

July 7, 1953

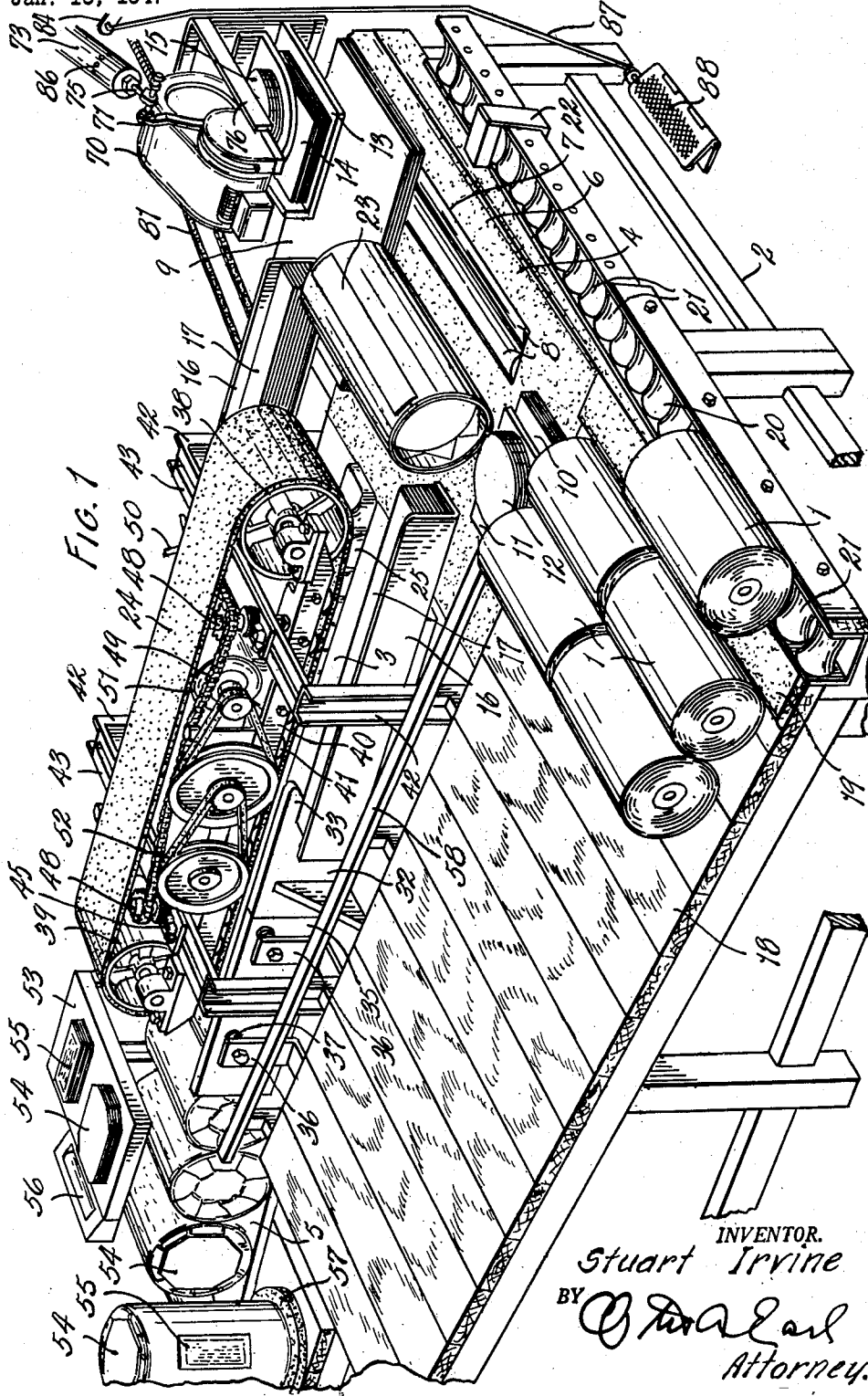
S. IRVINE

2,644,282

MACHINE FOR WRAPPING ROLLS OF PAPER AND THE LIKE

Filed Jan. 16, 1947

5 Sheets-Sheet 1



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MACHINE FOR WRAPPING ROLLS OF PAPER AND THE LIKE

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5 Sheets-Sheet 2

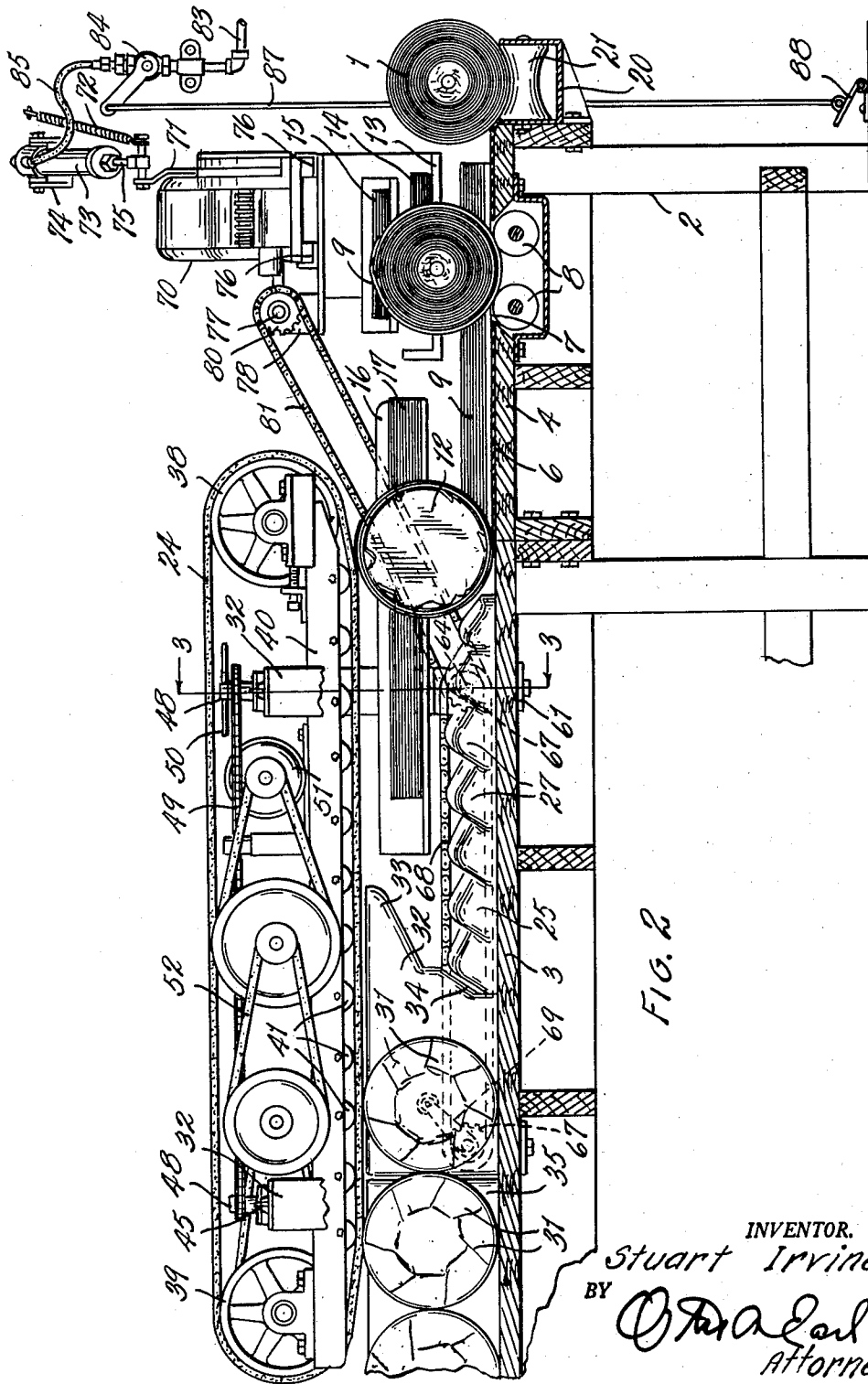


FIG. 2

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5 Sheets-Sheet 3

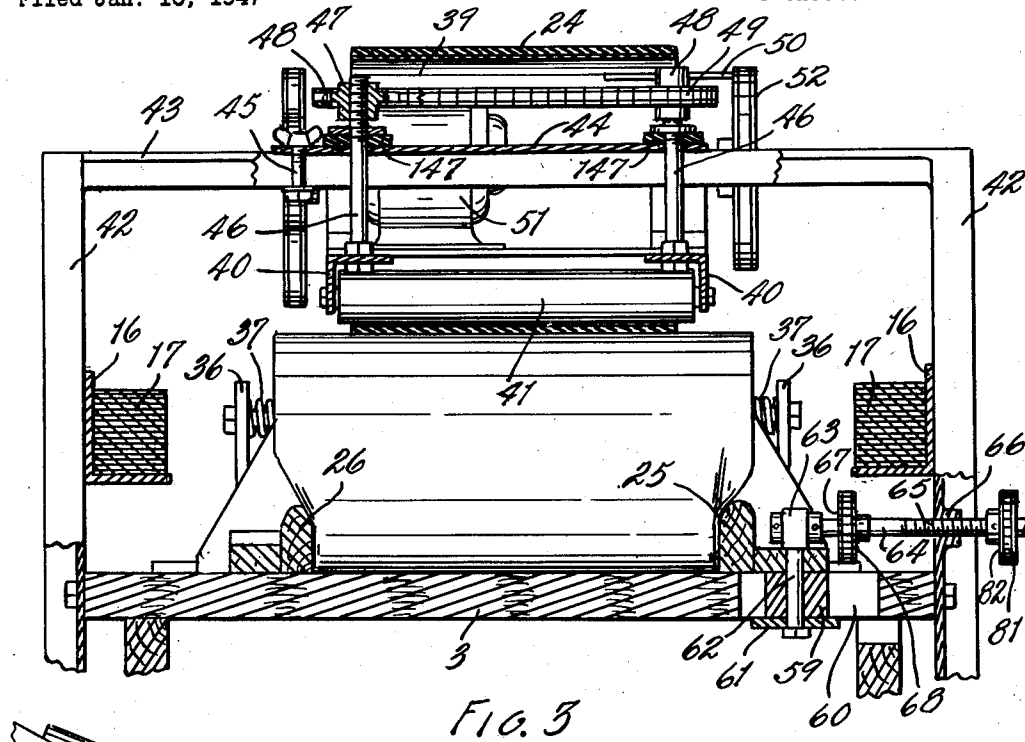


FIG. 3

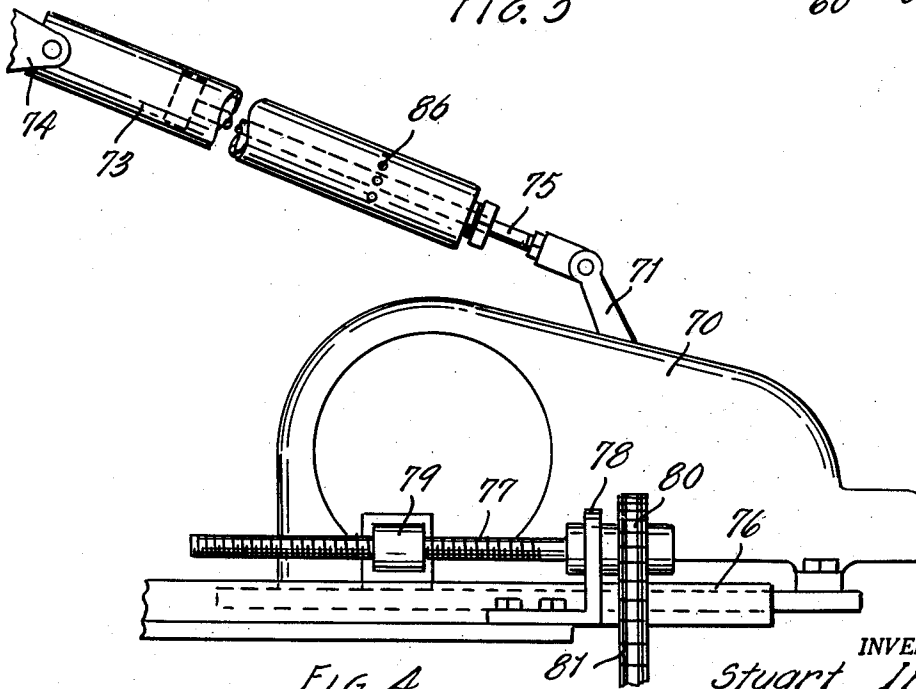


FIG. 4

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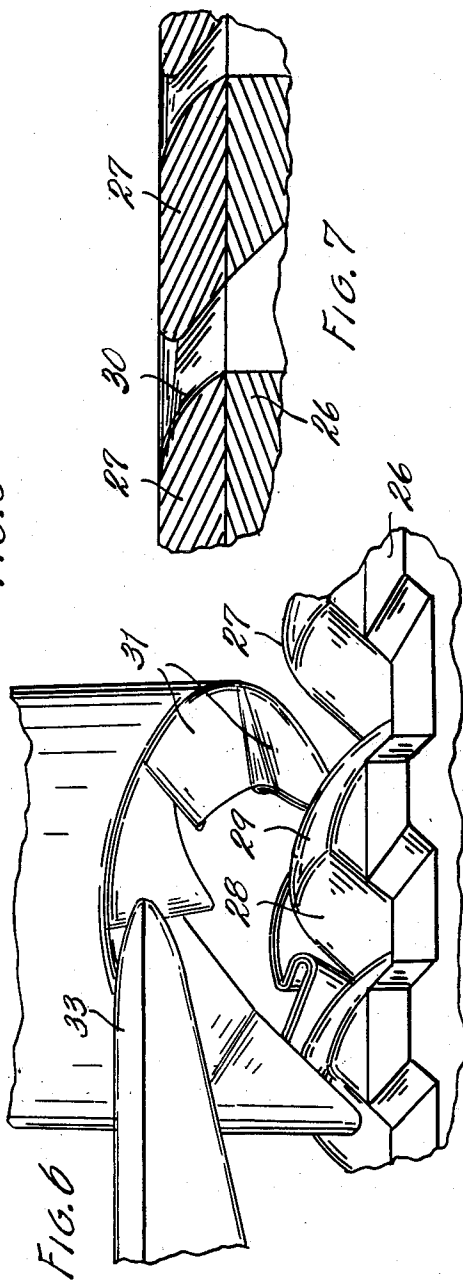
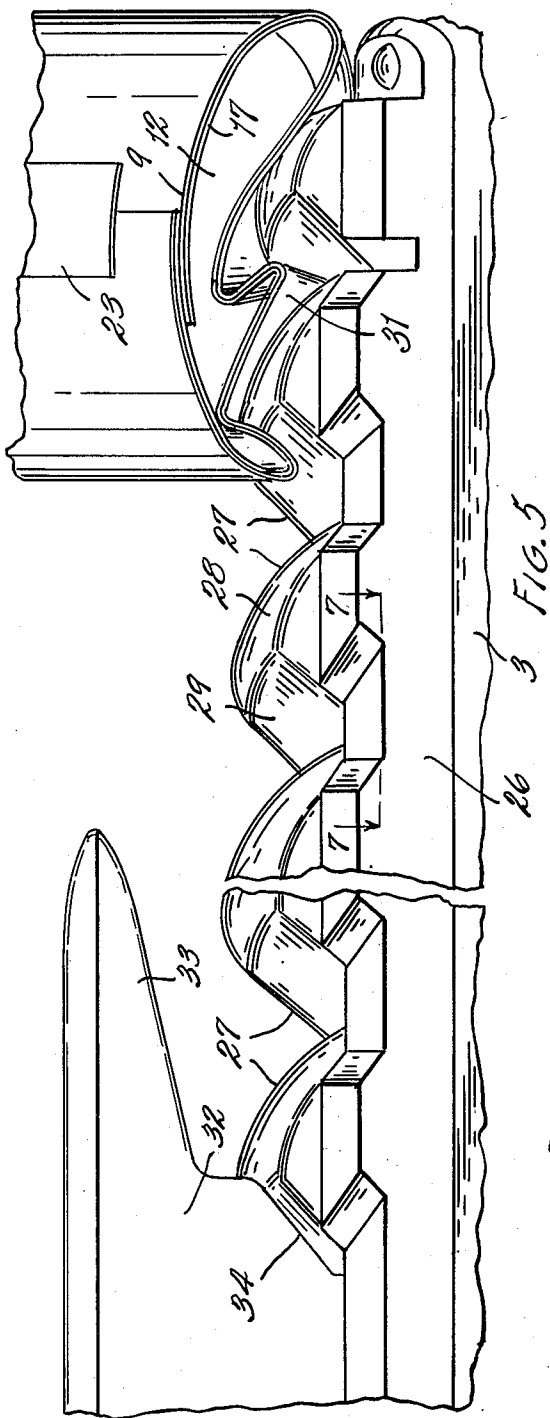
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MACHINE FOR WRAPPING ROLLS OF PAPER AND THE LIKE

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5 Sheets-Sheet 5

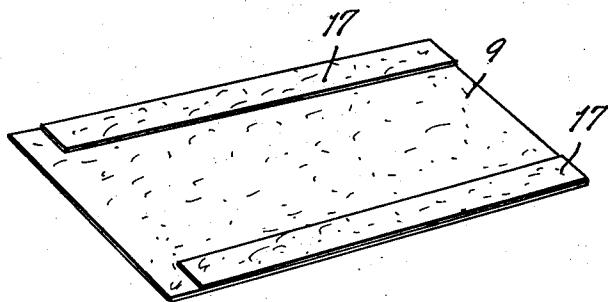


FIG. 8

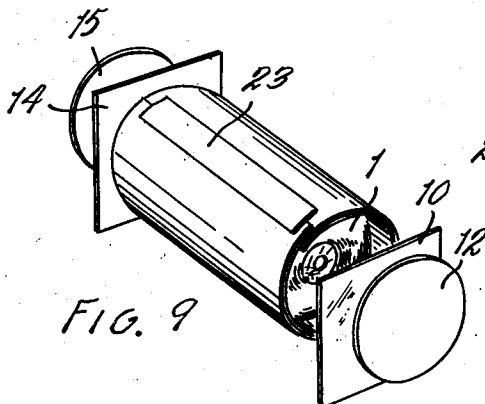


FIG. 9

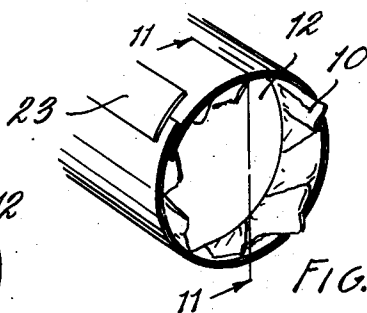


FIG. 10

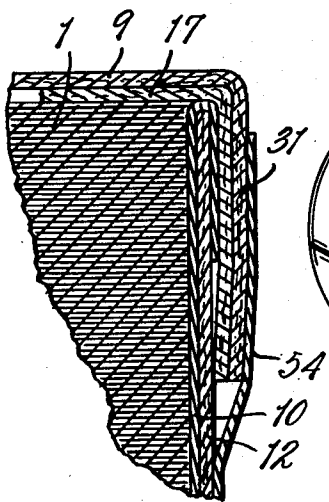


FIG. 13

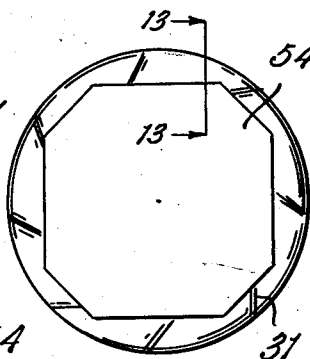


FIG. 12

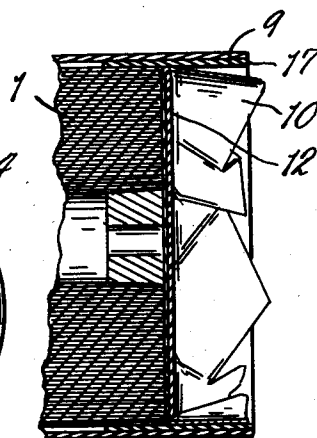


FIG. 11

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UNITED STATES PATENT OFFICE

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MACHINE FOR WRAPPING ROLLS OF
PAPER AND THE LIKE

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Application January 16, 1947, Serial No. 722,401

8 Claims. (Cl. 53—64)

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

The main objects of this invention are:

First, to provide a machine for wrapping rolls of paper which results in an effective wrap and greatly reduces the manual labor and the lifting of the rolls.

Second, to provide a wrapping machine of this character which enables the use of relatively heavy roll protecting and wrapper reinforcing means at the ends of the rolls.

Third, to provide a machine having these advantages which can be readily adjusted for rolls varying considerably both in diameter and in length.

Fourth, to provide a roll wrapping machine in which the projecting ends of the wrapper are uniformly folded flat against the ends of the roll and the folds effectively set or retained in that position facilitating the application of end seals thereto.

Fifth, to provide in a roll wrapping machine means for delivering rolls to the wrapper applying operator in convenient position for placing on a wrapping table.

Sixth, to provide a wrapping machine comprising a table at the front end thereof which greatly facilitates the placing of the wrapper around a roll to closely embrace the roll.

Seventh, to provide a wrapping machine having a tape dispensing means associated therewith adapted to deliver the tape of the proper length for holding the wrapper on the roll so that it may be rollingly translated through the machine.

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 drawings, in which:

Fig. 1 is a fragmentary perspective view of a wrapping machine embodying the invention.

Fig. 2 is a fragmentary view partially in longitudinal section showing the relation of various parts and certain structural details.

Fig. 3 is an enlarged fragmentary view partially in transverse section on line 3—3 of Fig. 2.

Fig. 4 is an enlarged fragmentary view showing the mounting of the tape dispensing machine and details of operating and adjusting connections therefor.

Fig. 5 is an enlarged fragmentary side perspective view of one of the folder units, a roll being conventionally illustrated, with parts thereof in folding relation to the folder unit.

Fig. 6 is an enlarged perspective view showing further details of the folder units and the roll in position for its wrapper to receive the final fold.

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Fig. 7 is an enlarged fragmentary view in horizontal section on a line corresponding to line 7—7 of Fig. 5.

Fig. 8 is a perspective view of a wrapper with the reinforcing and roll protecting strips arranged thereon preliminary to placing the wrapper around the rolls.

Fig. 9 is a perspective exploded view of the roll with the wrapper thereon and the end closures to be associated therewith.

Fig. 10 is a fragmentary perspective view with the end closure members in position.

Fig. 11 is an enlarged fragmentary view of the roll with the wrapper therearound in section on line 11—11 of Fig. 10.

Fig. 12 is an end view of one of the rolls after the end seal has been applied thereto.

Fig. 13 is an enlarged fragmentary view on a line corresponding to line 13—13 of Fig. 12.

The embodiment of the invention illustrated is especially designed by me for the wrapping of rolls of paper such for example as waxed wrapping paper used for various purposes. These rolls of paper are quite heavy and it has been the general practice to wrap them by hand and this entails heavy manual labor and is expensive as the output is relatively small. Further, when wrapped by hand it is not practical to use reinforcing material of the gauge or quality best suited for the purpose. The machine of the invention greatly increases the output of a pair of workmen and minimizes the physical effort on the part of the workmen. The desirable practice is for the pair of workmen, one at the front or feed end of the machine and one at the receiving or delivery end of the machine, to exchange places at reasonable intervals, thus equalizing the labor and further reducing the individual physical effort on the part of the workmen.

The rolls of paper I vary substantially both in the matter of length and diameter for different customers, and the machine of the invention is readily adjustable to accommodate a wide variation.

The embodiment of the invention illustrated comprises a suitable frame designated generally by the numeral 2 supporting a wrapping bed 3 and a front or wrapping table 4 which constitutes a front extension for the bed. At the rear end of the bed I provide a rear or receiving table 5 which likewise constitutes an extension for the bed.

The front table 4 is desirably provided with a rubber cover or mat conventionally illustrated at 6. This table has a transverse opening 7 therein below which the rolls 8 are mounted to rotatably support a roll of paper I. The table 4 is of such width as to provide a support for a stack of wrapping sheets 9. At the left hand side, the table receives a stack of end closure

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sheets 10 and a shelf 11 is provided for the end closure disk 12. At the right hand side of the table, a shelf 13 is provided for the end closure sheets 14 and a second shelf for the disks 15. Angular supports 16 are provided for the wrapper reinforcing and roll protecting strips 17.

The rolls 1 are supplied to the wrapping operator by the forwardly inclined platform-like feed chute 18 which has a stop 19 at its forward edge of sufficient height to stop the rolls as is shown in the drawings. However, the rolls may be easily pulled over this stop and into the transverse conveyor 20 having a plurality of rollers 21, the conveyor 20 being inclined so that the rolls to be wrapped are endwise conveyed to a position in front of the front or wrapping table. An adjustable stop 22 is provided for stopping the rolls of paper in proper position for convenient manipulation.

The operator places a wrapping sheet on the table and extending over the rollers 8 and arranges on this sheet the reinforcing strips 17 which are positioned so that their outer edges are flush with the ends of the wrapper. The operator then places a roll on the front or wrapping table above the rollers and swings up the front end of the wrapper and rotates the roll while supported by the rollers to wrap the wrapper therearound as is illustrated in Fig. 2. The gummed strip 23 is then applied to retain the overlapped edge of the wrapper. The end wrapper sheets are then inserted in the projecting ends and as they are reinforced by the strips 17 they are held in position to receive these strips which are merely pushed into the open ends of the wrapper. The disk-like closure strips which are of suitable diameter to loosely fit within the projecting ends of the wrapper are then inserted and the roll thus wrapped is rolled onto the bed and into position to be engaged by the feed belt 24.

The feed belt rolls the roll to be wrapped along the bed between the folder units 25 and 26. These folder units are identical except that the folder unit 25 is mounted for lateral adjustment on the bed as will be hereinafter described.

These folder units comprise a plurality of folders 27 having upwardly converging front and rear faces 28 and 29 respectively. The front faces 28 are gradually curved and merge into the rear faces 29. The adjacent faces of the folder members converge downwardly to provide recesses 30. The folder faces are transversely curved and outwardly inclined. The shape of these folders is of considerable importance in the securing of a plurality of folds 31 in the projecting end portions of the wrapper, each fold as formed being overlapped by a succeeding fold. The folds are made in the projecting ends of the wrapper and in the reinforcing strips without pulling or distorting these reinforcing strips. The reinforcing strips not only protect the ends of the rolls from damage which might result from rough handling in transportation and handling generally but they also overlap the end closure sheets and disks providing a very secure and complete closure for the ends of the rolls.

The rolls with the partially folded wrappers are passed from the folder units 27 to the final plate-like folders 32 which have forwardly projecting folder fingers 33 overhanging the rear folders of the unit 27, the folding edges 34 of the folders 32 acting to impart the final fold to the wrappers as the rolls pass between the retaining portions of the folders 32.

From the folders 32, the rolls are passed be-

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tween the fold retaining and roll checking plates 35 which are supported by the brackets 36 and yieldingly urged towards each other by the springs 37. These plates 35 further press the folds or iron them down as the rolls pass between the plates 35.

The belt 24 delivers the rolls to but not from the plates 35—that is, by direct engagement with the rolls. The rolls are checked by the plates and are then advanced or discharged from the plates by the push or impact imparted thereto by a succeeding roll.

The pulleys 38 and 39 of the feed belt 24 are carried by a frame comprising the longitudinal bars 40 connected by suitable crosspieces, these bars being formed of angle iron disposed to face inwardly and downwardly. A series of rollers 41 are mounted on the bars 40 and serve to support the bottom reach of the belt trained over the pulleys 38 and 39. The frame is provided with uprights 42 carrying the longitudinally slotted crosspieces 43 disposed between the reaches of the belt. Plates 44 are arranged on these crosspieces and adjustably secured thereto by means of the bolts 45 which permit transverse adjustment of the belt supporting frame. This transverse adjustment of the belt supporting frame permits the same to be adjusted centrally between the ends of the rolls when rolls of one run are of a different length from that of rolls of another run. This adjustment is necessary because the ends of all the rolls of all runs regardless of the lengths of the rolls are engaged by the fixed folder unit 26.

This belt supporting frame is supported for vertical floating movement by means of the threaded posts or hangers 46 arranged through the slots of the crosspieces. The hangers 46 have adjusting nuts 47 on their upper ends provided with sprockets 48, the sprockets being connected by the sprocket chain 49 so that all of the hangers are adjusted at one time. One of the units is provided with a hand piece 50. The belt is adjusted vertically to adapt the machine for different rolls of different diameters—that is, where a run is to be made on a particular diameter of rolls. It should be understood, however, that there is a substantial variation in the rolls of a run and the floating belt accommodates such variations as well as applies proper driving engagement with the rolls. The pads 47 serve as buffers or shock absorbers when all the rolls of a run pass from the belt or when the rolls of a particular run vary somewhat in diameter. The belt is driven from a motor 51 mounted on the belt supporting frame and connected by a series of belts and pulleys to the driven pulley 39, the series of belts and pulleys being designated generally by the numeral 52 and they serve to reduce the speed or as a speed reducing transmission.

As stated, the rolls are delivered between the spring pressed plates 35 and from them onto the receiving table 5. Above this receiving table is a shelf 53 for the end seals 54 and labels 55. A moistening or glue roller is conventionally shown at 56. A desirable practice is to apply one of the end seals 54 to the outer roll on the table 5 as is shown in Fig. 1. The roll with the end seal thereon is then up-ended on a resilient pad 57, as shown in Fig. 1, and the second end seal 54 applied to its upper end. The labels 55 are automatically applied before the end seals are applied. The completely wrapped rolls may be placed by the operator on a truck or conveyor as desired.

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The feed chute 18 is of sufficient dimensions to receive a considerable number of rolls to be wrapped and the bar 58 along the inner side prevents their being pushed into engagement with the parts of the frame so that they roll by gravity downward against the stop 19. The folder unit 25 rests upon the bed for lateral adjustment. It is held to the bed by the blocks 59 engaged in slots 60, plates 61 on the lower ends of the bolts holding the blocks in the slot. These bolts are provided with eyes 63 rotatably receiving the adjusting rods 64 which are threaded at 65 to receive the adjusting nuts 66 fixedly secured to the uprights 42. The adjusting rods 64 are provided with sprockets 67 connected by the sprocket chains 68. One of the rods 64 is provided with a hand piece 69 shown in dotted outline in Fig. 2. The rear folder members 32 are adjustable with and in effect constitute parts of the folder units.

The tape dispensing machine or device 70 is adapted to deliver the tapes 23, the machine being of the type that moistens the tapes as they are delivered. The details of the machine—that is, so far as the internal mechanism is concerned forms no part of the present invention except that the machine is operated to deliver tape by means of the lever 71 which is returned by the spring 72. In the embodiment illustrated, the lever 71 is actuated from a pneumatic engine comprising the cylinder 73 mounted on the bracket 74 and provided with a plunger having a plunger rod 75 connected to the crank 71.

To vary the stroke of the machine and thus the length of the tape delivered, the machine is mounted on a slideway 76 in fixed relation to the supporting bracket 74 so that when the machine 70 is bodily adjusted the length of the stroke of the lever on each actuation by the plunger is varied. This adjustment is accomplished by means of the screw 77 rotatably mounted on the bracket 78 carried by the support 76, the adjusting screw engaging the nut 79 secured to the dispensing machine. As it is desirable that the tape should be adjusted simultaneously with the adjustment of the folders, the screw 77 is provided with a sprocket 80 connected by the sprocket chain 81 to a sprocket 82 on one of the adjusting rods 64. With this arrangement, the feed of the tape dispensing machine is automatically adjusted.

The cylinder 73 is connected to a source of compressed air supply 83 through the valve 84 which is connected to the upper end of the cylinder by the flexible hose connection 85. The cylinder is provided with discharge or exhaust ports 86. The valve 84 is connected by the rod 87 to the foot treadle or lever 88 which is conveniently positioned at the front of the wrapping table.

I have illustrated and described my invention in a highly practical embodiment thereof and one which results in a very substantial saving both in time and effort on the part of operators; also a machine which does a superior wrapping job both in uniformity and neatness and one which enables the use of relatively heavy stock for reinforcing the ends of the wrapper and protecting the ends of the roll. I have not attempted in the accompanying drawings to illustrate the relative thickness of the wrapper and the reinforcing strips or the end closure disks and end wrappers and the seals. These, it will be understood, may be very materially varied but the variations are such that they do not permit of accurate illustration in drawings of this character. I have not attempted to illustrate or describe

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other variations or adaptations which I contemplate 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 my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a wrapping machine, the combination with a supporting frame including longitudinally slotted cross members, a bed supported by said frame, said slotted cross members being disposed transversely of said bed and vertically spaced therefrom, folder units disposed beneath said cross members and longitudinally of the bed and in laterally spaced relation to each other to permit a roll to be wrapped to be rolled between them, a feed belt supporting frame comprising a pair of bars disposed longitudinally of the bed, belt supporting rollers carried by said bars, plates adjustably mounted on said supporting frame slotted cross members for adjustment longitudinally thereof and transversely of the bed to adjust said belt supporting frame centrally between said laterally spaced folder units, hanger rods for said feed belt supporting frame disposed through said plates and through the slots of said supporting frame cross members, nuts on said rods and above said plates to be supported thereby and provided with sprockets, a sprocket chain connecting said sprockets for simultaneously adjusting said nuts, pulleys carried by said feed belt supporting frame, a belt trained on said pulleys, said rods extending loosely through said plates and the slots of said cross members to permit said belt supporting frame to be floatingly supported on the rolls to be wrapped as they pass beneath the belt, the bottom reach of the belt being supported on said pulleys and being supported against upward displacement by said rollers, and a driving motor for one of said belt pulleys carried by said feed belt supporting frame.

2. In a wrapping machine, the combination with a main supporting frame including longitudinally slotted cross members, of a bed over which a roll to be wrapped may be rolled disposed below said cross members and transversely thereof, folder units disposed below said slotted cross members and longitudinally of the bed in laterally spaced relation to each other to permit a roll to be wrapped to be rolled between them and below said slotted cross members, a feed belt supporting frame comprising a pair of bars disposed longitudinally of the bed, belt supporting rollers carried by said bars, plates adjustably mounted on said slotted cross members for adjustment longitudinally thereof and transversely of the bed to adjust said belt supporting frame centrally between said laterally spaced folder units, hanger rods for said feed belt supporting frame disposed through said plates and through the slots of said cross members, nuts on said rods and above said plates to be supported thereby and provided with sprockets, a sprocket chain connecting said sprockets for simultaneously adjusting said nuts, pulleys carried by said feed belt supporting frame, a belt trained on said pulleys, said rods extending loosely through said plates and the slots of said cross members to permit said belt supporting frame to be floatingly supported on the rolls to be wrapped as they pass beneath the belt, the bottom reach of the belt being supported against upward displacement by said rollers.

3. In a wrapping machine, a main frame and a bed over which a roll to be wrapped may be rolled,

folder units disposed longitudinally of the bed in laterally spaced relation to permit a roll to be wrapped to be rolled between them, plate-like folders disposed at the rear of said folder units to receive a roll between them and to support the folds of the wrapper thereon in folded position, said plate-like folders having forwardly projecting finger-like portions overhanging the rear portions of the folder units and coacting therewith to fold the final folds of the wrapper, fold retaining roll holder members disposed at the rear of said rear folders to receive and check the rolls advanced by a roll feeding means, a spring for yieldingly urging said fold retaining roll holder members towards the opposite ends of the rolls for releasably yieldingly holding the rolls and means disposed above and centrally of said laterally spaced folder units and supported by said main frame for feeding rolls of paper between said folder units, plate-like folders and fold retaining roll holder members.

4. In a wrapping machine, a main frame and a bed over which a roll to be wrapped may be rolled, folder units disposed longitudinally of the bed in laterally spaced relation to permit a roll to be wrapped to be rolled between them, plate-like folders disposed at the rear of said folder units to receive a roll between them and to support the folds of the wrapper thereon in folded position, said plate-like folders having forwardly projecting finger-like portions overhanging the rear portions of the folder units and coacting therewith to fold the final folds of the wrapper, at least one of said folder units and its associated rear folder being mounted on said bed for lateral adjustment, spring biased fold retaining roll holder members disposed at the rear of said rear folders to receive and check the rolls advanced by said belt, a roll feeding means, a spring for yieldingly urging said fold retaining roll holder members towards the opposite ends of the rolls for releasably yieldingly holding the rolls.

5. In a wrapping machine, the combination of a bed over which a roll to be wrapped may be rolled, folder units disposed longitudinally of the bed in laterally spaced relation to permit a roll to be wrapped to be rolled between them, one of said folder units being mounted for adjustment laterally of the bed, screws for adjusting said folder unit spaced longitudinally of the bed, driving connections for said screws, a tape dispensing device disposed at one side of said bed for adjustment laterally thereof in a direction substantially parallel to the direction of lateral adjustment of said folder unit and provided with a feed means comprising an operating crank, means for actuating said crank comprising a pivotally mounted cylinder and coacting plunger connected to said crank and mounted separately from the dispensing device and adjustable folder unit to be retained against lateral adjustment therewith, means for adjusting said tape dispensing device laterally of the bed comprising a screw, and common driving connections for said dispensing device adjusting screw and said adjusting screws of said adjustable folder unit whereby upon lateral adjustment of said folder unit and dispensing device the dispensing device is automatically adjusted to control the length of tape dispensed simultaneously with the lateral adjustment of the folder unit.

6. In a wrapping machine, the combination of a bed over which a roll to be wrapped may be rolled a main frame having supporting members disposed above and transversely of said bed,

folder units disposed longitudinally of the bed in laterally spaced relation to permit a roll to be wrapped to be rolled between them, a feed belt vertically floatingly supported above said bed longitudinally thereof to engage rolls to be wrapped and advance them between said folder units, and means for adjusting said belt in its entirety to different vertical positions, said means including a belt supporting frame, hanger rods for said belt supporting frame extending through said supporting members, nuts threaded on the upper ends of said rods and supportable on said supporting members, means for connecting said nuts for rotatably adjusting the same in unison, said rods extending loosely through said supporting members to permit said belt supporting frame to be floatingly supported in its entirety by the rolls to be wrapped as they pass beneath the belt.

7. In a wrapping machine, the combination of a bed over which a roll to be wrapped may be rolled, folder units disposed longitudinally of the bed in laterally spaced relation to permit a roll to be wrapped to be rolled between them, one of said folder units being laterally adjustable relative to the other, screw means for adjusting said adjustable folder unit laterally of the other, a tape dispensing device disposed at the front of said bed and at one side thereof, other screw means for varying the feed stroke of said tape dispensing device for varying the length of the tape discharged thereby, and common operating connections for said folder unit adjusting screw means and said tape feed adjusting screw means whereby they are simultaneously and correspondingly adjusted upon said lateral adjustment of said adjustable folder unit.

8. In a wrapping machine, the combination of a bed over which a roll to be wrapped may be rolled, folder units disposed longitudinally of the bed in laterally spaced relation to permit a roll to be wrapped to be rolled between them, one of said folder units being laterally adjustable relative to the other, means for adjusting said adjustable folder unit laterally of the other, a tape dispensing device disposed at the front of said bed and at one side thereof, means for varying the feed stroke of said tape dispensing device for varying the length of the tape discharged thereby, and common operating connections for said folder unit adjusting means and said tape feed adjusting means whereby they are simultaneously and correspondingly adjusted upon said lateral adjustment of said adjustable folder unit.

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