Dec. 12, 1950 H. C. BRYANS 2,533,993

ROLL CRIMPING MACHINE

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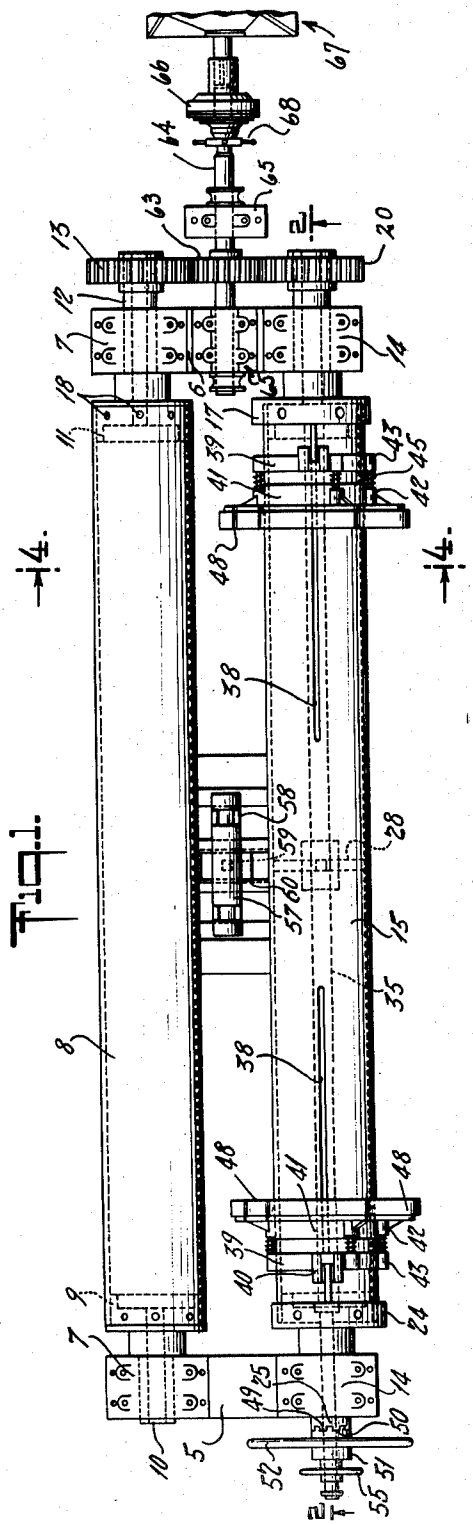


FIG. 1.

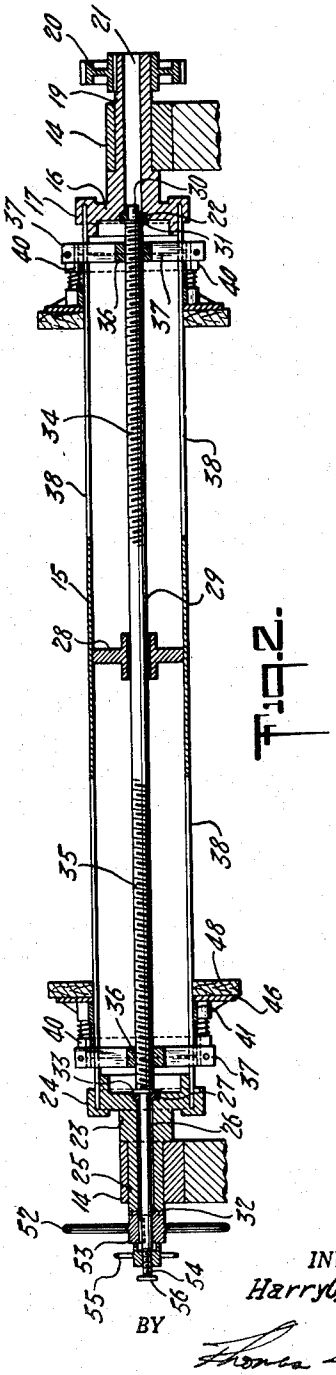


FIG. 2.

INVENTOR.
Harry C. Bryans
BY
Thomas E. Tate
AGENT

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Fig. 3.

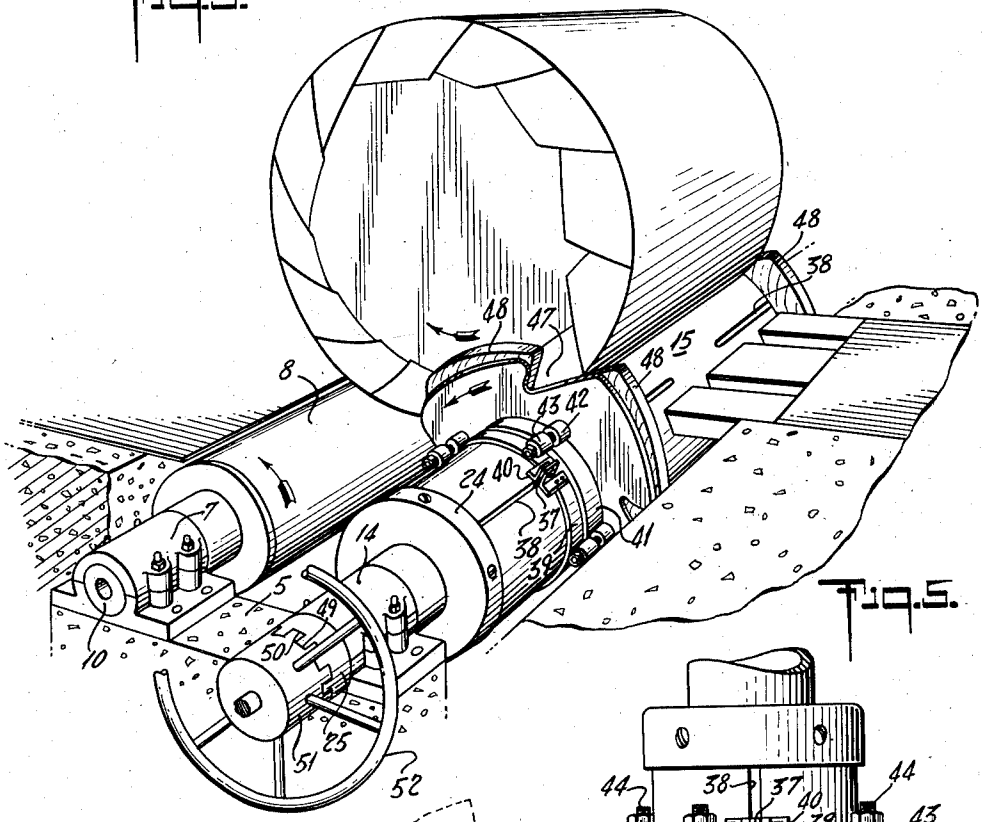


Fig. 5.

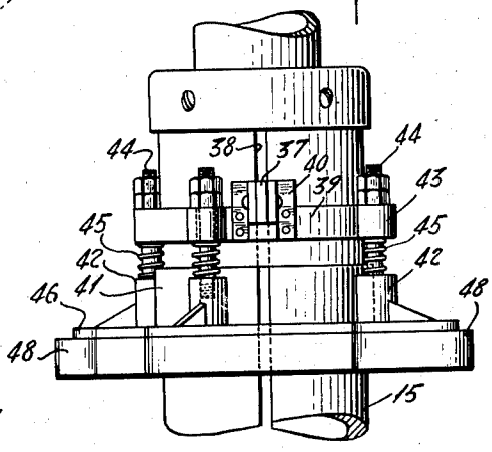
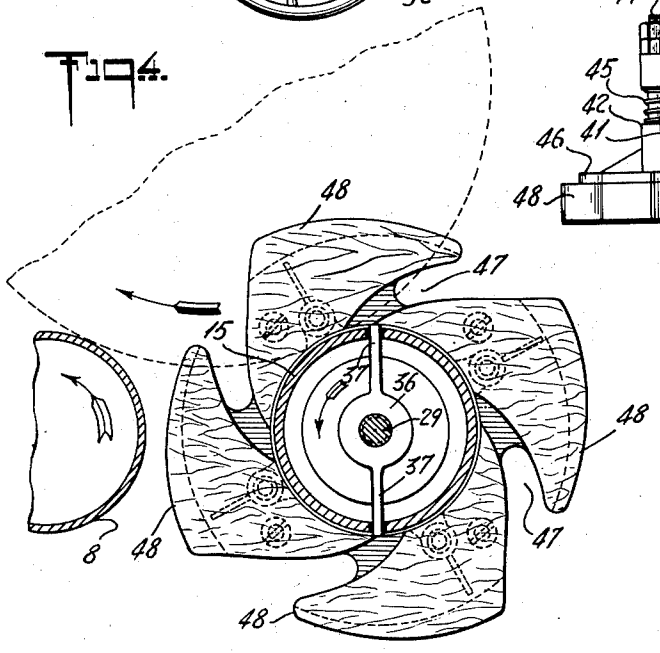


Fig. 4.



INVENTOR.
Harry C. Bryans
BY Thomas E. Tate
AGENT

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Fig. 6.

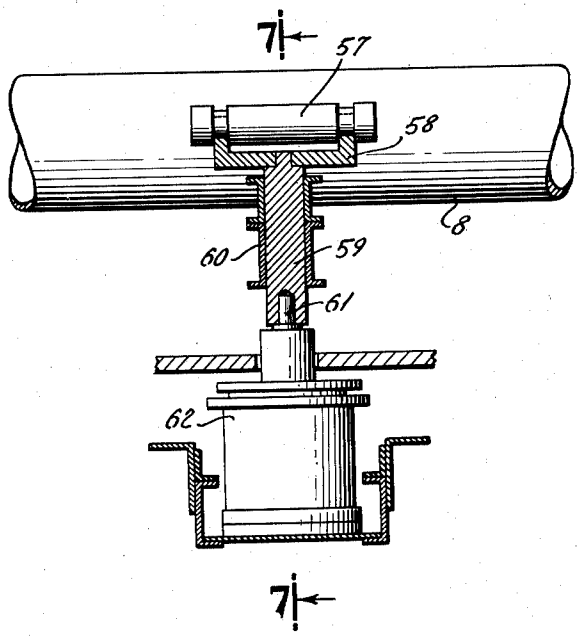
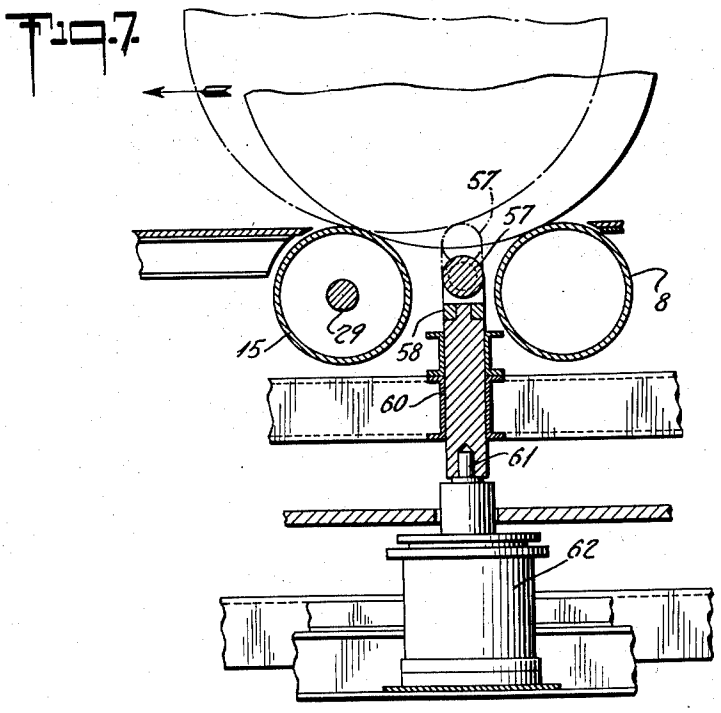


Fig. 7.



INVENTOR.
Harry C. Bryans
BY Thomas E. Tate
AGENT

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UNITED STATES PATENT OFFICE

2,533,993

ROLL CRIMPING MACHINE

Harry Christopher Bryans, Three Rivers, Quebec, Canada, assignor to Canadian International Paper Company, Montreal, Quebec, Canada, a corporation of Canada

Application November 8, 1949, Serial No. 126,171

6 Claims. (Cl. 93—5)

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This invention relates to new and useful improvements in crimping machines generally and particularly seeks to provide a novel machine for crimping the projecting ends of roll wrappers down onto the end faces of the rolls.

It is an object of this invention to provide a novel crimping machine particularly suitable for crimping the ends of the wrappers on large rolls of paper such as newsprint, and in which the newsprint roll is supported on a pair of driven carrier rolls, one of which is fitted with a pair of adjustably mounted crimping assemblies.

Another object of this invention is to provide a machine of the character stated in which means are provided for mechanically ejecting the newsprint roll after the crimping operation has been completed.

Another object of this invention is to provide a machine of the character stated in which one of the carrier rolls is plain and the other slotted so that operative connections may be maintained between the crimping assemblies carried by the slotted roll and adjusting devices mounted thereon.

Another object of this invention is to provide a machine of the character stated in which the slotted carrier roll is provided with a spaced pair of collars slidably mounted thereon and resiliently connected to a pair of crimper-carrying sleeves, there being a hand-wheel operated, internally positioned, adjusting screw operatively connected to the sliding collars whereby the spacing between the crimper sleeves can be readily varied.

A further object of this invention is to provide a machine of the character stated which includes means for quickly locking the adjusting devices in any desired position to maintain constant spacing between the crimpers.

A further object of this invention is to provide a machine of the character stated which is simple in design, rugged in construction and economical to manufacture.

With these and other objects in view, the nature of which will be more apparent, the invention will be more fully understood by reference to the drawings, the accompanying detailed description, and the appended claims.

In the drawings,

Fig. 1 is a top plan view of a crimping machine constructed in accordance with this invention;

Fig. 2 is a longitudinal vertical section taken along line 2—2 of Fig. 1;

Fig. 3 is a perspective view of the crimping machine showing a completely crimped paper

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roll supported thereon, portions of the supporting frame, of course, having been eliminated in the interest of clarity;

Fig. 4 is an enlarged transverse section taken along line 4—4 of Fig. 1;

Fig. 5 is an enlarged top plan view of one end of the slotted carrier roll and shows the crimping element assembly in greater detail;

Fig. 6 is an enlarged fragmentary longitudinal section showing details of the ejector mechanism; and

Fig. 7 is a similar transverse section taken along line 7—7 of Fig. 6.

Referring to the drawings in detail, the invention as illustrated is embodied in a crimping machine adapted to be mounted in a pit formed in the floor of the paper mill finishing room in such a manner that the upper surfaces of the carrier rolls are substantially co-planar with the floor surface. A supporting girder 5 is disposed transversely of the floor pit and is located adjacent one end thereof, and a similar supporting girder 6 is secured in the pit in spaced parallel relation from the girder 5, a distance slightly greater than the length of the carrier rolls. A plain carrier roll is journalled on suitable bearings 7, 7 on the supporting girders and comprises a hollow shell 8 having one end closed by a plug 9 which is provided with an outwardly projecting journal portion 10 rotatably supported in one of the bearings 7. The other end of the shell 8 is similarly closed by a plug 11 having an outwardly projecting journal portion 12 rotatably carried in the other bearing 7 but of a length sufficient to project beyond the face of the bearing so that a driving gear 13 may be rigidly affixed thereto.

A slotted carrier roll is journalled on suitable bearings 14, 14 carried by the supporting girders 5 and 6 and includes a hollow shell portion 15 having one end closed by a plug 16. The plug 16 is provided with an outer skirt portion 17 which together with the central body portion of the plug defines an annular groove which receives the associated end of the shell 15. A plurality of set screws 18 are used to secure the shell to the end plug 16. The plug 16 is provided with an outwardly projecting journal portion 19 which is rotatably carried in one of the bearings 14 and is of sufficient length that a driving gear 20 may be rigidly affixed thereto. The plug 16 and its associated journal 19 are provided with a centrally located bore 21, the inner end of which is enlarged to receive a ball bearing assembly indicated at 22.

The other end of the shell 15 is similarly closed by a plug 23 having a skirt portion 24 for receiving the associated end of the shell and an outwardly extending journal portion 25 rotatably carried in the other bearing 14. The plug 23 and journal 25 are also provided with a central bore 26 having its inner end enlarged to receive a ball bearing assembly indicated at 27.

A spider 28 is secured within the shell 15 in the central portion thereof and rotatably supports the central section of an adjusting screw 29 extending the full length of the shell. The adjusting screw 29 is provided with an end portion 30 of reduced diameter which is seated in the ball bearing assembly 22 and is prevented from axial movement to the right by a collar 31 rigidly affixed thereto adjacent the bearing 22.

The other end of the adjusting screw 29 is provided with a relatively long extension 32 projecting through and beyond the bore 26 of the plug 23. It is rotatably supported in the bearing assembly 27 and the adjusting screw 29 is prevented from moving axially to the left by a collar 33 rigidly affixed thereto adjacent the bearing 27. The end portions of the adjusting screw 29 are oppositely threaded as at 34 and 35. A collar 36 is threadably engaged with the threaded shaft portion 34 and is provided with a pair of oppositely disposed radially extending arms 37, 37 each having a length sufficient to project beyond the periphery of the shell 15. The shell 15 is provided with a pair of diametrically opposed slots 38, 38 through which the arms 37 extend.

A collar 39 is slidably mounted on the shell 15 and is provided with a pair of oppositely positioned mounting lugs 40, 40 rigidly affixed to the arms 37 so that when the threaded collar 36 is moved along the adjusting screw 29 the collar 39 will be similarly moved. A sleeve 41 is also slidably mounted on the shell 15 and is provided with a plurality of lugs 42 in alignment with similar lugs 43 on the collar 39. Resilient connections are provided between the collar 39 and the sleeve 41 by a plurality of studs 44 which are carried by the lugs 42 and extend through the lugs 43 and carry compression springs 45 interposed between the collar 39 and the sleeve 41 so that the sleeve always tends to be forced away from the collar by action of the springs. The studs 44, of course, prevent relative rotation of the sleeve 41 with respect to the collar 39.

The opposite face of the sleeve 41 is provided with a flange 46 having a plurality of notches 47 extending spirally inwardly from the periphery thereof to thereby define four blade-like elements which correspond generally to and provide support for individually fastened crimping elements. Crimping elements 48 are secured to the flange 46 and are provided with peripheral edge portions extending beyond the periphery of the flange and include flat face portions adapted to contact the projecting shoulders of the wrapper which has been placed around a paper roll to effect the crimping thereof against the ends of the paper roll.

A similar assembly, including the threaded collar 36, radial arms 37 and the collar and sleeve elements connected therewith, is provided adjacent the other end of the shell 15, but, of course, the threads on the collar 36 will have to be reversed in comparison to those above described in order to be properly engageable on the threaded portion 35 on the adjusting screw.

In order that the adjusting screw 29 may be readily rotated to vary the spacing between the

crimping elements 48 the end face of the journal 25 is provided with a plurality of radially-formed teeth or dogs 49 engageable with similar teeth or dogs 50 formed in the hub portion 51 of a hand-wheel 52 which is keyed as at 53 to the reduced diameter portion 32 of the adjusting screw 29. The extreme end portion of the screw extension 32 is threaded as at 54 and carries a small locking wheel 55 thereon. A flange or cap 56 is affixed to the end of the threaded portion 54 and prevents the locking wheel 55 from being completely removed from the shaft. However, the locking wheel 55 can be moved along the threaded portion 54 an amount at least sufficient to provide space for the hand-wheel 52 to be slid axially along the extension 32 to disengage its teeth 50 from the teeth 49 of the journal 25. When this has been done the hand-wheel can be rotated to effect rotation of the adjusting screw 29 and thus vary the spacing between the crimping elements 48. After the spacing has been thus adjusted the locking wheel 55 is again rotated on the threaded portion 54 to lock the hand-wheel 52 into immovable engagement with the journal 25. Thus when the hand-wheel and journal have become locked together the shaft 29, the shell 15 and crimping element assembly carried thereon will all rotate as a unit without any relative movement of rotation between the several parts.

Mechanisms are provided for ejecting the crimped roll of paper and include an ejector roller 57 rotatably supported in a yoke 58 which is affixed to the upper end of a vertically disposed slide 59 movably carried in a sleeve 60. The sleeve 60 is fastened to the supporting frame of the crimping machine in any desired manner. The lower end of the slide 59 is connected to the upper end of an air or hydraulic piston rod 61 carried by an operating air or hydraulic cylinder 62. The normal position of the ejector roller 57 is as indicated in full lines in Fig. 7 of the drawings, and when a crimped roll is to be ejected from the main carrier rolls the air cylinder 62 is actuated through any suitable control means (not shown) to raise the ejector roll to the dotted line position and thus roll the crimped paper roll away from engagement with the carrier rolls onto the floor of the finishing room. It should be noted that the slide 59 is preferably a square or rectangular cross section and the sleeve 60 is similarly sectioned to avoid any torsion to the ejector roll or to the crimped paper roll engaged thereby during the time that the ejecting action takes place.

The main carrier rolls are adapted to be positively driven in the same direction of rotation through the gears 13 and 20 which receive their power from a centrally located driving gear 63 rigidly affixed to a shaft 64 journalled in suitable bearings 65, 65 and which is connected through a clutch 66 to a reduction gear motor drive generally indicated at 67. The clutch 66 is provided with the usual shifting spider 68 which may be moved from an operative to a non-operative position through suitable clutch-shifting linkages (not shown).

It, of course, is to be understood that various details of arrangements and proportions of parts may be modified within the scope of the appended claims.

I claim:

1. A machine for crimping the projecting ends of wrapping material over the ends of a roll of paper covered thereby comprising a pair of carrier

rolls for supporting a wrapped roll of paper, means for positively driving said rolls in the same direction, one of said rolls being provided with spaced sets of radially-extending crimping elements movably mounted thereon, and means for positively adjusting the spacing between said sets of crimping elements.

2. A machine for crimping the projecting ends of wrapping material over the ends of a roll of paper covered thereby comprising a pair of carrier rolls for supporting a wrapped roll of paper, means for positively driving said rolls in the same direction, one of said rolls being provided with spaced sets of radially-extending crimping elements movably mounted thereon, means for positively adjusting the spacing between said sets of crimping elements, and means for ejecting the wrapped roll of paper following completion of crimping.

3. A machine for crimping the projecting ends of wrapping material over the ends of a roll of paper covered thereby comprising a pair of carrier rolls for supporting a wrapped roll of paper, means for positively driving said rolls in the same direction, a pair of sleeves slidably carried by one of said rolls, a plurality of radially extending crimping elements affixed to each of said sleeves, means positioned internally of said sleeve-carrying roll for adjusting the spacing between said sleeves, and means connecting said adjusting means and said sleeves, said connecting means extending through longitudinally disposed slots formed in the shell of said carrier roll.

4. A machine for crimping the projecting ends of wrapping material over the ends of a roll of paper covered thereby comprising a pair of carrier rolls for supporting a wrapped roll of paper, means for positively driving said rolls in the same direction, a pair of sleeves slidably carried by one of said rolls, a plurality of radially-extending crimping elements affixed to each of said sleeves, means positioned internally of said sleeve-carrying roll for adjusting the spacing between said sleeves, means connecting said adjusting means and said sleeves, said connecting means extending through longitudinally-disposed slots

formed in the shell of said carrier roll, and means for ejecting the wrapped roll of paper following completion of crimping.

5. A machine for crimping the projecting ends of wrapping material over the ends of a roll of paper covered thereby comprising a pair of carrier rolls for supporting a wrapped roll of paper, means for positively driving said rolls in the same direction, at least one of said rolls being of hollow shell construction and provided with a pair of spaced longitudinally-extending slots, a pair of sleeves slidably mounted on said slotted roll, a plurality of radially-extending crimping elements affixed to each of said sleeves, and means positioned internally of said slotted roll for adjusting the spacing between the groups of crimping elements carried by said sleeves and comprising an adjusting screw having oppositely threaded end portions, collars threadably engaged thereon and rigidly affixed connecting links extending between said collars and said sleeves through the slots in said roll.

6. A machine for crimping the projecting ends of wrapping material over the ends of a roll of paper covered thereby comprising a pair of carrier rolls for supporting a roll of paper, means for positively driving said rolls in the same direction, at least one of said rolls being of hollow shell construction and provided with a pair of spaced longitudinally extending slots, a pair of sleeves slidably mounted on said slotted roll, a plurality of radially-extending crimping elements affixed to each of said sleeves, means positioned internally of said slotted roll for adjusting the spacing between the groups of crimping elements carried by said sleeves and comprising an adjusting screw having oppositely threaded end portions, collars threadably engaged thereon and rigidly affixed connecting links extending between said collars and said sleeves through the slots in said roll, and means for ejecting the wrapped roll of paper following completion of crimping.

HARRY CHRISTOPHER BRYANS.

No references cited.