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**2,954,069**

# BANDING DEVICE FOR WRAPPING MACHINES

Filed March 14, 1957

3 Sheets-Sheet 1

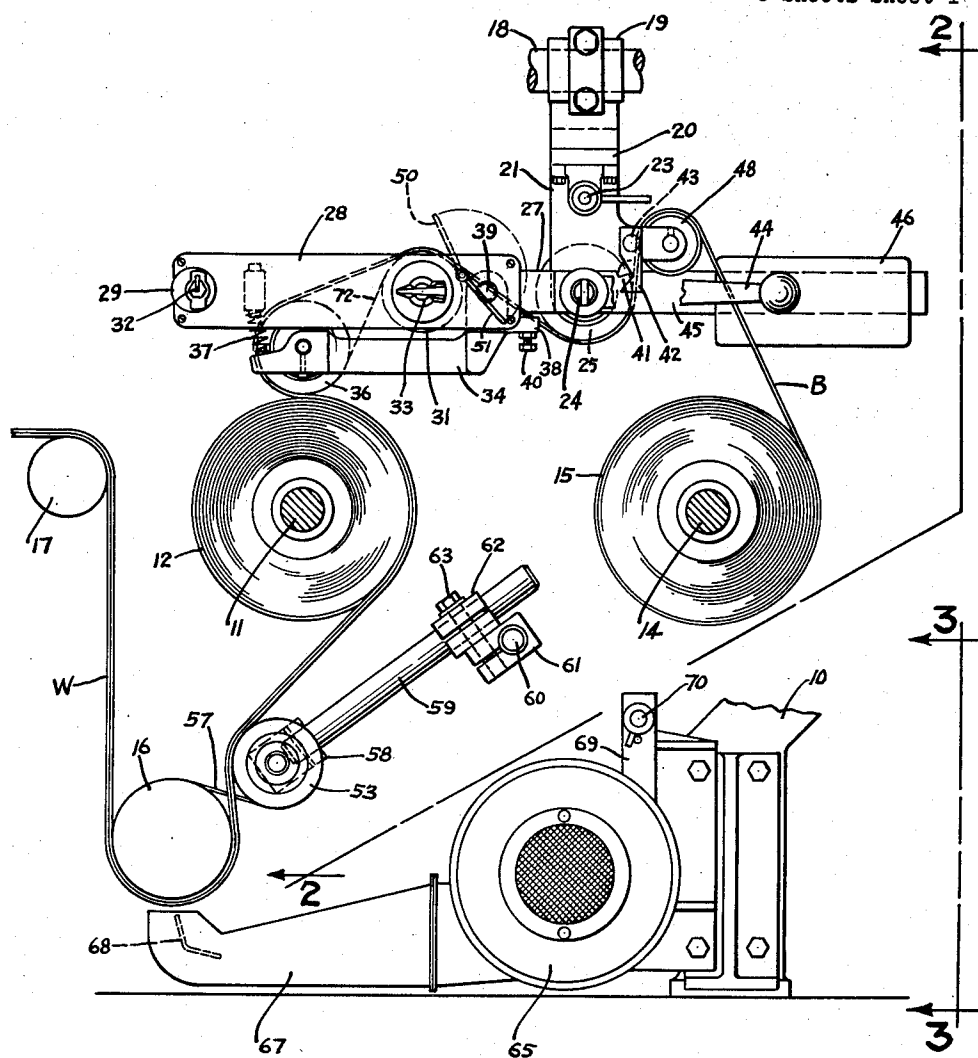


**FIG. 1**

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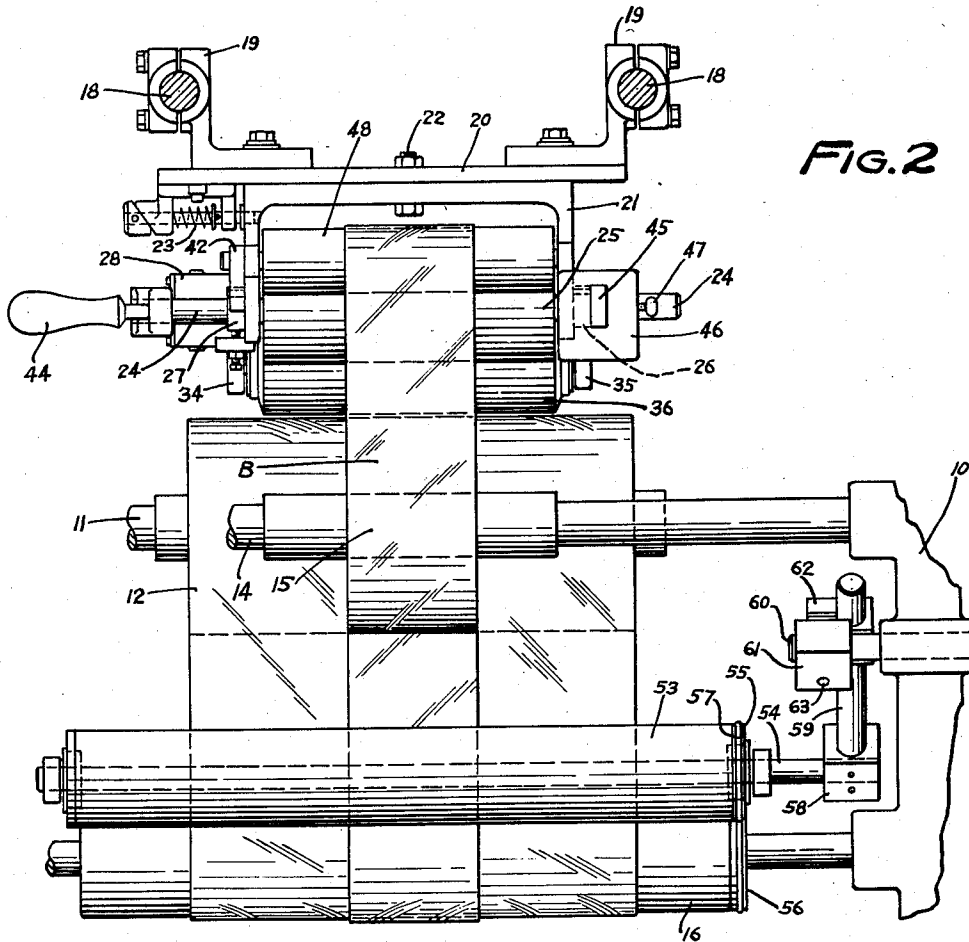


FIG. 2

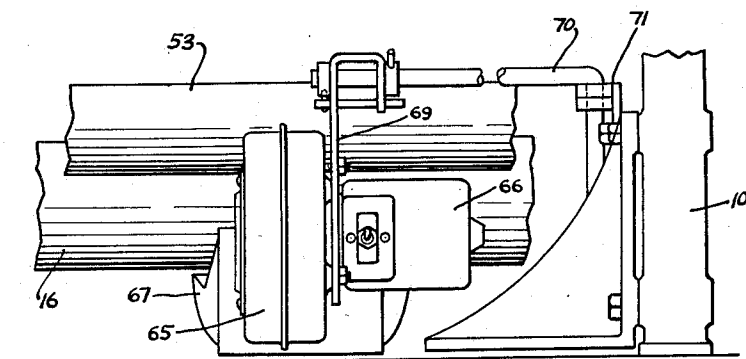


FIG. 3

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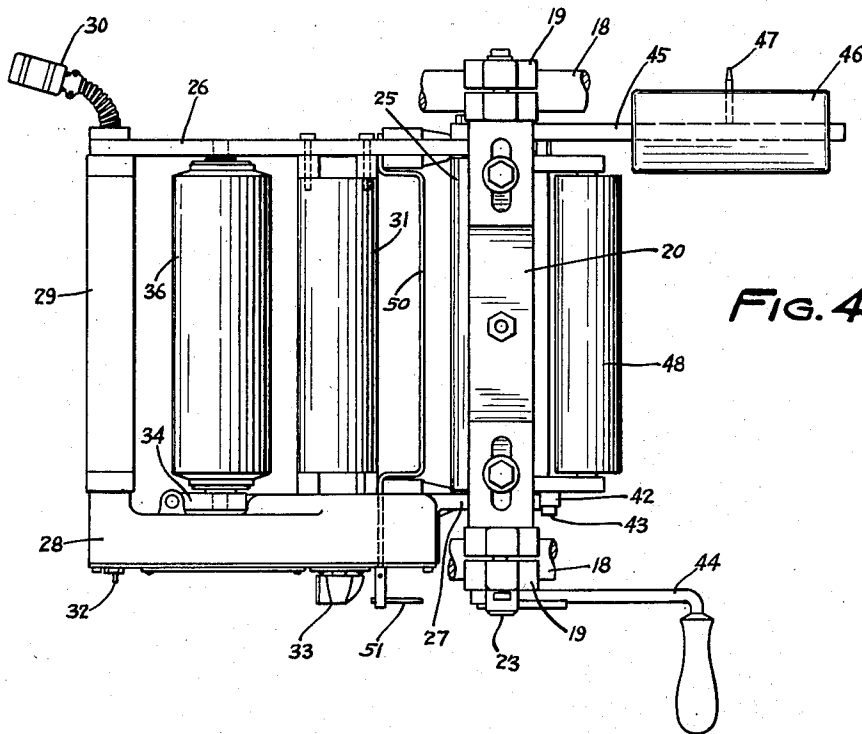
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BANDING DEVICE FOR WRAPPING MACHINES

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3 Sheets-Sheet 3



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## BANDING DEVICE FOR WRAPPING MACHINES

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11 Claims. (Cl. 154—1.6)

This invention relates to a new and improved mechanism for applying a labeling band to a wrapping strip by the application of heat and pressure prior to feeding the wrapping strip to a conventional wrapping machine. More particularly, this invention relates to a new and improved device for applying a paper reinforcing and labeling band to transparent bread wrapping strip material before the wrapping strip is fed to a conventional bread wrapping machine.

This invention constitutes an improvement over the invention described and claimed in my copending application Serial No. 518,775, filed June 29, 1955, now Patent No. 2,790,480 issued April 30, 1957, and this application is a continuation-in-part of my copending application.

The principal object of this invention is to provide a new and improved laminating device for attachment to a conventional wrapping machine for adhesively applying an adhesive-coated reinforcing band to a wrapping strip by the application of heat and pressure.

Other objects of the invention will become apparent as the description proceeds.

To the accomplishment of the foregoing and related ends, this invention then comprises the features hereinafter fully described and particularly pointed out in the claims, the following description setting forth in detail certain illustrative embodiments of the invention, these being indicative, however, of but a few of the various ways in which the principles of the invention may be employed.

The invention is illustrated by the drawings in which the same numerals refer to corresponding parts and in which:

Figure 1 is a side elevation of the laminating device of this invention;

Figure 2 is an end elevation, partly in section, taken generally along the line 2—2 of Figure 1 and in the direction of the arrows;

Fig. 3 is an end elevation taken along the line 3—3 of Figure 1 and in the direction of the arrows; and

Figure 4 is a top plan view.

The apparatus of this invention comprises an attachment for a conventional bread wrapping machine which is adapted to be positioned on the wrapping machine adjacent to the supply roll of wrapping material. The banding unit is suspended from the wrapping machine frame so that a pressure roll of the laminating device rests upon and rides the topmost portion or crown of the supply roll as a continuous paper web or band of reinforcing and label material is fed from a second supply roll. The band is first heated and then fed into direct engagement with the web or strip of wrapping material and bonded to it before the wrapping material is fed into the wrapping machine.

Referring to the drawings, a portion of the side frame of the wrapping machine to which the device of this invention is attached is shown generally at 10. The wrapping machine frame is provided with transverse horizontal shaft means 11 for mounting a supply roll 12

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of wrapping material for free rotation for feeding into the wrapping machine and also with transverse horizontal shaft means 14 parallel to shaft 11 for normally mounting a reserve roll of wrapping material, but, which in this instance is used for mounting a supply roll 15 of banding material B which is coated on both sides with a heat sensitive adhesive material. The supply roll mounts are of a conventional type having conical chucks for centering the supply rolls and are freely rotatable to enable the needed wrapping material to be drawn from the supply rolls to the existing drive roll 16 of the wrapping machine and thence over existing idler 17 into the wrapping machine, the structure of which is unchanged and is therefore not shown.

The wrapping machine is also provided with a pair of longitudinal parallel horizontal bars or rods 18 positioned above the supply rolls. While all wrapping machines conventionally in use are not provided with bars or rods 18 as shown in the drawings, they are provided with some equivalent means from which the banding unit of this invention may readily be suspended by simple mechanical adaptation of the mounting means. Although this invention is illustrated with particular reference to the supporting means present on an American Standard bread wrapping machine it will be readily understood that the banding unit of this invention is not limited to any particular supporting means, but is easily adapted to the National and other bread wrapping machines.

As shown, a pair of split bushings 19 is bolted to the rods 18 rearwardly of the wrapping supply roll 12. A transverse horizontal mounting bar 20 is bolted to the mounting bushings 19 and forms the support for the banding unit. A main support hanger or yoke 21 is pivotally supported at 22 below the center of horizontal mounting bar 20. A spring loaded locking pin 23 is mounted in a bracket on the lower side of one end of horizontal bar 20 and permits the locking of yoke 21 to hold the banding unit in its normal operating position as well as to permit release of the yoke to pivotally rotate the banding unit on its pivotal support 22 when the need arises.

A horizontal pivot shaft 24 is journaled for rotation in the ends of the open arms of the main support yoke 21. Shaft 24 is slotted preferably at both ends. A pivot idler 25 mounted on press fit bearings at both ends is carried on pivot shaft 24 between the arms of the main support yoke 20. A pair of parallel pivot arms 26 and 27 are keyed to the pivot shaft 24 and extend forwardly from yoke 21, that is, in the direction of travel of the wrapping material. Pivot arm 27 is conveniently cast with an integral electrical control box 28. The free ends of the pivot arms 26 and 27 are connected by a smooth tubular cross-tie 29 which serves as a convenient conduit for the passage of electrical wires from a suitable electrical connector 30 to the electrical control box 28. Alternatively, as explained in greater detail hereinafter, the tie bar 29 may be fitted with a heating element and used as an auxiliary heating means.

Positioned between and supported by the pivot arms 26 and 27 intermediate of the pivot idler 25 and the horizontal cross-tie 29 is a smooth cylindrical tubular heater block or stationary roll 31 housing an electrical heating element. The heating element may be, for example, an eight inch, 650 watt cartridge heater. The heater block or roll 31 is supported away from the pivot arms by means of blocks or washers of heat insulating material such as Transite to minimize heat transfer from the block or roll 31 to the rest of the banding device. Although shown as a stationary roll or tubular block it is apparent that the heating means may be a rotatable roll, but with a somewhat more difficult task of energizing the heater element. Electrical control box 28 houses a switch con-

trolled from switch lever 32 and a thermostatic control regulated by means of adjustable regulator knob 33 on control box cover at the side of the pivot arm.

Pivotally mounted on the pivot arms 26 and 27, respectively, between the pivot idler 25 and the heater block 31 is a pair of pressure roll bearing arms 34 and 35, both of which are generally parallel and extend forwardly in the direction of cross-tie 29. Supported between the free ends of pressure roll bearing arms 34 and 35 is a resilient surfaced pressure roll 36. Pressure roll 36 is desirably a rubber covered metal tube provided with press fit flange bearings and mounted on a fixed shaft carried by the bearing arms 34 and 35.

The extreme free ends of the pressure roll bearing arms 34 and 35 are each provided with adjustable spring means 37 which bear against the pivot arms and tend to push the pressure roll bearing arms 34 and 35 and the pressure roll 36 downwardly from the pivot arms 26 and 27. The relative movement between the pivot arms and the pressure roll bearing arms is limited by virtue of a stop 38 on each of the pressure roll bearing arms rearwardly of the pivotal mounts 39. Regulation and adjustment of this movement is provided by means of a bolt 40 threaded into the stop 38 on each of the pressure roll bearing arms.

One of the pivot arms 27 is provided with teeth at its end adjacent pivot shaft 24 to form a ratchet 41 which is engaged by a pawl 42 pivotally mounted on the outside of yoke 21. By means of a crank 44 fit onto either slotted end of pivot shaft 24 the entire pivoted heater block and pressure roll assembly may be rotated on the pivot shaft 24 and locked in a lifted position with the pressure roll lifted away from the surface of the wrapper supply roll 12, as for example, when changing wrapper supply rolls.

The other pivot arm 26 is provided at its end adjacent the pivot shaft 24 with a counterweight arm 45 which carries a counterweight 46 to balance the weight of the heater and pressure roll assembly carried by the pivot arms. The counterweight 46 is slidable along the arm 45 and is secured by means of a thumbscrew 47.

To provide proper tension on the strip of banding material as it is fed from the band supply roll 15 to the supply roll 12 of wrapping material a second idler 48 is provided. Idler 48 is mounted in the path of the band B slightly above and rearwardly of pivot idler 25. The idler 48 is preferably a hollow tube provided with press fit bearings at both ends and mounted on a stationary shaft carried by extension arms formed integral with the arms of the yoke 19.

An eccentrically mounted open loop band lifter 50 is supported at either end by pivot arms 26 and 27, respectively, rearwardly of the heater block 31. One end of the band lifter extends through the idler arm 27 and electrical control box 28 and is provided with an external handle 51 by means of which the idler may be rotated from its normal position out of the path of movement of banding strip B upwardly and across that path in order to lift the band off of the heater block 31.

The purpose of the band lifter is to remove the band (which is coated with a heat sensitive sealing material) out of contact with the heater block 31 at such times as the wrapping machine is not in operation in order to prevent excessive heating of the band and its sealing material. Otherwise the sealing material tends to overheat and run so that when the machine is again put in operation the area of the band which was adjacent the heater element has an insufficient layer of sealing material left to form a satisfactory bond with the wrapping strip. By virtue of the band lifter, in the case of any stoppage the operator need merely flick handle 51 to temporarily lift the band from the heater block.

Because the web contact position of the pressure roll 36 varies as the diameter of the supply roll 12 decreases an adjustable auxiliary drive roll 53 is provided to insure

a uniform pull on the composite banded wrapping strip regardless of the supply roll diameter. Auxiliary drive roll 53 is disposed in the path of the composite strip between the supply roll 12 and the existing drive feed roll 16 of the wrapping machine. Roll 53 is preferably in the form of a hollow tube provided at each end with a press fit bearing and mounted on a stationary shaft 54. One end of roll 53 is provided with a pulley 55. The existing drive roll 16 of the wrapping machine is provided with a similar pulley 56 and roll 53 is driven from the drive roll 16 by means of a spring belt 57.

Shaft 54 is carried in the lower mounting block 58 which is fixedly mounted on one end of an arm 59. Arm 59 is in turn adjustably mounted on a stub shaft 60 which is carried by the existing spindle frame 10 of the wrapping machine. Arm 59 is mounted on shaft 60 so as to provide a four-way adjustment of the roll 53 by means of a single adjustment. A partially split block 61 is fitted over stub shaft 60. A similar partially split block 62 is fitted over the free upper end of arm 59 and a single bolt 63 is inserted in threaded openings passing through the split portions of both blocks. Each block comprises a cubical piece of metal having a hole bored through it in one direction and a longitudinal slit intersecting the bore along its entire length. A single adjustment of bolt 63 permits both a rotary and lateral movement of the double block 61—62 with respect to the stub shaft 60 and likewise permits both rotary and lateral movement of the double block relative to the arm 59 thereby providing simple and easy means of adjusting the position of the roller 53.

In order to insure a secure and permanent bond between the banding strip and the web of wrapping material it is desirable to cool the composite web in order to congeal the heat softened sealing material. For this purpose there is provided a blower 65 suitably driven, as by an electric motor 66, and provided with an air nozzle 67 especially adapted to direct a cooling blast of air across the entire width of the band as it passes around drive roll 16. The air nozzle 67 is provided with a damper means 68 to adjust and regulate the air flows. The blower 65 is supported by a bracket 69 which is adjustably mounted on a right angle rod 70 which in turn is supported in a pivotal mount 71 on the wrapping machine frame 10 to permit the blower nozzle 67 to be easily pivoted into and out of its operating position. The composite web may be cooled with a steady blast of ordinary room air, or if desired or necessary, air from any conventional cooling unit or air conditioning unit may be passed by a suitable duct to the air inlet of blower 65.

In the normal operation of the banding device of this invention to produce a wrapper having a reinforcing and labeling band on the inside of the finished package, a supply roll of wrapping material, such as cellophane, is placed on spindle 11 and a supply roll of paper banding material is placed on spindle 14. Then, as shown in Figure 1, the banding strip B is unrolled from its supply roll 15 and threaded over idler 48 down and under idler 25, up and over cylindrical heater block 31 where its adhesive coating is softened and thence around and under pressure roll 36 where the band with its softened adhesive coating is pressed into adherence with the web of wrapping material to form a composite banded web W which then is passed over roll 53 to the normal drive roll 16 of the bread wrapping machine where it is cooled and the adhesive is congealed before the wrapping strip is fed into the wrapping machine.

If it is desired to produce a finished wrapped package in which the reinforcing and labelling band appears on the outside, the banding strip B is threaded as described except that it is passed from the heating block 31 directly under the pressure roll 36 along the path indicated by broken line 72 (Figure 1) and thence around the opposite side of supply roll 12, over roll 53 to the feed roll 16 and thence into the wrapping machine. It will be apparent

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that to produce a composite wrapper with the band on the outside it will also be necessary that the supply roll 12 be turned end for end on the spindle 11 in order that it will unroll in the proper direction. The band B is preferably coated with sealing material on both sides so that it is immaterial which side comes into direct contact with the heater block.

Where additional heating of the adhesive layer is desirable or necessary an auxiliary heating element may be installed in the tubular cross-tie 29 and the band B is then threaded to pass over the cross-tie element 29 before passing under the pressure roll 36. This may be done whether the band is to appear on the inside or the outside of the finished wrapped package.

Intimate contact between the pressure roll 36 and the crown of the cellophane supply roll 12 is assured by virtue of the adjustable mounting of the resilient pressure roll. Compensation for unevenness of the cellophane roll can be readily made by adjustment of bolts 40.

No independent drive means need be provided for the banding device of this invention. The feeding mechanism of the wrapping machine pulls the wrapper strip from its supply roll along with the band adhered thereto.

The pivotal mount 22 permits the entire banding unit to be easily swung out of the way to provide access for cleaning, repairing and the like. The pawl and ratchet arrangement at the end of the pivot arms 27 permits the heater block and pressure roll assembly to be lifted out of contact with the wrapping supply roll for changing the supply roll and the like. The pivotal mounting of the blower likewise permits it to be swung out of the way.

It will be readily apparent that this unit is adapted to the use of bands of varying widths as demanded by particular wrapping requirements. The band lifter 50 permits lifting of the band away from the surface of the heater block 31 to prevent overheating and melting of the heat sensitive sealing material on the band and to prevent sticking of the band to the heater element at the end of a run.

The banding device as heretofore described produces a composite banded wrapper wherein the band is secured to the wrapping strip over the entire surface of one side of the band. If desired the band need not be secured over its entire surface but may be secured at selective portions, as for example, only along the marginal edges of the band. This may be accomplished, for example, by selective heating of the adhesive-coated band as it passes over the heating block 31. One relatively simple manner by which selective heating may be accomplished is to form the tubular housing for heater block 31 from two tubular sections made of metal having good heat conductivity characteristics such as aluminum, and an intermediate tubular section of the same diameter as the metal tubes, but somewhat narrower than the width of the band and formed from a material having poor heat conductivity properties. A somewhat similar result may also be obtained by positioning two smaller heater elements within the normal metal heater block housing, the two heating elements being separated by heat insulating material over a space somewhat less than the width of the band.

Either of these expedients are within the skill of the art. They have the disadvantage, however, of nonflexibility. If the heater block were constructed to selectively heat the marginal edges of a narrow band, wider bands could also be selectively heated on the same apparatus except the marginal edges which were heated would be considerably wider. However, if the heater block were constructed for the selective heating of the marginal edges of a relatively wide band that unit would not be adapted to the selective heating of both marginal edges of a narrower band. Thus, where greater flexibility is desired the cylindrical heater block 31 is desirably replaced by an idler roll and the heater elements are disposed in a pair of concave shoes having a curvature adapted to fit the outer surface

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of the idler roll. These shoes are adjustably mounted to permit relative lateral movement along the length of the idler to selectively heat marginal edges of bands of any desired width.

It is apparent that many modifications and variations of this invention as hereinbefore set forth may be made without departing from the spirit and scope thereof. The specific embodiments described are given by way of example only and the invention is limited only by the terms of the appended claims.

I claim:

1. In a wrapping machine having means for supporting a supply roll of wrapping material in web form, drive means for drawing the web from said roll and delivering it to the wrapping mechanism of said machine and reserve supply roll support means adapted to support a supply roll of narrower reinforcing banding material; a band laminating device comprising a pivotally mounted frame extending longitudinally of said machine and carrying a pressure roll positioned above the wrapping material supply roll support means and adapted to rest resiliently on top of said supply roll; a pair of parallel horizontal idler rolls mounted above said supply roll support means in the path of travel of said banding material between the band material supply roll and the pressure roll; horizontal tubular heating means carried in said frame parallel to said idlers and mounted in the path of travel of said banding material between said idlers and said pressure roll; and positive auxiliary drive roll means mounted in the path of travel of said web of wrapping material between the supply roll of wrapping material and said wrapping machine drive means for assisting movement of the web of wrapping material through the machine; said auxiliary drive roll being driven from said wrapping machine drive means.

2. Apparatus according to claim 1 further characterized in that an eccentric band lifting means is mounted adjacent to said heating element in the normal path of travel of said banding material, said means being pivotally mounted in said frame and including a smooth transverse portion extending below the normal path of travel of said banding material and adapted to be moved to a position above the normal path of travel of said banding material whereby eccentric movement of said lifting means alters the path of travel of said banding material and lifts the same from the surface of the heater element.

3. Apparatus according to claim 1 further characterized in that positive forced cooling means are provided adjacent to the path of travel of said wrapping material at a point in said path of travel downstream from said wrapping material supply roll.

4. Apparatus according to claim 3 further characterized in that said cooling means is an air blower having a nozzle directed against the path of travel of said wrapping material bearing the laminated narrower reinforcing banding material.

5. In a wrapping machine having means for supporting a supply roll of wrapping material in web form, drive means for drawing the web from said roll and delivering it to the wrapping mechanism of said machine, reserve supply roll support means adapted to support a supply roll of narrow reinforcing banding material, a band laminating device comprising a yoke hanger suspended from the wrapping machine, a horizontal pivot shaft journaled for pivotal rotation in the arms of said yoke, an idler roll on said shaft, a pair of pivot arms keyed to said shaft, a horizontal tubular heating element parallel to said idler and carried between said pivot arms, a pair of pressure roll bearing arms pivotally supported below said first pair of arms, a resilient pressure roll mounted between said second pair of arms, a second idler roll carried by said yoke parallel to said first idler and mounted in the path of travel of said banding material between the banding material supply roll and said first idler, an auxiliary drive roll mounted in the path of travel of said wrapping web

between said wrapping material supply roll support means and the drive means of said wrapping machine, said auxiliary drive roll being driven by said wrapping machine drive means.

6. Apparatus according to claim 5 further characterized in that said yoke hanger is pivotally mounted on said wrapping machine for movement transverse to the axis of the wrapping machine.

7. Apparatus according to claim 5 further characterized in that one of said pair of pivot arms is provided with a counterweight arm carrying a counterweight.

8. Apparatus according to claim 7 further characterized in that said pivot shaft journalled for pivotal rotation in the arms of said yoke has a crank and ratchet keyed thereto and a pawl on said yoke adapted to engage said ratchet, said ratchet comprising one end of the other of said pair of pivot arms.

9. Apparatus according to claim 5 further character-

ized in that cooling means is provided adjacent to the path of travel of said wrapping material adjacent to the wrapping machine drive roll.

10. Apparatus according to claim 9 further characterized in that said cooling means is an air blower.

11. Apparatus according to claim 5 further characterized in that said tubular heating element is provided with means for selective heating of said banding material.

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