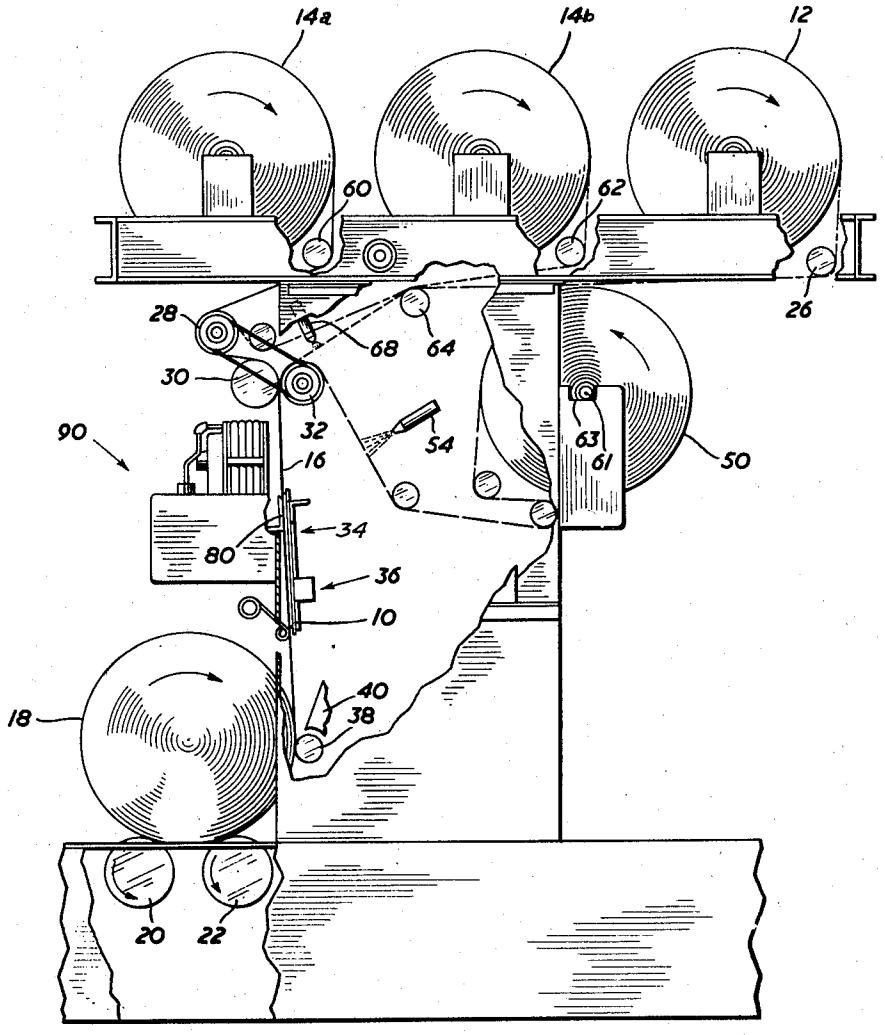
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ROLL WRAPPING

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——————— FROM ROLL 14a

- - - - - - - - - - - - - - - " " 14b

—·—·—·—·— " " 12

— — — — — " END BAND 50

FIG. 1

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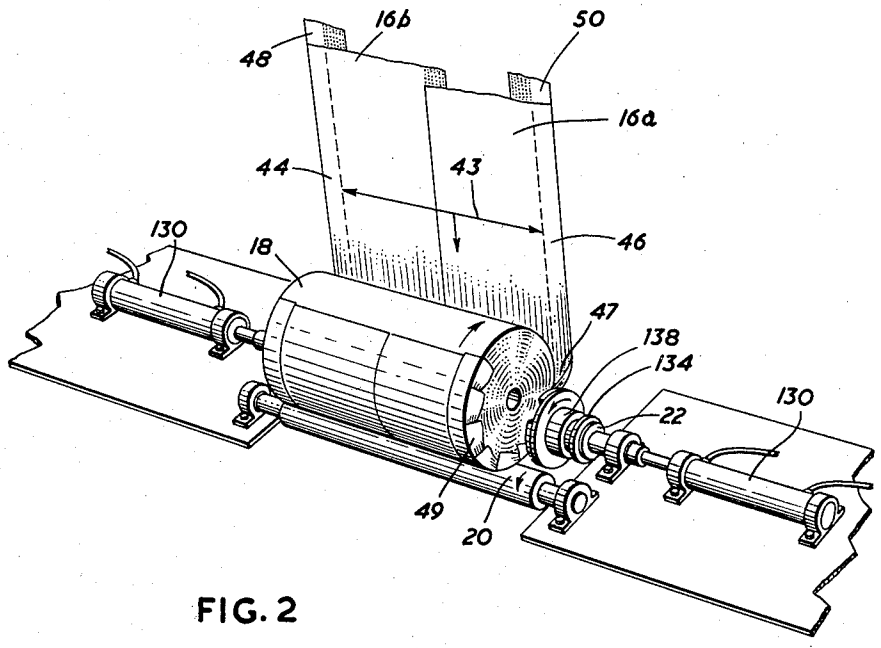


FIG. 2

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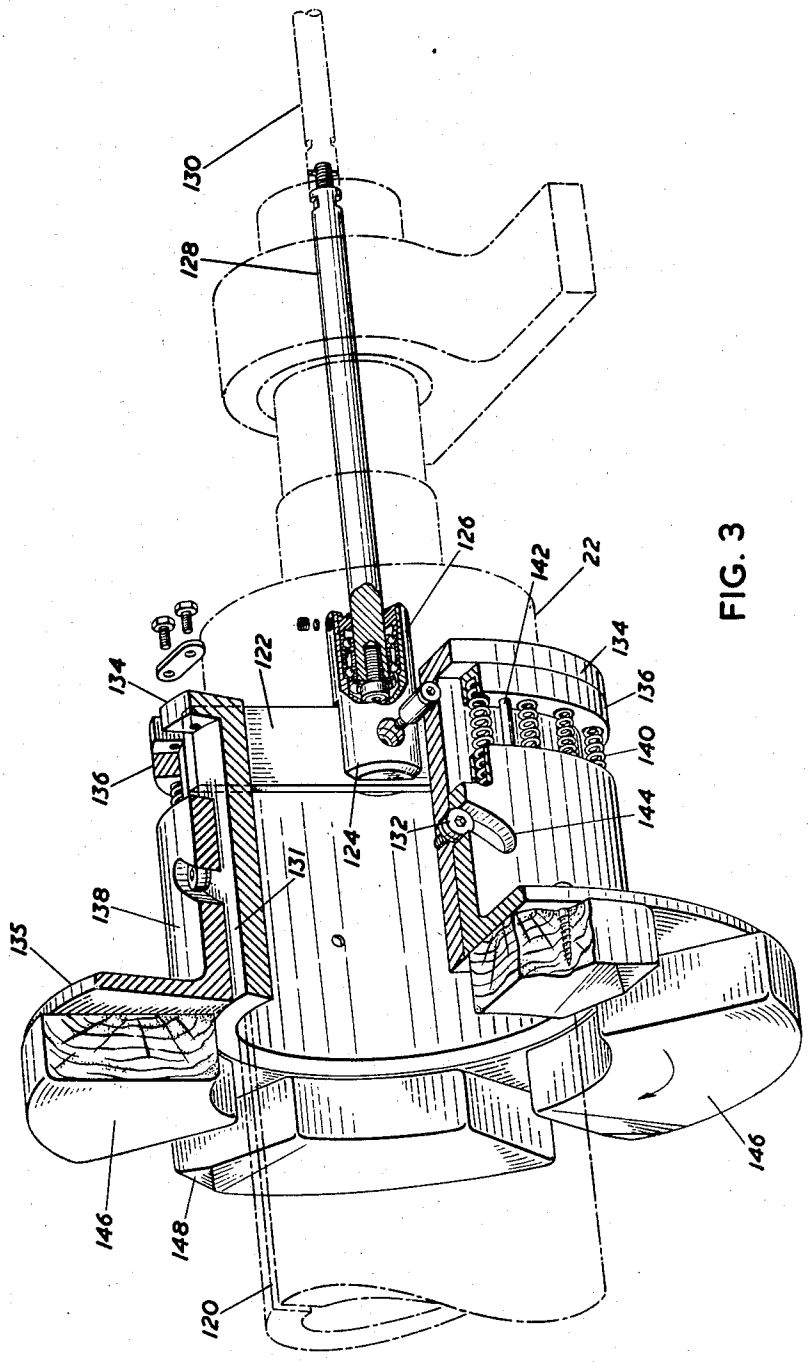


FIG. 3

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2,893,190

ROLL WRAPPING

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Application July 6, 1955, Serial No. 520,315

5 Claims. (Cl. 53—380)

This invention relates to a roll wrapping machine and improvements therein. By a roll I mean any cylindrical object to be wrapped in paper, but the invention is particularly applicable to rolls of paper to be so wrapped.

The wrapping machine and improvements are shown in the attached drawings in which:

Figure 1 shows a schematic illustration of the operation of a paper wrapping machine.

Figure 2 illustrates the strip used with the invention.

Figure 3 illustrates the crimping mechanism.

The overall operation of the machine may be indicated by a reference to Figure 1.

A cabinet schematically shown at **10** supports a series of rollers **12**, **14A**, **14B** carrying wrapping paper adapted to supply the wrapping paper strip **16** to wrap a roll **18** as shown at the bottom of the machine resting on and rotated by a pair of drive rollers **20** and **22**.

The wrapping paper strip is hereinafter referred to as the "wrapping strip **16**" or as the "strip **16**" to distinguish it from the roll of paper or other material **18** to be wrapped. For the purposes of this application it is sufficient if the paper **18** is considered as a cylindrical body to be wrapped.

The paper supplied (say) by roll **12** is led under a tension roller **26** about a driven roller **28** and between a pair of horizontally disposed puller rollers **30** and **32**. The horizontally disposed puller rollers provide a vertical path for the strip into guide means **34** where the cutting and gluing is performed as will be described hereinafter, by means shown here schematically as **36**.

After the necessary glue is applied and the paper is cut as will be hereinafter described, the paper length is supplied between press roll **38** and the roll **18** under the assistance of any suitable guide means such as those schematically shown at **40**.

The roll to be wrapped is rotated under the impulsion of drive rollers **20** and **22**.

The leading end of a length of a glued strip **16** is caught between the press roll **38** and the roll to be wrapped **18** and the press roll pressure attaches the strip end to roll **18** where it is pulled around with that roll. When the length of the strip **16** from the end initially stuck to roll **18** to the cutting means is sufficient to supply the requisite number of wrapping turns, the wrapping movement of strip **16** is halted by stopping puller rollers **30** and **32** and drive rollers **20** and **22**, and the cutting and gluing means **36** cuts off the wrapping length. The movement of the drive rolls is then recommenced until the cut end of the first length of strip **16** is wound on the roll **18**.

Glue for attaching the beginning and end of the length is applied by suitable means adjacent the cutting and gluing means **36**.

The wrapping paper strip **16** must be not only wide enough to provide a portion **43** to cover the roll **18** to be wrapped but must also be wide enough to supply an extension **44** and **46** on each side for crimping over each end thereof.

Crimping means **146** (see Figure 8) to crimp the over-extending portions **44** and **46** of the strip **16** on to the ends of the rolls **18**, are provided as illustrated at each end of the roll **22**. The crimped portions known as "crimps" are designated as "**49**" on Figure 2.

Due to the tendency to fray that transportation and handling produce at the corners of the rolls reinforcing strips known as end bands **48** and **50** are attached to each side of the strip **16** for reinforcement purposes.

When the wrapping strip is applied to the roll to be wrapped, crimping means are provided at each end thereof to produce an adequate crimping. It had been known to provide crimpers which rotated on one of the drive rollers which contacted the over-extending paper at each end of the roll to be wrapped and crimped it down against the roll **18**. It was also known that due to the increasing thickness of the paper at the end of the roll as it was crimped the crimping rollers must retract slightly axially and resilient means were provided for such retraction. However, since the crimping action is not only an axial one but has a circumferential component, the resistance to such crimping as the paper became thicker was a helical one.

Unless the retractability of the crimper rollers corresponds in direction and sense to the reactive force exerted by the paper, torn paper and improper "crimps" can result (see U.S. Patent No. 2,638,725 to A. T. Hurter et al.).

Thus proper crimping cannot be achieved unless the crimping blocks can retract in the direction of the reactive force exerted by the thickening paper, hence the crimping blocks must be helically retractable.

It is therefore an object of the present invention to provide a method and means whereby the crimpers are allowed a certain resilient helical retraction during crimping.

It is an object of the present invention also to provide crimpers which move into and out of position under hydraulic or pneumatic pressure.

It is a specific object of this invention to provide crimping blocks which bend the paper relative to the roll, the blocks being shaped as truncated sectors of a circle, said blocks being arranged on a crimper mounting member and being arranged coaxially with one of the drive rollers.

The crimper blocks are preferably chamfered on their leading radial edges to ease the bending operation.

Referring now to Figures 2 and 3, one of the drive rollers **22** is shown provided with longitudinal slots **120** adapted to receive an axially slidable bar **122**. The bar **122** is attached to a slotted shaft **124** contiguously projecting from the outer portion of a thrust bearing **126**. The inner portion of the thrust bearing is connected to an axial thrust shaft **128** operated by an air piston **130** for application of the crimpers to and retraction from the roll. The keying diametrical bar **122** is rigidly attached to a sleeve **131** slidable axially on the roller **22** provided with a radially extending flange **134**. The sleeve **131** is provided with four upwardly extending guide rollers **132** and on the outer surface of the sleeve **131** is mounted a sliding member **138** which has a large radially extending flange **135** on the end adjacent the roll carrying the crimping blocks **146**. An annular backing ring **136** is slidably movable on the sleeve **131** and its backward movement is restrained by the radial flange **134** and is resiliently connected to the crimper mounting member **138** by compression springs **140**. Circumferential alignment between the backing ring **136** and the block mounting member **138** is maintained by keying rods **142** which are adapted to be received in elongated apertures (not shown) in the crimper mounting member **138**. Thus the crimper mounting member **138** may move

axially with respect to the mounting ring, but relative circumferential movement between these two members is prevented by the keying rods **142**. A number of helical slots **144** in the crimper block mounting member **138** extending helically away from the roll to be wrapped in the opposite direction to that of rotation and receive the rollers **132**, the slots and rollers thereby defining the relative movement between the mounting member **138** and the sleeve **131** and therefore between the crimper blocks **146** and the drive roll **22**. Thus on the receipt of reaction pressure by blocks **146** from the paper being crimped the mounting member **138** moves helically backward under the resisting pressure until the resilient compression springs **140** balance the pressure of the paper being crimped. Meanwhile the springs are retained axially aligned by the keying rods **142** and the radial movement of the ring **136**.

The crimper blocks **146** are preferably truncated sectors of a circle and such sectors are mounted on each mounting member **138** facing the roll **18** to be wrapped, the sectors delineating a portion of the outline of a circle co-axial with the axis of rotation of mounting member **138** and roller **22**. The leading radial edge **148** of each block is chamferred as shown, to ease the initial reactive crimping pressure between paper and crimper.

During the placing of a roll to be wrapped on the drive rollers and during the removal of a wrapped roll therefrom, the crimpers must be retracted from the vicinity of the wrapped roll and then must be brought into contact with the roll during the crimping operation.

When this operation is performed mechanically some difficulty is encounted in bringing the crimper blocks into the proper degree of contact with the roll ends.

It has therefore been found advantageous to provide a hydraulic or pneumatic control for the crimpers on each side of the roll whereby the crimpers may easily be applied to and retracted from the roll to be wrapped. No problem is encountered in bringing the blocks into contact with the roll because the blocks and their mounting members merely move inward under hydraulic or pneumatic pressure until contact is made with the roll which acts as the stop member for the movement of the crimper assembly.

There is thus provided a set of crimper blocks **146** which may be moved into and out of contact with the roll to be crimped and supply a crimping action thereto by piston-operated means and wherein the reaction by the thickening paper has been compensated for by the helical retraction means.

I claim:

1. In a roll wrapping machine: a pair of drive rollers for rotating and supporting said roll during wrapping; a pair of crimping means slidably mounted on one of the drive rollers, retractable means for moving said crimping means into contact with said rolls to perform the crimping operation, and means allowing helical retraction of said crimper blocks relative to said wrapped roll.

2. Crimping means comprising: a pair of drive rollers adapted to mount a roll to be wrapped, a pair of sleeves axially movable with respect to one drive roller, crimper block mounting means helically movable with respect to said sleeves and resilient means biasing said block mounting means toward said roll relative to said sleeves.

3. In a roll wrapping machine having means for supporting and rotating a roll to be wrapped; a pair of crimping means adapted to rotate adjacent each end of the roll to be wrapped for crimping the wrapping paper thereabout, said crimper means comprising a number of truncated sectorial blocks together delineating a circle adapted to rotate parallel to and adjacent the end of said roll.

4. In a roll wrapping machine having means for supporting and rotating a roll to be wrapped: a pair of crimping means adapted to rotate adjacent each end of said roll about an axis parallel thereto for crimping the wrapping paper thereabout, said crimper means comprising a number of circumferentially spaced blocks provided with radial leading edges adapted to contact said wrapping paper.

5. A roll wrapping machine as claimed in claim 4 wherein said leading edges are chamfered.

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