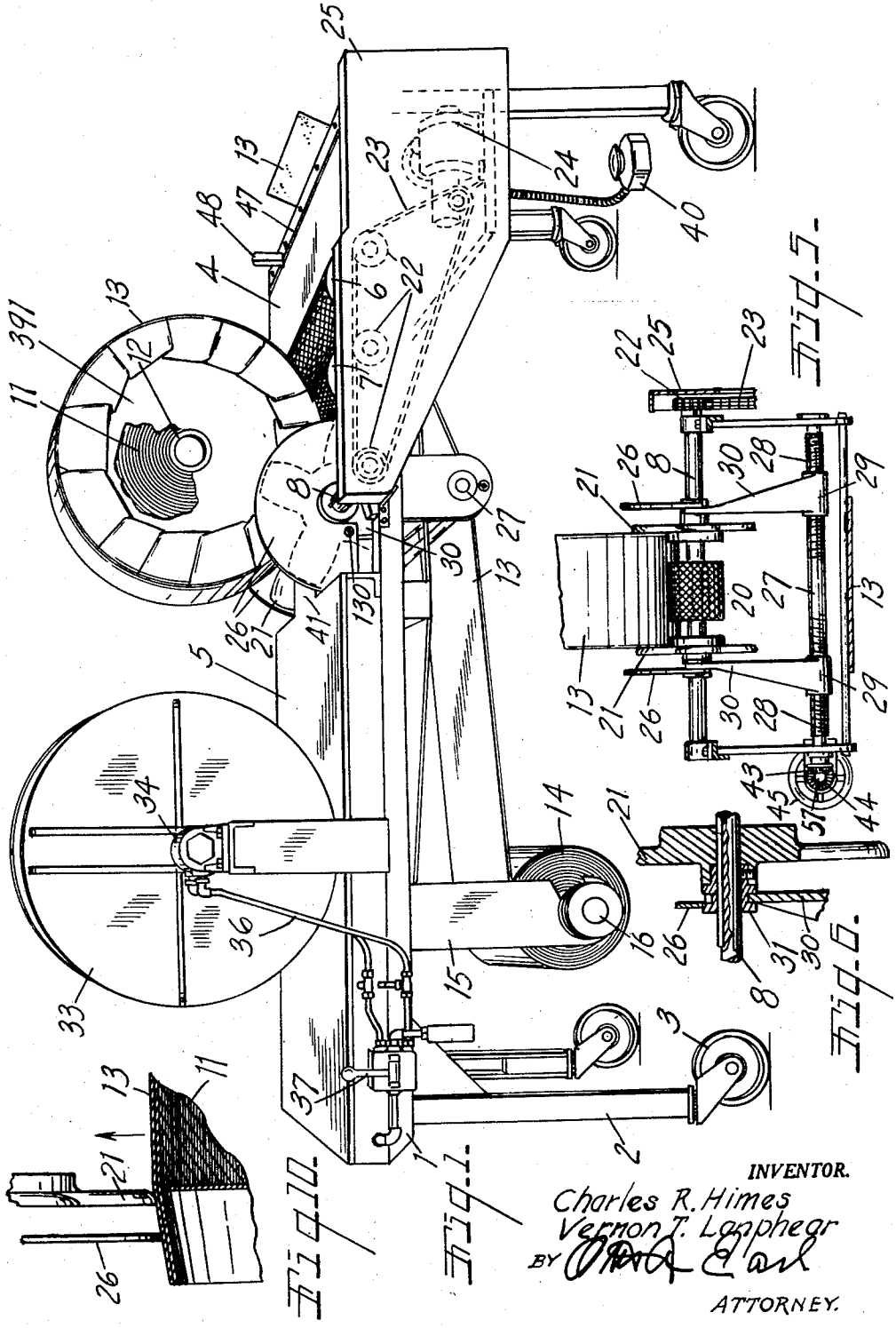
Sept. 16, 1958 C. R. HIMES ET AL 2,851,839

MACHINE FOR WRAPPING ROLLS OF PAPER AND THE LIKE

Filed June 18, 1956 3 Sheets-Sheet 1



INVENTOR.
Charles R. Himes
Vernon T. Lanphear
BY
ATTORNEY.

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Filed June 18, 1956 3 Sheets-Sheet 2

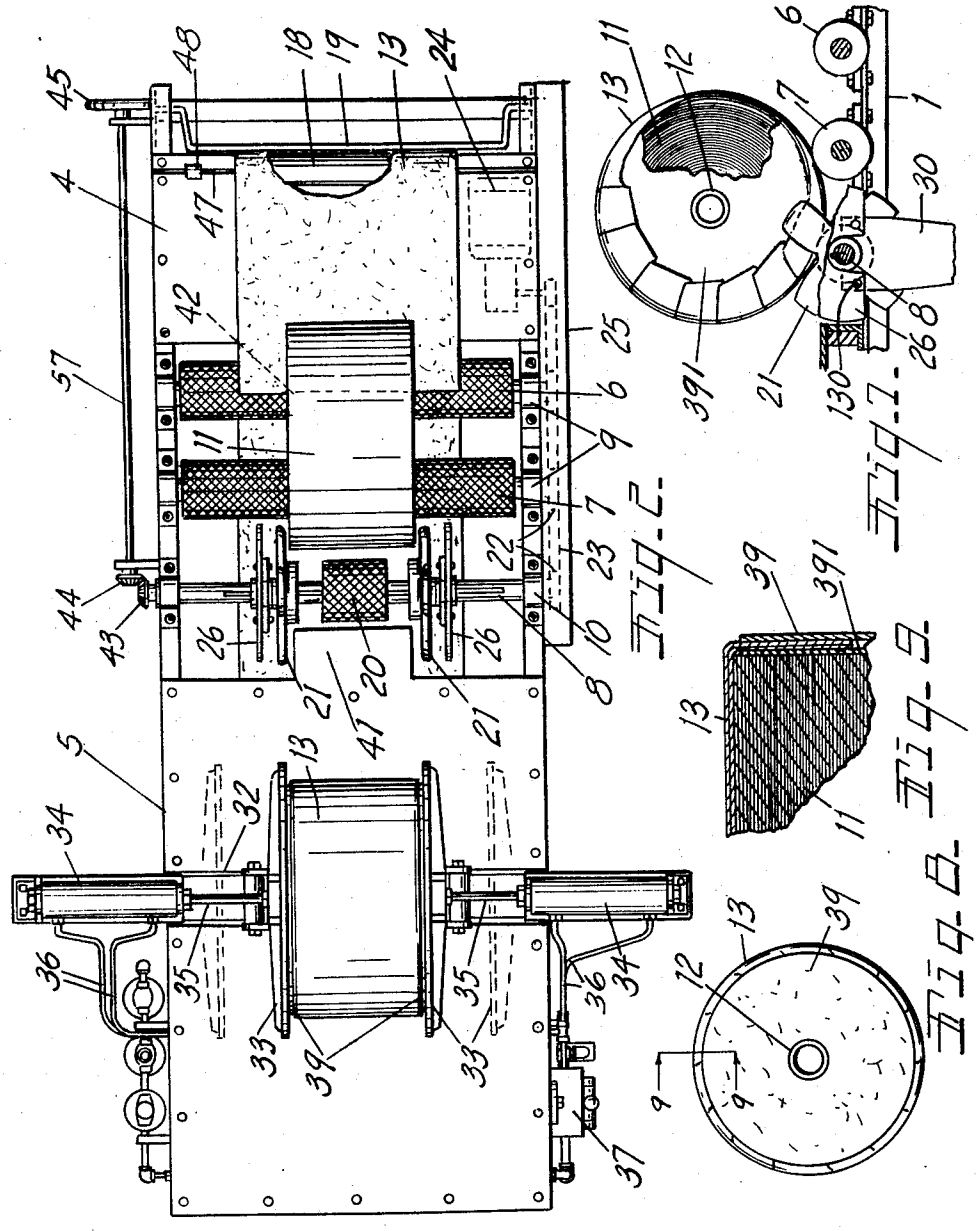


FIG. 2

FIG. 3

FIG. 4

FIG. 5

INVENTOR.
Charles R. Himes
Vernon T. Lanphear
BY
ATTORNEY.

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Filed June 18, 1956 3 Sheets-Sheet 3

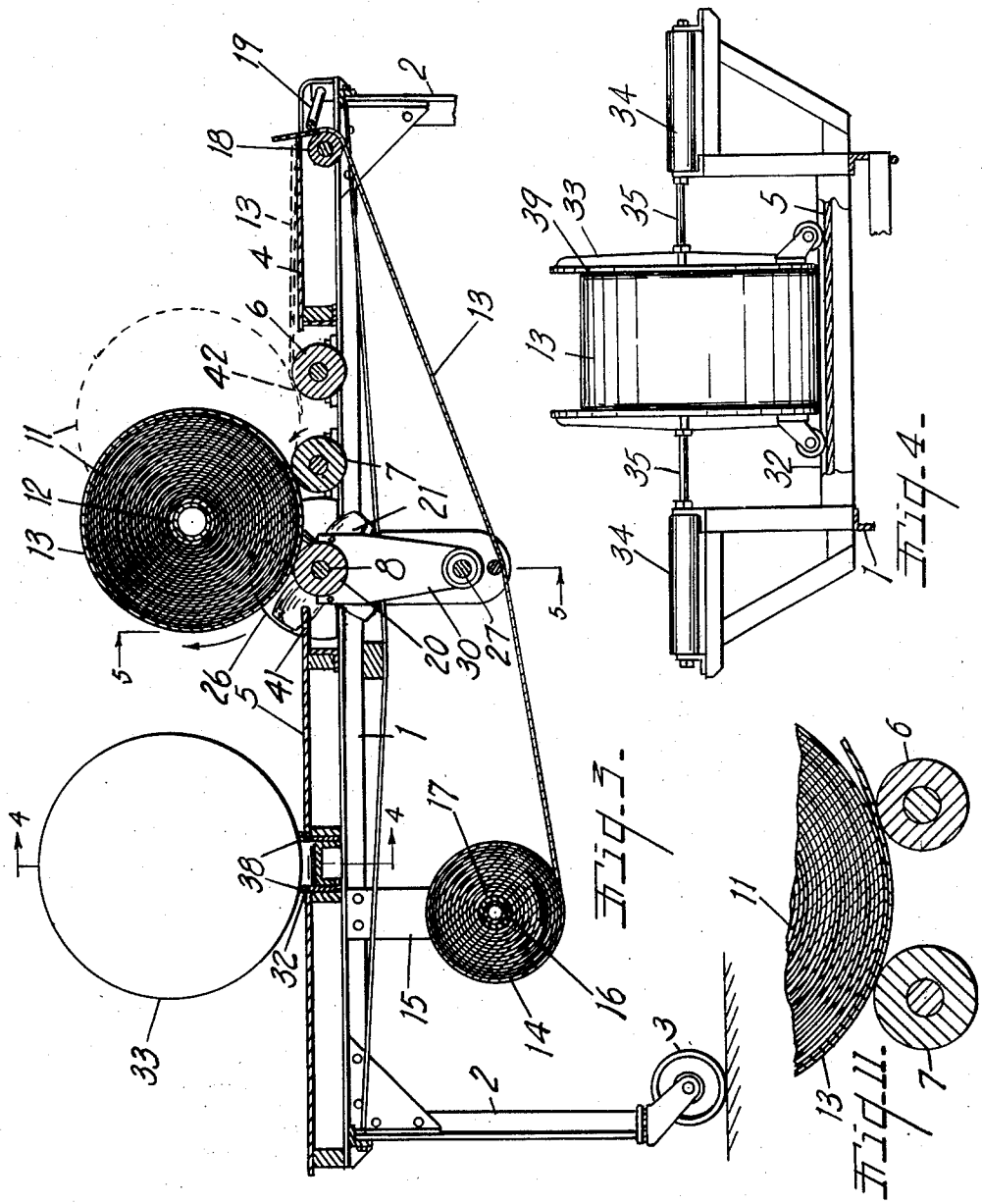


Fig. 3.

Fig. 4.

Fig. 11.

INVENTOR.
Charles R. Himes
Vernon T. Lanphear
BY
ATTORNEY.

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MACHINE FOR WRAPPING ROLLS OF PAPER AND THE LIKE

Charles R. Himes and Vernon T. Lanphear, Kalamazoo, Mich., assignors to Kalamazoo Vegetable Parchment Company, Kalamazoo, Mich.

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10 Claims. (Cl. 53—380)

This invention relates to a machine for wrapping rolls of paper and the like.

The main objects of this invention are:

First, to provide a machine for wrapping rolls which tightly wraps the wrapping material around the roll and folds the ends thereof upon the ends of the roll and clamps disc-like wrapper end members commonly called headers to the folded ends of the wrapper.

Second, to provide a wrapping machine which accompishes the ends indicated with a relatively small amount of labor and effort on the part of the operator.

Third, to provide a wrapping machine having these advantages which is quite compact and at the same time of relatively large capacity.

Objects relating to details and economies of the invention will appear from the description to follow. The invention is defined and pointed out in the claims.

A preferred embodiment of the invention is illustrated in the accompanying drawing, in which:

Fig. 1 is a side perspective view of a wrapping machine embodying our invention with a roll having a wrapper end folded thereon over an inner header disc which is partially broken away.

Fig. 2 is a top plan view with the roll positioned on the wrapping rolls and with one end of the wrapping web positioned to begin the wrapping, the wrapping web being partially broken away, the header clamps being shown in retracted position by dotted lines.

Fig. 3 is a central longitudinal section showing a wrapper around a roll, the roll being indicated in wrapping position, as is shown in Fig. 2 by dotted lines.

Fig. 4 is a fragmentary view partially in transverse section on a line corresponding to line 4—4 of Fig. 3.

Fig. 5 is a fragmentary view partially in section on a line corresponding to line 5—5 of Fig. 3.

Fig. 6 is a fragmentary view partially in section illustrating details of the means for supporting and adjusting the wrapper folder members.

Fig. 7 is a fragmentary view partially in vertical section and partially broken away, illustrating the relation of the folders to the roll and its wrapper.

Fig. 8 is an end elevational view of the wrapped roll.

Fig. 9 is an enlarged fragmentary view on a line corresponding to line 9—9 of Fig. 8.

Fig. 10 is an enlarged fragmentary view illustrating the relation of the folders to the roll and the wrapper, and the relation of folder guards to the folders.

Fig. 11 is a fragmentary sectional view illustrating the difference in diameter of the rolls 6 and 7 exaggerated for clearness.

In the accompanying drawings we have illustrated our invention as embodied in a machine for wrapping rolls of paper but it will be understood it may be used for wrapping rolls of other material or other cylindrical objects.

The embodiment of our invention illustrated comprises a suitable frame designated generally by the

numeral 1 and having legs 2 provided with caster wheels 3. The bed of the table comprises a front section 4 and a rear section 5 spaced to receive wrapping rollers 6 and 7 and the folder shaft 8 and parts mounted thereon.

The rolls 6 and 7 are supported in spaced parallel relation by suitable bearings 9. The shaft 8 is supported in parallel relation to the axes of the rollers 6 and 7 by suitable bearings 10. The rollers 6 and 7 are spaced to supportedly receive and rotate a roll of paper designated by the numeral 11. The roll of paper to be wrapped is pre-wound on a core indicated at 12. The rollers 6 and 7 are spaced to support and rotate the roll for wrapping the wrapping material 13 around the roll.

The roller 6 is of slightly less diameter than the roller 7 so that pull or tension is applied to the wrapper to wrap it tightly around the roll. In the embodiment illustrated, which is a commercial embodiment, the roll 7 is 4¼ inches in diameter and the roll 6 is .020 of an inch less diameter.

The roll of wrapping paper 14 is supported below the bed section 5 by means of the hangers 15 carrying the spindle 16 which is disposed through the core 17 of the roll of wrapping paper. A guide roller 18 for the wrapping paper web is positioned at the front edge of the front bed section 4, as is best shown in Fig. 3.

A pivoted clamp 19 is provided to clamp the web against the guide roller 18 preventing its retracting movement while permitting forward movement of the web.

The shaft 8 is provided with a roller 20 which is relatively short as compared to the rollers 6 and 7 and is spaced from the rear wrapping roller 7 to coact therewith in supporting and rotating the roll of paper with the wrapper wrapped therearound in operative relation to the folders 21 which are splined upon the shaft 8 for adjustment axially thereof to permit proper positioning of the folders relative to the ends of the roll to be wrapped.

The shaft 8 and the rollers 6 and 7 are driven in timed relation desirably at the same speed. As the roller 6 is of less diameter its surface speed is slightly less than that of roller 7, which permits roller 7 to tighten and hold tight the wrapper as it is applied. In the embodiment illustrated, the rollers 6 and 7 and the shaft 8 are provided with sprockets 22 driven through the sprocket chain 23 from the motor 24, the drive parts being indicated conventionally by the dotted lines in Fig. 5. A guard plate 25 is provided for these parts.

The folders are simultaneously adjusted to adapt them to rolls of varying lengths. This, in the embodiment illustrated, is accomplished by the adjusting shaft 27 which has oppositely threaded end portions 28 with which the portions 29 of the brackets 30 threadedly engage. The guards 26 are fixedly secured to the brackets 30 at 130. These brackets 30 engage the supports 31 which are slidable on the shaft.

A slide way 32 is mounted transversely of the bed in rearwardly spaced relation to the folding means and is adapted to slidably support the header clamps 33 for adjustment to and from each other. These header clamps are simultaneously retracted and advanced by fluid, desirably pneumatic actuated means, comprising the cylinders 34 and coacting pistons, not illustrated, the plunger rods 35 of which are connected to the clamp members. Means for controlling the flow of air to the cylinders through the connections indicated at 36 is conventionally indicated at 37.

As the details of this mechanism form no part of our present invention, we have not illustrated and described the same herein. The important feature is that the clamp members are simultaneously adjusted to and from clamping position and when separated, as indicated by dotted

lines in Fig. 2, a wrapped roll with ends of the wrapper folded may be transferred from end folding position to a position between the clamps and properly centered by positioning on the supports 38, see Fig. 3.

In this position the outer end discs or headers 39, as they are commonly called, with adhesive on the inner sides thereof, are positioned over the folded ends of the wrapper and the clamp members actuated to clamp the headers 39 against the ends of the roll. The clamp members are left in clamping position until the adhesive is set. This completes the wrapping operation.

The section 5 of the bed is provided with a forward extension 41 which projects between the folders 21 so that the wrapped roll with the ends folded, as shown in Fig. 1, may be rolled off the roller 20 onto the bed section 5 and positioned on the locating supports 38, as shown in Fig. 3. The motor 24 is controlled from a switch, conventionally indicated at 40.

With the parts thus arranged, the desirable procedure in wrapping a roll is to position the end of the web of wrapping paper in overlapping relation to the roll, as is illustrated in Fig. 2, and place the pre-wound roll 11 on the rollers 6 and 7. The end of the wrapper may be adhesively attached to the roll, but a practical practice is for the operator to grasp the web and guide it around the roll during the first turn or wrap. The wrapper is preferably wrapped around the roll more than once, two wraps being shown. After the operator has positioned the web of the wrapper, as is shown in Fig. 2, the steps on the control switch 40. It is found convenient to have the switch of the type that automatically opens so that the operator can hold it in "on" position until the wrapper is completely wrapped around the roll, and then allow it to open, if he desires, while he is positioning the wrapped roll in folding position on the rollers 7 and 20. Before folding, the inner headers 391 are placed on the ends of the roll within the projecting ends of the wrapper. With the roll in position on the rollers 7 and 20, the switch is again closed and held closed until it is again turned off, and the projecting ends of the wrapper are completely folded. As stated, the folders may be adjusted to rolls of various lengths. To increase the gripping action for rotating the rolls and feeding the wrapper, rollers 6, 7 and 20 are knurled. Guards 26 are provided so that the operator will not position his hands to be struck by the blades of the folders.

For convenience the adjusting shaft 27 is provided with a beveled gear 43 with which the beveled gear 44 on the adjusted shaft 57 is provided with a hand wheel 45 at the front end of the machine. This provides for quick adjustment. The machine illustrated is provided with a transverse slot 47 in the front section 4 of the bed adapted to receive and guide the cutter 48.

With the ends of the wrapper folded, the wrapped roll is rolled off the rollers 7 and 20 onto the bed section 5, and rolled therealong and positioned on the supports 38 between the header clamp members. The outer wrapper headers 39 are provided with adhesive on their inner sides and positioned in overlapping relation to the end folds of the wrapper. The clamping members control valve is then opened and the header clamping members are simultaneously actuated to clamp the outer headers against the ends of the roll. The clamping members are maintained in clamping position until the adhesive has set.

The embodiment of our machine illustrated is portable, is of large capacity and the wrapped rolls have an attractive finished appearance. We have not attempted to illustrate or describe other embodiments or adaptations of our invention which we contemplate for particular types of rolls, as it is believed that this disclosure will enable those skilled in the art to embody or adapt the invention as may be desired.

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

1. In a machine for wrapping rolls, the combination with a bed having an opening therein of a pair of driven wrapping rollers disposed in said bed opening and adapted to supportedly rotate a roll positioned thereon for wrapping a wrapper around the roll with the end edges of the wrapper projecting beyond the ends of the roll, a driven shaft disposed in said opening in said bed at the rear of and parallel to the axes of said wrapping rollers and driven in timed relation therewith and having a central relatively short roll supporting roller thereon positioned to coact with the rear wrapping roller to supportedly rotate a roll shifted thereto from said wrapping rollers, wrapper folder means comprising a pair of driven folders mounted upon and shiftable axially of said shaft and having angularly spaced blades engaging and successively folding segments of the projecting end portions of the wrapper wrapped around the roll upon the ends of the roll as the folders and the roll with the wrapper therearound are rotated in timed relation, means for simultaneously adjusting said folders axially on said shaft, a way disposed transversely of said bed in rearwardly spaced relation to said folders, wrapper header clamps slidably mounted on said way for adjustment to and from each other and to receive a roll with the end folded wrapper thereon between them, and means for simultaneously adjusting and applying pressure to said clamps for clampingly supporting headers disposed upon the folded ends of the wrapper.

2. In a machine for wrapping rolls, the combination with a bed having an opening therein of a pair of driven wrapping rollers disposed in said bed opening and adapted to supportedly rotate a roll positioned thereon for wrapping a wrapper around the roll with the end edges of the wrapper projecting beyond the ends of the roll, a driven shaft disposed in said opening in said bed at the rear of and parallel to the axes of said wrapping rollers and driven in timed relation therewith and having a central relatively short roll supporting roller thereon positioned to coact with the rear wrapping roller to supportedly rotate a roll shifted thereto from said wrapping rollers, wrapper folder means comprising a pair of driven folders mounted upon and shiftable axially of said shaft and having angularly spaced blades engaging and successively folding segments of the projecting end portions of the wrapper wrapped around the roll upon the ends of the roll as the folders and the roll with the wrapper therearound are rotated in timed relation, guard members mounted on said shaft at the outer sides of said folders, and means for simultaneously adjusting said folders on said shaft.

3. In a machine for wrapping rolls, the combination with a bed having an opening therein of a pair of driven wrapping rollers disposed in said bed opening and adapted to supportedly rotate a roll positioned thereon for wrapping a wrapper around the roll with the end edges of the wrapper projecting beyond the ends of the roll, a driven shaft disposed in said opening in said bed at the rear of and parallel to the axes of said wrapping rollers and driven in timed relation therewith and having a central relatively short roll supporting roller thereon positioned to coact with the rear wrapping roller to supportedly rotate a roll shifted thereto from said wrapping rollers, a pair of driven folders mounted upon and shiftable axially of said shaft and having angularly spaced blades engaging and successively folding segments of the projecting end portions of the wrapper wrapped around the roll upon the ends of the roll as the folders and the roll with the wrapper therearound are rotated in timed relation, means for simultaneously adjusting said folders on said shaft, a way disposed transversely of said bed in rearwardly spaced relation to said folders, wrapper header clamps slidably mounted on said way for adjustment to and from each other and to receive a roll with the end folded wrapper thereon between them, and means for simultaneously adjusting and applying pressure to said clamps for clampingly supporting headers disposed upon the folded ends of the wrapper.

4. In a machine for wrapping rolls, the combination with a bed having an opening therein of a pair of driven wrapping rollers disposed in said bed opening and adapted to supportedly rotate a roll positioned thereon for wrapping a wrapper around the roll with the end edges of the wrapper projecting beyond the ends of the roll, a driven shaft disposed in said opening in said bed at the rear of and parallel to the axes of said wrapping rollers and driven in timed relation therewith and having a central relatively short roll supporting roller thereon positioned to coact with the rear wrapping roller to supportedly rotate a roll shifted thereto from said wrapping rollers, a pair of driven folders mounted upon and shiftable axially of said shaft and having angularly spaced blades engaging and successively folding segments of the projecting end portions of the wrapper wrapped around the roll upon the ends of the roll as the folders and the roll with the wrapper therearound are rotated in timed relation, and means for simultaneously adjusting said folders on said shaft.

5. A machine for wrapping rolls comprising a pair of driven wrapping rollers adapted to supportedly rotate a roll positioned thereon for wrapping a wrapper around the roll with the end edges of the wrapper projecting beyond the ends of the roll, a driven shaft disposed at the rear of and parallel to the axes of said wrapping rollers and driven in timed relation therewith and having a roll supporting roller thereon positioned to coact with the rear wrapping roller to supportedly rotate a roll shifted thereto from said wrapping rollers, folders on said shaft having angularly spaced blades successively engaging and folding segments of the projecting end portions of the wrapper wrapped around the roll upon the ends of the roll into overlapping relation as the folders and the roll with the wrapper therearound are rotated in timed relation, a way disposed transversely of said bed in rearwardly spaced relation to said folders, wrapper header clamps slidably mounted on said way to receive a roll with the end folded wrapper thereon between them and for adjustment to and from each other, and means for simultaneously adjusting and applying pressure to said clamps for clampingly supporting headers disposed upon the folded ends of the wrapper.

6. A machine for wrapping rolls comprising a pair of driven wrapping rollers adapted to supportedly rotate a roll positioned thereon for wrapping a wrapper around the roll with the end edges of the wrapper projecting beyond the ends of the roll, a driven shaft disposed at the rear of and parallel to the axes of said wrapping rollers and driven in timed relation therewith and having a roll supporting roller thereon positioned to coact with the rear wrapping roller to supportedly rotate a roll shifted thereto from said wrapping rollers, folders on said shaft having angularly spaced blades successively engaging and folding segments of the projecting end portions of the wrapper wrapped around the roll upon the ends of the roll into overlapping relation as the folders and the roll with the wrapper therearound are rotated in timed relation, a way disposed transversely of said bed in rearwardly spaced relation to said folders, wrapper header clamps slidably mounted on said way to receive a roll with the end folded wrapper thereon between them and for adjustment to and from each other, and means for simultaneously adjusting and applying pressure to said clamps for clampingly supporting headers disposed upon the folded ends of the wrapper.

7. A machine for wrapping rolls comprising a pair of driven wrapping rollers adapted to supportedly rotate a roll positioned thereon for wrapping a wrapper around the roll with the end edges of the wrapper projecting beyond the ends of the roll, a driven shaft disposed at the rear of and parallel to the axes of said wrapping rollers and driven in timed relation therewith and having a roll supporting roller thereon positioned to coact with the rear wrapping roller to supportedly rotate a roll shifted thereto from said wrapping rollers, and folders on said shaft having blades successively engaging and folding segments of the projecting end portions of the wrapper wrapped around the roll upon the ends of the roll into overlapping relation as the folders and the roll with the wrapper therearound are rotated in timed relation.

8. A machine for wrapping rolls comprising a pair of driven wrapping rollers adapted to supportedly rotate a roll positioned thereon for wrapping a wrapper around the roll with the end edges of the wrapper projecting beyond the ends of the roll, a driven shaft disposed at the rear of and parallel to the axes of said wrapping rollers and driven in timed relation therewith and having a roll supporting roller thereon positioned to coact with the rear wrapping roller to supportedly rotate a roll shifted thereto from said wrapping rollers, and folders on said shaft having blades successively engaging and folding segments of the projecting end portions of the wrapper wrapped around the roll upon the ends of the roll into overlapping relation as the folders and the roll with the wrapper therearound are rotated in timed relation.

9. In a machine for wrapping a roll in combination with a bed, first and second driven wrapping rollers provided with knurled peripheries, the second roller being of a diameter approximating but exceeding that of the first roller, said rollers being driven at the same speed and adapted to supportedly rotate a roll positioned thereon for wrapping a wrapper around a roll with the end edges of the wrapper projecting beyond the ends of the roll, a driven shaft disposed at the rear of and parallel to the axis of the second roller and driven in timed relation therewith, and having a supporting roller positioned to coact with said second wrapping roller to supportedly rotate a roll shifted thereto from said wrapping rollers, and angularly spaced wrapper folder members mounted on said shaft engaging and successively folding segments of the projecting end portions of the wrapper wrapped around the roll upon the ends of the roll as the roll and folder members are rotated.

10. In a machine for wrapping a roll in combination with a bed, first and second driven wrapping rollers, the second roller being of a diameter exceeding that of the first roller, said rollers being driven at the same speed and adapted to supportedly rotate a roll positioned thereon for wrapping a wrapper around a roll with the edges of the wrapper projecting beyond the ends of the roll, a driven shaft disposed at the rear of and parallel to the axis of the second roller, and driven in timed relation therewith, and having a supporting roller positioned to coact with said second wrapping roller to supportedly rotate a roll shifted thereto from said wrapping rollers, and angularly spaced wrapper folder members mounted on said shaft engaging and successively folding segments of the projecting end portions of the wrapper wrapped around the roll upon the ends of the roll as the roll and folder members are rotated.

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