FEEDING DEVICE FOR CONCRETE PIPE MACHINE

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12 Claims

A packer head concrete pipe machine for making a cylindrical pipe in an upright mold. Concrete is moved from a hopper by a conveyor into a feeding device positioned adjacent the top of the mold. A rotatable packer head is carried upwardly with a vertically movable carriage to pack the concrete against the cylindrical mold to form a cylindrical pipe. The feeding device has a cone-shaped funnel mounted in the top table for directing the concrete into the top of the mold. A ring carrying a pair of scraper blades moves around the cone-shaped funnel on operation of a fluid motor to push the concrete into the mold.

BACKGROUND OF THE INVENTION

Packer head concrete pipe machines utilize a vertically moving rotating packer head in the formation of concrete pipe in a mold. When the packer head emerges through the top ring of the mold it carries with it surplus concrete which is spilled over on the table surrounding the top of the mold. This excess concrete must be moved back into the next mold by an operator using a shovel, trowel or hoe. This operation requires time and labor and is not suitable toward automatic machines that do not require an operator. The packer pipe machine shown in Pat. No. 3,262,175 is an example of a packer head concrete pipe machine in which surplus concrete is moved up onto a table. This concrete must be manually moved back into the next mold.

SUMMARY OF THE INVENTION

The invention relates to a concrete pipe machines having a feeding device which diverts concrete into a mold. Located for movement through the mold is a rotating packer head which moves in an upright direction to form the concrete pipe. The feeding device has a member with a funnel-shaped surface which cooperates with a plurality of moving scraper blades used to direct and force the concrete on the member into the mold. Drive means operate to selectively move the scraper blades to deposit excess concrete carried up by the packer head on the member into another mold.

IN THE DRAWINGS

FIG. 1 is a front elevational view of a concrete pipe making machine equipped with the concrete feeding device of the invention;

FIG. 2 is an enlarged sectional view taken along the line 2—2 of FIG. 1 with the rotary packer head located above the pipe mold;

FIG. 3 is an enlarged sectional view taken along the line 3—3 of FIG. 1 with parts broken away to show the drive and roller support for the scraper ring;

FIG. 4 is a sectional view taken along the line 4—4 of FIG. 3; and

FIG. 5 is an enlarged sectional view taken along the line 5—5 of FIG. 3.

Referring to the drawings there is shown in FIG. 1, a concrete pipe making machine 10 having an upright frame 11 mounted on a base 12. The frame 11 is located over an upright cylindrical mold 13 used in the formation of the concrete pipe. A horizontal feeder table 14 is positioned adjacent the upper end of mold 13. Feeder table 14 vertically mounted on upright guides 15 is operable to be raised and lowered to accommodate different sized molds. When table 14 is raised the finished pipe and mold can be removed from the machine, and a new mold placed under the feeder table 14. Mounted on the feeder table 14 is a concrete feeding device 19 of the invention operable to direct the concrete discharged from a conveyor 16 into the mold and store surplus concrete left over in the formation of a pipe for discharging into a subsequent mold.

A movable carriage 21 is slidably supported on upright guide rods 22 for movement toward and away from the feeding device 19. Carriage 21 is raised and lowered in any suitable manner, for example a winch illustrated schematically at 23 supported from the top of the frame. Hydraulic cylinders or rotating screw shafts may be used to raise and lower the carriage 21. Projected downwardly from carriage 21 is a support tube enclosing a drive shaft 26 for a rotatable packer head 27. The motor 28 mounted on the carriage 21 drives a power transmitting unit (not shown) operable to rotate the shaft 26 and packer head 27. The packer head 27 is similar to the packer head shown in U.S. Pat. No. 3,262,175.

Referring to FIG. 2, the upright cylindrical mold 13 fits over a forming ring or pallet 29 resting on the base 12. The pallet 29 is used to form the bell in the end of concrete pipe 31. Embedded within the pipe 31 is a reinforcing wire cage 32 which extends the entire length of the pipe. In the formation of the pipe the packer head 27 rotates in the direction of the arrow 33 and is moved vertically to place and work the concrete in a cylindrical form about the reinforcing cage 32. As the packer head 27 moves through the top opening of the mold excessive or surplus concrete 34 is carried upwardly onto the feeding device 19. This surplus concrete is stored on the feeding device until a new mold is inserted under the feeder table 14.

A cylindrical header 36 secured to the bottom of the feeder table is located in the top of the mold 31 to form the steeped or male portion of the pipe which fits into the bell of an adjacent pipe. Head 36 surrounds an opening 37 in the feeder table floor which allows the packer head to move vertically in the mold and provides a passageway into the mold 13 for the concrete delivered from the conveyor 16.

As shown in FIG. 4, concrete feeding device 19 mounted on the feeder table 14 comprises a downwardly converging funnel or cone member 38 secured to an annular angle support 39 mounted on table 14. The upper or large end of the cone is reinforced with an annular ring 41. The diameter of the cone 38 can vary with the size of the opening 37 so as to accommodate different sized molds. Surrounding the cone member 38 is an upright octagonal-shaped frame 42 comprising or members secured to the table 14. A cover plate 43, shown in FIG. 3, having a circular center opening is attached to the top of the frame 42. Located between the frame and the upper portion of the cone member 38 is a rotatable member indicated generally at 44. As shown in FIG. 4, member 44 comprises an annular ribbed member having an outwardly directed channel cross-section. Referring to FIGS. 4 and 5, the lower flange of ring 46 rides on the plurality of circumferentially spaced support rollers 47 rotatably mounted on upright plates 48 secured to the frame 42. The upper flange of ring 46 projects under inner peripheral circular edge of the cover plate 43. As shown in FIG. 3, the rotatable member 44 is horizon-
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While there have been shown and described a concrete feeding device in conjunction with a concrete pipe making machine, it is to be understood and the feeding device may be made by those skilled in the art without departing from the spirit of the invention. The invention is defined in the following claims.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A feeding device for a concrete pipe forming machine having a vertically movable and rotatable packer head comprising: a stationary member having an upper opening, a lower opening smaller than the upper opening and around the packer head, and an inner funnel-shaped surface between the upper opening and lower opening for storing concrete adjacent the packer head and directing concrete into a mold for concrete pipe, scraper means having a portion located adjacent said surface, movable generally flat annular ring means supporting the scraper means, said annular ring means located transversely of and surrounding the upper opening, whereby substantially the entire center area of the stationary member is open for the movement of concrete ring into the mold, and drive means for moving the movable means whereby the scraper means moves relative to the funnel-shaped surface to deposit concrete on the surface into the mold.

2. The feeding device of claim 1 wherein the member is an inverted cone-shaped funnel.

3. The feeding device of claim 1 wherein the scraper means includes at least one scraper unit mounted on the movable means.

4. The feeding device of claim 3 including means to adjustably mount the scraper units on the movable means.

5. The feeding device of claim 1 including means mounting the movable annular means for rotation about the longitudinal axis of the annular means.

6. The feeding device of claim 5 including motor means operable to rotate the annular means.

7. A feeding device for a concrete pipe forming machine having a vertically movable and rotatable packer head comprising: a stationary member having an upper opening, a lower opening around the packer head, and a surface between the upper opening and lower opening for storing concrete adjacent the packer head and directing concrete into a mold for concrete pipe, a support adjacent the stationary member, scraper means having a portion adjacent said surface, a generally flat rotatable annular ring located and movable around the upper opening supporting the scraper means, whereby substantially the entire center area of the stationary member is open for the movement of concrete into the mold, means rotatably mounting the ring on the support, and drive means operable to rotate the annular ring on the support for movement around the upper opening whereby concrete on the surface of the stationary member is directed into the mold by the moving scraper means.

8. The feeding device of claim 7 wherein the stationary member is funnel-shaped, and said mounting means comprises rollers located below the upper opening of the stationary member, mounting means being rotatable and rotatable about the longitudinal axis of the stationary member.

9. The feeding device of claim 7 wherein the scraper means includes at least one scraper unit adjustable mounted on the annular ring.

10. The feeding device of claim 7 wherein the support includes a generally horizontal table located adjacent the top of a mold, said table having an opening aligned with the top of the mold, said stationary member comprising a downwardly converging funnel member secured to the table with the upper and lower openings aligned with the opening in the table.

11. The feeding device of claim 10 wherein said drive means includes a motor and power transmitting means connecting the motor with the ring whereby on operation of the motor the scraper means rotate relative to the funnel member.
12. The feeding device of claim 7 wherein said drive means include an endless flexible member surrounding and engaging a cylindrical portion of the annular ring, a motor for driving the flexible member and biasing means acting on the motor and flexible member to hold the flexible member in driving engagement with the cylindrical portion.

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