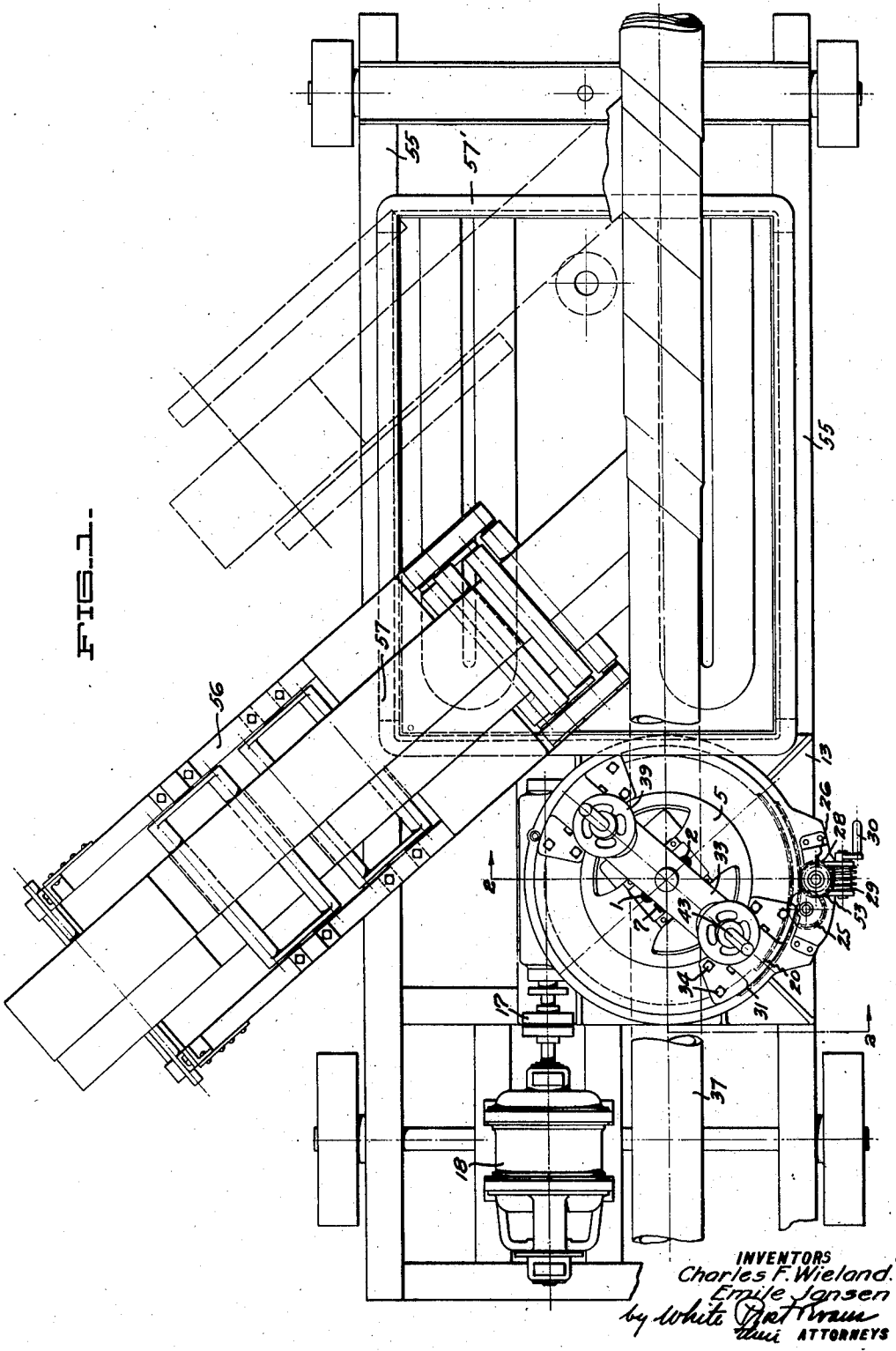
Feb. 9, 1926. 1,572,258

C. F. WIELAND ET AL

PIPE WRAPPING MACHINE

Filed June 15, 1925 3 Sheets-Sheet 1

FIG. 1.



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PIPE WRAPPING MACHINE

Filed June 15, 1925 3 Sheets-Sheet 2

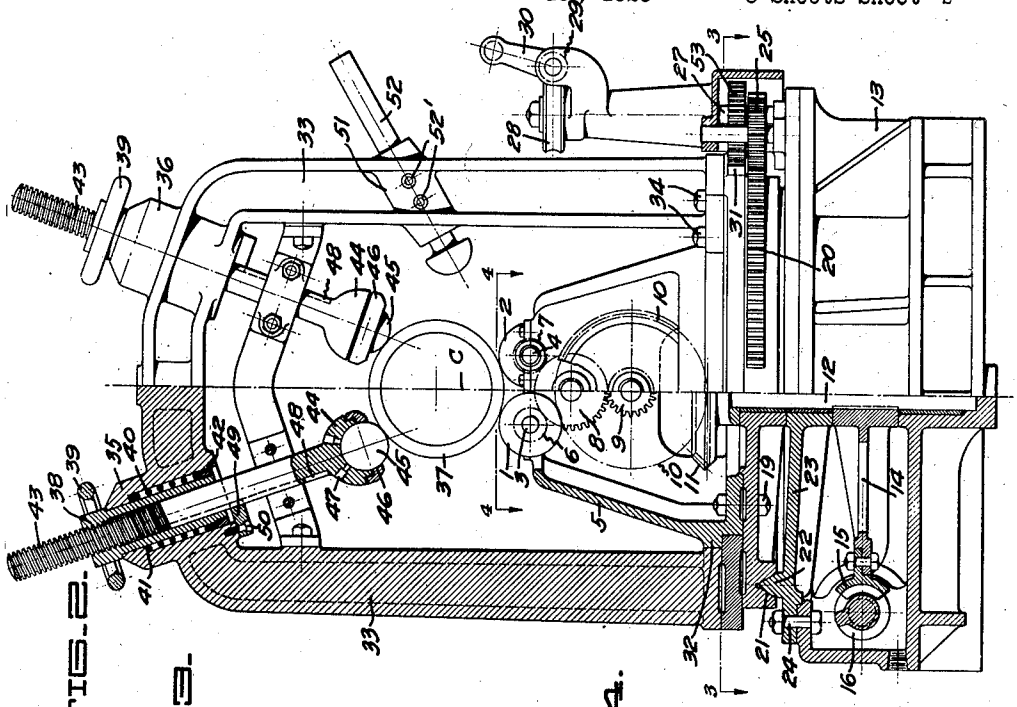


FIG. 2.

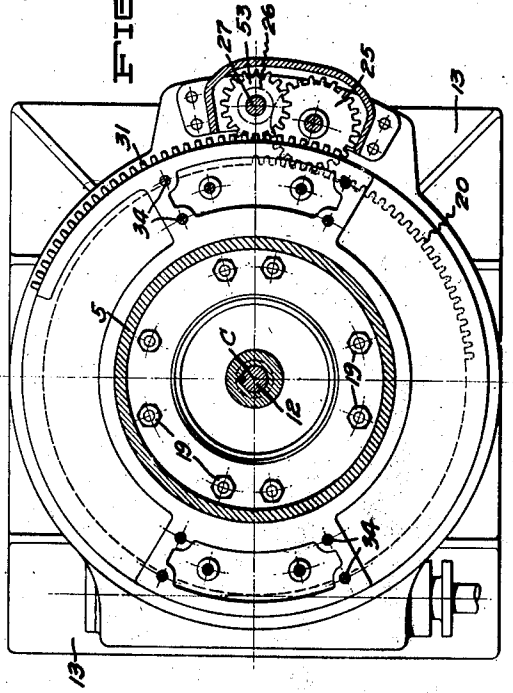


FIG. 3.

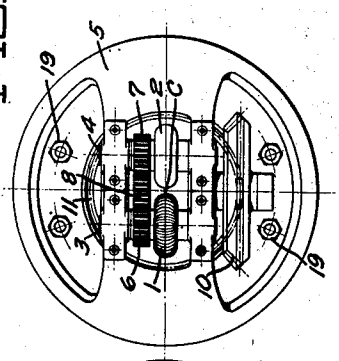


FIG. 4.

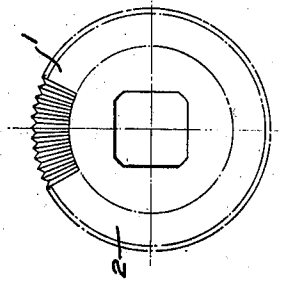


FIG. 5.

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Filed June 15, 1925 3 Sheets-Sheet 3

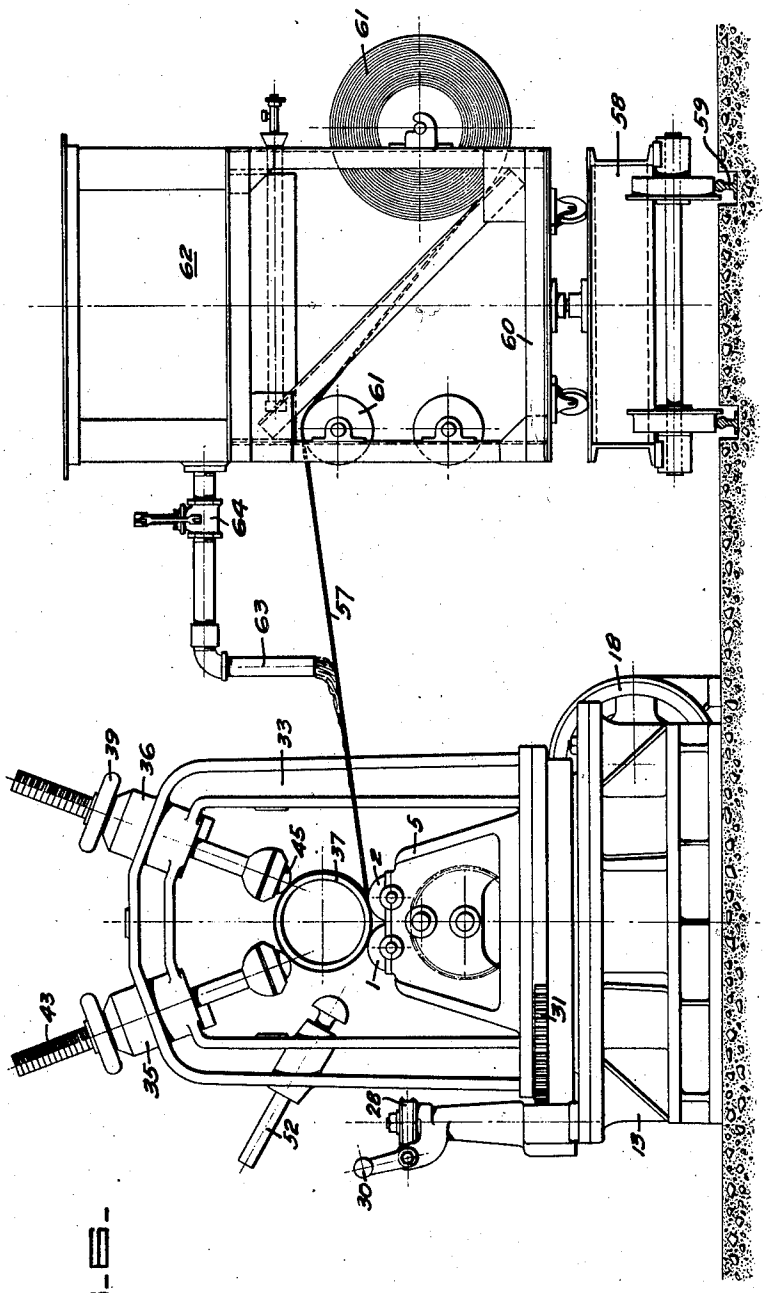


FIG. 8.

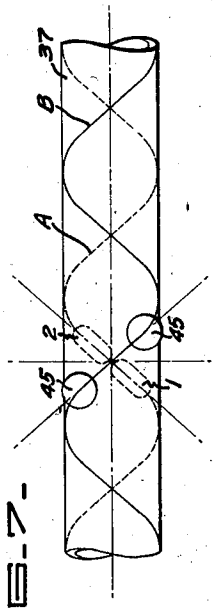


FIG. 7.

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UNITED STATES PATENT OFFICE.

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PIPE-WRAPPING MACHINE.

Application filed June 15, 1925. Serial No. 37,146.

To all whom it may concern:

Be it known that we, CHARLES F. WIELAND and EMILE JANSEN, citizens of the United States, and residents of the city and county of San Francisco, State of California, have invented certain new and useful Improvements in Pipe-Wrapping Machines, of which the following is a specification.

Our invention relates to pipe wrapping machines of the type in which the pipe is rotated and fed forwardly through the machine by the same feed rollers. Heretofore it has been the practice to provide a plurality of such feed rollers, usually three, equidistantly spaced, each of which was individually adjustable radially with respect to the pipe whereby the rollers could be brought into engagement with the pipe and adjusted for the various sizes of pipe. By this arrangement the lower arc of the pipe to be wrapped was supported in different horizontal planes as a result of the adjustment made, particularly in the cases of different sizes of pipe. Heretofore the angularity of the feed rollers with respect to the axis of the pipe had also been adjusted by imparting a motion to each of the rollers in the same direction. In some instances each of the rollers were adjusted individually and in others they were all moved in the same direction by some means connecting them, such as gears.

It is an object of this invention to provide novel means for feeding and rotating the pipe in which rollers in a fixed horizontal position are provided for supporting pipes of whatever diameter are to be handled, whereby the lower arc of the pipes will remain in the same horizontal plane for all sizes of pipes.

Another object of the invention is to provide a pair of parallel feed rollers which together support the pipe regardless of its size in the same horizontal plane and which rollers impart the entire feeding and rotating motion to the pipe.

It is a further object of this invention to provide adjustable means arranged to cooperate with said rollers and hold the pipe in position thereon.

It is another object of the invention to provide means for simultaneously traversing the feed rollers and the holding means in opposite directions, the same angular distance with respect to a line drawn at right angles to the axis of the pipe whereby the paths described by the feed rollers and the holding means respectively on the pipe will have the same pitch, in other words, the points of contact will describe parallel spiral lines on the pipe as it is rotated and fed forward.

The invention possesses other advantageous features, some of which with the foregoing, will be set forth at length in the following description where we shall outline in full that form of the invention which we have selected for illustration in the drawings accompanying and forming part of the present specification. In said drawings we have shown one form of device embodying our invention, but it is to be understood that we do not limit ourselves to such form, since the invention as set forth in the claims may be embodied in a plurality of other forms.

Referring to the drawings:

Figure 1 is a plan view of a machine embodying our invention.

Fig. 2 is an enlarged detail view partly in section and partly in elevation taken on the line 2—2 of Fig. 1, illustrating the feed rollers in inactive position.

Fig. 3 is a sectional view taken on the line 3—3 of Fig. 2.

Fig. 4 is a sectional view taken on the line 4—4 of Fig. 2.

Fig. 5 is a side view illustrating one of the knurled rollers.

Fig. 6 is an end elevation of a machine embodying our invention shown in connection with another type of machine for feeding and impregnating the wrapping material with a water-proof composition; and

Fig. 7 is a diagrammatic view illustrating the position of the feed rollers and the holding means with respect to the axis of the pipe and the spiral lines described by the same on the pipe.

Our invention comprises a pair of rollers, 1, 2, respectively fixed on parallel shafts 3, 4, which shafts are journaled in a frame 5, as best shown in Figs. 2 and 4. The frame 5 is shown as circular in cross-section having a center C and the rollers 1, 2 are positioned equidistantly from the center C on opposite sides thereof. The shafts 3, 4 are respectively provided with gears 6, 7, both of

which gears mesh with a gear 8. The gear 8 is driven by a spur gear 9 carried by a bevel gear 10 which meshes with a bevel gear 11. The bevel gear 11 is carried on a shaft 12 vertically journaled within a casing 13, which casing forms a supporting base for the traversing and feeding mechanism. The shaft 12 is centrally positioned within the casing 13 and frame 5 and its center line coincides with the center C. Within the casing 13 the shaft 12 carries a spider 14 which supports a worm gear 15 which meshes with a worm 16. The worm 16 is coupled at 17 with a motor 18. From this it will be seen that the feed rollers 1, 2 are driven in the same direction by motor 18 through worm 16, worm gear 15, bevel gears 11, 10 and gears 9, 8, the latter gear driving gears 6, 7 which are fixed on the shaft of the respective feed rollers.

The frame 5 is suitably secured at its base, such as by bolts 19, to a gear 20 concentric with shaft 12 and loosely mounted thereon. The gear 20 is provided with an undercut or more or less triangular groove 21 adapted to fit over a flange 22 formed on the top of a cover plate 23 for the casing 13 which cover plate is secured to said casing by bolts 24. In this manner the frame 5 is rotatably supported on the casing 13, the parts 21 and 22 constituting a ways therefor. The gear 20 meshes with a pinion 25 which meshes with a spur gear 26 on the shaft 27. The shaft 27 carries a worm gear 28 which meshes with a worm 29 which is rotated by a handle 30. It is therefore apparent that the frame 5 and the parts carried thereby may be traversed or rotated in a horizontal plane about the center C by means of handle 30 through worm 29, worm gear 28, shaft 27, spur gear 26, pinion 25 and gear 20.

A gear 31 concentric with frame 5 is loosely supported on the gear 20 so as to be independently rotatable thereof and held in position thereon by a projection or flange 32 formed in the frame 5 as shown in Fig. 2. The gear 31 supports an inverted U-shaped structure or frame 33 which is suitably secured thereto such as by bolts 34.

The structure or frame 33 is formed with two housings 35, 36, positioned equidistantly from and on opposite sides of the center C and inclined at an angle with respect thereto converging inwardly or toward the rollers 1, 2. The housings 35, 36 each support mechanism for holding a pipe 37, which is to be wrapped, on the feeding and rotating rollers 1, 2, and since they are both similar in construction, but one will be described and for this purpose the housing 35 which is shown in section in Fig. 2, has been selected. An internally threaded member 38 extends into the housing 35 and is provided with a hand wheel 39 for rotating the same. Within the housing 35 the member 38 is surrounded by a helical spring 40 which bears against an internal shoulder 41 in the upper end of the housing 35 and against a collar 42 screwed on the lower end of the member 38. A threaded shaft 43 extends through the member 38 and projects into the frame 33. At the free or projecting end of the shaft 43 is preferably formed a hemispherical cup or socket 44 to receive a ball or roller 45 which is held in position in said cup or socket by a threaded member 46. If desired the cup 44 may be provided with lubricating orifices 47. The shaft 43 is held against rotation by means of a slot 48 formed therein adapted to receive a key 49 fixed to the structure 33 in any suitable manner such as by a screw 50. Thus when the pipe 37 is supported on the rollers 1, 2 as shown in Fig. 6, the balls 45 may be readily adjusted to engage said pipe and hold the same in position thereon by means of the hand wheels 39 in a manner readily understood. If desired, the structure 33 may be provided with an auxiliary housing 51 positioned in one of its upright legs on the side in which direction the rollers 1, 2 are rotated to accommodate a pin 52 which extends inwardly towards the rollers 1, 2 and which may be adjusted in any desired position by means of set screws 52'. The purpose of the pin 52 is to provide means to assist in holding the pipes of larger sizes on the rollers 1, 2 as will be readily understood.

The gear 31 meshes with a pinion 53 on shaft 27 so that when the handle 30 is rotated the gear 31 and the structure 33 with the entire mechanism carried thereby is rotated through worm 29, worm gear 28, shaft 27, and gears 53 and 31. It will be observed that the rotation of shaft 27 is transmitted to gear 31 through gear 53, which latter gear is fixed on shaft 27, whereby if the shaft is rotated in a clockwise direction the gear 31 is rotated in a counterclockwise direction. In the case of gear 20, however, the motion is transmitted from the shaft 27 through an intermediate gear 25 which reverses the direction of the gear 20 with respect to gear 31. For example, if the shaft 27 is rotated in a clockwise direction, the gear 20 is also rotated in a clockwise direction. The gear ratios between gears 31 and 53 and between gears 20, 25 and 26 are such that each of the gears 31 and 20 will be rotated through the same distance by any movement of the shaft 27 but in opposite directions.

From the foregoing it will be seen that the entire rotative force is transmitted to the pipe 37 through the rollers 1, 2 which occupy a fixed position so as to support all pipes with their lower arcs in the same horizontal plane. The speed of rotation of the pipe 37 of course is determined by the speed

of motor 18 and the ratios of the gears in the train connecting it with rollers 1, 2; however, the speed of longitudinal motion of the pipe 37 is determined by the angularity of the rollers 1, 2 with respect to the longitudinal axis of said pipe. Obviously by adjusting the speed of rotation of the pipe and the speed of its longitudinal movement the pitch of the spiral characterizing the strip of covering as it is wrapped upon the pipe may be determined. From the construction hereinbefore described it will be understood that the balls 45 are resiliently held against the pipe 37 by means of springs 40 which give sufficiently to permit the balls to accommodate themselves to any inequality in the surface of the pipe. The angularity of the feed rollers 1, 2 is adjusted in accordance with the width of the wrapping strip and the amount of the lap but when making such adjustments through the mechanism hereinbefore described the balls 45 are also angularly adjusted to the same degree but in the opposite direction. In this manner the balls 45 and the rollers 1, 2 describe parallel or coincident spirals on the pipe 37. This will be readily understood from Fig. 7, in which the spiral described by the rollers 1, 2 is indicated at A and the spiral described by the rollers 45 is indicated at B.

The unit thus far described may be mounted on a carriage 55, as shown in Fig. 1, and a roller guide 56 for feeding the strip of wrapping material 57 to the pipe 37 is provided. Any number of roller guides 56 may be provided, depending upon the number of layers of material that are to be wound on the pipe 37. A tank 57' is arranged on the carriage 55, in which a waterproof composition such as asphalt is heated and in which the strip of wrapping material is impregnated with the hot compound from which it is fed to the pipe 37 by means of the roller guides 56. The roller guides 56 may be carried by the tank in which the hot bituminous compound is being heated and are positioned so as to pass the strip of wrapping material to the pipe at an angle determined by the pitch of the helix characterizing the wrapping as it is applied.

In Fig. 6 we have shown apparatus embodying our invention as occupying a fixed position and other means for feeding the strip of wrapping material coated with hot bituminous compound to the pipe. In this case a truck 58 on a track 59 is shown supporting a turntable 60. The turntable 60 carries a supply of the wrapping material which is wound on rolls as indicated at 61. The turntable 60 may be positioned to feed the strip of wrapping material to the pipe 37 at any desired angle. Positioned above the rolls 61 the turntable is provided with a tank 62 which contains the hot bituminous compound. A pipe 63 controlled by a valve 64 extends from the tank 62 and is arranged to supply hot compound to the strip of wrapping material at a point intermediate the pipe 37 and the rolls 61.

We do not wish to be limited to details of construction shown since various modifications may be made without departing from the scope of the invention. For example, the usual type of rollers may be provided in lieu of the balls shown for holding the pipe in position on the feed rollers. Nor is the invention limited to wrapping pipes, since it may be employed for wrapping any cylindrical object.

We claim:

1. In a machine for wrapping pipes and the like, rollers having parallel axes adapted to support and engage a pipe, means rotatably supporting said rollers in a fixed horizontal plane whereby pipes of various sizes are supported with their lower arcs in the same horizontal plane, means for rotating said rollers simultaneously in the same direction and means for traversing said supporting means in a horizontal plane whereby said rollers may be angularly positioned with respect to the pipe.

2. In a machine for wrapping pipes and the like a pair of rollers having parallel axes, means supporting said rollers in a fixed horizontal plane, a common means for rotating said rollers in the same direction and means for traversing said supporting means in a horizontal plane.

3. In a machine for wrapping pipes and the like a frame occupying a fixed horizontal position and adapted to be traversed in a horizontal plane, parallel feed rollers thereon located on opposite sides of the center of rotation of said frame, and means for rotating said rollers simultaneously in the same direction comprising a vertical shaft co-axial with said center of traverse.

4. In a machine for wrapping pipes and the like a traversable element having parallel feed rollers thereon adapted to engage and support a pipe, a second traversable element having means adapted to engage and hold a pipe on said rollers and means for simultaneously traversing said elements in opposite directions at the same rate of speed.

5. In a machine for wrapping pipes and the like feed rollers positioned below the pipe, means for holding the pipe on said rollers positioned above the pipe and means for simultaneously varying the angular position of said rollers and holding means with respect to the axis of the pipe to the same degree.

6. In a machine for wrapping pipes and the like feed rollers positioned below the pipe in a fixed horizontal plane, means for holding the pipe on said rollers positioned above the pipe and means for simultaneously

varying the angular positions of said rollers and holding means with respect to the axis of the pipe to the same degree.

7. In a machine for wrapping pipes and the like a horizontally traversable element having parallel feed rollers adapted to engage and support a pipe, a second horizontally traversable element having a vertical element, and means carried by said vertical element for holding a pipe in position on said rollers.

8. In a machine for wrapping pipes and the like, an element adapted to be traversed in a horizontal plane, having parallel feed rollers adapted to engage and support a pipe, a second horizontally traversable element having a vertical element, means carried by said vertical element for holding a pipe in position on said rollers and means for simultaneousy traversing both of said traversable elements in opposite directions at the same speed.

9. In a machine for wrapping pipes and the like a horizontally traversable element having parallel feed rollers adapted to engage and support a pipe, a second horizontally traversable element having a vertical element, means carried by said vertical element for holding a pipe in position on said rollers comprising adjustable elements extending downwardly and converging toward said rollers.

10. In a machine for wrapping pipes and the like a horizontally traversable element having parallel feed rollers adapted to engage and support a pipe, a second horizontally traversable element having a vertical element, means carried by said vertical element for holding a pipe in position on said rollers comprising adjustable elements extending downwardly and converging toward said rollers and means for simultaneously traversing both of said horizontally traversable elements in opposite directions at the same speed.

11. In a machine for wrapping pipes and the like a horizontally traversable element having parallel feed rollers positioned equidistantly on opposite sides of the center of traverse, and a second horizontally traversable element concentric with said first element having means positioned equidistantly on opposite sides of said center of traverse for holding a pipe on said feed rollers.

12. In a machine for wrapping pipes and the like a horizontally traversable element having parallel feed rollers positioned equidistantly on opposite sides of the center of traverse, a second horizontally traversable element concentric with said first element having means positioned equidistantly on opposite sides of said center of traverse for holding a pipe on said feed rollers and means for simultaneously traversing both of said horizontally traversable elements in opposite directions at the same speed.

13. In a machine for wrapping pipes and the like a horizontally traversable element having parallel feed rollers positioned equidistantly on opposite sides of the center of rotation, and a second horizontally traversable element concentric with said first element having means positioned equidistantly on opposite sides of said center of traverse for holding a pipe on said feed rollers comprising a ball and socket.

In testimony whereof, we have hereunto set our hands.

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