Feb. 2, 1960 A. E. BETZEL, SR 2,923,486

POWER DRIVEN PIPE WRAPPING MACHINE

Filed Aug. 19, 1955 2 Sheets-Sheet 1

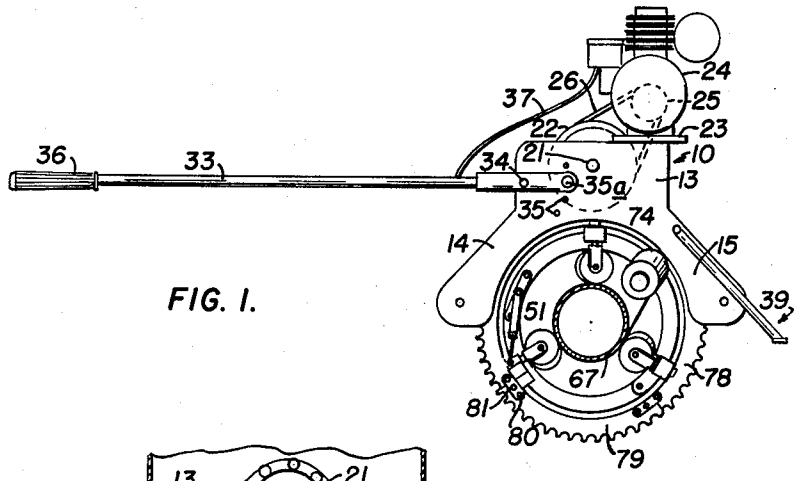


FIG. 1.

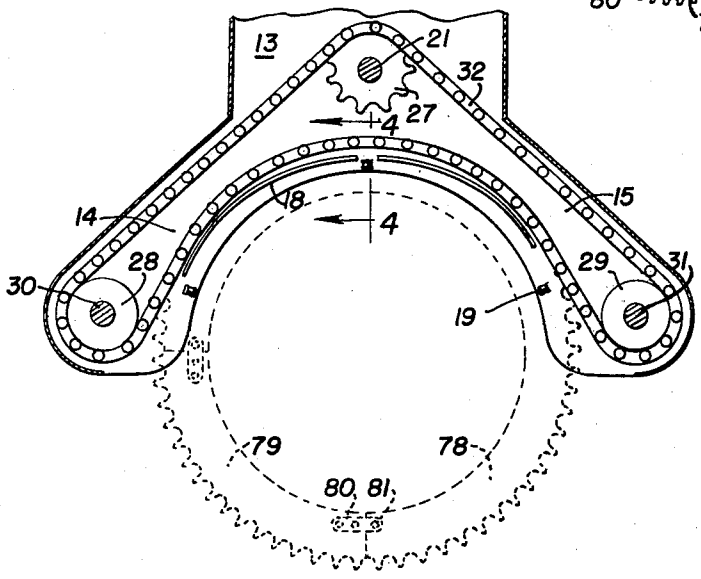


FIG. 2.

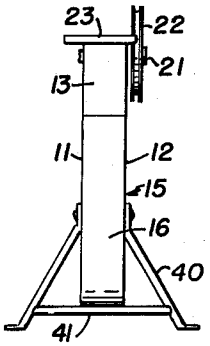


FIG. 3.

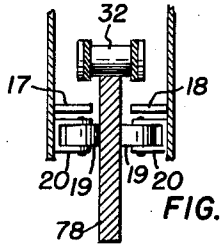


FIG. 4.

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POWER DRIVEN PIPE WRAPPING MACHINE

Filed Aug. 19, 1955 2 Sheets-Sheet 2

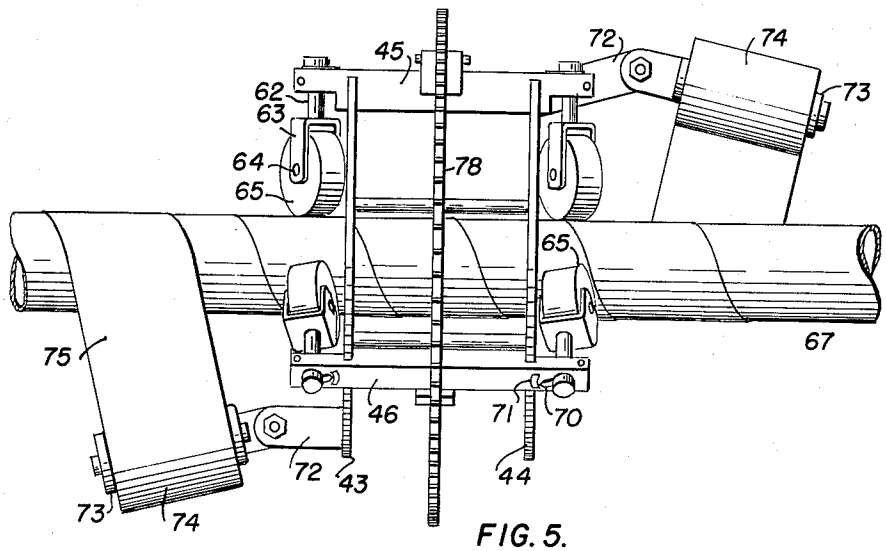


FIG. 5.

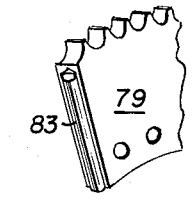


FIG. 7.

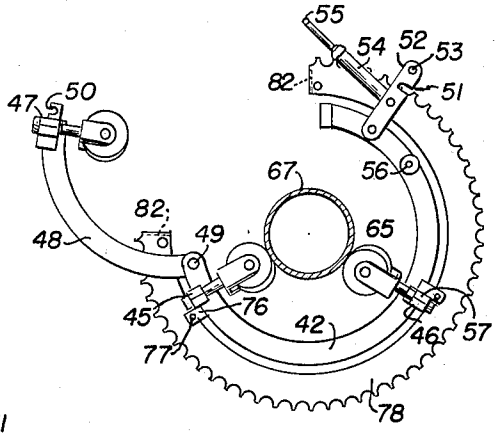


FIG. 6.

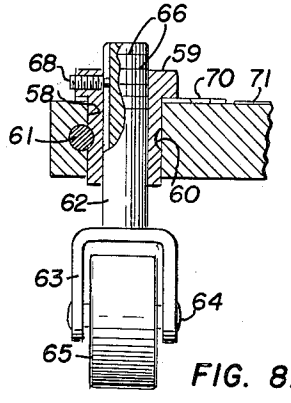


FIG. 8.

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POWER DRIVEN PIPE WRAPPING MACHINE

Alvin E. Betzel, Sr., Arlington, Tex.

Application August 19, 1955, Serial No. 529,443

1 Claim. (Cl. 242—11)

This invention relates to pipe wrapping machines and has reference to new and useful means for transmitting motive power thereto.

A major impediment to the efficient use of power driven wrapping machines has been the excessive weight of the machines and the consequent cumbersome manner in which they have had to be assembled about a section of pipe. In many instances, with prior equipment, the assembly of a pipe wrapping machine about a section of pipe has required the use of a power crane or other auxiliary lifting device to raise and manipulate the wrapping machine into position about the pipe. The need for extra equipment and personnel in installation reduces the economic usefulness of wrapping machines and often prohibits their economic use for relatively small wrapping jobs.

An object of the invention is to provide a power driven pipe wrapping machine of light weight and simple construction.

A further object of the invention is to provide a power driven pipe wrapping machine which may quickly and easily be assembled about a section of pipe.

Another object of the invention is to provide a power driven pipe wrapping machine constructed into two separate yet easily assembled parts whereby weight may be greatly reduced for lifting and attachment of the machine to a section of pipe.

A particular object of the invention is to provide separate powering and wrapping units for a pipe wrapping machine which units may be interchangeably used with other pipe wrapping machines and which units may be quickly and easily fitted together for use.

A further object of the invention is to provide simple adjustments for a power driven pipe wrapping machine whereby said machine may be used with pipes of various diameters.

Another object of the present invention is to provide means whereby a powering unit may be attached to a wrapping unit of a pipe wrapping machine without the use of tools or tedious adjustments.

An additional object of the invention is to provide a pipe wrapping machine capable of wrapping pipe of relatively large diameter and wherein said pipe wrapping machine may be lifted to and assembled about a section of pipe by one man of average strength without the use of auxiliary lifting devices.

These and other objects will become apparent from the following description and the accompanying drawings, wherein:

Figure 1 is a front elevational view of a powering unit and a wrapping unit of a pipe wrapping machine assembled about a section of pipe.

Figure 2 is a sectional and front elevation of the transmission housing, the sprocket gears, and the sprocket chain as embodied in the described form of the invention.

Figure 3 is a side elevational view of the transmission housing and the stand of a pipe wrapping machine.

Figure 4 is a sectional view of the transmission housing,

sprocket chain, annular sprocket gear and guide roller of the present invention taken along the line 4—4 of Figure 2.

Figure 5 is a side elevational view of the wrapping unit of a pipe wrapping machine contemplated in the present invention with the wrapping unit shown assembled about a section of pipe.

Figure 6 is a front elevational view of the wrapping unit of a pipe wrapping machine showing the quarter frame open and the removable segment of the annular sprocket gear removed to position the unit about a section of pipe.

Figure 7 is a broken perspective view of an end of the removable segment of the sprocket gear.

Figure 8 is a partially sectional and elevational view of a roller of the present invention showing its means of attachment and adjustment to a cross bar of a pipe wrapping machine.

The invention is particularly directed to a means of transmitting motive power from a powering unit to wrapping unit by an arrangement of parts wherein the powering unit may simply be placed upon the wrapping unit and wherein neither adjustment nor mechanical connections need be made.

When the two units are thus assembled they act as a single unit transmitting motive power from a motor in the powering unit to the wrapping unit which revolves about a section of pipe. In so revolving the wrapping unit traverses a helical course about the pipe, the forward aspect of which carries the powering unit forward along the section of pipe being wrapped.

In the drawings, a transmission housing **10** is made of flat metal stock. Forward and rear walls **11** and **12** of the housing **10** are substantially parallel with one another and are shaped so that their upper portions form a box like enclosure **13**. Their lower portions extend outward and downward therebeneath forming leg members **14** and **15**. Beneath the box like portion **13** of the housing **10** and between the legs **14** and **15** thereof the lower edges of the forward and rear walls **11** and **12** are curved upward and inward to form a curved opening between the two legs **14** and **15** which curve is of a larger radius at its upper center portion than at its sides. Side walls **16** extend between the edges of the forward and rear walls **11** and **12** at the outer and upper portions of the legs **14** and **15**. Flanges **17** and **18**, formed in accordance with the curve between the legs **14** and **15**, extend inward from the forward and rear walls **11** and **12**. Guide rollers **19**, positioned to engage the front and rear sides of a sprocket to be described, also project from the surfaces of the walls **11** and **12**. The plane of rotation of each guide roller **19** is substantially parallel with the immediately adjacent portion of the flanges **17** and **18**. Guide roller brackets **20** support the guide roller **19**, said brackets being attached to the interior of the forward and rear walls **11** and **12** of the housing **10**. A main shaft **21** extends between and is journaled through the forward and rear walls **11** and **12** near the top and center thereof. One end of the main shaft **21** extends rearwardly from the housing **10** beyond the rear wall and a driven pulley **22** is attached to the rearward projecting end of the main shaft. An engine mounting plate **23** is attached to the top of the box like portion **13** of the housing **10** where an engine **24**, preferably of the air cooled internal combustion type, is secured to the engine mounting plate. A driving pulley **25** is attached to the drive shaft of the engine **24** and a belt **26** is placed about the driving pulley **25** and the driven pulley **22**.

A driven sprocket **27** is attached to the main shaft **21** within the housing **10** and both the driven pulley **22** and the driven main sprocket **27** rotate with the shaft **21**

which is journaled through the forward and rear walls of the housing. Guide rollers 28 and 29 are journaled to shafts 30 and 31 which extend between the forward and rear walls of the housing near the lower extremities of the legs 14 and 15. A sprocket chain 32 is positioned about the sprocket 27 and guide rollers 28 and 29 within the housing 10, and the lower portion of the chain rests upon the flanges 17 and 18 when the power unit is removed from the sprocket, to be described. The chain 32 is long enough to provide slack within the housing when the lower portion of the chain is resting upon the flanges 17 and 18. The forked end of a handle 33 is attached to the housing 10 by means of a pivot pin 34. A plurality of adjustment holes 35 are provided through the forward wall of the housing and a corresponding hole, not numbered, through an adjacent extension of the handle 33 to provide means of attachment with an adjustment bolt 35*a*. The projecting end of the handle 33 is provided with a rotatable hand grip 36 and control cable 37 extends from the hand grip to the throttle of the engine 24. Attached to the leg 15 of the housing 10 opposite the handle 33 is a stand 39 provided with forward and rearward extending members 40 and a reinforcing member 41. By means of the stand 39 the powering unit may be placed upright on any level surface when not in use.

In general terms, the wrapping unit consists of rollers depending from a circular frame, rolls of wrapping material attached to the circular frame, and a sprocket attached to the periphery of the circular frame. The sprocket is adapted to fit into the housing of the power unit between the flanges 17 and 18 and to engage the sprocket chain 32 and to thereby transmit motive power from the powering unit to the wrapping unit.

More especially, a circular frame 42 is comprised of parallel annular members 43 and 44 fastened to cross bars 45, 46 and 47 extending therebetween. The cross bars 45, 46 and 47 are regularly spaced about the circular frame 42 and are parallel with each other. Each end of each cross bar projects outward beyond the annular members 43 and 44. A section 48 of the circular frame, including one of the cross bars 47, is constructed separately from the rest of the frame and is pivotally attached thereto by means of a pivot pin 49. The pivoted end of the setcion 48 of the frame 42 carries the cross bar 47 attached thereto and sockets 50 are formed in the cross bar 47 exteriorly of the annular members 43 and 44. A latch 51 is provided on the main annular frame 42 near the junction of the pivoting end of the quadrant 48 for the purpose of securely enclosing the frame about a section of pipe. The latch 51 is of the toggle type and includes parallel toggle arms 52 pivotally attached at corresponding ends to the annular members 43 and 44. Handles 53 are provided at the projecting ends of the toggle arms 52. Centrally located between the handles 53 and the points of attachment to the circular frame, spring loaded tension arms 54 are pivotally attached to the toggle arms 52. Balls 55, adapted to fit within the sockets 50, are attached to the extending ends of the tension arms 54. Toggle rests 56 are provided on the circular frame members to prevent the toggle arms 52 from pivoting into the area circumscribed by the circular frame 42. Each end of each cross bar 45, 46 and 47 is provided with a slot 57 cut in a plane of the axis of the circular frame. Cylindrical openings 58, which communicate with the innermost parts of the slots 57 are likewise provided near each end of each cross bar 45, 46 and 47; the axis of each cylindrical opening 58 is perpendicular to the axis of the circular frame 42. Sleeves 59 are provided for each cylindrical opening 58 through the ends of the cross bars 45, 46 and 47, and an arcuate grove 60 is centrally formed about the outer circumference of each sleeve 59. A bolt 61 extends through the slot between the bifurcated members of each cross

bar, and part of the circumference of the bolt 61 passes through the cylindrical opening 58 where it is accommodated by the groove 60 in the sleeve 59. The bolt 61 may be tightened to affix the orientation of the sleeve 59, and the bolt 61 serves the additional function of confining the sleeve 59 within the cylindrical opening 26 when the bifurcated members of the cross bars 45, 46 and 47 are not so drawn together. Cylindrical posts 62 made from shaft stock are adapted to pass through the interior of the sleeves 59 and to communicate with the interior walls thereof. The base end of each post 62 projects inward perpendicularly toward the axis of the circular frame 42. The base of each post 62 is fastened to a U-shaped bracket 63 which in turn has parallel arms projecting inward toward the axis of the circular frame. An axle 64 extends between the extremities of the inward projecting arms of the U-shaped bracket 63. A cylindrical roller 65 made of rubber or other suitably tough resilient substance is journaled about each axle 64. Markings 66 are provided about the circumference of the outward extending portion of each post 62, and which markings are calibrated to correspond to the various settings required to properly engage standard sizes of pipe 67 with the rollers 65. A set screw 68 is provided through the wall of the outer portion of each sleeve 59 to lock the same and post 62 together when the proper setting adjustment has been made. A pointer 70 is attached to each sleeve 59, and a corresponding scale 71 is positioned adjacently on the ends of each cross bar 45, 46 and 47. Calibrations are marked upon each scale 71 corresponding to the various angular settings required of the rollers to helically circumscribe pipes of different diameters with uniform linear progress per revolution. The angular setting of each roller 65 may be affixed by locking the sleeve 59 within the cylindrical opening 58 by means of the bolt 61 which draws together the bifurcated members of the cross bars 45, 46 and 47.

Spool support brackets 72 are attached to the circular frame 42 and extend forward and rearward therefrom respectively. Spools 73 are adjustably attached to the extending ends of the spool support brackets 72. Rolls 74 of wrapping fabric 75 are positioned about the spools 73 and fabric 75 is paid therefrom to the circumference of a section of pipe 67 about which the wrapping unit is rotated on the rollers 65.

Outward extending mounting brackets 76 are bolted to each cross bar 45, 46 and 47 at a position equidistant between the two annular members 43 and 44 of the circular frame 42. The outward extending edge of each bracket 76 is recessed with a rectangular notch and bolts 77 disposed parallel to that outer edge extend between opposite sides of each bracket 76 through the notches therein. A sprocket or main gear 78 is positioned about the circular frame 42. The inner circumference of the sprocket gear 78 is positioned within the notch in each mounting bracket 76. Holes aligned with the bolts 77 are provided through the sprocket gear 78 by which the gear is attached to the circular frame 42. A segment 79 of the annular sprocket gear 78 is removably attached to the rest of the gear by mounting bars 80 and bolts 81 placed on the sides of the adjoining extremities of the sprocket gears components. Grooves 82 are provided at the exposed ends of the major portion of the annular sprocket gear 78, and corresponding tongues 83 are provided at the exposed ends of the removable segment 79 to facilitate proper alignment when the two parts of annular sprocket gear are being attached to one another. The sprocket 78 is attached to the circular frame 42 so that the removable segment 79 is in approximate radial alignment with the pivoting quadrant 48 of the circular frame 42.

In operation, markings 66 on the posts 62, corresponding with the size of pipe to be wrapped, are aligned with the outer surface of the sleeves 59 and are set in that

position by the set screws 68. Each sleeve 59 is then rotated until the pointers 70 are opposite the appropriate markings of the scale 71. The bolts 61 are then tightened. The segment 79 is removed from the annular sprocket gear 78 by removal of the bolts 81 and bars 80. The section 48 of the frame 42 is swung open and the wrapping unit is then placed over a section of pipe 67 by means of the opening provided in the absence of the sector 79. With the frame 42 about the pipe the pivoting section 48 of the frame 42 is closed against the remainder of the frame and is secured by the latch 51. The removable sector 79 of the annular sprocket gear 78 is then replaced attached by the bolts 81 and bars 80. The spools 73 are then adjusted to the supporting brackets 72 and rolls of wrapping fabric 74 are placed thereon. Fabric ends 75 are drawn from each roll and secured by suitable means to the circumference of the pipe 67.

The powering unit is placed upon the wrapping unit so that the upper portion of the annular sprocket gear 78 extends into the housing 10 between the flanges 17 and 18 and engages the sprocket chain 32. The oblate construction of the opening between the legs 14 and 15 of the housing 10 causes the upper part of the annular sprocket gear 78 to engage the chain 32 before lower portions of the gear engage the chain. This progressive engagement of the sprocket gear 78 and the chain 32 makes possible the positive engagement of a large part of the circumference of the sprocket gear 78 by the chain 32 without disassembly of the chain. The projecting end of the handle 33 is adjusted to a comfortable height for the operator by selection of a suitable adjustment hole 35 and attachment of the inner end of the handle thereto with the adjustment pin 35*a*. The engine 24 is then started and the operator walks beside the power driven pipe wrapping machine controlling its speed with the rotatable hand grip 36. In a preferred form of the invention the driving pulley 25 is provided with a conventional centrifugal clutch, not shown, so that the machine

may be idled by rotation of the hand grip 36 without stopping operation of the engine.

The invention is not limited to the exemplary construction herein shown and described, but may be made in various ways within the scope of the appended claim.

What is claimed is:

In a pipe wrapping machine, the combination of a pipe wrapping unit and a demountable power unit therefor, said pipe wrapping unit comprising a rotatable frame adapted to be coaxially positioned around the pipe to be wrapped, a main sprocket around said rotatable frame and secured thereto, inwardly directed rollers mounted on said frame, the axes of said rollers being angularly set with reference to the length of pipe to be wrapped, wrapping spools mounted on said frame adapted to apply wrapping tape around the pipe to be wrapped when said frame is rotated, said power unit comprising a power unit frame having depending legs on the sides thereof, an engine mounted on said power unit frame, a drive sprocket connected with and driven by said engine, chain guide rollers on said depending legs, an endless chain over said guide rollers and engaging said drive sprocket and the upper portion of said main sprocket of the wrapping unit, and an arcuate flange mounted on said power frame, the arc of which flange is inwardly of the upper periphery of said main sprocket and positioned to support said chain when said power unit is lifted from said wrapping unit.

References Cited in the file of this patent

UNITED STATES PATENTS

985,763	Robinson	Feb. 28, 1911
1,006,173	Aine	Oct. 17, 1911
1,279,404	Morris	Sept. 17, 1918
1,937,073	Stuve	Nov. 28, 1933
2,388,018	Stover	Oct. 30, 1945
2,770,284	Myrick	Nov. 13, 1956