Feb. 24, 1953

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2,629,297

APPARATUS FOR PRODUCING PROTECTIVE BINDING FROM FLAT STOCK

Filed Nov. 16, 1950

3 Sheets-Sheet 1

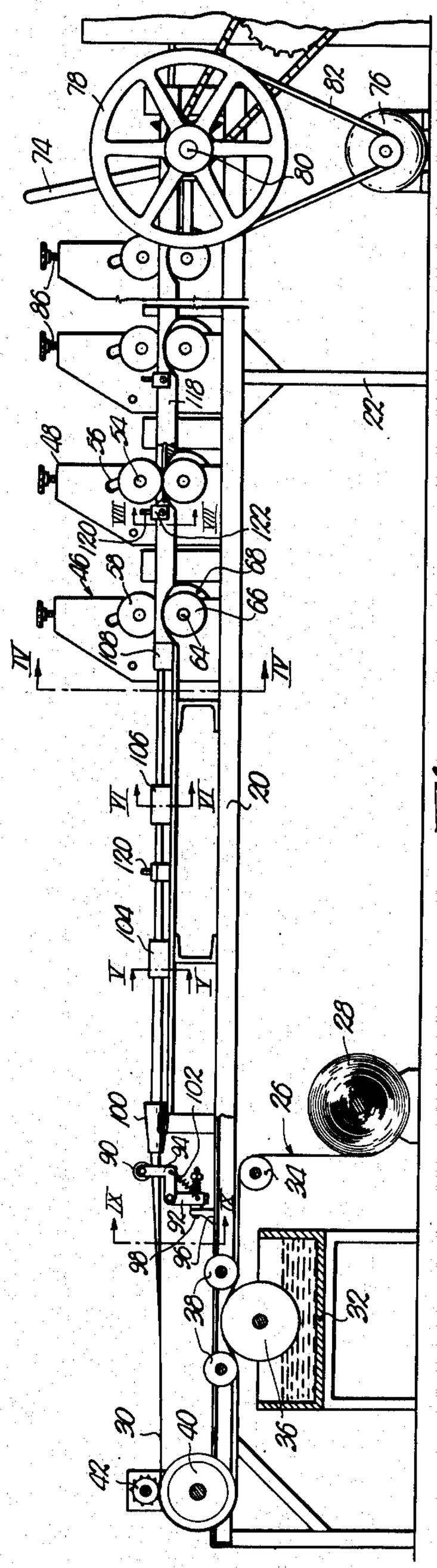

Fig. 1.

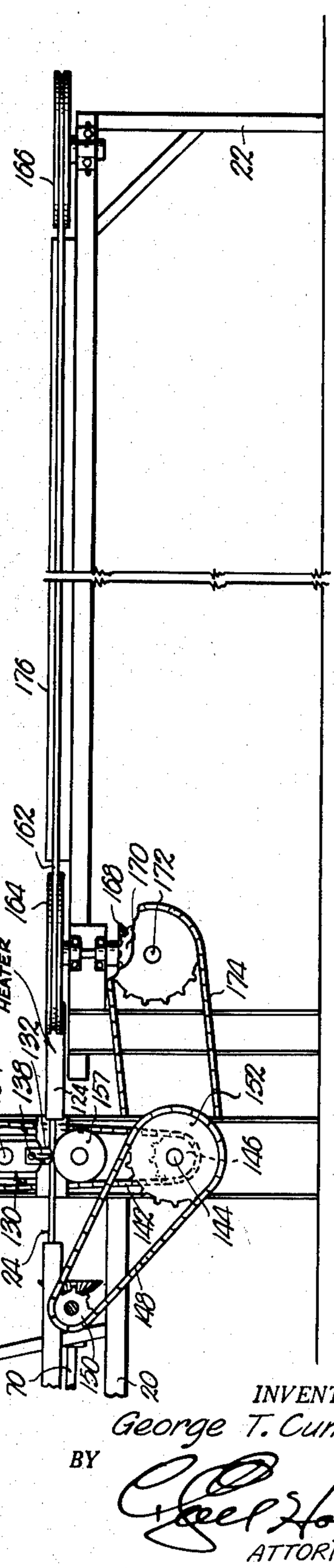

Fig. 1a.

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3 Sheets-Sheet 2

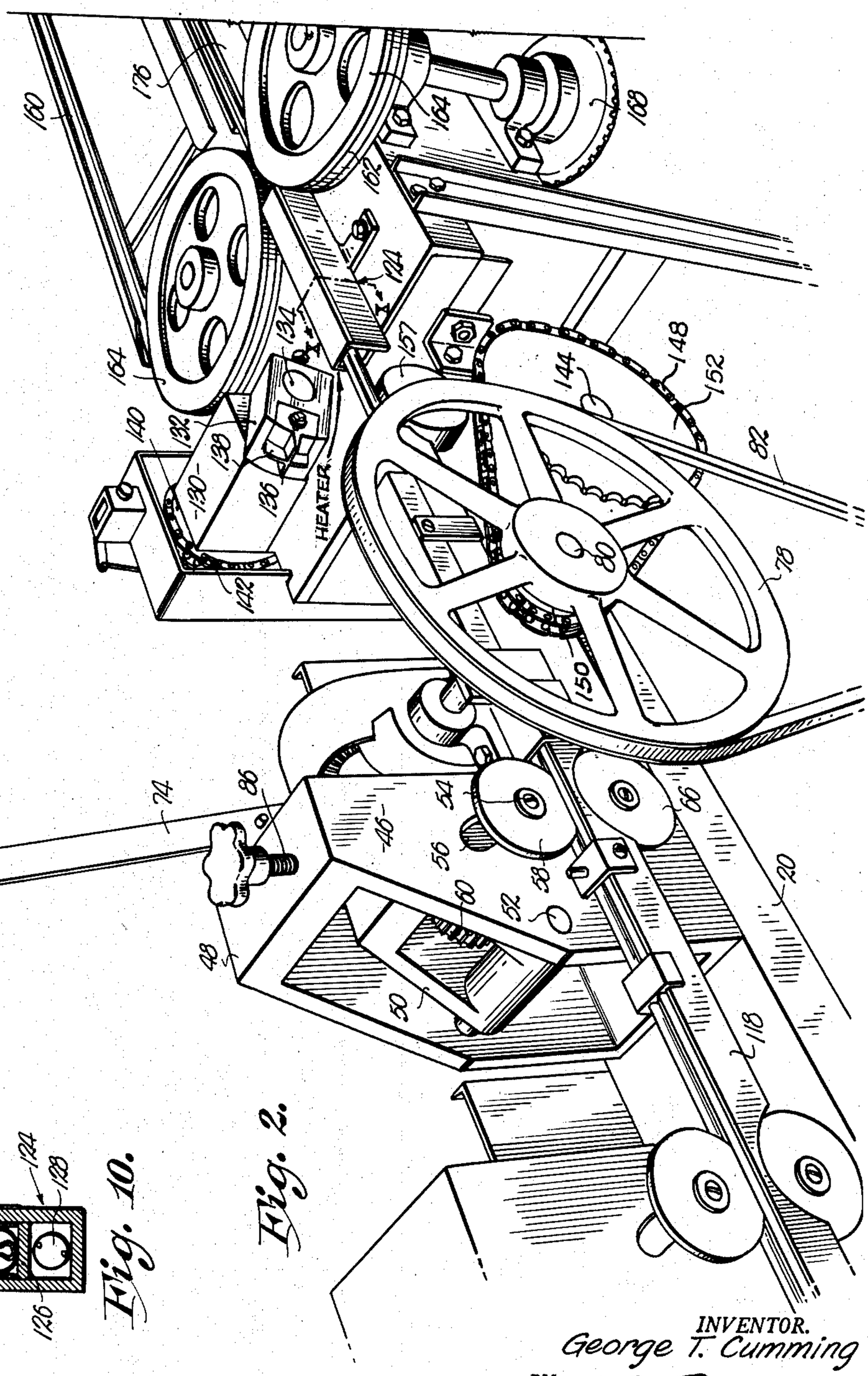

Fig. 2.

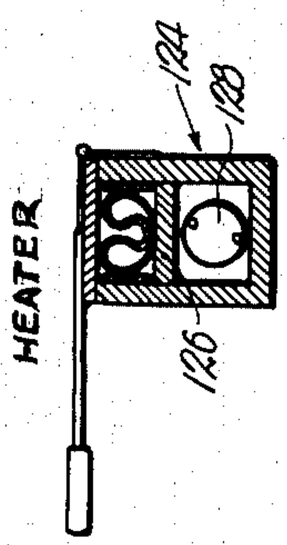

Fig. 10.

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3 Sheets-Sheet 3

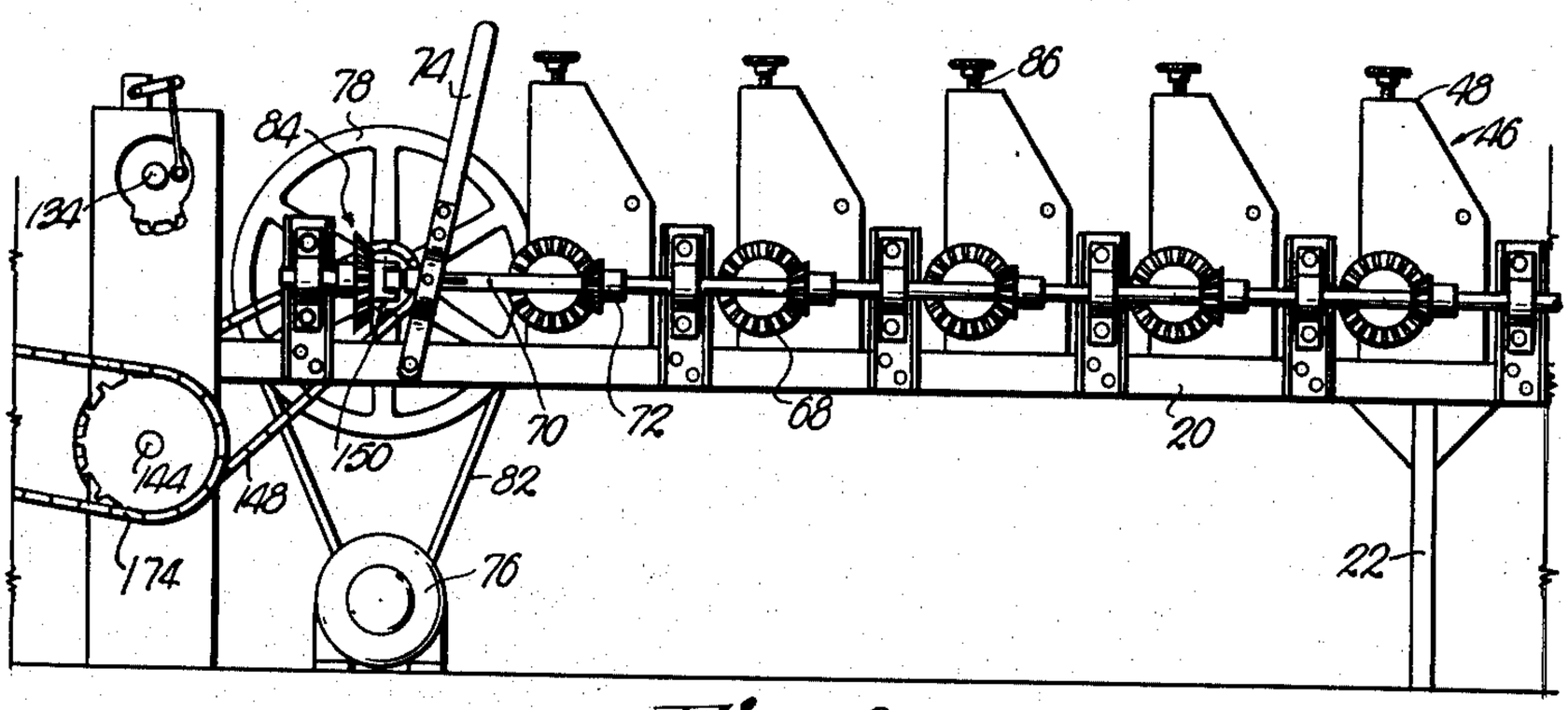

Fig. 3.

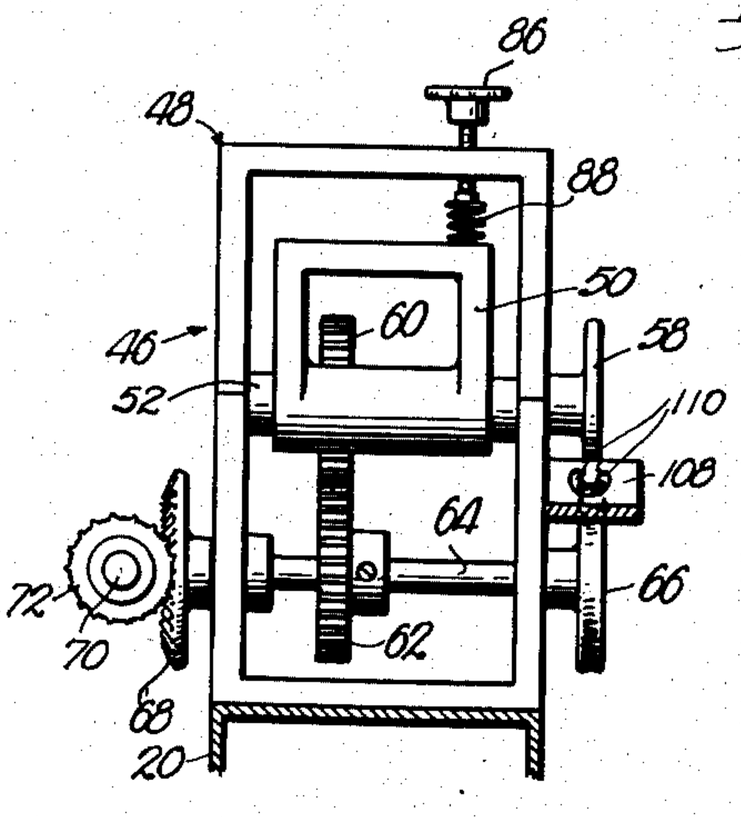

Fig. 4.

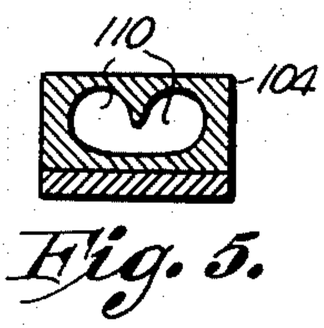

Fig. 5.

Fig. 6.

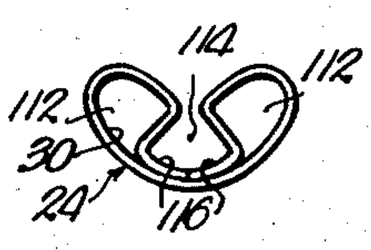

Fig. 7.

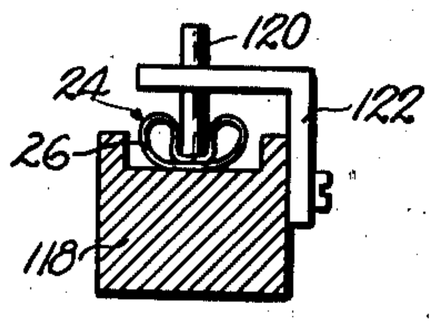

Fig. 8.

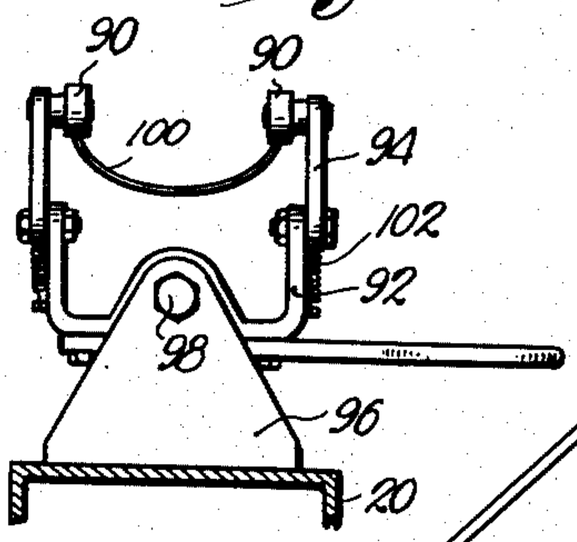

Fig. 9.

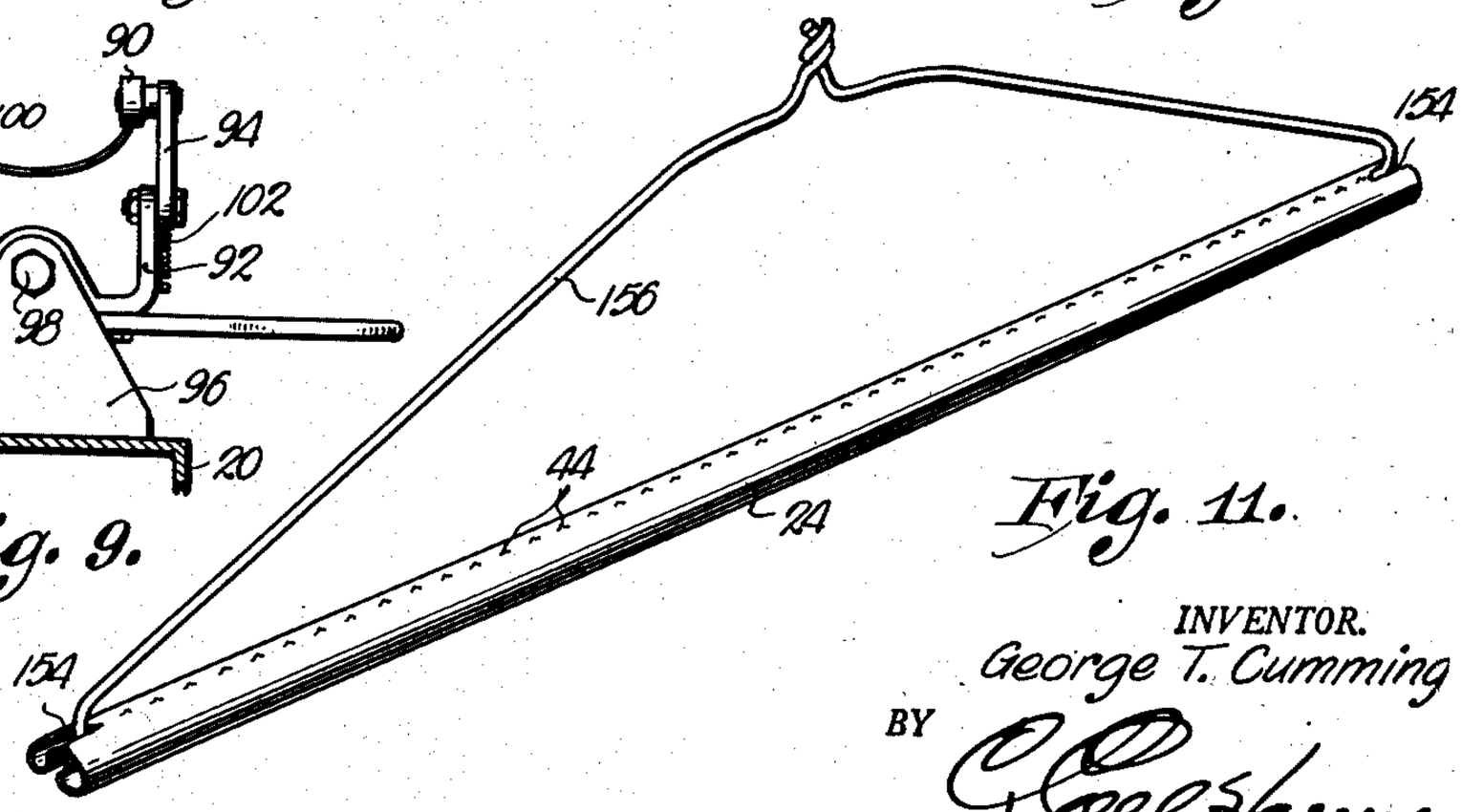

Fig. 11.

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APPARATUS FOR PRODUCING PROTECTIVE BINDING FROM FLAT STOCK

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Application November 16, 1950, Serial No. 195,987

3 Claims. (Cl. 93—1)

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This invention relates to a machine for producing a protective binder in the nature of an elongated, tubular member having a channel adapted for mounting upon a conventional clothes hanger in covering relationship to a portion thereof, the primary object being to speed up the manufacturing steps and to produce a more satisfactory binding quickly, easily and without undue expense.

It is well known that conventional wire clothes hangers commonly used particularly by cleaning establishments, are not entirely satisfactory for supporting clothing in draped or looped relationship to the horizontal portion of the hanger because of the crease that is soon formed in the garment after the same hangs for a period of time. Consequently, various attempts have been made to enlarge the horizontal part of the hanger by a protective binding usually made from cardboard and adapted for insertion upon the hanger subsequent to its manufacture. While such bindings take various forms, one of the most satisfactory types is that which constitutes an elongated, tubular body usually of cardboard having a channel between the tubes for at least partially embracing the normally horizontal wire portion of the hanger. Such protecting binding strips have the ends thereof slit to hold the same in place and through the provision of stampings, the protecting device can be rendered more efficient by utilization of the stampings as an anti-skid means.

Accordingly it is the most important object of the present invention to provide apparatus for producing the aforesaid devices having means for feeding a continuous strip or tape from a roll thereof, applying adhesive to one face of the tape, folding the marginal edges of the strip against the adhesively coated face thereof presenting a pair of side-by-side, parallel tubular portions and a channel between the tubes, all automatically and continuously as the strip is fed through the machine.

A further object of this invention is the provision of a number of die members disposed along the path of travel of the aforesaid tape, each having a pair of side-by-side interconnecting bores through which the tape is fed and caused to fold or roll upon itself to present the hanger receiving channel.

Another object of this invention is the provision of a plurality of opposed pressure rollers for moving the tape as the same is formed and glued, the rollers serving additionally to press the folded marginal edges of the tape against the adhesive face of the strip until such time as adherence is effected.

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Other objects include the way in which a specially formed rotatable cutter is provided to sever the formed tape into predetermined lengths; the way in which the cutter operates to slit the ends of the lengths adapting the finished device for mounting upon a hanger; the way in which a perforator is provided for the tape to present a device that more effectively holds the garment on the hanger; the manner of heating the strip after folding thereof to enhance the adhesive bond; and many other more minor objects all of which will be made clear or become apparent as the following specification progresses, reference being had to the accompanying drawing, wherein:

Figure 1 is a side elevational view of a portion of the apparatus for producing protective binding from flat stock made pursuant to the present invention.

Fig. 1*a* is a side elevational view of the apparatus and comprising the remainder thereof.

Fig. 2 is a fragmentary, enlarged perspective view of a portion of the apparatus.

Fig. 3 is a fragmentary, elevational view showing that side of the apparatus opposite to that illustrated in Figs. 1 and 1*a*.

Fig. 4 is a transverse, cross-sectional view taken on line IV—IV of Fig. 1 with the article-forming strip omitted.

Fig. 5 is a cross-sectional view taken on line V—V of Fig. 1 with the article-forming strip omitted.

Fig. 6 is a cross-sectional view taken on line VI—VI of Fig. 1 with the article-forming strip omitted.

Fig. 7 is an end elevational view of the finished binder.

Fig. 8 is a cross-sectional view taken on line VIII—VIII of Fig. 1.

Fig. 9 is a transverse, sectional view taken on line IX—IX of Fig. 1, looking in the direction of the arrows with the article-forming strip omitted.

Fig. 10 is a transverse, cross-sectional view taken on line X—X of Fig. 2; and

Fig. 11 is a fragmentary, perspective view of a coat hanger showing the protective binding formed by the apparatus of this invention operably mounted on the hanger.

The apparatus of this invention includes a relatively long frame illustrated particularly in Figs. 1 and 1*a*, and broadly designated by the numeral **20**, which frame **20** may conveniently be supported at a desired height through the medium of a plurality of legs **22** as illustrated.

The device to be produced by the apparatus is illustrated in Figs. 7 and 11 and designated by the

numeral 24. It is made in its entirety from flat stock in the nature of an elongated, flexible strip 26 that is initially wound on a roll 28 rotatably supported in any suitable manner below frame 20 at one end thereof (see Fig. 1). The particular nature of the flat, relatively narrow tape-like strip is of no significance but it is contemplated that the same be of a relatively stiff cardboard.

One face 30 of the strip 26 or at least a portion thereof, is initially coated with an adhesive stored within an open top vessel 32 beneath frame 20 and between roll 28 and the proximal end of the frame 20. The tape 26 passes from the roll 28 over an idler 34 and thence over a roller 36 comprising an applicator for the glue within the vessel 32 and rotatably mounted on frame 20 therebeneath and disposed for rotation within the glue in vessel 32. It is noted in Fig. 1, tape 26 passes over the roller 36 and beneath a pair of spaced-apart idlers 38 carried by frame 20 and adapted to hold the tape 26 tightly against applicator 36. From the idlers 38 and the roller 36, strip 26 is wound about a rotatable member 40 carried by frame 20 at one end thereof and beneath a rotatable perforator 42. The perforator 42 is disposed to puncture the strip 26 throughout its length and midway between the longitudinal edges thereof presenting a row of struck-out portions 44 in the finished article 24 as illustrated in Fig. 11 of the drawings.

The strip 26 is fed along the frame 20 from the roll 28 over the gluing means and perforating means just above described by a plurality of sets of opposed pressure roller assemblies carried by the frame 20. Each assembly is broadly designated by the numeral 46 and includes an enclosed up-standing frame 48 mounted upon the frame 20 having a block 50 therewithin swingably mounted on a transverse shaft 52.

A second shaft 54 on block 50 parallel with supporting shaft 52 is mounted for swinging movement within an arcuate slot 56 formed in the frame 48 and through which shaft 54 passes. Shaft 54 carries a roller 58 on one end thereof exteriorly of the frame 48 and a gear 60 that is in mesh with an underlying gear 62 that is mounted on a shaft 64 traversing the frame 48 and rotatably carried thereby. The ends of the shaft 64 extend beyond frame 48 and carry a roller 66 and a gear 68, the roller 66 directly underlying the roller 58.

All of the gears 68 and shafts 64 are driven by a common elongated shaft 70 rotatably carried by the frame 20 in parallelism with its longitudinal axis, the shaft 70 having a pinion 72 thereon for each gear 68 respectively. The elongated drive shaft 70 for the assemblies 46 is also mounted for reciprocable movement on its longitudinal axis and a lever 74 operably connected thereto and swingably secured to frame 20 serves as a means for shifting the pinions 72 into and out of engagement with the respective gears 68.

Rotative movement is imparted to the shaft 70 through the medium of an electric motor or other prime mover 76, mounted in any suitable manner below frame 20 intermediate the ends of the latter and a pulley 78 on a shaft 80 traversing the frame 20 and rotatably carried thereby is operably joined with prime mover 76 by means of a continuous belt 82. A suitable clutch 84 interconnects the shafts 70 and 80 when lever 74 is swung to one end of its path of travel.

Each assembly 46 is provided with an adjusting screw 86 having a spring 88 on the lowermost

end thereof and carried by frame 48 with spring 88 bearing against the block 50, thus the rollers 58 and 66 are yieldably held biased toward each other and the tension is adjusted by means of the screw 86. Likewise, the gear 60 is held in mesh with the gear 62. It is clear that when the strip 26 is threaded between the plurality of opposed pressure rollers 58 and 66, it will be moved on its longitudinal axis along the frame 20.

Frame 20 carries a guiding means for the strip 26 taking the form of a pair of spaced-apart rollers 90 mounted on a U-shaped bracket 92 through the medium of swingable L-shaped arms 94. An up-standing member 96 on the frame 20 mounts the U-shaped support 92 through the medium of a bolt 98. The strip 26 is initially folded or bent in the shape shown by Fig. 9, arcuate transversely by means of a suitably shaped funnel 100 carried by the frame 20 and the rollers 90 contact the longitudinal edges of the strip 26 as shown in Fig. 9. Rollers 90 are held biased downwardly against the taut strip 26 by means of a spring 102 for each arm 94 respectively.

From the funnel 100, the strip 26 passes through a plurality of substantially identical die members 104, 106 and 108. These die members are mounted on the frame 20 in alignment and in spaced-apart relationship between the funnel member 100 and the first assembly 46. The cross-sectional contour of the die members is illustrated in Figs. 4, 5 and 6 and it is seen that each includes a pair of side-by-side substantially parallel bores 110 that are in registering relationship. The diameters of the bores progressively decrease in diameter as the first assembly 46 is approached.

From the time that the strip 26 enters the funnel 100 until the product 24 is completely formed, the longitudinal marginal edges of the strip 26 are progressively rolled and folded over the adhesively coated face 30 thereof by the funnel member 100 and by the die members 104, 106 and 108. It is seen that these forming devices shape the device 24 as illustrated in Fig. 7 of the drawing presenting a pair of spaced-apart, parallel, tubular portions 112 that are divided by a central, longitudinal channel 114.

All of the uppermost rollers 58 of the assemblies 46 are disposed within the channel 114 and serve to press the marginal edges 116 of the strip 26 against the adhesive face 30 thereof. It is seen that the funnel 100 and the die members 104—106—108 cooperate to produce the desired shape and that by virtue of the lowermost rollers 66 having a peripheral groove formed therein as shown in Fig. 4, the outermost face of the strip 26 opposite to face 30, is rounded in the manner illustrated in Fig. 7 of the drawings.

After the strip 26 leaves the die member 108, it is directed into a channel-like track 118 that extends along the frame 20 and is carried thereby. Track 118 is provided with an opening in the bottom thereof for clearing each roller 66 respectively as illustrated in Fig. 1 of the drawings. Additionally, track 118 carries a plurality of vertical pins 120 adjacent each assembly 46 respectively and carried by an L-shaped bracket 122. The pins 120 project downwardly into the track 118 and within the channel 114 of the formed strip 26. Thus pins 120 cooperate with the rollers 58—66 in holding the edges 116 in contact with the face 30 of strip 26 as the latter progresses along the frame 20 and through the track 118.

In order to insure a positive bond between the marginal edges 116 and the face 30 of strip 26, there is provided a heater 124 on the track 118 comprising an elongated tubular body having a partition 126 therein presenting a lower compartment for receiving a heating element 128 and an upper compartment through which the strip 26 passes.

Before the strip 26 enters the heater 124, it is subjected to a rotatable cutting assembly 130 for severing strip 26 into desired lengths as illustrated at 24 in Fig. 11. Assembly 130 includes a head 132 mounted upon a horizontal shaft 134 above the advancing strip 26. Head 132 removably mounts a cutter including a blade 136 that traverses the longitudinal axis of the strip 26 and an intersecting knife 138 that is disposed within a vertical plane passing through the abutting marginal edges 116 of strip 26. That end of the shaft 134 opposite to head 132 carries a sprocket 140 over which is passed an endless chain 142.

An idler shaft 144 underlying frame 20 and parallel with shaft 134 carries a sprocket 146 for the chain 142. An endless chain 148 is trained over sprockets 150 and 152 on shafts 80 and 144 respectively.

The entire gear ratio of the apparatus is so formed as to cause cutting of the strip 26 by the cutter blade 136 into desired lengths 24 upon each complete revolution of the head 132. Simultaneously, with the severing of the strip 26 by blade 136, the blade 138 forms a relatively short notch or slit 154 in the strip 26 at the abutting marginal edges 116, thereby presenting as shown in Fig. 11, an interlocking means for the devices 24 when the same is mounted upon the normally horizontal stretch (not shown) of a conventional wire garment hanger 156 shown fragmentarily in Fig. 11. The struck-out portions 44 prevent slippage of garments draped over the device 24.

An idler 157 rotatably mounted beneath the strip 26 serves as a supporting anvil for the strip 26 as the cutter blades 136 and 138 move into contact therewith. The severed lengths of folded and formed strip 26 are directed into heater 124 carried by frame 20 and are advanced to the discharge end of the frame 20 by means of a pair of flexible, endless belt-like conveyors 160 and 162. The conveyors 160 may comprise any suitable material but in the instance illustrated, it is preferred to use a flat spring-like metallic tape. Each conveyor 160 is carried by a pair of spaced-apart sheaves 164 and 166 mounted by the frame 20 for rotation on vertical axes. The mounting shafts for the sheaves 164 are each provided with a gear 168 on the lowermost end thereof, each of which is in turn in mesh with a gear 170 on a rotatable horizontal shaft 172 beneath frame 20 and driven from the shaft 144 through the medium of an endless chain 174. The proximal side-by-side parallel lengths of the conveyors 160 and 162 that frictionally engage and receive the severed lengths 24, move the same along a channel-like track 176 for discharge at that end of the frame 20 opposite to the perforating means 40—42.

The entire apparatus above described is obviously operable with very little workman attention. As soon as the roll 28 is mounted and the tape 26 threaded through the machine, swinging of the lever 74 will place all of the moving parts into operation and the severed protecting devices 24 may be collected at the discharge end of the frame 20. All of the folding and rolling of the marginal edges 116 of the strip 26 is automatic by

virtue of the die members 100, 104, 106 and 108 and the rollers 58 and 66 cooperating with the pins 120 press the edges 116 tightly against the adhesive surface 30 of strip 26. Severance into predetermined lengths and forming of the slits 154 is also automatic and as just above described, the conveyors 160 and 162 receive the lengths and move the same along a desired distance before final feeding into a receptacle therefor.

Many details of construction may be changed or varied within the spirit of this invention and therefore, it is desired to be limited only by the scope of the appended claims.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. Apparatus for producing an elongated, tubular protective binding having a longitudinal channel, said apparatus including a frame; opposed pressure rollers carried by said frame for advancing a flexible, binding-producing strip along the frame as the strip is fed to the frame at one end thereof and passed between the rollers; structure disposed for engagement with one face of the advancing strip for applying adhesive thereto; and a number of spaced-apart, aligned, strip-receiving die members on the frame for folding the marginal edges of the strip upon said one face thereof as the strip is advanced, presenting a pair of spaced tubular portions and a channel between said portions, said rollers being disposed within the channel to force said edges against said one face of the strip for joinder therewith through the medium of the adhesive thereon, there being a plurality of pins carried by the frame between the tubular portions in overlying sliding engagement with said edges for holding the same against unfolding.

2. Apparatus for producing an elongated, tubular protective binding having a longitudinal channel, said apparatus including a frame; a pair of opposed pressure rollers carried by said frame for advancing a flexible, binding-producing strip along the frame as the strip is fed to the frame at one end thereof and passed between the rollers; structure disposed for engagement with one face of the advancing strip for applying adhesive thereto; a number of spaced-apart, aligned, strip-receiving die members on the frame for folding the marginal edges of the strip upon said one face thereof as the strip is advanced, presenting a pair of spaced tubular portions and a channel between said portions, said rollers being disposed within the channel to force said edges against said one face of the strip for joinder therewith through the medium of the adhesive thereon; and means adjacent one of the rollers and extending between said tubular portions, holding the same spaced-apart, thereby maintaining said channel to receive the one roller.

3. Apparatus for producing an elongated, tubular protective binding having a longitudinal channel, said apparatus including a frame; opposed pressure rollers carried by said frame for advancing a flexible, binding-producing strip along the frame as the strip is fed to the frame at one end thereof and passed between the rollers; structure disposed for engagement with one face of the advancing strip for applying adhesive thereto; a number of spaced-apart, aligned, strip-receiving die members on the frame for folding the marginal edges of the strip upon said one face thereof as the strip is advanced, presenting a pair of spaced tubular portions and a channel between said portions, said rollers being disposed

within the channel to force said edges against said one face of the strip for joinder therewith through the medium of the adhesive thereon, there being a plurality of sets of said rollers spaced along the frame; and pins between the sets and carried by the frame between the tubular portion for holding the edges against unfolding.

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