United States Patent [19]

Malone

[11] **3,917,183**

[45] **Nov. 4, 1975**

[54] **ROLL-WINDING APPARATUS**

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[22] Filed: **Apr. 18, 1974**

[21] Appl. No.: **461,998**

[52] **U.S. Cl.** ..... **242/56 R;** 242/66; 242/DIG. 3

[51] **Int. Cl.** **B65h 19/20;** B65h 17/08

[58] **Field of Search** ..... 242/56 R, 60, 66, 78.7, 242/68.7, DIG. 3

[56] **References Cited**

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3,386,678	6/1968	Malone	242/56 R
3,537,662	11/1970	Keesling et al.	242/56 R

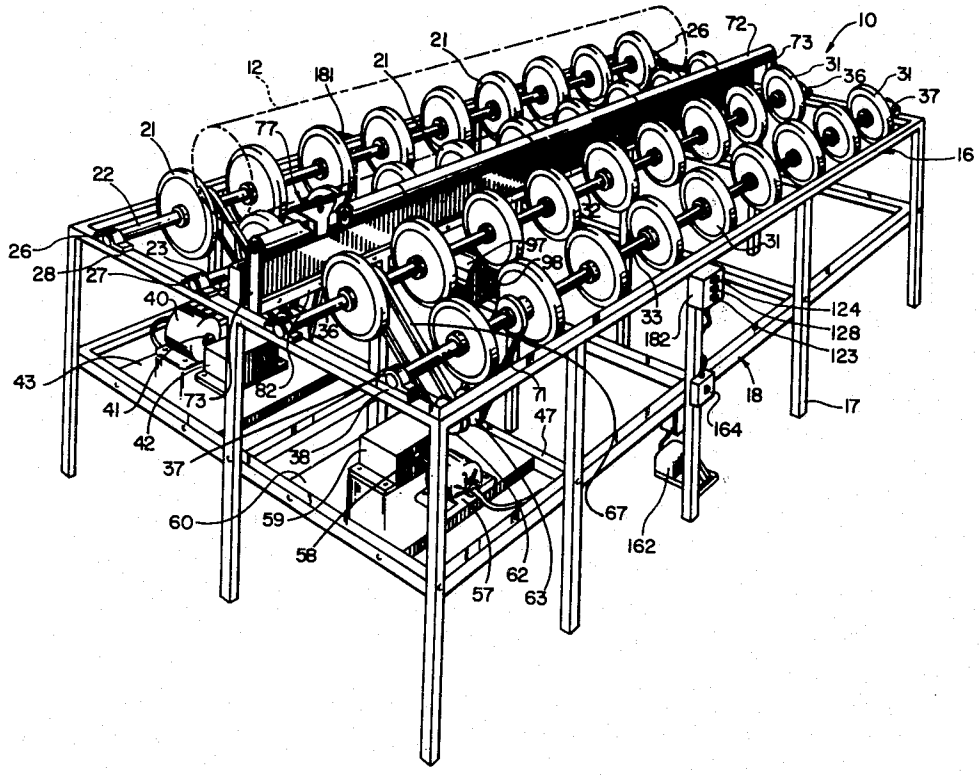
Primary Examiner—Leonard D. Christian

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[57] **ABSTRACT**

An apparatus for unwinding a predetermined length of rolled material from a supply thereof and rolling the unwound material includes first and second spaced parallel sets of supply rollers, for supporting the supply of rolled material therebetween and first and second spaced parallel sets of take-up rollers for supporting a roll of material unwound from the supply. The rollers of each set are fixed on one of four elongated shafts rotatably supported on a frame. Guide means, mounted between the supply and take up rollers, are elevated a sufficient distance above the take-up rollers to prevent any tendency of the material taken up to unwind and avoids the necessity of employing a material holddown means at the take-up rollers. First and second driving motors drive the supply and take-up rollers in synchronism to pay off material from the supply over the guide means and take-up the rewound material at a constant linear speed. The motors may be controlled individually or jointly. A footage counter driven by a wheel in contact with the unwound material as it passes between the supply rollers and the take-up rollers, measures the desired length of material to be unwound from the supply. When a predetermined amount of material has been unwound from the supply, a motor-driven cutter, mounted for rectilinear movement in a track aligned transversely with respect to the path of the unwound material, is actuated to sever the material taken-up from the supply.

4 Claims, 5 Drawing Figures



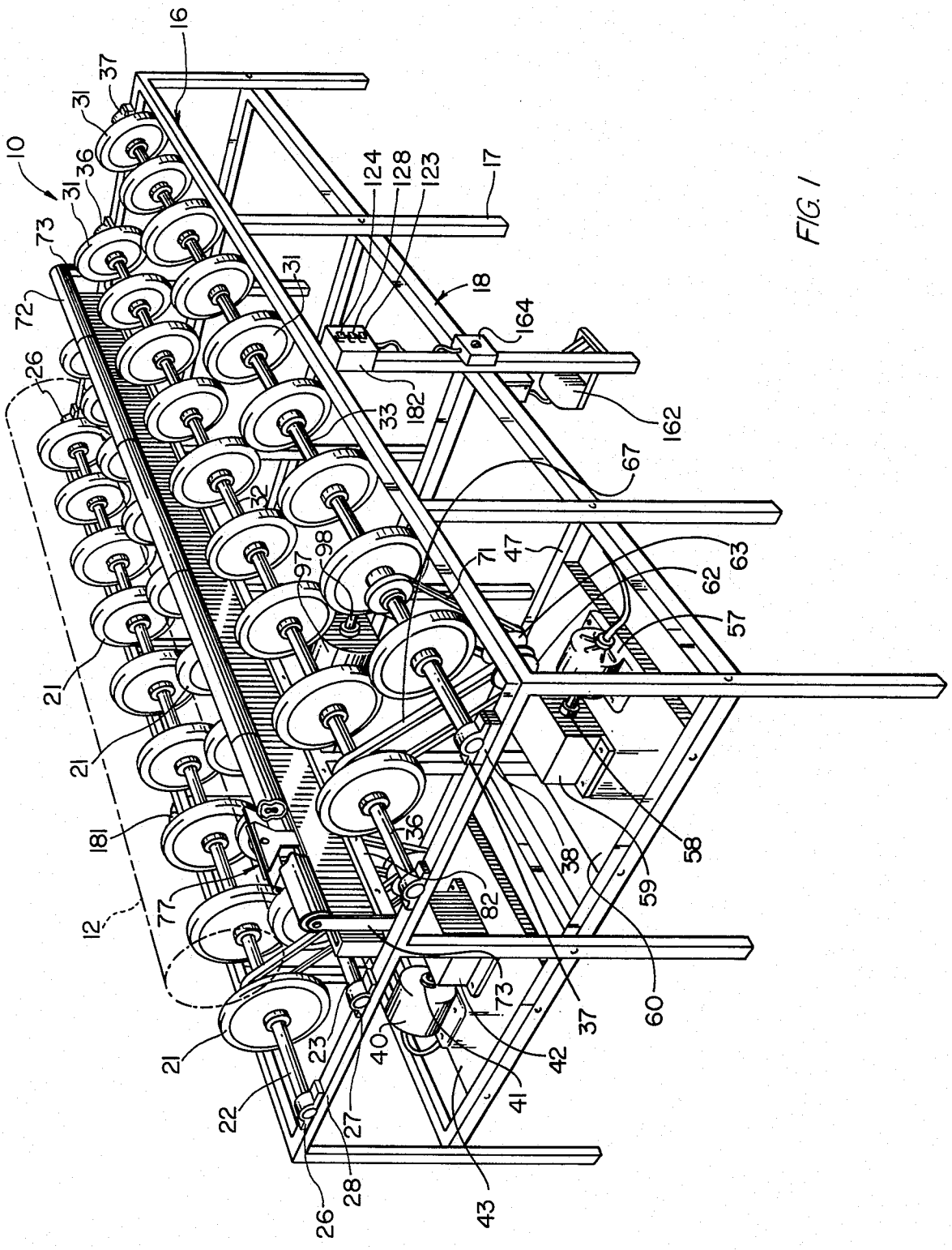

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FIG. 1

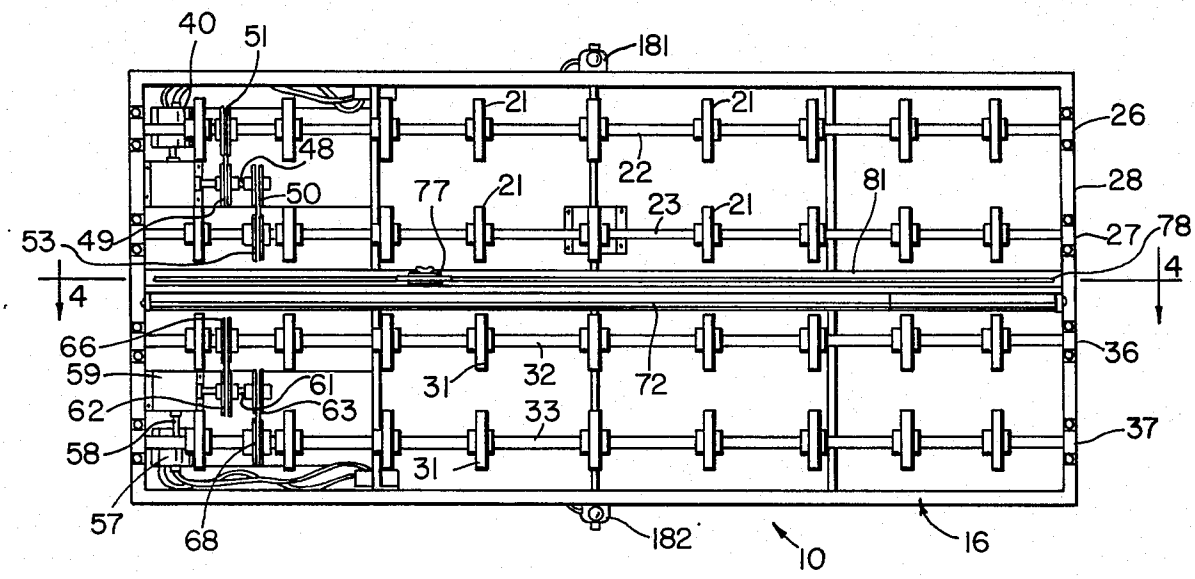


FIG. 2

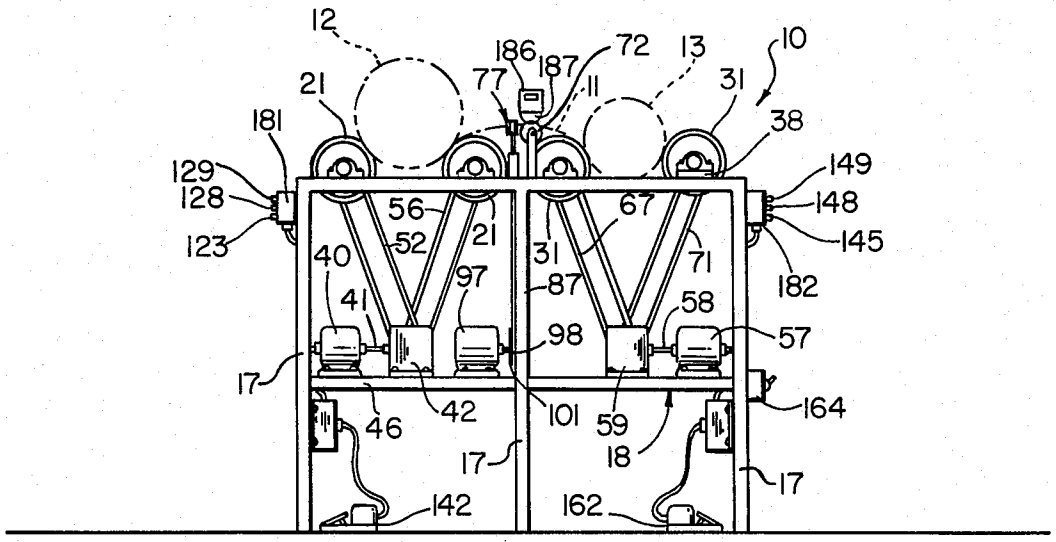


FIG. 3

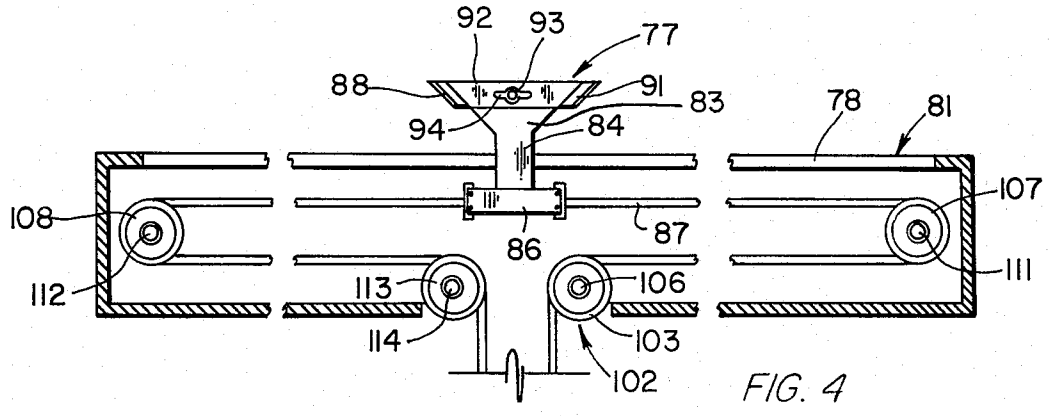


FIG. 4

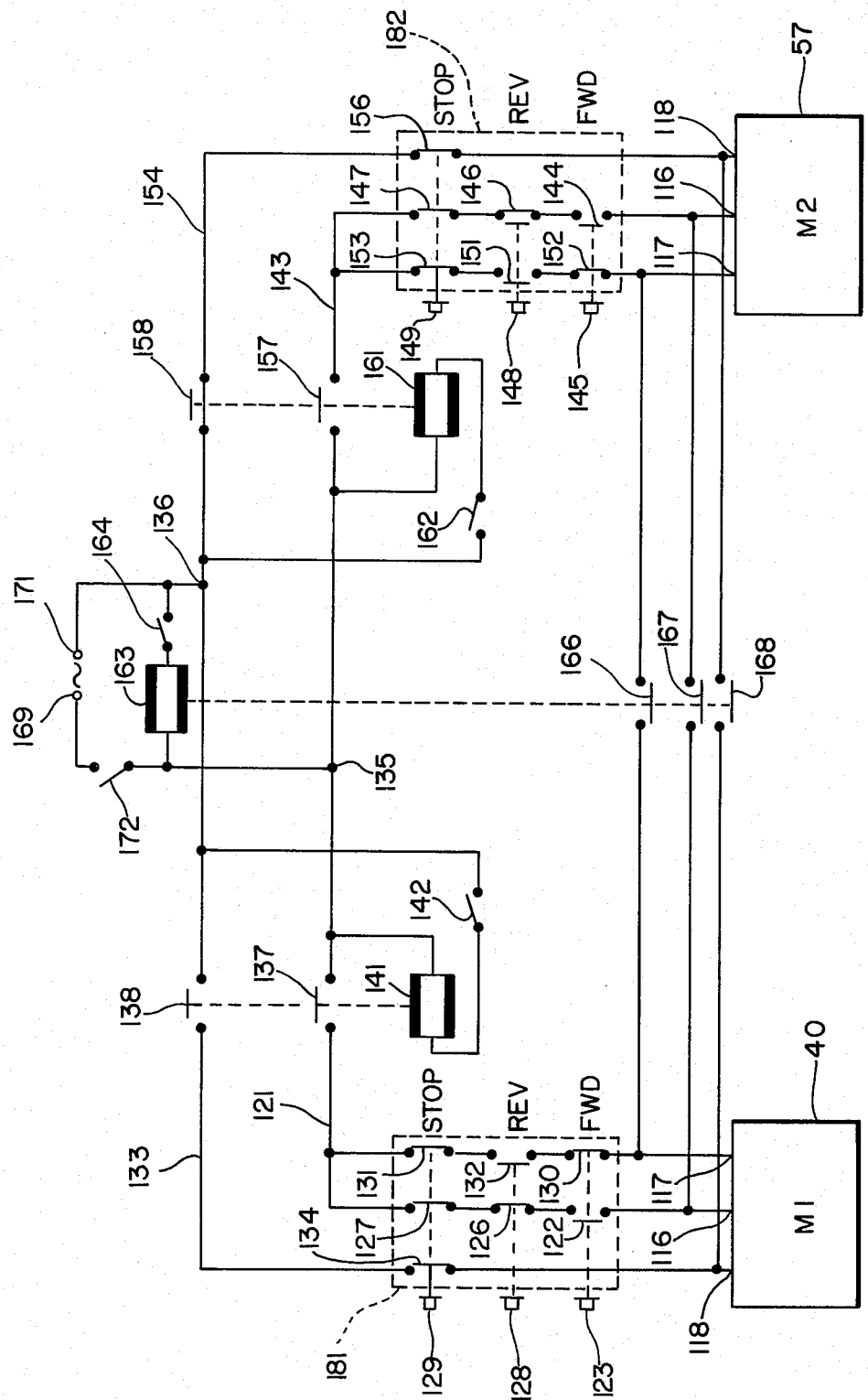

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FIG. 5

ROLL-WINDING APPARATUS

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to roll winding apparatus and, more particularly, to an apparatus for unwinding a measured length of rolled material from a supply thereof and rolling the unwound material.

2. Technical Considerations and Prior Art

U.S. Pat. No. 3,386,678 to F. A. Malone (hereinafter, "Malone '678"), which is specifically incorporated by reference herein, discloses a roll winding apparatus including a pair of elongated rollers mounted on a pivotal carriage for rotatably supporting a supply of rolled material, for example, linoleum, to facilitate the unwinding thereof, and first and second sets of spaced rollers for receiving and supporting the unwound material therebetween to take-up the unwound material. The take-up rollers are driven unidirectionally to unwind a predetermined amount of the supply of rolled material and to wind the material upon itself or a suitable tubular core into a roll while the length of the unrolled material is measured. The rewound material is held in engagement with the take-up rollers during rewinding by a retractable holddown device.

The second set of take-up rollers are slightly elevated. As the take-up rollers are driven, the rolled material is unwound from the supply and passed over a plurality of coaxial spaced rotatably mounted guide rollers which guide the unwound material onto the take-up rollers.

The uppermost portions of the guide rollers are disposed at a lower elevation than the uppermost portions of the take-up rollers. If the material being unwound has a relatively high degree of stiffness, as, for example, linoleum, the set of take-up rollers nearest the guide roller over which the material is advanced causes portions of the material on either of the first set of take-up rollers to bend slightly downward. Therefore, a holddown device was necessary to prevent the material from unwinding while supported on the take-up rollers.

It has been discovered that if the material is delivered onto the take-up rollers from a point elevated with respect thereto such that the material is fed between the take-up rollers tangent to a point on the first set of take-up rollers which is lower than the uppermost portions of the first set of take-up rollers, without contacting the uppermost portions of the first set of take-up rollers, no holddown device is required.

It has further been determined that larger material supplies may be unwound and rewound quickly and efficiently if the supply is supported on rollers similar to the take-up rollers and both the supply rollers and the take-up rollers are driven at a constant speed. Driving both the supply rollers and the take-up rollers greatly facilitates the unwinding of material from larger rolls thereof, for example, rolls which may be 12 feet or more in axial length and containing several hundred feet of material.

Additionally, the cutting means shown in Malone '678 included an elongated saw blade which was reciprocably driven by a motor through a crank arm. It has also been determined that a cutter mounted for rectilinear movement transversely of the path of the material and provided with back-to-back removeable blades, can sever the material between the supply and the take-up roll more efficiently by driving the cutter from a position on one side of the material to a position on the other side of material in a rectilinear path transverse to the direction of movement of the material between the rolls.

SUMMARY OF THE INVENTION

One object of the present invention is to provide a new and improved apparatus for unwinding a predetermined length of rolled material from a supply thereof and rolling the unwound material, wherein a holddown means for the unwound material being rolled is unnecessary.

Another object of the present invention is to provide a new and improved apparatus for unwinding a predetermined length of rolled material from a supply thereof and rolling the unwound material wherein large, heavy rolls of material may be accommodated.

A further object of the present invention is to provide a new and improved apparatus for unwinding a predetermined length of rolled material from a supply thereof and rolling the unwound material, wherein both the supply and the unwound material being rolled are driven positively and in synchronism at a constant speed.

A further object of the present invention is to provide a new and improved apparatus for unwinding a predetermined length of rolled material from a supply thereof and rolling said unwound material wherein the predetermined length of the material may be severed from the supply utilizing a cutter capable of severing the material along a linear path transverse to the path of the material between the rolls from one edge of the material to the other and vice-versa.

An apparatus for unwinding a predetermined length of roller material from a supply thereof and rolling the unwound material, in accordance with the principles of the present invention, may include first and second sets of supply rollers for rotatably supporting the supply of rolled material therebetween, first and second sets of take-up rollers, spaced from the supply rollers for rotatably supporting the rolled material unwound from the supply therebetween, means for driving the take-up rollers to roll the unwound material; and guide means, interposed between the supply rollers and the take-up rollers, for guiding the unwound material from the supply rollers and between the take-up rollers and elevated a sufficient distance above the first set of take-up rollers to prevent the unwound material from contacting the first set of take-up rollers until the material has passed over their uppermost portions to prevent any tendency of the material to unwind.

BRIEF DESCRIPTION OF THE DRAWINGS

A complete understanding of the present invention can be obtained from the following detailed description of a preferred embodiment thereof when read in conjunction with the accompanying drawings, wherein:

FIG. 1 is a perspective view of a roll winding apparatus in accordance with the principles of the present invention;

FIG. 2 is a plan view of the roll winding apparatus of FIG. 1;

FIG. 3 is a side elevational view of the apparatus of FIG. 1;

FIG. 4 is an enlarged fragmentary sectional view of a portion of the apparatus of FIG. 1, taken along the lines 4—4 of FIG. 2; and

FIG. 5 is an electrical schematic diagram of a control circuit for driving a pair of drive motors for the roll winding apparatus of FIG. 1.

DETAILED DESCRIPTION

Referring to FIGS. 1, 2 and 3, there is shown a roll winding apparatus 10 for unwinding a predetermined length of rolled material 11 (FIG. 3) from a supply 12 thereof and rolling the unwound material into a roll 13. The material 11 may be, for example, linoleum or the like, characterized by a high degree of stiffness whereby the material 11 has the tendency to retain a curled or rolled shape when it is removed from the supply roll 12.

The apparatus 10 includes an upper frame member 16 having a plurality of spaced supporting legs 17—17 depending therefrom and an intermediate frame member 18 secured to the legs 17—17 in a plane parallel to the plane of the upper frame member 16. A plurality of supply or payoff rollers 21—21, for supporting the supply roll 12 therebetween, are supported in aligned, spaced relationship on first and second parallel shafts 22 and 23 to which the rollers 21—21 are keyed.

The shafts 22 and 23 are journaled at their opposite ends in two pairs of pillow blocks 26—26 and 27—27, respectively, secured to a pair of end braces 28—28 of the upper frame member 16. Similarly, a plurality of take-up rollers 31—31 for supporting the roll 13 therebetween, are supported in aligned, spaced relationship on two shafts 32 and 33 to which the rollers 31—31 are keyed. The shafts 32 and 33 are journaled at their opposite ends in two pairs of pillow blocks 36—36 and 37—37, respectively. The pillow blocks 36—36 are secured directly to the end braces 28—28 of the frame member 16, while the pillow blocks 37—37 are secured to the end braces 28—28 through a pair of spacers 38—38. The spacers 38—38 elevate the set of take-up rollers 31—31 secured to the shaft 33 above the set of take-up rollers 31—31 secured to the shaft 32 and the supply rollers 21—21. This arrangement is similar to that disclosed in Malone '678.

The two sets of supply rollers 21—21 are driven by a first motor 40 having an output shaft 41 coupled to a first speed reducer 42, both mounted on a plate 43 secured between an end brace 46 and a cross brace 47 of the intermediate frame member 18. An output shaft 48 of the speed reducer 42 is provided with first and second spaced drive pulleys 49 and 50 (FIG. 2). The pulley 49 is driveably connected to a pulley 51 keyed to the shaft 22, through a timing belt 52. Similarly, the pulley 50 is driveably connected to a pulley 53 keyed to the shaft 23, through a timing belt 56.

The take-up rollers 31—31 are driven by a second motor 57 having an output shaft 58 coupled to a second speed 59 speed reducer mounted on a plate 60 secured between the end brace 46 and the cross brace 47. An output shaft 61 of the speed reducer 59 is provided with first and second spaced drive pulleys 62 and 63. The pulley 62 is driveably connected to a pulley 66, keyed to the shaft 32, through a timing belt 67. Similarly, the pulley 63 is driveably connected to a pulley 68 keyed to the shaft 33, through a timing belt 71.

A guide means 72, which may be, for example, a plurality of rollers, but is preferably a single continuous roller, is rotatably supported in an elevated position between the supply rollers 21—21 and the take-up rollers 31—31 between a pair of brackets 73—73 secured to the end braces 28—28 of the upper frame member 16.

The guide roller 72 serves to guide the unwound material 11 advanced from the supply roll 12 between the take-up rollers 31—31. The elevation of the guide roller 72 with respect to the first set of take-up rollers 31—31 mounted on shaft 32 permits the material 11 initially to engage the first set of take-up rollers 31—31 at a point tangent to the first set of rollers 31—31 and between the sets of take-up rollers, below the uppermost portion of the first set of rollers 31—31. This arrangement avoids the possibility that the weight or stiffness of the material between the guide roller 72 and the first set of take-up rollers 31—will act as a lever, with the uppermost portions of the first set of take-up rollers 31—31 acting as a fulcrum such as to prevent the material 11 from winding upon itself when it is supported between the sets of take-up rollers 31—31.

This latter feature is considered of primary importance, and varies from the arrangement in Malone '678 where the uppermost portion of the guide is lower than the uppermost portions of the first set of take-up rollers. Thus, the elevation of the guide roller 72 permits the material 11 be rolled itself as shown at 13 between the two sets of take-up rollers 31—31 without the necessity of providing a complex holddown mechanism of the type disclosed in Malone '678 where the material being guided onto the take-up rollers had to advance up and over the first set of take-up rollers and thus had the tendency to unwind.

In the present apparatus the guide roller 72 is elevated so that its uppermost portion lies in a plane elevated from the plane in which the uppermost portions of the first set take-up rollers 31—31 are situated. Any tendency of material 11 to recurve around the guide roller is thus avoided.

A cutter 77 is mounted for movement rectilinearly in two opposite directions in a slot 78 formed in an elongated enclosure 81 supported on a longitudinal center brace 82 of the upper frame member 16.

As shown in FIG. 4, the cutter 77 includes a trapezoidal mounting plate 83 depending from which is a support plate 84 attached to a clamping means 86 through which the cutter 77 is attached to an endless carrier 87 which may be a belt or chain.

First and second oppositely facing cutting blades 88 and 91 are mounted in the cutter 77 by a clamping plate 92 disposed over a threaded stud 93. The clamping plate 92 is held in place on the mounting plate 83 by a wing nut 94 threaded onto the stud 93.

Referring to FIG. 3, a cutter driving motor 97 has an output shaft 98 upon which is mounted a pulley or sprocket 101 around which the endless carrier 87 is trained. The carrier 87 passes upwardly through an aperture 102 formed in the underside of the enclosure 81, partially around a guide sheave 103 rotatably mounted on a shaft 106 supported within the enclosure 81, and around a pair of guide sheaves 107 and 108 spaced at opposite ends within the enclosure 81 and rotatably mounted on shafts 111 and 112, respectively, supported within the enclosure 81. The carrier 87 is thereafter passed partially around a guide sheave 113 aligned with the guide sheave 103 and rotatably mounted on a shaft 114 supported within the enclosure 81 and outwardly through the aperture 102 and around the pulley 101 on the output shaft 98 of the motor 97.

When the motors 40 and 57 are not energized and the motor 97 is energized driving the output shaft 98 thereof, the cutter 77 is moved along the path of the slot 78 formed in the enclosure 81 in a direction trans-

verse to the direction in which the material **11** was advanced. The height of the blades **88** and **91** is such that the cutting edges thereof, are aligned with the material **11** such that the material may be severed transversely either by the blade **88** when the cutter **77** moves from a position at the extreme right of the slot **78** to a position on the extreme left thereof, or by the blade **91** when the cutter moves from a position at the extreme left of the slot **78** to a position on the extreme right thereof. The cutter **77** is not actuated until the motors **40** and **57** are de-energized. This occurs when a predetermined length of the material **11** is rewound onto the roll **13** from the roll **12.**

The mounting plate **83** is preferably disposed at an angle to the plate **84** such that the blades **88** and **91** cut the material **11** in an oblique plane. Additionally, as shown in FIG. **4,** the blades **88** and **91** are disposed at a predetermined angle to avoid tearing the material **11.**

FIG. **5** shows a simplified electrical schematic diagram of the control system for the apparatus **10.** Each of the motors **40** and **57** is preferably a fractional horsepower A.C induction motor provided with forward and reverse inputs **116** and **117** and a common input **118** respectively. When electrical driving potential is applied between the forward input **116** and the common input **118** of either motor **40** or **57** the motor is driven in a forward direction, driving the rollers **21—21** or **31—31** clockwise in FIGS. **1** and **3** to advance the material **11** from the supply roll **12** to the take-up roll **13.**

When the driving potential is applied between the reverse input **117** and the common input **118** of either motor **40** or **57,** the motor is driven in a reverse direction to drive the rollers **21—21** or **31—31** counter-clockwise in FIGS. **1** and **3,** to advance the material **11** from the take-up roll **13** to the supply roll **12.**

The forward input **116** of the motor **40** is connected to a line **121** through a normally-open contact **122** of a push-button switch **123** and normally-closed contacts **126** and **127** of a pair of push-button switches **128** and **129.** The reverse input **117** of motor **40** is connected to the line **121** through a pair of normally-closed contacts **130** and **131** of the push-button switches **123** and **129,** respectively, and a normally-open contact **132** of the push-button switch **128.**

The common input **118** of the motor **40** is connected to a line **133** through a contact **134** of the push-button switch **129.** The lines **121** and **133** are connected to a pair of terminals **135** and **136** through first and second normally-open contacts **137** and **138,** respectively, of a relay **141** connected between the terminals **135** and **136** through a foot-pedal switch **142.**

Similarly, the forward input **116** of the motor **57** is connected to a line **143** through a normally-open contact **144** of a push-button switch **145** and a pair of normally-closed contacts **146** and **147** of a pair of push-button switches **148** and **149,** respectively. The reverse input **117** of the motor **57** is connected to the line **143** through a normally-open contact **151** of the push-button switch **148** and a pair of normally-closed contacts **152** and **153** of the push-button switches **145** and **149,** respectively. The common input **118** of the motor **57** is connected to a line **154** through a normally-closed contact **156** of the push-button switch **149.**

The lines **143** and **154** are connected to the terminals **135** and **136** through a pair of contacts **157** and **158,** respectively, of a relay **161** which is connected across the terminals **135** and **136** through a foot-pedal switch **162.**

A relay **163** is connected across the terminals **135** and **136** through a control switch **164.** The forward, reverse and common inputs **116, 117** and **118** of the motors **40** and **57** are connected, respectively, through three normally-open contacts **166, 167** and **168** of the relay **163.** A source of electrical energy, for example, a 120v, 60hz. source of alternating current, is connected to a pair of terminals **169** and **171.** The terminal **169** is connected to the terminal **135** through a power switch **172,** while the terminal **171** is directly connected to the terminal **136.**

When the power switch **172** is closed the terminals **135** and **136** are energized. This permits the motors **40** and **57** to be controlled individually or jointly by a single operator if the switch **164** is closed.

If the power switch **172** is closed and the control switch **164** is open, the motor **40** may be controlled individually by selectively actuating either of the switches **123** or **128** to condition the motor **40** for either forward or reverse operation and thereafter actuating the foot-pedal switch **142,** connecting the relay **141** across the terminals **135** and **136** to energize the relay **141,** closing the contacts **137** and **138** thereof, to energize the lines **121** and **133,** respectively. If the switch **122** is closed, energy will be supplied to the forward input **116,** of the motor **40** through contacts **122, 126** and **127,** and to the common input **118** through contact **134,** to drive the motor **40** in a forward direction, driving the rollers **21—21** clockwise in FIGS. **1** and **3.**

If switch **128** is closed the actuation of the foot-pedal switch **142** will cause the inputs **117** and **118** of the motor **40** to be energized through the contacts **130, 131, 132** and **134,** driving the rollers **21—21** in the reverse or counter-clockwise direction in FIGS. **1** and **3.** It can be seen from FIG. **5** that the contacts **130** and **126** of the switches **123** and **128,** respectively, act as lock-out contacts for the forward and reverse inputs **116** and **117** of the motor **40** to prevent simultaneous actuation of the switches **123** and **128** from having any effect.

Simialrly, the switch **145** or **148** may be selectively closed to condition the motor **57** for forward or reverse operation upon the actuation of the foot pedal switch **162,** which energizes the relay **161** closing the normally-open contacts **157** and **158** thereof, to energize the lines **143** and **154.**

If the switch **145** is closed when the foot pedal switch **162** is actuated the inputs **116** and **118** of the motor **57** are energized through the contacts **144, 146, 147** and **156** to drive the take-up rollers **31—31** in the forward direction, clockwise as shown in FIGS. **1** and **3.** Similarly, if the switch **148** is closed when the foot pedal switch **162** is actuated, inputs **117** and **118** of the motor **57** will be energized through the contacts **151, 152, 153** and **156** to drive the motor **57** in a reverse direction driving the rollers **31—31** counter-clockwise as shown in FIGS. **1** and **3.**

If it is desired to stop either the motor **40** or **57** it is merely necessary to depress either the push-button switch **129** or the push-button switch **149.** Actuation of the switch **129** disconnects the lines **121** and **133** from the inputs **116, 117** and **118** of the motor **40** such that even if the foot-pedal switch **142** is closed the motor **40** is de-energized. Similarly, actuation of the push-button switch **149** disconnects the lines **143** and **154** from the inputs **116, 117** and **118** of the motor **57** to de-energize the motor **57** even when the foot-pedal switch **162** is closed.

The switches 123, 128 and 129 and the switches 145, 148 and 149 may be housed in two enclosures 181 and 182, respectively, positioned on either side of the apparatus 10, for example, as shown in FIGS. 1, 2 and 3, on the supporting legs 17. The operating switches for each motor may be of types other than push-buttons, for example, cam-operated type switches actuated by a lever or the like.

When the control switch 164 is closed the relay 163 is energized, closing the contacts 166, 167 and 168 thereof to connect the forward, reverse and common inputs 116, 117 and 118 of the motor 40 to the forward, reverse and common inputs 116, 117 and 118 of the motor 57, respectively. This permits the motors 40 and 57 to be operated in synchronism by a single operator located on either side of the apparatus 10. Thus, for example, an operator on the left side of the apparatus 10 as shown in FIG. 3 can operate both the motors 40 and 57 to drive the rollers 21—21 and 31—31 clockwise by actuating push-button switch 123, conditioning the motors 40 and 57 for operation in the forward direction when the foot-pedal switch 142 is actuated, energizing the relay 141 to close the contacts 137 and 138 thereof to energize the inputs 116 and 118 of the motor 40 directly and to energize the inputs 116 and 118 of the motor 57 through the relay contacts 167 and 168, respectively. Similarly, when the switch 128 is closed, the inputs 117 and 118 of the motor 41 are energized in the normal manner, while inputs 117 and 118 of the motor 57 are energized through the relay contacts 166 and 168.

It can be seen from FIG. 5 that an operator on the right side of the apparatus 10 as shown in FIG. 3 could operate both of the motors 41 and 57 by the operation of push-button switches 145 or 148 and the actuation of the foot pedal switch 162. If the switch 145 is closed, actuation of the foot-pedal switch 162 energizes the relay 161 to close the contacts 157 and 158 thereof, energizing the inputs 116 and 118 of the motor 57 directly and energizing the inputs 116 and 118 of the motor 41 through the contacts 167 and 168, respectively. Similarly, if the switch 147 is closed, upon the actuation of the foot-pedal switch 162, the inputs 117 and 118 of the motor 57 are energized in the normal manner, while the inputs 117 and 118 of the motor 41 are energized through the relay contacts 166 and 168, respectively.

The control switch 163 may be placed on the framework of the apparatus 10 at any place convenient to both operators or may be placed below the enclosure 181 or 182 on either side of the apparatus 10, as shown in FIG. 3.

As disclosed in Malone '678, a footage counter 186 driven by a wheel 187 (FIG. 3 only) in contact with the material 11 fed from the supply roll 12 to the take-up roll 13 may be provided in order to determine the precise length of material 11 taken up.

In operation, the supply roll 12 is supported longitudinally between the supply rollers 21—21, with its axis parallel to the axis of the supply rollers 21—21. The leading end of the material 11 on the supply roll 12 is passed over the guide roller 72 and is advanced downwardly between the two sets of take-up rollers 31—31. The supply roll 12 may be placed on the supply rollers 21—21 by an automatic apparatus or through a suitable mechanical conveyor, for example, a forklift truck or the like. The material unwound from the supply roll 12 and rewound on the take up roll 13 may be rewound on a suitable tubular core, as taught in Malone '678, or the material 11 may be rewound upon itself into the roll 13.

The power switch 172 is closed to energize the terminals 135 and 136 from the energy source appearing at the terminals 169 and 171. The control switch 164 is closed to energize the relay 163, closing the contacts 166, 167 and 168 to condition the control circuit of FIG. 5 for joint operation of the motors 40 and 57 by a single operator who selectively closes either the switch 123 or the switch 145 to condition both of the motors 40 and 57 for operation in the forward direction. The operator thereafter actuates either the foot-pedal switch 142 or 162 to energize either the relay 141, closing the normally-opened contacts 137 and 138 thereof, to energize the inputs 116 and 118 of the motor 40 in the normal manner and the motor 57 through the contacts 167 and 168 of the relay 163, or the relay 161, closing the contacts 157 and 158 thereof to energize the inputs 116 and 118 of the motor 57 in the normal manner and the inputs 116 and 118 of the motor 40 through the contacts 167 and 168 of the relay 163.

The material 11 is advanced from the supply roll 12 to the take-up roll 13 until a predetermined amount thereof, as indicated by the counter 186, has been rewound. Thereafter, the operated one of the foot-pedal switches 142 or 162 is released to de-energize the relay 141 or 161, opening the contacts 137 and 138 or 157 and 158, respectively, thereof, to de-energize the motors 40 and 57. The cutter drive motor 97 is then actuated to move the cutter 77 longitudinally from a position on one side of the apparatus 10 to a position on the other side thereof, severing the material 11 transversely of the direction in which it was advanced. Thereafter, the switch 164 may be opened to de-energize the relay 163 opening the contacts 166, 167 and 168 thereof, to condition the control circuit of FIG. 5 for the individual operation of the motors 40 and 57. If the foot-pedal switch 162 is closed to actuate the relay 161 closing the contacts 157 and 158 energizing the inputs 116 and 118 of the motor 57, which is still conditioned for forward operation, the trailing edge of the material 11 between the rewound roll 13 and the cutter 77 will be taken up so that the predetermined amount of the material 11 is completely wound upon take-up roll 13. The roll 13 is then removed and may be stored or shipped as desired.

Though it is preferable to utilize both drive motors 40 and 57 to unwind and rewind the material 11, it will be appreciated that the motor 40 and the drive elements associated therewith may be eliminated from the apparatus 10 and the motor 57 alone may be depended upon for unwinding and rewinding the material 11, especially for smaller rolls of material.

Further predetermined lengths of the material 11 may be unwound from the supply roll 12 and rewound. If it is desired to replaced the supply roll 12 with a different supply roll, the leading edge of the material 11 between the supply roll 12 and the cutter 77 may be rewound back on the supply roll 12 closing the switch 128 and actuating the foot-pedal switch 142 to energize the relay 141, closing the contacts 137 and 138 thereof, to energize the inputs 117 and 118 of the motor 40 driving the motor 40 in the reverse direction to rotate the supply rollers 21—21 clockwise as shown in FIGS. 1 and 3 until the leading edge of the material 11 between the supply roll 12 and the cutter 77 has been rewound back upon the supply roll 12. Thereafter, the

supply **12** may be removed and replaced with a supply roll **12** of another material or a material having a different design or the like.

To aid in the removal of the supply roll **12** or the take-up roll **13**, the apparatus **10** may be advantageously provided with lifting or elevator mechanisms (not shown) of a type similar to the type shown and described in Malone '678.

While the operation apparatus of the invention has been described in foregoing detailed description as being suitable for unwinding and rolling predetermined lengths of linoleum, it will be appreciated that the apparatus is suitable for use with other materials which are wound in a similar manner and that various changes and other modifications can be made in the invention without departing from the spirit and scope of the invention.

What is claimed is:

1. An apparatus for unwinding a predetermined length of rolled material from a supply thereof and rolling the unwound material, which comprises:

first and second sets of parallel horizontal supply rollers for rotatably supporting the supply of rolled material therebetween;

first and second sets of parallel horizontal take-up rollers, parallel to and spaced first and second distances, respectively, away from said supply rollers, for rotatably supporting the unwound material therebetween;

means spacing said second set of take-up rollers above said first set of take-up rollers;

an elongated guide roller means, parallel to and interposed between said supply rollers and said take-up rollers and adjacent to said first set of take-up rollers for guiding the unwound material onto said take-up rollers;

means supporting said guide roller means a sufficient distance above said supply rollers and said take-up rollers to prevent the unwound material from contacting said first set of take-up rollers until the material has passed over the uppermost portions of said first set of take-up rollers, to prevent any tendency of the material to unwind itself; and

means for driving said take-up rollers to roll said unwound material.

2. An apparatus as defined in claim **1** and including:

cutter means comprising a support, means for mounting a pair of blades on said support in aligned relationship with the cutting edges thereof facing opposite directions;

means mounting said cutter for rectilinear movement in said opposite directions along a path between said supply rollers and said elongated guide roller means adjacent and parallel to said guide roller means and transverse to the direction in which the material is unwound; and

means for selectively driving said cutter in said opposite directions along said path to sever the unwound material from the supply in either direction.

3. An apparatus according to claim **1** wherein the axes of said supply rollers and said first set of take-up rollers lie in a common horizontal plane.

4. An apparatus according to claim **2** wherein each of said blades is mounted at a predetermined angle.

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