

Jan. 29, 1952

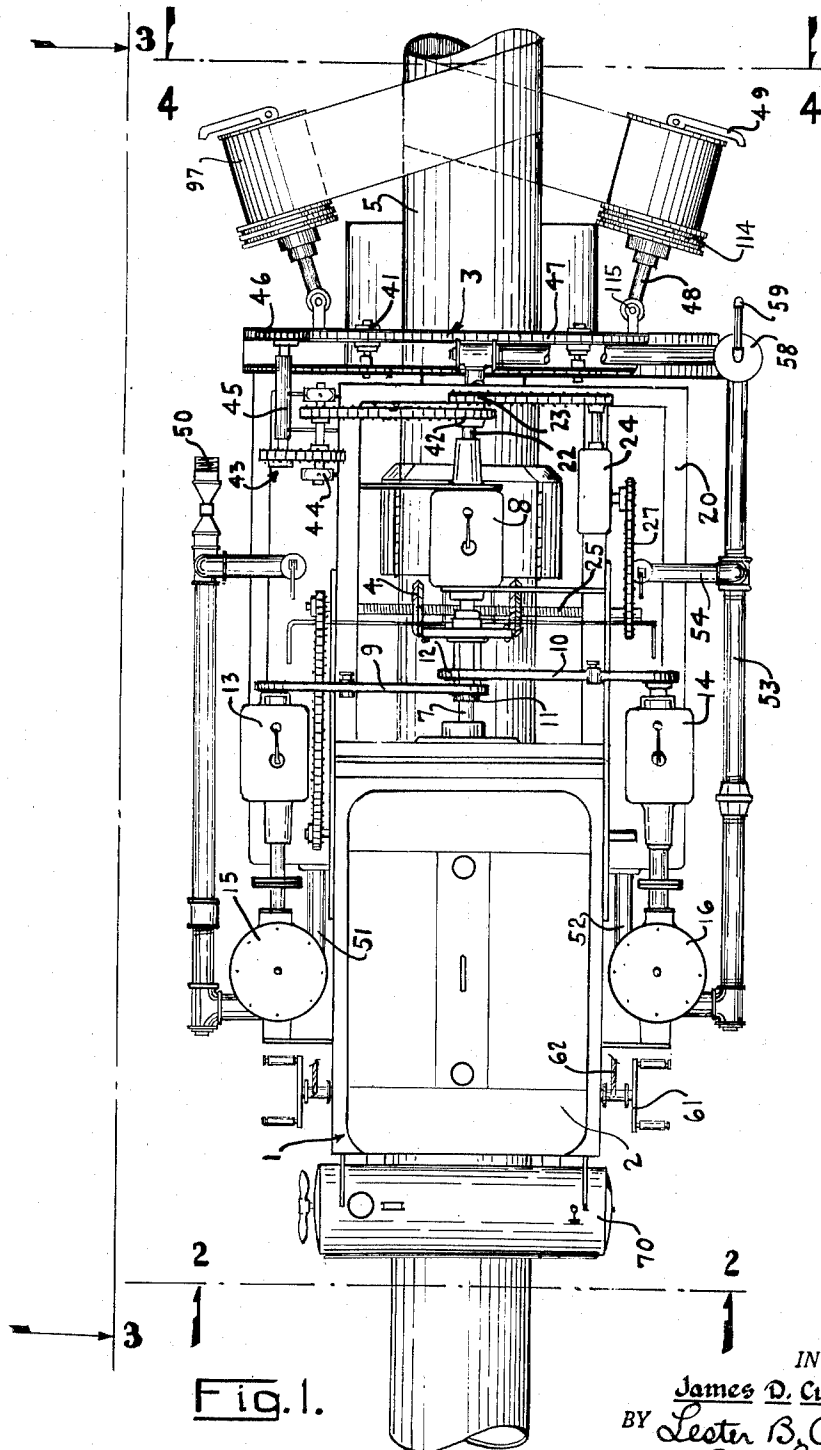
J. D. CUMMINGS

2,583,819

PIPE COATING AND WRAPPING MACHINE

Filed July 2, 1948

9 Sheets-Sheet 1



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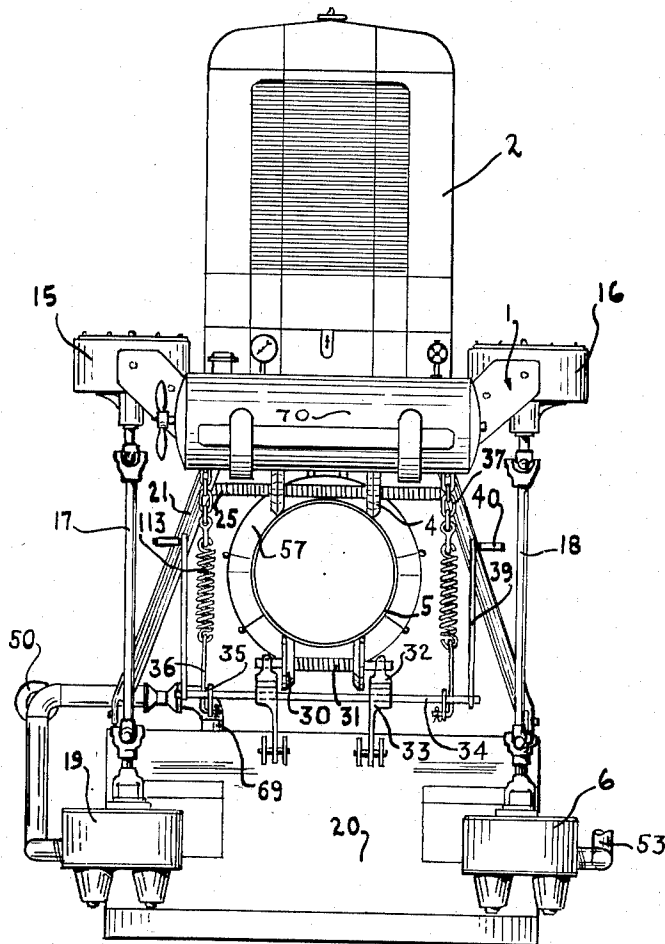


Fig. 2

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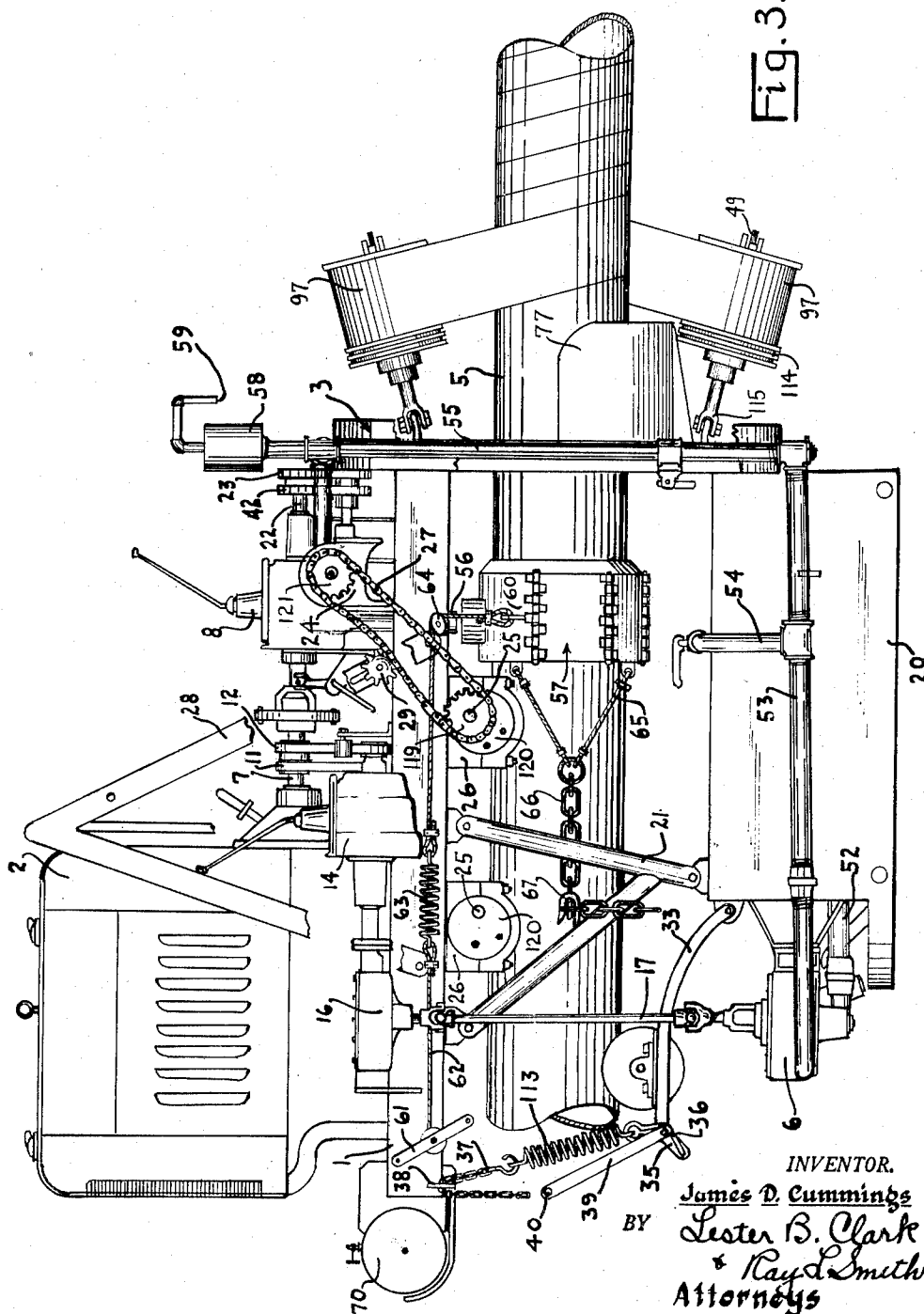
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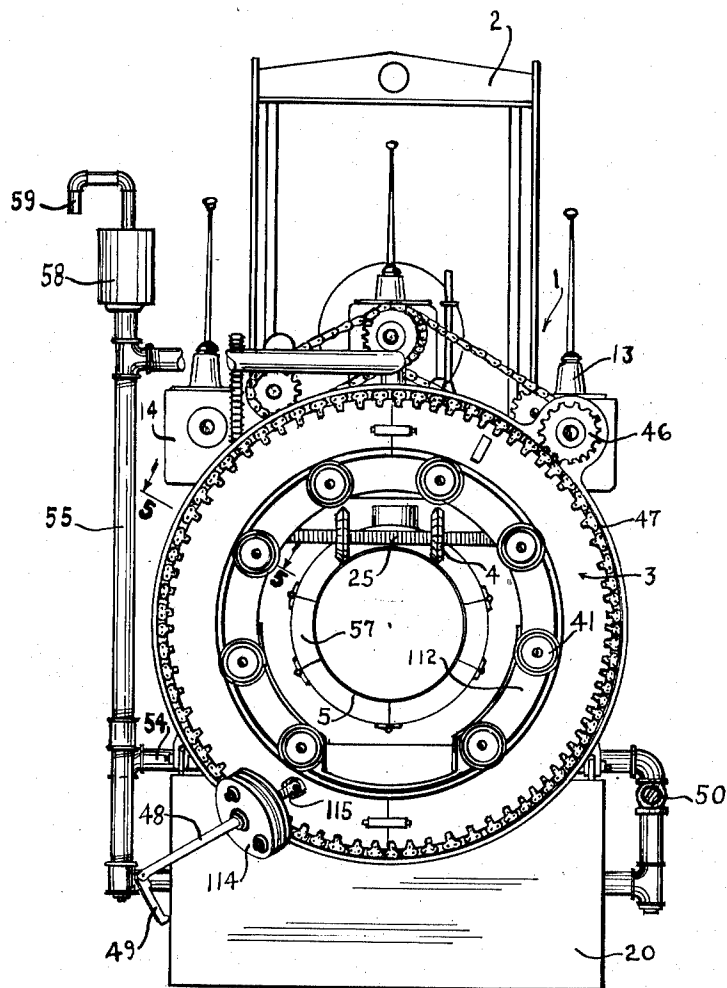


Fig. 4.

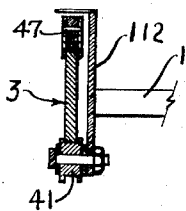


Fig. 5.

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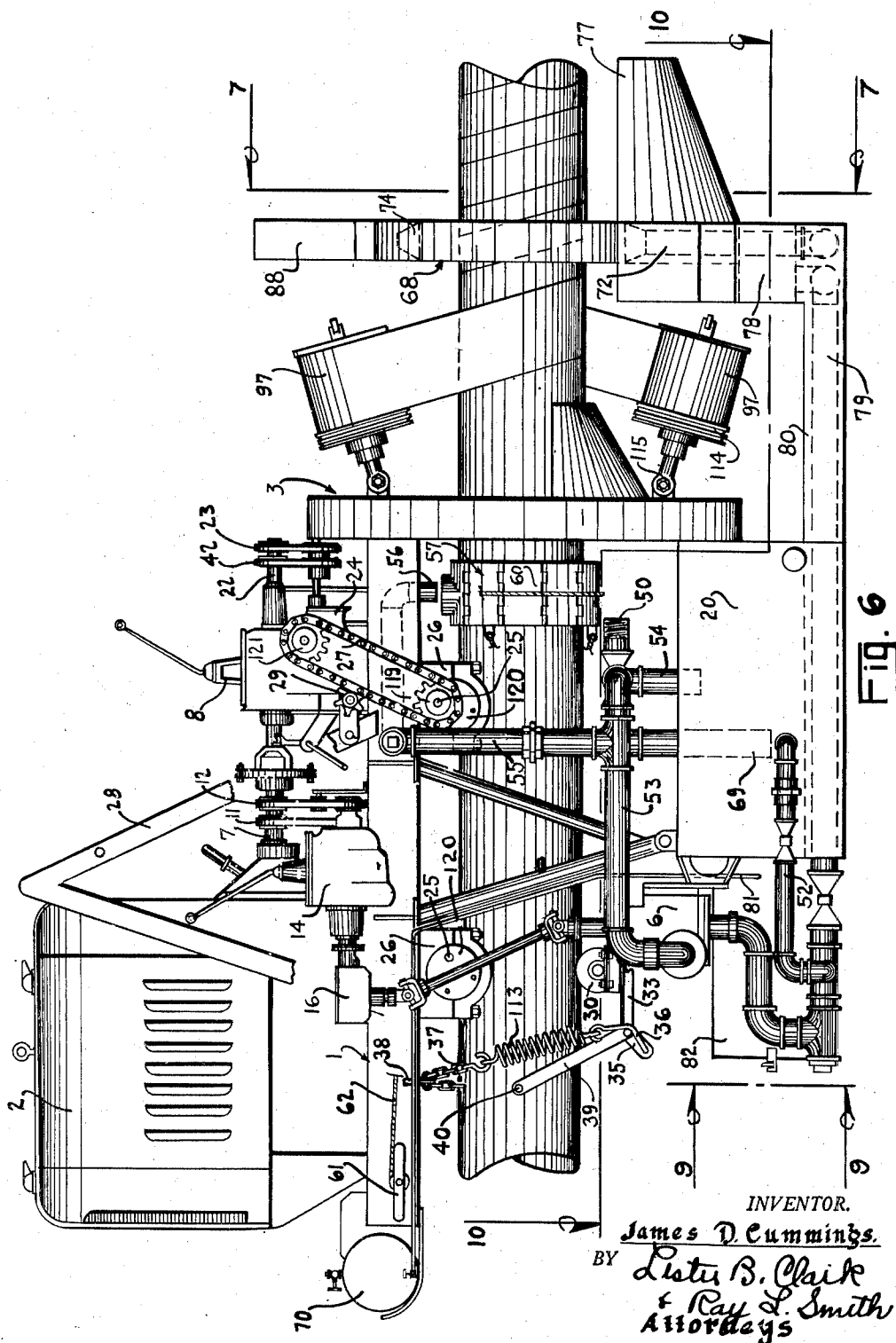
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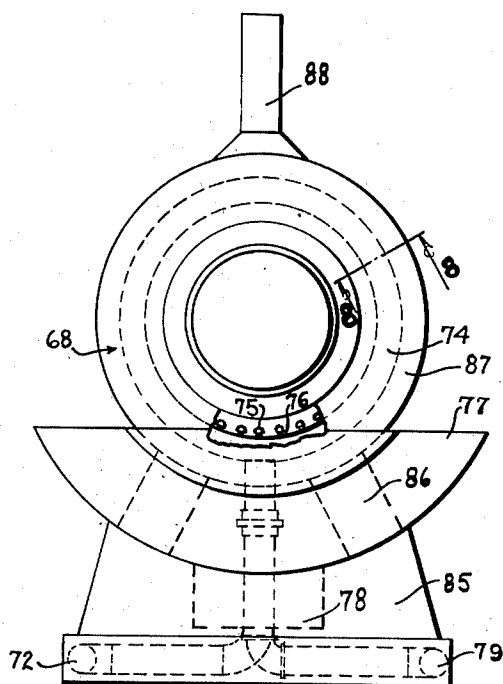


Fig. 7

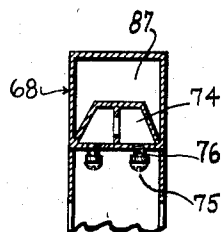


Fig. 8

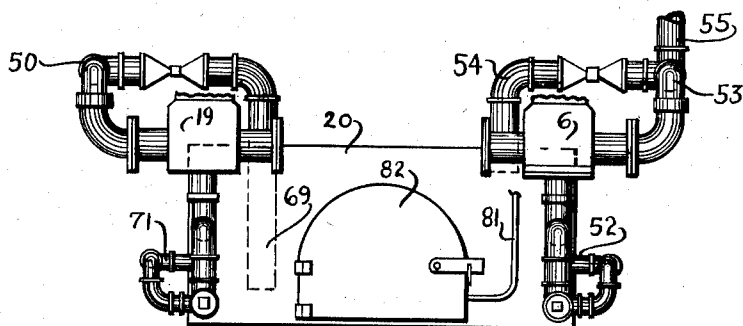


Fig. 9

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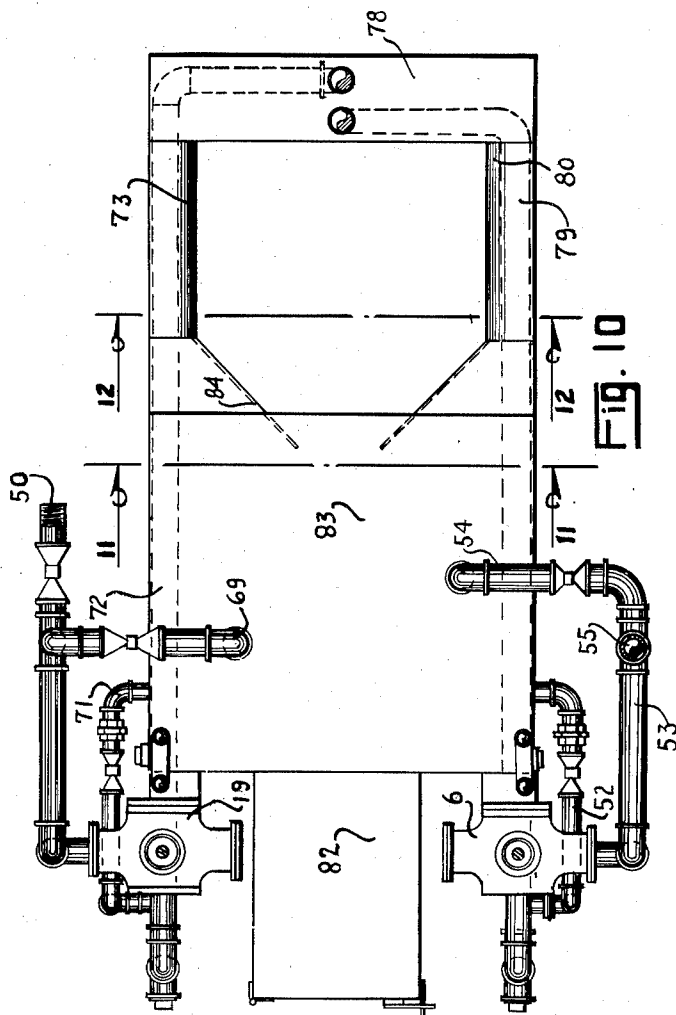


Fig. 10

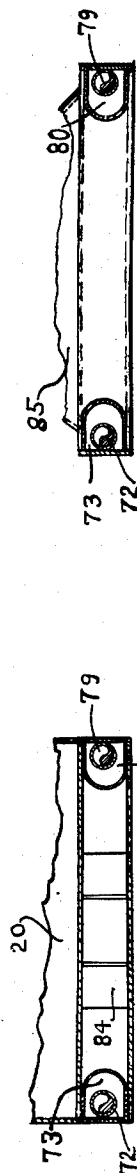


Fig. 12

Fig. 11

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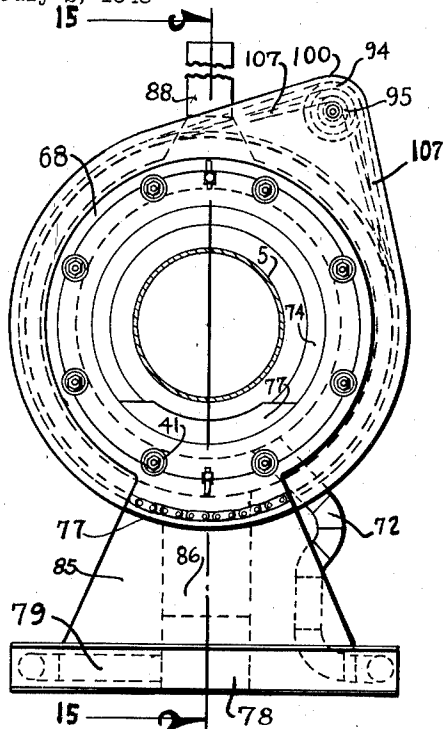


FIG. 14

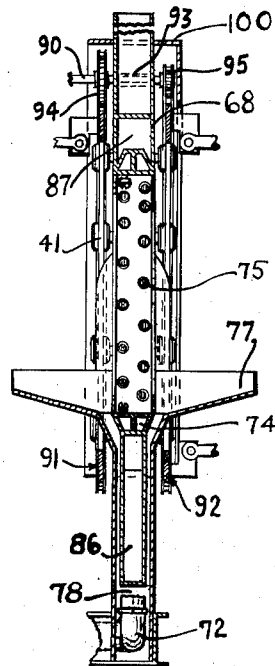


FIG. 15

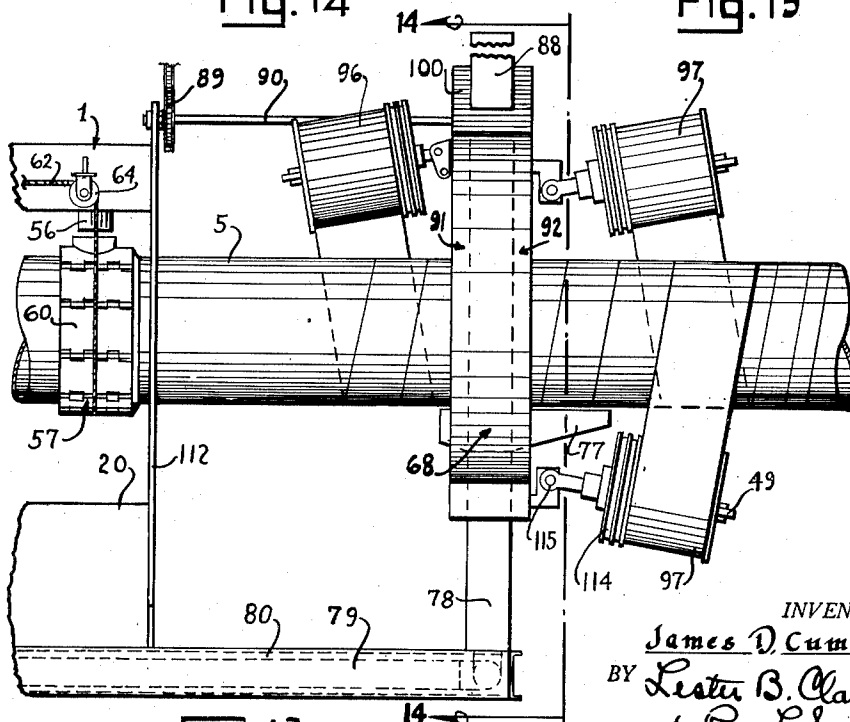


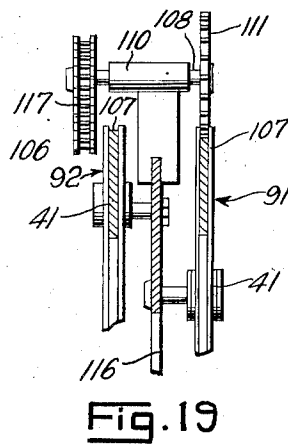
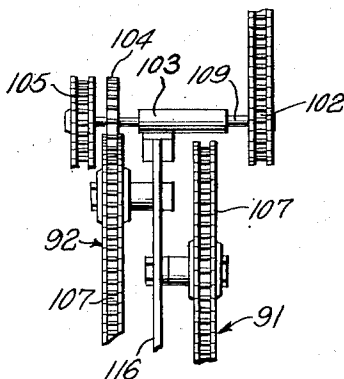
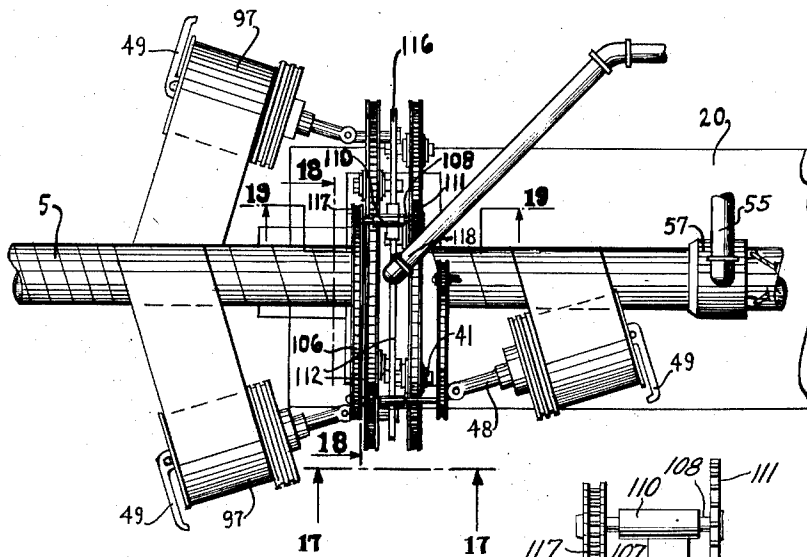
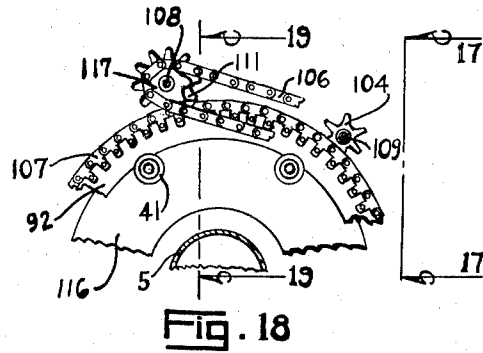
FIG. 13

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UNITED STATES PATENT OFFICE

2,583,819

PIPE COATING AND WRAPPING MACHINE

James D. Cummings, Houston, Tex.

Application July 2, 1948, Serial No. 36,689

11 Claims. (Cl. 154—41)

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This invention relates to pipe protection machines, and is an improvement of prior Patent No. 2,359,751 granted October 10, 1944.

It is an object of this invention to provide a pipe protection machine of this class in which traction wheels, on a shaft journaled in bearings rigidly mounted on the frame, are in driving engagement with the upper side of the pipe being processed.

It is a further object of this invention to provide a pipe protection machine of this class in which traction wheels, on a threaded shaft journaled in bearings rigidly mounted on the frame, support the frame from the pipe being processed.

It is still a further object of this invention to provide a pipe protection machine of this class in which rollers are pivotally mounted on the frame for guiding engagement with the lower side of the pipe being processed.

Yet a further object of this invention is to provide a pipe protection machine of this class in which rollers are supported by a toggle pivotally mounted on the frame, so that the rollers may be quickly adjusted and brought into guiding engagement with the lower side of various diameter pipes being processed.

It is also a further object of this invention to provide a pipe protection machine of this class which has integral therewith a heating unit for heating the coating fluid.

It is another object of this invention to provide a pipe protection machine of this class in which the pipe is first coated, then wrapped, and then coated, and in which a heating unit built integrally with the machine heats the fluid of both protective coats.

It is also another object of this invention to provide a pipe protection machine of this class in which the pipe is first coated, then wrapped, then coated, and then wrapped again, and in which the wrapping heads for applying both wraps are mounted on either side of the means which applies the heated fluid for the second coat.

It is yet another object of this invention to provide a pipe protection machine of this class in which the fluid in the annular coating ring is surrounded by a heating jacket.

It is still a further object of this invention to provide a pipe protection machine of this class in which a single prime mover drives the traction wheels along the pipe, rotates the pipe wrapping mechanism, and drives the right angle drives which operate the coating fluid pumps.

It is an additional object of this invention to

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provide a pipe protection machine of this class which has a coating shoe which is pulled along the pipe by adjustable tension means connecting the shoe to the frame, and which has on the frame a variable tension adjustable means for tightening the shoe around the pipe.

Other and further objects of this invention will become apparent upon referring to the drawings in which:

Fig. 1 is a plan view of a machine adapted to apply an application of coating material to the pipe surface and to cover this coating with a wrap which is shown being applied from two wrapping drums so that the webs of wrapping material overlap.

Fig. 2 is a front end elevation taken along line 2—2 of Fig. 1.

Fig. 3 is a side elevation taken along line 3—3 of Fig. 1.

Fig. 4 is a rear elevation taken along line 4—4 of Fig. 1.

Fig. 5 is a fragmentary sectional view of the yoke, ring gears, and rollers, taken along line 5—5 of Fig. 4.

Fig. 6 is a side elevation of a machine adapted to apply an application of coating material, then to wrap the coating, and then to apply a second coating over the wrap, the wrap being applied from two wrapping drums so that the webs of wrapping material overlap.

Fig. 7 is a rear end elevation taken along line 7—7 of Fig. 6.

Fig. 8 is a fragmentary sectional view through the jacketed coating ring, taken along line 8—8 of Fig. 7.

Fig. 9 is a front end elevation of the lower part of the machine, taken along lines 9—9 of Figs. 6 and 10.

Fig. 10 is a plan view of the lower part of the machine, taken along line 10—10 of Fig. 6.

Fig. 11 is a sectional elevation taken along lines 11—11 of Fig. 10.

Fig. 12 is a sectional elevation taken along lines 12—12 of Fig. 10.

Fig. 13 is a partial side elevation of a machine adapted to apply an application of coating material to the pipe surface, then to wrap over the coating, then to coat the wrapping material, and finally to apply a second wrap, the first wrap being applied from a single drum of wrapping material and the second wrap being applied from two drums.

Fig. 14 is a sectional end elevation taken along line 14—14 of Fig. 13.

Fig. 15 is a sectional side elevation taken along line 15—15 of Fig. 13.

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Fig. 16 is a partial plan view of a modification of the machine shown in Fig. 13.

Fig. 17 is a fragmentary side elevation of the yoke, ring gears, rollers, and of a portion of the ring gear drive, taken along line 17-17 of Fig. 16.

Fig. 18 is a fragmentary sectional end elevation of the yoke, ring gears, rollers, and of a portion of the ring gear drive, taken along line 18-18 of Fig. 16.

Fig. 19 is a fragmentary sectional side elevation of the yoke, ring gears, rollers, and of a portion of the ring gear drive, taken along line 19-19 of Fig. 16.

In the form of the invention disclosed in Figs. 1-5, inclusive, a machine adapted to apply one coat of protective material and to wrap this coat with a wrapping material is shown as having a frame 1 on which is mounted a prime mover 2 such as a gasoline engine which is adapted to drive the wrapping head 3, the traction wheels 4 which propel the machine along the pipe 5 which is being processed, and the pumps 6 and 19 which circulate the coating material which is applied to the pipe.

From the prime mover 1 an interconnecting shaft 7 leads directly to a transmission unit 8. Belt drives 9 and 10 are shown passing over pulleys 11 and 12 on the shaft 7 to drive respectively the transmissions 13 and 14 which are directly connected to right angle drives 15 and 16 which, through universals 17 and 18, drive the pumps 6 and 19. A sump 20 is shown below the pipe 5 and is rigidly connected to the frame 1 by means of structural members 21 and the yoke 112 of the wrapping head 3.

The transmission from the transmission unit 8 to the traction wheels 4 is accomplished by means of the shaft 22 which has the sprocket 23 thereon connected to drive the reducer 24 and through the reducer 24, the sprocket 119 which is mounted on the traction wheel shaft 25. This shaft 25 is journaled in the traction wheel eccentric 120 radially outward from the axis thereof. The eccentric 120 in turn is mounted on the pillow block 26 which is rigidly mounted to the frame 1. As the axes of the eccentric and pillow block are concentric, the shifting of the eccentric about the pillow block and the locking thereof results in rotatably locating the shaft 25 in desired vertical positions.

By providing means for vertically positioning the shaft 25, and by threading the shaft 25 and providing a keyway therealong, the wheels 4 may be keyed in position along the shaft, and the shaft may then be vertically located to drive the machine along pipes of various diameter. A forward pair of wheels 4, mounted by similar adjustable means but not being power driven, is shown located forward of the driven wheels 4 to further support the frame and balance the driving thereof.

The sprocket chain 27, which interconnects sprocket 121 on the reducer 24 with the sprocket 119 on the traction wheel shaft 25, is shown maintained in tension by means of the adjustable take-up sprocket 29 which is mounted on a structural member 28 of the frame.

In order to guide the machine along the lower side of the pipe and in order to position the machine against rocking about the pipe, guide rollers 30 are provided which are mounted on a threaded shaft 31 which is journaled in bearings 32 mounted on arms 33 which are pivoted from the sump 20.

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A rod 34 is pressed through the ends of the arms 33 and links 35 are pressed on this rod outwardly of the arms 33. Toggle legs 36 are pivotally connected in links 35 and these toggle legs are connected with the frame 1 above the pipe 5 by means of the spring 113 and the chain 37 which can be adjustably positioned in a lug 38 rigidly mounted on the frame.

Arms 39 having handles 40 thereon are rigidly mounted at either end of the rod 34 so that when either of these arms are rotated the guide rollers 30 may be adjustably and flexibly positioned against any diameter of pipe 5 which the machine may be processing. It is obviously easy to rotate the arms 39 in a reverse direction to release the guide rollers 30 from contact with the pipe 5. The rollers 30 can also be adjustably positioned at various horizontal distances apart to accommodate various diameter pipe in a horizontal direction, as the threaded shaft permits this adjustment in like manner as is accomplished on the shaft 25 for the traction wheels 4.

The yoke 112 is mounted to rigidly connect the upper members of the frame 1 above the pipe 5 with the sump 20 below the pipe and this yoke has rollers 41 rotatably supported therefrom as shown in Fig. 5 so that the wrapping head 3 may be driven therearound. This driving is accomplished through the transmission unit 8 and the shaft 22 which rotates sprocket 42 through a sprocket transmission system 43 journaled in brackets 44 and 45 supported from the frame 1 so that the sprocket 46 intermeshes with the sprocket chain 47 which is shown mounted around the periphery of the sprocket toothed wrapping head 3.

A brake drum 114 is shown pivotally mounted on the wrapping head 3, and the shaft 48 on which this drum is mounted is shown as extending outwardly therefrom to receive a roll of wrapping material. The arm 49 is pivoted in the shaft 48 to be positioned coaxially therewith when the wrapping drum is positioned on the shaft, after which the arm can be positioned as shown in Fig. 1 by an well-known mechanical means, not shown, within and connected to the shaft 48, so that the pivotal connection 115 of the shaft 48 with the driving head 3 may be changed to a rigid connection when the handle 49 is locked in the positions shown in Figs. 1 and 4.

The wrapping head 3 can have a plurality of wrapping drums mounted thereon, two such drums being shown mounted in Fig. 1 while the head shown in Fig. 4 has only a single drum of wrapping material mounted thereon.

To circulate the coating fluid the pump 19 is adapted to be connected at the nipple 50, by means of a flexible hose, to a portable container, not shown, which has therein heated coating fluid.

The pump takes suction from this flexible hose and delivers the coating fluid into the sump 20 through the line 51. The pump 6 on the opposite side of the machine takes suction from the sump 20 through the line 52 and discharges through the line 53 either back into the sump through the line 54 or upwardly through the line 55 and through the downspout 56 into the coating shoe 57 which is adapted to ride along the pipe as the machine progresses. The line 55 has bubble trap 58 thereon and a vent 59, as shown in Fig. 3, to act as a buffer against successive discharges and to vent the air bubbles which may be entrapped in the coating fluid.

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The shoe 57 is joined together in hinged segments 60 and the shoe can be tightened around various diameter pipes by means of turning the handle 61 which is connected to the shoe through the line 62, the spring 63 and the pulley 64 which is pivotally mounted on the frame 1. The shoe 57 is attached to be pulled along with the machine by means of the lines 65 and the chain 66 which can be adjustably positioned in the hook 67 which is rigidly fixed to a structural member 21 of the frame 1.

In this form of the machine the sump is not heated but a fuel tank 70 is provided to carry fuel along with the machine as a reservoir to fill the heated torch which has to be applied to the sump 20 to heat up any coating material therein prior to putting the machine in use.

In the form of the invention disclosed in Figs. 6 through 12, inclusive, a machine is shown which is adapted to apply a coating to the pipe 5 by means of the shoe 57; it is then adapted to wrap over the coating thus applied by a wrapping head of similar design as that disclosed in Fig. 3; and the machine is then adapted to apply a second coating of protective material over the wrap thus applied through the coating head.

In this machine the driving mechanism and structural features of the frame and sump are similar to the modification of the machine hereinbefore described. It differs in that the sump is heated and the piping of the machine is so adapted to feed coating material to and to circulate coating material from both the coating shoe 57 and the coating head 68.

In this machine the coating material is taken by pump 19 from the reservoir tank through the flexible connection connected to the nipple 50, and suction can also be taken directly from the sump through the spout 69. The pump is then adapted to discharge through line 71 into line 72 which passes through a duct 73, which passes below and on the side of the sump to the coating head 68 where it is designed to discharge upwardly into an annular ring 74 of a sufficient diameter to surround the largest type of pipe contemplated by the size of the particular model of the machine, and through this ring the fluid discharges radially through orifice plugs 75 onto the pipe to be coated. The orifice plugs are adapted to be brought into proximity with various diameters of pipe to be coated by changing the lengths of the nipples 76 which connect with plugs into the annular ring.

The fluid falls from the pipe thus coated into the drip pan 77 and runs down the pan to fall by gravity into the reservoir 78. A pipe 79 is shown connected to the bottom of the reservoir 78 and this pipe passes through a duct 80 to the suction side of the pump 6. As in the modification previously described this pump is adapted to discharge fluid either back into the sump or upwardly to fall into the shoe 57. In this modification the bubble trap shown in Fig. 3 has been omitted for reasons of clarity of description but such equipment may be provided.

In this device the fuel reservoir 70 is piped by means of the fuel line 81 to a burner 82 which is integrally affixed to the sump so that the products of combustion from the burner discharge into the heating jacket 83 beneath the sump and are deflected by means of the baffles 84 into the ducts 73 and 80 and from thence upwardly through the jacket 85 which surrounds the reservoir 78 and through connection ducts 86 to the annular jacket 87 which surrounds the annular

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coating ring 74. From the jacket 87 the exhausted products of combustion are discharged outwardly through the vent 88. It is thus possible in the device of this machine to maintain and circulate heated coating fluid to both the shoe and the coating head.

Figs. 13, 14 and 15 show a modification of the machine adapted to coat, then wrap, then coat, then again wrap a pipe to be processed and in this machine a coating head 68 insures that the second coating is applied in the same manner as in the modification of the machine described immediately above.

In the device of this machine a sprocket wheel 89 is driven from the transmission 8 through a transmission system similar to that of Fig. 1 so as to turn a shaft 90 in a manner to drive both wrapping heads 91 and 92. In this modification of the machine the coating head 68 serves the same function as the yoke 112 to structurally support the bearings 93 in which the shaft 90 turns to drive both the sprocket 94 to propel the inside wrapping head 91 and the sprocket 93 to propel the outside wrapping head 92.

In this machine the sprocket 94 is twice the diameter of the sprocket 95 so that the inner wrapping head 91 turns twice as fast as the outer wrapping head 92 so that a single drum of wrapping material 96 covers the first protective coating applied by the shoe while two drums of wrapping material 97 mounted on the outer wrapping head 92 overlap in applying the protective wrap over the coating which has been applied through the coating head 68.

It should be noted that in this modification the sprockets 94 and 95 are hooded by a guard 100 which is a rigidly extending member from the coating head frame 68.

Figs. 16 through 19, inclusive, show a modification of the machine adapted to apply two coats and two wraps but in this machine, which is adapted to serve smaller diameter pipes, it is not found necessary to maintain a heated coating head 68 and the second coat as well as the first coat of material is applied by the pump 6, not shown, the second coat falling from spout 118 beside yoke 116, shown in Fig. 16, to fall by gravity on the pipe 5 and from thence to fall into the sump 20 which underlies the after part of the machine below the wrapping-head section.

In this machine no hood or guard is shown over the sprockets and chain constituting the driving transmission. The sprocket 102 is driven from the transmission 8, and is mounted on shaft 109 which is journaled in bearing 103 which is rigidly mounted on yoke 116. Shaft 109 also has thereon sprocket 104 and sprocket 105, the sprocket 104 being meshed to drive the annular sprocket chain 107 of the outer wrapping head. The sprocket 105, by means of sprocket chain 106, drives the sprocket 117 which is mounted on shaft 108, this shaft being journaled in bearing 110 rigidly mounted on the yoke 116. The shaft 108 has on the inner end thereof the sprocket 111, twice the diameter of the sprocket 104 and this sprocket is meshed to drive the inner wrapping head so that this head, containing a single drum of wrapping material, has twice the speed of the outer wrapping head.

It is obvious that the improvements of the device of this invention are devised to provide a pipe protection machine in which the machine is driven along the pipe by traction wheels on shafts in pillow blocks rigidly mounted to the frame above the pipe so that the wheels support

the frame from the pipe and in this improvement the guide rollers beneath the pipe which keep the machine from tilting as it progresses onwardly are pivotally positioned from the sump and this improvement admits of great flexibility and rapidity of adjustment.

This feature, in combination with the incorporation of the means for maintaining the sump heated by heating units integrally attached thereto, results in a greatly improved pipe protection machine and in machines of this class where it is desirable to apply a second coating of material over the wrapping of the first coating, the incorporation of a second coating head which is an annular ring surrounded by a heated jacket and provided with radially extending spray nozzles, provides a much more positive method of applying this second coating.

Broadly this invention seeks to incorporate these and other features hereinbefore described as an improvement over prior Patent No. 2,359,751, granted October 10, 1944.

What is claimed is:

1. A machine for applying protective materials to pipe comprising, a frame extending longitudinally about said pipe, bearings rigidly mounted on said frame, a threaded shaft journaled in said bearings, traction wheels on said shaft for driving engagement with the upper side of said pipe, a sump comprised in said frame, roller support means pivotally attached to said sump, rollers thereon adapted by said support means to be guided into engagement with the lower side of said pipe, a pipe coating and a pipe wrapping device supported by said frame, and means on said frame for driving said devices and said traction wheels, said coating device including a jacketed ring supported from said sump to surround said pipe and apply liquid thereto, a combustion chamber beneath said sump and integral therewith, and means for conducting heat through said chamber and jacket.

2. A machine for applying protective materials to pipe comprising, a frame extending longitudinally about said pipe, bearings rigidly mounted on said frame, a threaded shaft journaled in said bearings, traction wheels on said shaft for driving engagement with the upper side of said pipe, a sump comprised in said frame, toggle means pivotally attached at one end to said sump and adjustably and releasably connected at the other end to said frame, rollers on said toggle means between the ends thereof for guiding engagement with the lower side of said pipe, devices supported by said frame for applying protective materials to pipe, and means on said frame for driving said devices and said traction wheels.

3. A machine for applying protective materials to pipe comprising, a frame extending longitudinally about said pipe, bearings rigidly mounted on said frame, a threaded shaft journaled in said bearings, traction wheels on said shaft for driving engagement with the upper side of said pipe, a sump comprised in said frame, roller support means pivotally attached to said sump, rollers thereon adapted by said support means to be guided into engagement with the lower side of said pipe, pumps connected to said sump, transmissions on said frame for driving said traction wheels, right angle drives on said frame for driving said pumps, wrapping means supported from said frame, and a single prime mover on said frame connected to drive said transmissions, right angle drives, and wrapping means.

4. A machine for applying protective materials to pipe comprising, a frame extending longitudinally about said pipe, bearings rigidly mounted on said frame, a threaded shaft journaled in said bearings, traction wheels on said shaft for driving engagement with the upper side of said pipe, a sump comprised in said frame, roller support means pivotally attached to said sump, rollers thereon adapted by said support means to be guided into engagement with the lower side of said pipe, a shoe surrounding said pipe for applying coating material to the surface of said pipe, a line for conducting coating liquid from said sump to said pipe above said shoe, a bubble trap in said line, pumps connected to said sump for supplying coating liquid to said line, wrapping means supported from said frame, and means on said frame for driving said traction wheels, pumps, and wrapping means.

5. A machine for applying protective materials to pipe comprising, a frame extending longitudinally about said pipe, bearings rigidly mounted on said frame, adjustable eccentric means in said bearings, a threaded shaft journaled in said eccentric means to be positioned by said eccentric at various elevations to accommodate various diameter pipes, traction wheels on said shaft for driving engagement with the upper side of said pipe, a sump comprised in said frame, roller support means pivotally attached to said sump, rollers thereon adapted by said support means to be guided into engagement with the lower side of said pipe, a shoe surrounding said pipe for applying coating material to the surface of said pipe, adjustable means for connecting said shoe and frame, means on said frame for tightening said shoe about said pipe, a line for conducting coating liquid from said sump to said pipe above said shoe, a bubble trap in said line, pumps connected to said sump for supplying coating liquid to said line, wrapping means supported from said frame, and means on said frame for driving said traction wheels, pumps, and wrapping means.

6. A combination pipe coating and wrapping machine comprising, a frame extending longitudinally about said pipe, bearings rigidly mounted on said frame, a threaded shaft journaled in said bearings, traction wheels on said shaft for driving engagement with the upper side of said pipe, a sump comprised in said frame, pump means connected to said sump for transferring coating fluid to and from said pipe, roller support means pivotally attached to said sump, rollers thereon adapted by said support means to be guided into engagement with the lower side of said pipe, a jacketed ring supported from said sump to surround said pipe and apply liquid thereto, a combustion chamber beneath said sump and integral therewith, means for conducting heat through said chamber and jacket, pipe wrapping means supported by said frame, and a prime mover on said frame connected to drive said traction wheels, pump means, and wrapping means.

7. A combination pipe coating and wrapping machine comprising, a frame extending longitudinally about said pipe, bearings rigidly mounted on said frame, a threaded shaft journaled in said bearings, traction wheels on said shaft for driving engagement with the upper side of said pipe, a sump comprised in said frame, pump means connected to said sump for transferring coating fluid to and from said pipe, roller support means pivotally attached to said sump, rollers thereon adapted by said support means to be guided into engagement with the lower side of said pipe, a jacketed ring supported from said sump to sur-

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round said pipe and apply liquid thereto, a combustion chamber beneath said sump and integral therewith, means for conducting heat through said chamber and jacket, pipe wrapping means supported by said ring, and a prime mover on said frame connected to drive said traction wheels, pump means, and wrapping means.

8. A combination pipe coating and wrapping machine comprising, a frame extending longitudinally about said pipe, bearings rigidly mounted on said frame, adjustable eccentric means in said bearings, a threaded shaft journaled in said eccentric means to be positioned by said eccentric at various elevations to accommodate various diameter pipes, traction wheels on said shaft for driving engagement with the upper side of the pipe, a sump comprised in said frame, roller support means pivotally attached to said sump, rollers thereon adapted by said support means to be guided into engagement with the lower side of said pipe, a yoke suspended from said frame, ring gears carried on opposite sides of said yoke for rotation around said pipe, wrapping material holders carried by said ring gears, a coating device carried by said frame forwardly of said ring gears, a second coating device supported by said yoke, pumps connected to said sump for transmitting fluid to said coating devices, and a single prime mover on said frame connected to drive said traction wheels, ring gears, and pumps.

9. A combination pipe coating and wrapping machine comprising, a frame extending longitudinally about said pipe, bearings rigidly mounted on said frame, adjustable eccentric means in said bearings, a threaded shaft journaled in said eccentric means to be positioned by said eccentric at various elevations to accommodate various diameter pipes, traction wheels on said shaft for driving engagement with the upper side of the pipe, a sump comprised in said frame, roller support means pivotally attached to said sump, rollers thereon adapted by said support means to be guided into engagement with the lower side of said pipe, a yoke suspended from said frame, ring gears carried on opposite sides of said yoke for rotation around said pipe, wrapping material holders carried by said ring gears, a coating device carried by said frame forwardly of said ring gears, a second coating device supported by said sump, pumps connected to said sump for transmitting fluid to said coating devices, and a single prime mover on said frame connected to drive said traction wheels, ring gears, and pumps.

10. A machine for applying protective materials to pipe comprising, a frame extending longitudinally about said pipe, bearings rigidly mounted on said frame, adjustable eccentric means in said bearings, a threaded shaft journaled in said eccentric means to be positioned by said eccentric at various elevations to accommodate various diameter pipes, traction wheels

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on said shaft for driving engagement with the upper side of said pipe, a sump comprised in said frame, roller support means pivotally attached to said sump, rollers thereon adapted by said support means to be guided into engagement with the lower side of said pipe, wrapping means supported from said frame, pipe coating means consisting of a shoe surrounding said pipe for applying coating material to the surface of said pipe, adjustable means for connecting said shoe and frame, means on said frame for tightening said shoe about said pipe, a line for conducting coating liquid from said sump to said pipe above said shoe, a bubble trap in said line, pumps connected to said sump for supplying coating liquid to said line, there being means on said frame for driving said traction wheels, pumps, and wrapping means.

11. A machine for applying protective materials to pipe comprising, a frame extending longitudinally about said pipe, bearings rigidly mounted on said frame, adjustable eccentric means in said bearings, a threaded shaft journaled in said eccentric means to be positioned by said eccentric at various elevations to accommodate various diameter pipes, traction wheels on said shaft for driving engagement with the upper side of said pipe, a sump comprised in said frame, roller support means pivotally attached to said sump, rollers thereon adapted by said support means to be guided into engagement with the lower side of said pipe, a shoe surrounding said pipe for applying coating material to the surface of said pipe, adjustable means for connecting said shoe and frame, means on said frame for tightening said shoe about said pipe, a line for conducting coating liquid from said sump to said pipe above said shoe, a bubble trap in said line, a jacketed ring supported from said sump to surround said pipe and apply liquid thereto, a combustion chamber beneath said sump and integral therewith, means for conducting heat through said chamber and jacket, pumps connected to said sump for supplying coating liquid to said line and to said jacketed ring, wrapping means supported from said frame for wrapping said pipe after it is coated by said shoe and before it is coated by said jacketed ring, and means on said frame for driving said traction wheels, pumps, and wrapping means.

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