48**.

The lobes on the cam **48** are positioned relative to the spindles **22** so that the hot wire **34** will be moved away from contact with the film as the reel is rotating a wound film toward ejecting position, and will subsequently allow downward movement of the hot wire to sever the film shortly after the reel has rotated toward the position illustrated in FIG. 2. In the latter position, it will be seen that the film **10** is just about to be contacted by the unwound core **24** while the upper cage **30** and lower cage **32** are moving toward clamping position upon said core. Cutoff of the film **10** occurs just prior to, or simultaneously with, clamping of the cages **30** and **32** upon the unwound core **24**. In such manner, the thin and limp film is cut off after the film has been brought in contact with the unwound core, thus assuring proper start of the film on the core. The arrangement of the hot wire cutoff means of the invention is synchronized with the rewind sequence of operations of the rewind machine, and provides cutoff of the wound film in a clean and effective manner. Since it assures engagement of the film with the unwound roll just prior to film cutoff it eliminates the problems of core winding when handling thin and limp film, which problems have been encountered in known methods of the prior art. The method and means of the invention will conveniently handle film of the polyolefin type up to 0.75 mil in thickness, and is especially beneficial for handling thin and limp film in a thickness range of 0.15 to 0.5 mil.

A second embodiment of the invention in which the same numerals will be used to identify parts identical with those in the first described embodiment, is illustrated in FIGS. 4 to 6. The film cutoff means of the second embodiment, comprises a sawtooth cutter, or blade **50** which is supported upon parallel arms **52** secured by bracket means **54** to the lower cage assembly **32**. It will be seen that the cutter **50** is arranged somewhat forwardly of the end roll of rollers on the lower cage so that the cutter will contact the film and sever it just after the film is engaged by the unwound core being rotated into position by the reel **20**. In such manner, contact of the cut off film is assured just prior to, or simultaneously with, clamping action of the upper and lower cages upon the unwound core.

From the foregoing, it will be seen that both embodi-

ments of the invention provide for cutoff of the film after it has been brought into contact with the unwound core, thus assuring proper start of film windup on the core when handling thin or limp film. The method and means of the invention provides an easy and reliable solution to the problem of starting a thin and limp film upon an unwound core, which problem often proved difficult, if not impossible, in film rewind machines of the prior art.

The foregoing description has been given in detail without thought of limitation since the inventive principles involved are capable of assuming other forms without departing from the spirit of the invention or the scope of the following claims.

What is claimed is:

1. A rewind machine for winding a film of thin and limp material upon a core and having a rotatable reel for supporting a plurality of cores and a cage assembly including a plurality of rollers for clamping upon a core while it is being wound with said film, a cutoff means for said film including a hot wire, a pair of arm members for supporting said hot wire transversely of said film, a cam means mounted upon said reel and engageable by said arms, and a resilient means for maintaining the arms in engagement with said cam means, said cam means being adapted to cause movement of said arms so that the hot wire will be moved away from said film and being further adapted to allow said resilient means to move said arm members so as to sever the film at a point somewhere between a wound core and an unwound core after the unwound core has been brought into engagement with said film and the cage assembly has moved toward clasping relationship upon said unwound core.

2. A rewind machine for winding a film of thin and limp material upon a core and having a rotatable reel for supporting a plurality of cores and a cage assembly including a plurality of rollers for clamping upon a core while it is being wound with said film, a cutoff means for said film, a pair of arm members for supporting said cut-off means transversely of said film, a cam means mounted upon said reel and engageable by said arms, and a resilient means for maintaining the arms in engagement with said cam means, said cam means being adapted to cause movement of said arms so that the cut-off means will be moved away from said film and being further adapted to allow said resilient means to move said arm members so as to sever the film at a point somewhere between a wound core and an unwound core after the unwound core has been brought into engagement with said film and the cage assembly has moved toward clasping relationship upon said unwound core.

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