Oct. 29, 1968 R. S. BENDER ET AL 3,407,565

ROLL WRAPPER

Filed Aug. 31, 1965 6 Sheets-Sheet 1

Fig. 1

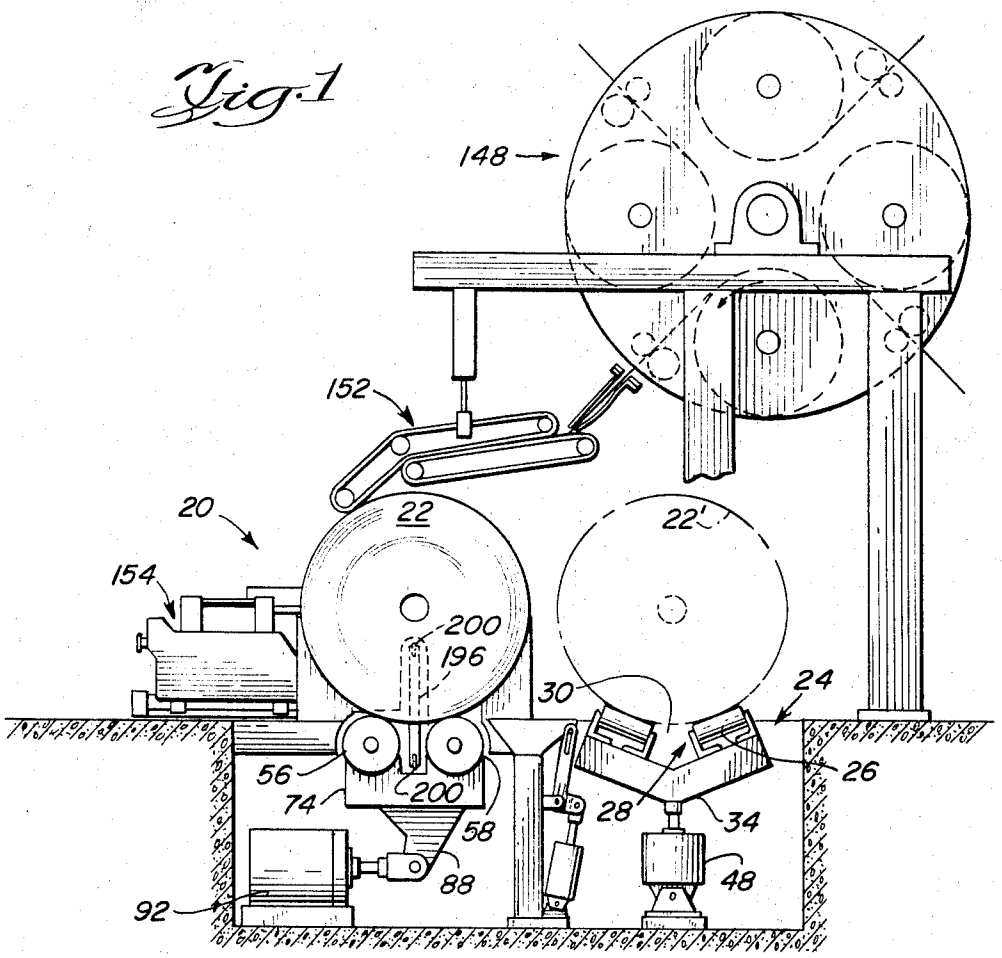
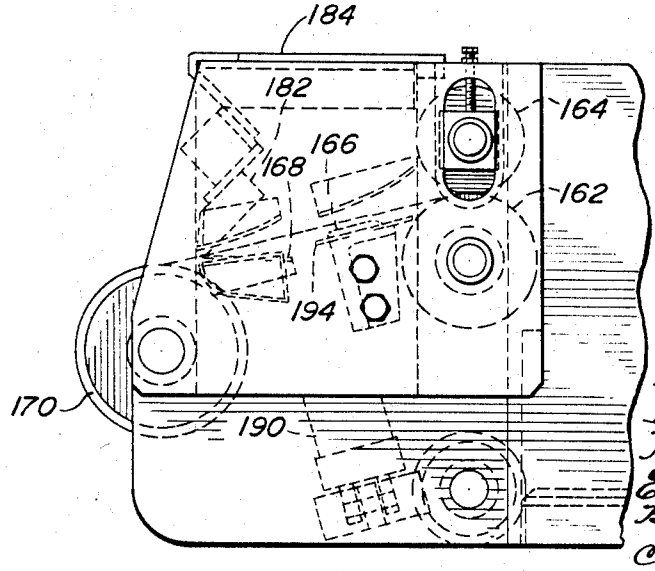


Fig. 9



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ROLL WRAPPER

Filed Aug. 31, 1965 6 Sheets-Sheet 2

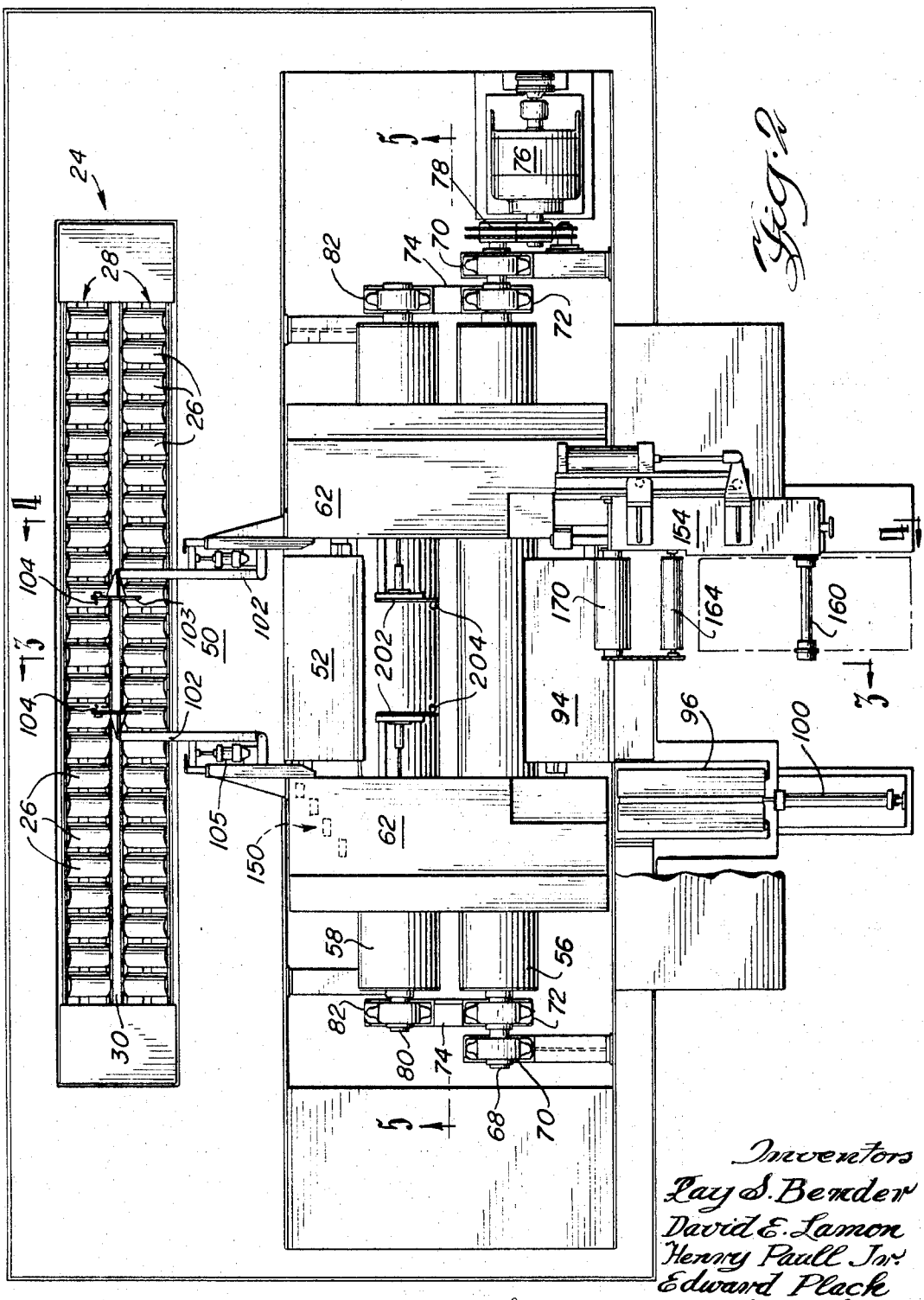

Fig. 2

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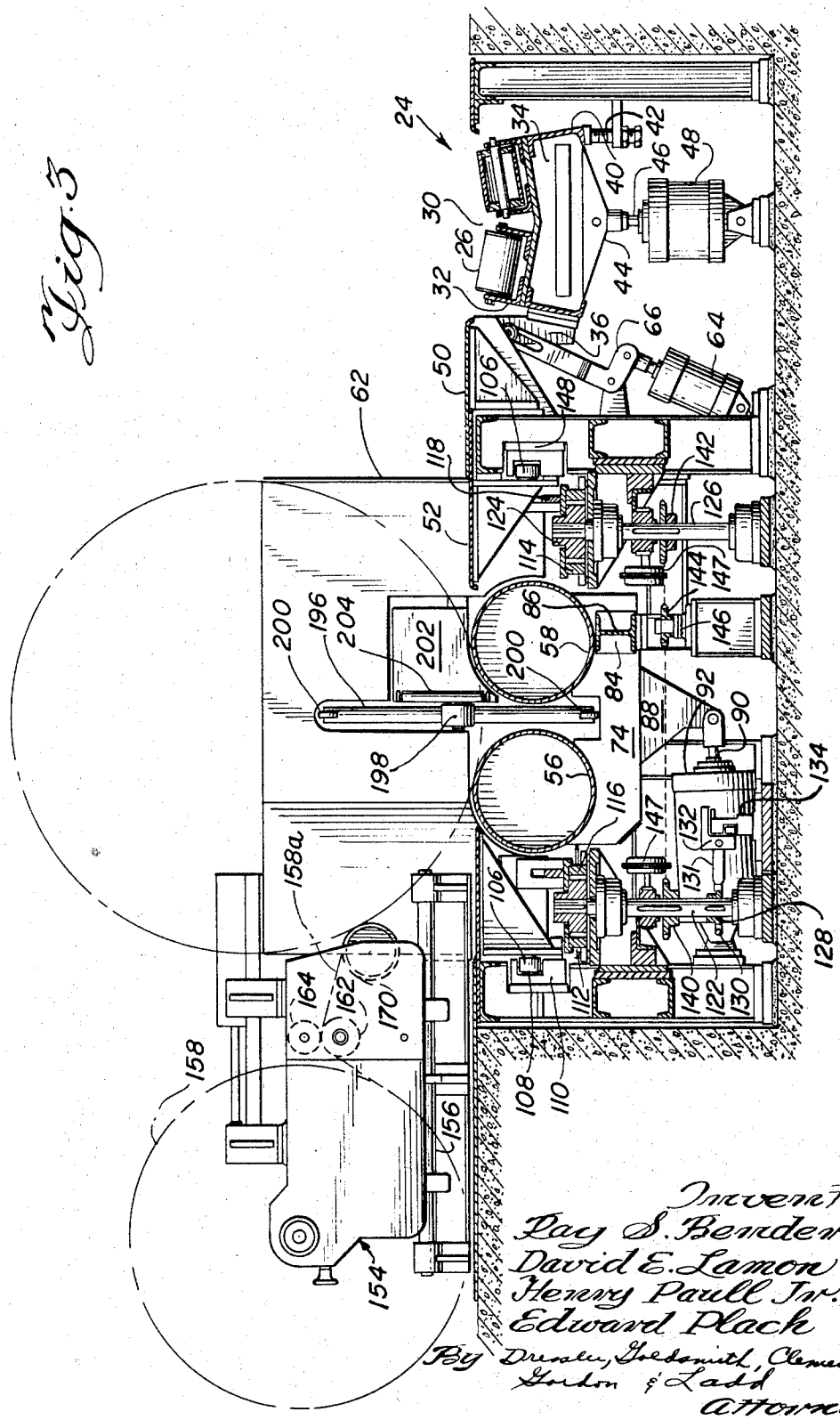
ROLL WRAPPER

Filed Aug. 31, 1965 6 Sheets-Sheet 3

Fig. 3



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ROLL WRAPPER

Filed Aug. 31, 1965 6 Sheets-Sheet 4

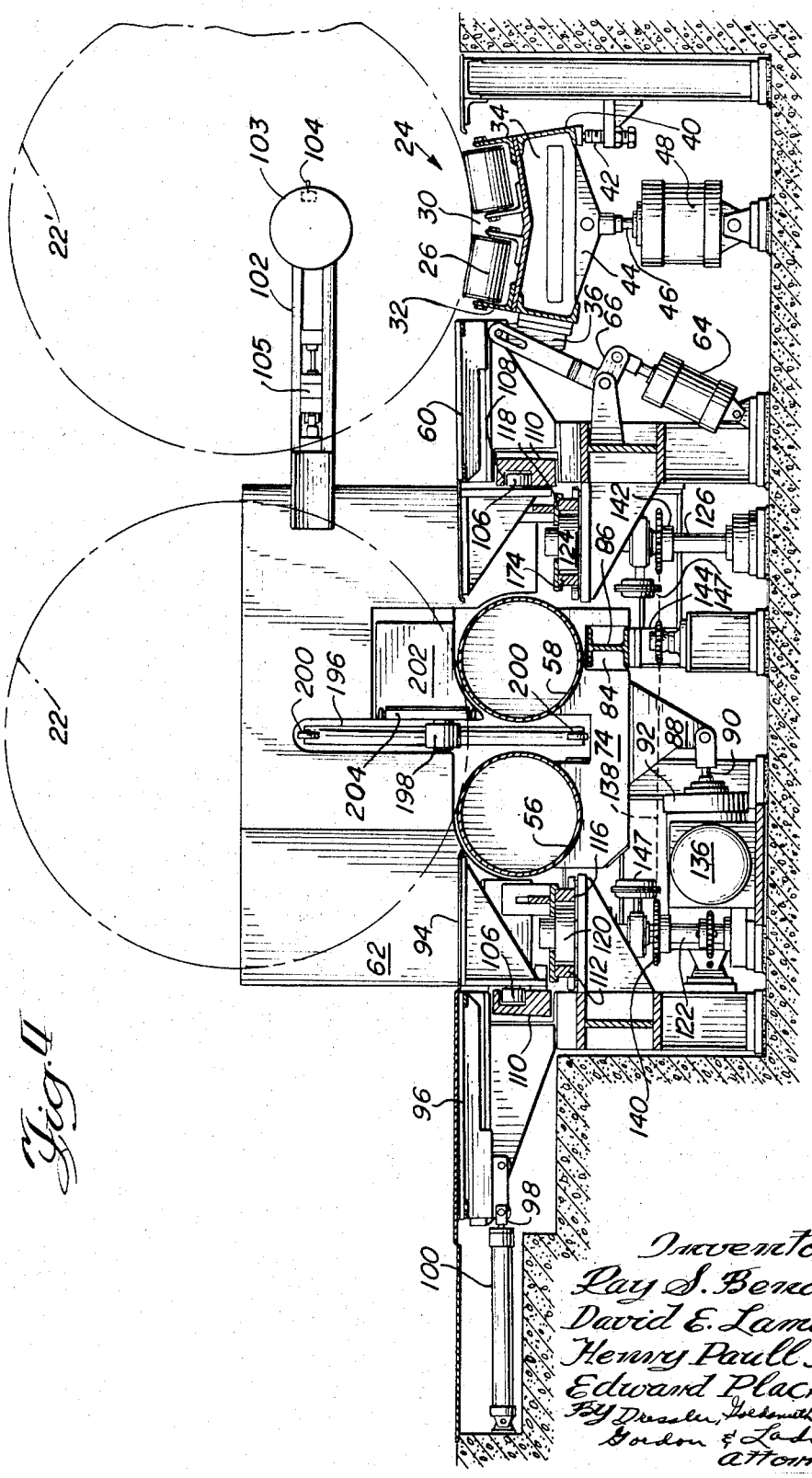

Fig. 11

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ROLL WRAPPER

Filed Aug. 31, 1965 6 Sheets-Sheet 5

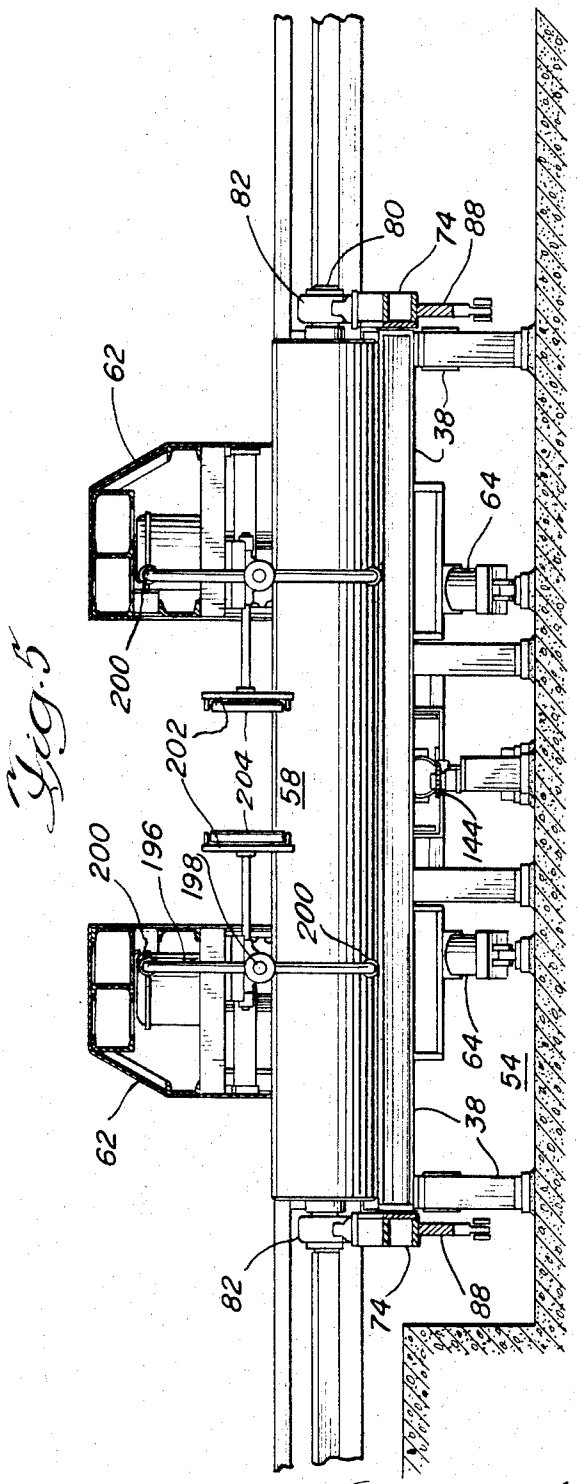

Fig. 5

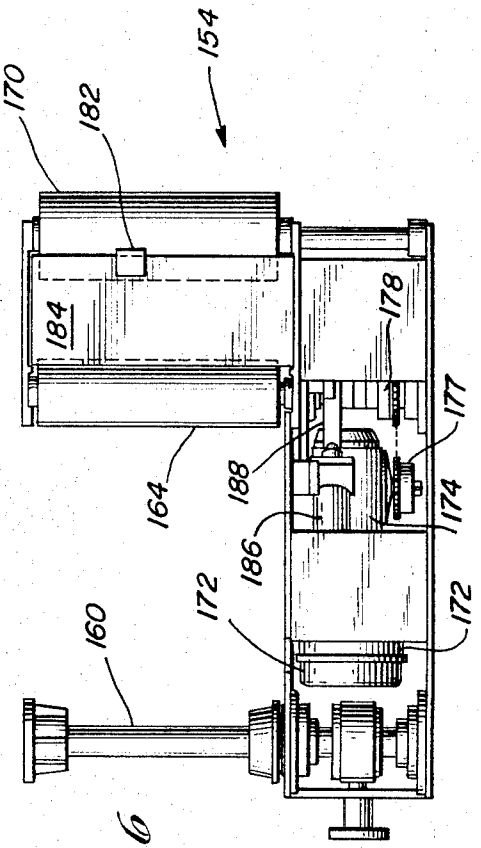

Fig. 6

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Oct. 29, 1968 R. S. BENDER ETAL 3,407,565

ROLL WRAPPER

Filed Aug. 31, 1965 6 Sheets-Sheet 6

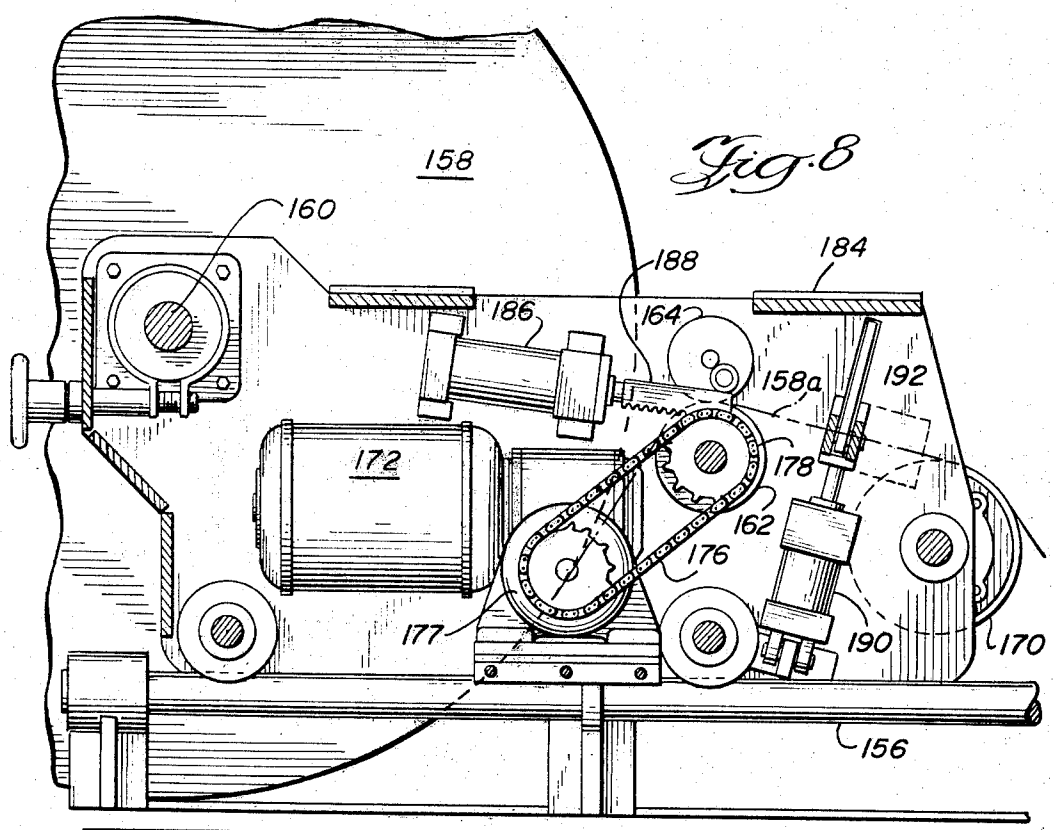

Fig. 8

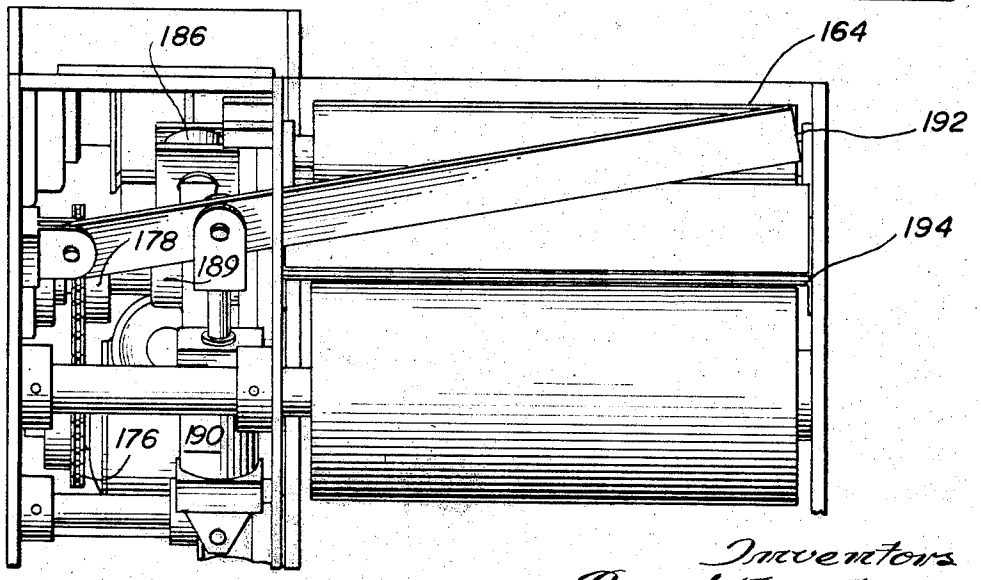

Fig. 7

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3,407,565

ROLL WRAPPER

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Filed Aug. 31, 1965, Ser. No. 484,021
6 Claims. (Cl. 53—214)

ABSTRACT OF THE DISCLOSURE

Apparatus for wrapping a cylindrical roll and for tucking and crimping the wrapper against the ends of the roll including an assembly disposed on either side of the roll operable to center the roll relative to said assembly, to properly position banders relative to the roll for applying reinforcing banding to the roll overlapping the ends thereof, and to tuck and crimp the wrapper and overlying banding against the end of the roll.

This invention relates to packaging and more particularly to devices for supplying protective wrapping material to large bodies and for tucking and crimping the wrapping around the bodies.

Many products are manufactured in continuous sheets or webs. These materials, paper for example, are easily formed into large cylindrical bodies. These rolls of material are not only conveniently shaped for storage and shipment, but also provide a ready means of feeding the material for use. Since the investment in each roll of material can be quite substantial, the importance of protecting these rolls from damage prior to utilization cannot be overemphasized. It can be readily seen, for example, that even a small gouge in the surface of a roll of paper can render a substantial portion of the material unfit for use. Similarly, any injury to the rim or edging of such a roll can easily render it unusable since the resulting indentations may severely limit the capability of the material to unwind from the roll.

The desired protection may be provided by suitably encasing the body in an appropriate covering or wrapping. Rolls of the type under consideration typically range in size from two to eight feet in length and have diameters that range from one to six feet. It is readily seen that handling such cumbersome rolls can become quite difficult.

An existing procedure for applying protective coverings to these large rolls includes the following sequence of steps: (1) Manual selection of a wrapper or waterproof paper covering; (2) manual alignment and orientation of the roll with the wrapper, e.g., by rolling the roll onto the wrapper spread out on a flat surface, so that a portion of the wrapper overlaps the ends of the roll; (3) securing the leading edge of the wrapper to the roll; (4) pushing the roll forward until it is enveloped by the wrapper; (5) manual application of reinforcing banding to the wrapped roll with a portion extending over the end of the roll; (6) tucking and crimping the overlapping portions of the wrapper and reinforcing banding over the ends of the roll; and (7) gluing of a header or cover piece to each end of the roll.

It becomes apparent, considering the size of the rolls, that it can be a quite expensive, time-consuming and laborious task just to accurately measure the large pieces of wrapping material required and to accurately position and center the roll with respect to the wrapper. In fact, just moving the immense roll itself is rather strenuous. The difficulties of the job do not end with application of a wrapper since it is also important to accurately position the reinforcing banding on the surface of the roll.

Furthermore, tucking and crimping the banding and wrapper against the end of the roll are also difficult tasks which, if not properly performed, produce an inaccurately positioned, loosely tucked and inconsistently crimped wrapping and, therefore, a poorly protected roll.

In accordance with the present invention, there is provided an apparatus which is capable of operating automatically to wrap securely a roll of paper or similar material with a wrapper and a reinforcing banding. Such an apparatus is also capable of uniformly, quickly and consistently tucking and crimping the portions of the banding and wrapper overlapping the ends of the roll being wrapped. This device also eliminates many of the material handling problems usually associated with large rolls of material and provides for automatic selection of the wrapper to be used.

Use of the present invention can (1) reduce the number of operating personnel, (2) increase their productivity, and (3) eliminate most, if not all, of the manual steps previously necessary to accomplish wrapping and reinforcing of these large size rolls. Thus, the speed and efficiency of an entire assembly line may be increased by use of the present invention due to the time savings resulting from the automatic handling of the roll. Furthermore, once the wrapper is actually applied to the roll, and any reinforcing banding also incorporated, the automatic tucking and crimping of overlapping portions of the wrapping and banding can be accomplished neatly, rapidly, efficiently, effectively and uniformly.

More specifically, an apparatus incorporating the features of the present invention is capable of receiving rolls which vary over wide ranges of size including, but not limited to, rolls having one to six foot diameters and varying in length from about two to about eight feet. A receiving section of the apparatus transversely positions the roll relative thereto. The roll is then ejected from the receiving section into position on a pair of drums for wrapping, tucking and crimping. The roll is rotated by the drums and a pair of tucking and crimping assemblies are properly positioned relative to the ends of the roll. The position of these assemblies controls the operation of a wrapper supply mechanism to select a wrapper of proper size such as will overlap each end of the roll. The wrapper supply mechanism feeds the wrapper to the surface of the roll to which it is attached, and the roll is rotated to cause the wrapper to envelop it.

A bander connected to the tucking and crimping assembly is positioned adjacent the surface of the roll to supply reinforcing banding externally to the wrapper. The primary purpose of this banding is to provide additional protection to the more easily damaged areas of the roll, such as the edges of the roll.

Each tucking and crimping assembly includes a first member which operates to tuck the overlapping portions of the wrapper and banding against the end of the roll and a second member to periodically and uniformly crimp the tucked wrapper and banding portions. Upon completion of the wrapping, tucking and crimping operations, the assemblies are withdrawn from the roll and the roll is discharged to allow for any additional operation desired, such as application of end headers or tagging.

Thus, it is seen that by the present device there is provided an apparatus which is capable of simply and automatically supplying wrapping material to a roll of substantial size. In addition, the apparatus of the present invention is capable of automatically supplying a reinforcing banding and of tucking and crimping the portions of wrapper and banding overlapping the ends of the roll in order to protect the edges of the wrapped roll.

Numerous other advantages and features of the present invention will become readily apparent from the follow-

ing detailed description of the invention and of one embodiment thereof, from the claims and from the accompanying drawings in which each and every detail shown is fully and completely disclosed as a part of this specification, in which like reference numerals refer to like parts, and in which:

FIGURE 1 is a diagrammatic view of an entire roll wrapping, tucking and crimping apparatus embodying the features of the present invention shown in combination with a wrapper supply and feed mechanism suitable for use with the roll wrapper;

FIGURE 2 is a plan view of the roll wrapper apparatus of FIGURE 1;

FIGURE 3 is a side elevational view, partially in section taken along the line 3—3 of FIGURE 2;

FIGURE 4 is another side elevational view partially in section, taken along the lines 4—4 of FIGURE 2;

FIGURE 5 is a front elevational view partially broken away, taken along the lines 5—5 of FIGURE 2;

FIGURE 6 is a plan view of a bander apparatus utilized with the roll wrapper of the present invention;

FIGURE 7 is a front view of the bander;

FIGURE 8 is a side view, partially cut way of the bander; and

FIGURE 9 is a partial side view of the bander taken from the opposite side to that of FIGURE 8.

The overall roll wrapping apparatus **20** is shown with its respective elements in operative relation in FIGURE 1. A cylindrical roll of paper **22** to be wrapped is shown in dotted lines at **22'** positioned in the receiving section **24** of the roll wrapper **20**. The receiving section **24** includes a plurality of free running rollers **26** located just below floor level that are designed to receive and allow transverse positioning of the roll **22'**. The rollers **26** are divided into two sets **28**, the rollers in both sets canted towards each other to form a trough **30** to receive the roll **22'**. The rollers **26**, as clearly shown in FIGURE 3, are each freely supported in a roller rack **32** mounted on a centering table **34**. One side of the table **34** is affixed to an arm **36** pivotally attached to the frame of the roll wrapper **20**. The opposite side of the centering table **34** is supported at its lower corner **40** by an adjustable stop **42**. The bottom **44** of the table **34** is connected to the piston **46** of a compressed air ejection cylinder **48** which, when activated, extends the piston **46** causing the table **34** to pivot on the pivot arm **36** to eject the roll into the roll wrapper across cantilevered floor plates **50**, **52** which cover the machinery pit adjacent the rollers **26** and also adjacent a pair of roller drums **56**, **58**.

Adjustable extender plate **60** (FIGURE 4) also span the gap adjacent the power drums **56**, **58**. These extenders **60** are shown retracted to allow the tucking and crimping assemblies **62** to converge without interference. Positioning of each of the extenders **60** is accomplished by an air cylinder **64** connected to one end of a bell crank **66** which pivots upon actuation of the cylinder **64** to cause reciprocal movement of the extender plates **60** connected to its other end.

When ejected from the receiving section, the roll moves into the machine **20** until it comes to rest on the spaced horizontal roller drums **56**, **58** extending substantially the entire width of the roll wrapping machine **20**. As most clearly shown in FIGURE 2, the shaft **68** of driven drum, shown as drum **56**, although either or both drums may be driven, is supported at either end by a pair of outer pillow blocks **70** attached to the machine frame. A pair of inner pillow blocks **72** which ride on shaft **68** each pivotally support one side of a generally U-shaped discharge yoke **74**. The drum **56** is driven by a motor **76** to which it is coupled through appropriate gearing **78**. The ends of the shaft **80** of the other drum **58**, in this instance an idler drum, are supported in pillow blocks **82** which are each secured in the other side of a discharge yoke **74**.

Referring again to FIGURES 3 and 4, a portion of each yoke **74** is provided with a slot **84** to receive a spacer bar

86 upon which the yoke **74** rests. A linking member **88** extends down from the bottom of each yoke **74** and is connected to a piston rod **90** of a discharge air cylinder **92**. When the cylinders **92** are activated, the yoke assemblies **74** are pivoted about the pillow blocks **72** of the driven drum **56** to discharge the roll **22** from the machine **20** across exit floor plates **94**. Additional retractable extender plates **96** (FIGURE 4) are connected to a piston rod **98** of an air cylinder **100**. When the cylinder **100** is energized, the extender plates **96** are positioned adjacent the exit floor plate **94** to allow long rolls to cross the gap. The plates **96** are retracted to allow inward movement of the tucking and crimping assemblies **62** when narrow rolls are being wrapped.

As may readily be seen from FIGURE 2, the assemblies **62** are equally spaced from a line passing through the center of the apparatus (indicated by section line 3—3). Because of this relationship, it is desirable to transversely center a roll to be wrapped relative to the assemblies **62** before ejecting the roll onto the drums **56**, **58**.

In the disclosed embodiment of the roll wrapper this centering is accomplished while the roll **22'** is in place in the receiving section **24**. A roll in place in the trough **30** defined by the two sets of rollers **28** is transversely centered relative to the tucking and crimping assemblies **62** by a pair of centering arms **102** extending out horizontally from and affixed to the assemblies **62**. As the assemblies **62** converge, one of the arms **102** engages one end of the roll **22'** displacing it transversely along the rollers **26**.

Centering of the roll is completed when both ends of the roll contact the face **103** of each arm **102** and activates a limit switch **104**, mounted on each arm **102**. When both switches **104** are activated, thereby indicating that the centering of the roll is completed, movement of the assemblies ceases. An air cylinder **105** located in each centering arm **102** is energized to open the arms **102** slightly thereby relieving the pressure of the arms **102** against the roll. The roll **22'** may then be freely ejected from the receiving section **24** onto the drums **56**, **58** as described above.

The tucking and crimping assemblies are powered by any suitable means which is capable of imparting equal and opposite lateral movement to the assemblies for centering the roll and which is responsive to activation of the centering arm limit switches for fixing the position of the assemblies. In the disclosed embodiment of the roll wrapper, for example, the tucking and crimping assemblies **62** each ride on a plurality of rollers **106** attached to either side of each assembly. The rollers **106**, in turn, ride in tracks **108** formed in a pair of guide rails **110** traversing the apparatus.

Each assembly is driven in equal and opposite directions through a pair of racks **112**, **114** and **116**, **118** suspended, respectively, from either end of each assembly. The racks **112**, **116** mesh with opposite sides of an upper pinion **120** keyed to a first drive shaft **122** while racks **114**, **118** similarly mesh with another upper pinion **124** keyed to a second drive shaft **126**. The first shaft **122** is driven through a lower sprocket **128** keyed thereto and engaged by a chain drive **130** connected to an arm **131** which is part of a carriage and cam follower system supported in a carriage base **134**. The carriage **132**, coupled to the piston of a compressed air motor **136** (FIGURE 4), moves reciprocally as the motor **136** is energized and de-energized thereby rotating the drive shafts **122**, **126** through the carriage and cam follower system **132** and chain drive **130**. A chain **138** connects two sprocket wheels **140**, **142** keyed to the first and second shafts **122**, **126**, respectively, to transmit rotational movement of the first shaft **122** to the second shaft **126**. An idler wheel **144** positioned between the two drive shafts **122**, **126** engages the chain **138** and is provided with a drive tensioner **146** to regulate the tension of the chain. When both centering arm limit switches **104** are activated, the motor **136** is

de-energized and brakes **147** are activated to hold the assemblies **62** in place.

Wrapper for the roll is provided by a wrapper feed assembly indicated generally at **148** which is capable of selecting the proper size wrapper for the roll being wrapped. A plurality of limit switches **150**, indicated diagrammatically in FIGURE 2, are suspended from one of the assemblies **62**. As the assemblies converge, each switch is successively and alternately activated to close an appropriate electrical circuit that controls the selection of the wrapper. Thus, as each switch is activated, a narrower wrapper is selected by a wrapper feeding assembly **148** so a wrapper of proper width is available for wrapping the roll **22**.

The wrapper feeding assembly **148** supplies the selected wrapper through a threading mechanism **152** to the surface of the roll **22**. Adhesive is applied to the wrapper as it passes through the threading mechanism **152** to attach the wrapper to the roll surface. The rotating roll **22** draws the wrapper around it thereby causing the wrapper to completely envelop the roll. Details of the wrapper supply assembly **148**, the threading mechanism **152** and adhesive applying means are not necessary to the understanding of nor are they considered part of the present invention.

When the roll is wrapped, reinforcing banding is applied to the wrapped roll in order to provide additional protection for those areas most apt to be damaged, particularly the edges of the roll. In accordance with the present invention, bander mechanism **154** is positioned relative to each assembly **62** so the banding is added to cover the edges of the roll. The banding has sufficient width to overlap the end of the roll and still have enough material for attachment to the surface of the roll. In the discosed embodiment, the reinforcing bander mechanism **154** is connected to one side of each crimping and tucking assembly **62** and is properly positioned relative to the roll by transverse movement of the assemblies when centering the roll.

Referring more particularly to FIGURES 6, 7, 8 and 9, there is shown the bander **154** mounted on a horizontal travel bar **156** for movement to and away from the surface of the roll **22**. The reinforcing banding **158** is rotated on a core shaft **160** with the feed **158***a* passing from underneath the roll of banding up over a drive roller **162** which has a rider roller **164** resting thereon to apply pressure to the banding **158**. The leading edge **158***a* of the banding then passes, as most clearly shown in FIGURE 9, between a first and second pair of guide plates **166**, **168**, respectively, which direct the banding over the top of a guide roller **170** which may although not necessarily engage the surface of the roll **22** of paper being wrapped. When it is desired to apply the reinforcing banding **158** to the roll **22**, the bander assembly **154** is displaced forward along the horizontal bar **156** until the guide roller **170** is adjacent to the surface of the roll **22** to define a gap that will guide the banding **158** along the surface of the roll **22** as it passes over the guide roller **170**.

Feeding of the banding **158** is initiated by energizing a motor **172** which causes rotation of the drive roller **162** through appropriate gearing **174** and chain drive **176** connected between the sprocket wheels **177**, **178** connected, respectively, to the gearing **174** and drive roller **162**. After passing over the feed roller **170** the leading edge **158***a* travels along the surface of the roll **22** to the nip defined by the roll **22** and the drum **56**. The banding **158** is maintained under tension by the frictional forces between the roll **22** and the drums **56**, **58** which tend to advance the banding at a speed faster than the rate it is being advanced by the bander **154**. The sprocket wheel **178** includes an overspeed clutch which allows the drive roller **162** to freely rotate at this faster speed. A glue gun **182** (FIGURE 9) mounted on a top **184** of the bander assembly **154** applies adhesive to the reinforcing band **158** so that it may be attached to the surface of the roll **22** as the banding **158** passes between the roll **22** and the drums **56**, **58**.

In order to sever the banding after the proper amount has been supplied to the roll **22**, it is desirable to slacken the banding during the severing operation. This slack in the banding **158** allows the bander **154** to neatly sever the banding with a simple shear stroke.

As shown in FIGURES 7 and 8, the banding is slackened by activating a cylinder **186** connected to a rack **188** engaged with the drive roll **162**. The sudden movement of the rack causes a speed increase in the drive roller **162** to which the rack is coupled through a pinion and second over speed clutch **189**. The momentary increase in the speed of rotation of the drive roller **162** slackens the banding **158** between the drive roller **162** and the guide rollers **170**. Another air cylinder **190** is activated at this time to cause a cutter bar **192** to pass down alongside a serrated cutting edge **194** to sever the slackened banding **158**. The signal which activates the cylinder **190** also de-energizes the motor **172** and actuates the glue gun **182** to apply adhesive to the trailing edge of the banding **158** so it can be firmly attached to the surface of the roll **22**.

Complete protection of the roll is accomplished by folding or tucking the overlapping portions of the wrapper and banding against the ends of the roll. In accordance with the present invention each of the tucking and crimping assemblies are properly positioned for tucking and crimping during the centering of the roll. While the roll is still rotating over the drums **56**, **58**, the assembies are energized to tuck and crimp the overlapping wrapper and banding portions against the end of the roll. Thus, when the roll is discharged from the roll wrapper, it is ready for an end cover or header, for tagging and for shipment or storage.

Referring back to FIGURES 2 through 5, there is shown one embodiment for tucking and crimping the wrapper in which each assembly **62** includes an arm **196** pivotally mounted at its center **198** and having a tucking roller **200** mounted at either end. The relationship of the arm **196** to the remainder of assembly **62** is such that initial positioning of the roll **22** by the centering arms **102** attached to the crimping and tucking assemblies **62** positions the arm **196** so that when rotated in a plane normal to the end of the roll **22**, it passes immediately adjacent the end of the roll to tuck the overlapping portions of the wrapper and reinforcing banding against the end. Each tucking and crimping assembly **62** is also provided with a crimping plate **202** which is extended out and held stationary against the end of the roll **22** to periodically crimp the excess tucked wrapper as it passes under the leading edge **204** of each crimping plate **202**. Because of the uniform rotational speed of both the arm **196** and the roll **22**, the tucking arm **196** and crimping plate **202** produce uniform, evenly spaced, neat tucking and crimping.

Thus, there has been disclosed a wrapping, tucking, and crimping apparatus which is capable of automatically providing a wrapper for cylindrical rolls or other bodies varying over wide ranges of size, of applying a reinforcing banding to selected areas of such rolls or bodies and of tucking and crimping the ends of the wrapper against the ends of the bodies or rolls to protect the surfaces and edges thereof.

In operation, a roll to be wrapped is placed on the receiving section for transverse centering relative to a pair of tucking and crimping assemblies. As these assemblies converge, one of a pair of entering arms attached to the assemblies contacts the end of the roll and moves it transversely along the receiving roller until centered. The roll is then ejected onto a pair of drums which cause the roll to rotate. A wrapper is supplied and attached to the surface of the roll and envelops it as the roll rotates. Similarly, a bander supplies reinforcing banding to selected areas of the roll. While the roll is still being rotated, the assemblies are energized to tuck and crimp the overlapping portions of the wrapper and banding against the

ends of the roll. The assemblies are then withdrawn and the roll discharged from the apparatus in condition for any other steps that may be desired.

It will be readily observed from the foregoing detailed description of the invention and in the illustrated embodiment thereof that numerous variations and modifications may be effected without departing from the true spirit and scope of the novel concepts and principles of this invention.

What is claimed is:

1. A machine for tucking and crimping a wrapper on a roll comprising in combination a tucking and crimping assembly, means extending from the assembly and engaging one end of the roll upon transverse movement of said assembly for centering the roll relative to said assembly, means for rotating the roll, and means attached to and transversely positioned by said assembly relative to the roll for applying banding to the surface of the roll in end overlapping relation thereto, said assembly including means for tucking overlapping portions of the wrapper and banding against the end of the roll, and means located adjacent the end of the roll for crimping the tucked portions.

2. Apparatus for tucking and crimping a wrapper located on a roll in end overlapping relation, said apparatus comprising in combination means for rotating the roll, bander means for applying a reinforcing banding to the roll in end overlapping relationship therewith, means for tucking the overlapping portions of the wrapper and banding against the end of the roll, means for crimping the tucked portions of the banding and wrapper, said bander means including means for advancing the banding, means for guiding the banding along the surface of the roll into contact with said roll rotating means, said roll and said roll rotating means cooperating to define feed means for maintaining tension in said banding, means for slackening the banding, and means for severing the slackened banding.

3. A machine for tucking and crimping a wrapper on a roll comprising in combination a tucking and crimping assembly, means extending from said assembly and engaging one end of the roll upon transverse movement of said assembly for centering the roll relative to said assembly, means for rotating the roll, bander means for supplying banding overlapping the ends of the roll, said bander means being attached to said assembly for transverse positioning of said bander means relative to the roll, said bander means including means for advancing the banding, means cooperating with the surface of the roll for guiding the banding along the surface of the roll and means for severing the banding, said tucking and crimping assembly including means for tucking the overlapping portions of the wrapper and banding against the end of the roll, and means for crimping the tucked wrapper and banding.

4. A roll wrapping and crimping machine comprising in combination a tucking and crimping assembly, means located adjacent said assembly for receiving a roll to be wrapped, arm means attached to said assembly and engaging the ends of the roll for centering the roll relative to said assembly along said receiving means, means for ejecting the roll from said receiving means, drum means for positioning and rotating the discharged roll, means for supplying a wrapper to the roll in end overlapping relation thereto, means connecting said assembly to bander means for positioning said bander means relative to said roll, said bander means having a roller adjacent the surface of the roll, and means energizing said bander means for applying banding to the roll over said roller in overlapping relation to the end of the roll, said tucking and crimping assembly including means for tucking the overlapping portions of the wrapper and banding against the ends of the roll, and means positioned adjacent said tucking means for crimping the tucked wrapper and banding.

5. An apparatus for wrapping a cylindrical roll comprising in combination a plurality of canted free running rollers arranged in two sets to define a roll receiving recess, a pair of tucking and crimping assemblies, an arm extending from each of said assemblies engaging one end of the roll upon convergence of said assemblies toward each other for transversely centering the roll relative to said assemblies along said rollers, means for tilting said rollers to eject the roll therefrom, a pair of drums disposed beneath said tucking and crimping assemblies for positioning the ejected roll, a motor for driving at least one of said drums to rotate the roll, means for supplying a wrapper to the roll in end overlapping relation thereto, a plurality of banders for applying reinforcing banding to the surface of the roll, said bander assemblies each including a guide roller adjacent the surface of the roll, a pair of rollers between which the banding passes, a motor for rotating one of said pair of rollers to initially advance the banding over said guide roller and along the roll, an overspeed clutch associated with said one roller and responsive to increased speed of the banding for disengaging said motor means from said one roller, a rack for rotating said one roller at a rate sufficient to increase the speed of the banding for slackening the banding between said pair of rollers and said guide roller, and a blade for severing the banding when slackened, each of said tucking and crimping assemblies including an arm pivotally mounted at its center for rotation in a plane perpendicular to the ends of the roll, a rotatable head on each end of said arm for tucking the overlapping portion of the wrapper and banding against the end of the roll, a crimping plate having a cylindrical leading edge and a surface parallel to and adjacent the end of the roll for crimping the tucked wrapper and banding, and means for vertically displacing one of said drums to discharge the roll from said drums.

6. Apparatus for applying a wrapper to a roll comprising in combination a pair of assemblies disposed for transverse reciprocable movement, means for receiving a roll to be wrapped and adapted to allow transverse movement thereof, means attached to each assembly for engaging one end of a roll positioned on said receiving means and for causing transverse movement of said roll until centered with respect to said assemblies, and bander means supported on each said assembly and transversely movable therewith for simultaneous positioning of each said bander means relative to the ends of said roll whereby reinforcing banding supplied by each said bander means overlaps one end of the roll.

References Cited

UNITED STATES PATENTS

2,803,935	8/1957	Gibson	53—380
2,880,560	4/1959	Gibson	53—211 X
2,893,191	7/1959	Lancaster	53—214 X
2,904,946	9/1959	Ullstrom et al.	53—380
2,919,527	1/1960	Smith et al.	53—216 X
3,033,102	5/1962	Fryklund.	
3,290,861	12/1966	Prager	53—214
3,330,095	7/1967	Sandberg	53—380

FOREIGN PATENTS

176,024	7/1961	Sweden.

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