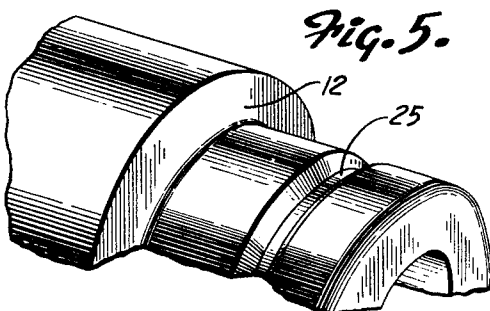
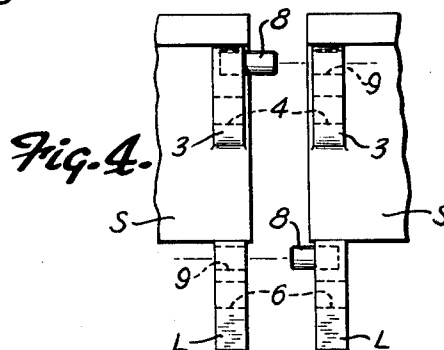
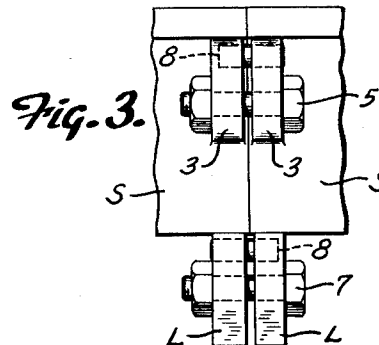
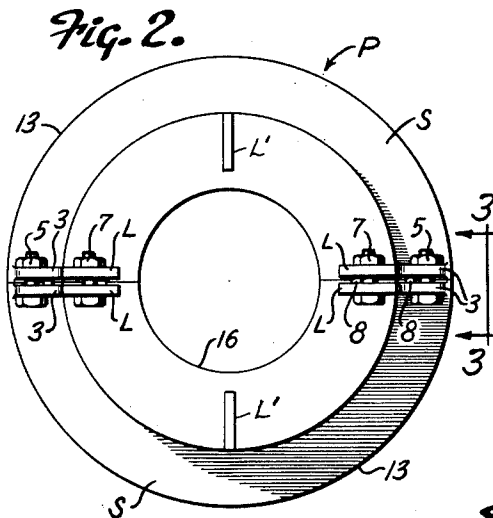
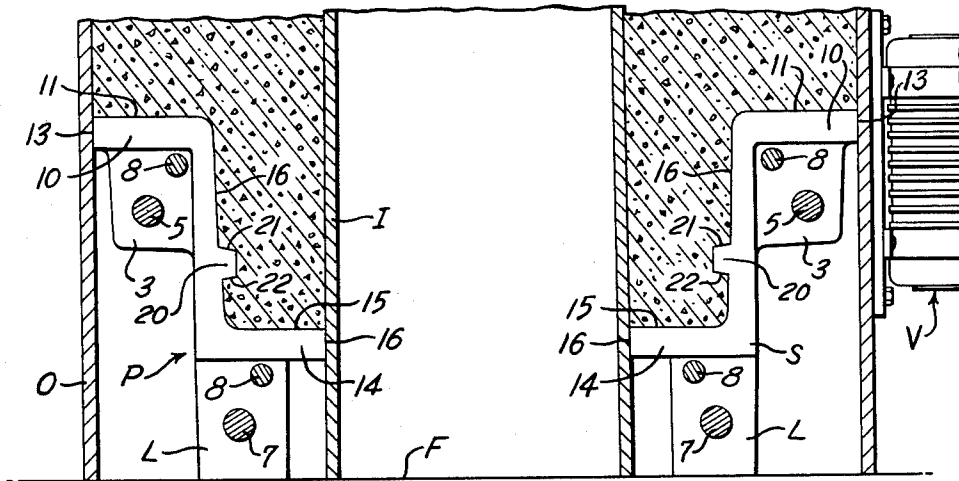


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SECTIONALIZED PALLET WITH INTEGRAL GROOVE
FORMING MEANS FOR CONCRETE PIPE
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SECTIONALIZED PALLET WITH INTEGRAL GROOVE FORMING MEANS FOR CONCRETE PIPE

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This invention relates generally to pallets for forming the spigot end of a concrete pipe.

In bell and spigot type of pipes, it is necessary to form an annular groove around the periphery of the spigot for the reception of a sealing ring, and many different pallets and sectionalized forming rings have been proposed heretofore for this purpose. Some of these proposed rings were of the sectionalized type while others were of the single piece, expandable type. Still other prior art forming rings were made of one piece and axially held in the pallet by separate and removable means. These prior art devices have proved not to be completely satisfactory for any one of a number of reasons, such as, the inability to hold the unit in assembled relationship while being subjected to intense vibration; difficulty in removing the pallet and associated parts from the finished pipe; inaccuracy and non-uniformity of the finished pipe end; difficulty in cleaning the pallet and its various parts; displacement of the forming ring; or excessive labor required to assemble and disassemble the forms.

Accordingly, it is an object of the present invention to provide an improved pallet and integral forming rib which overcomes the above shortcomings of prior art devices.

More specifically, the present invention provides a pallet made up of sections which are accurately and rigidly held in assembled relationship and each of which have an integral rib or groove defining means. Pipe sections having accurately formed and uniform spigot ends are thereby formed which require no finishing or smoothing up after the forms have been removed. The improved pallet sets snugly within the outer mold to form a leak-proof joint therewith, but will not bind or wedge therein because the sections of which the pallet is comprised are locked to one another. This feature, together with the integral groove forming rib, prevents dislocation of any of the parts either in the assembly process, during the pour, or during the intense vibration to which the complete assembly is subjected.

After the pour has been completed, the pallet's inner and outer molds can be easily removed from the pallet and the latter then readily removed from the finished spigot end. The disassembled pallet can then be easily and completely cleaned and then also accurately assembled for the next pour.

The present invention has proved to have particular, though not exclusive, utility in forming lengths of pressure pipe where the density and strength requirements of the finished pipe makes the use of intense vibration necessary to settle and densify no-slump concrete. Furthermore, the finished joints are very accurately and uniformly formed and require no subsequent finishing or matching of lengths. Consistently good sealing is thus obtained in the joints of the finished line.

These and other objects and advantages of the invention will appear hereinafter as this disclosure progresses, reference being had to the accompanying drawings, in which:

FIGURE 1 is an elevational, cross-sectional view of a pallet made in accordance with the present invention and being shown in assembled relationship with the lower ends of the inner and outer molds;

FIGURE 2 is a bottom view of the pallet shown in FIGURE 1;

FIGURE 3 is a fragmentary, elevational view taken generally from the line 3—3 in FIGURE 2, but on an enlarged scale, and showing the end portions of the pallet in an assembled position;

FIGURE 4 is a view similar to FIGURE 3 but showing the end portions of the pallet sections in a separated position; and

FIGURE 5 is a fragmentary view of a pipe and showing the spigot end thereof as made with the present invention.

Referring in greater detail to the drawings, the sectionalized pallet P is shown as comprised of two sections, these half sections being similar to one another. More than two sections may be utilized with the present invention, particularly for making larger diameter pipes.

When the pallet is assembled as shown in FIGURE 1, it rests on the floor F by its circumferentially spaced legs L and L1 which permit the fork of a lift truck (not shown) to be inserted under the pallet for conveying the finished pipe to the curing area.

An inner mold I and an outer mold O are slipped axially around the assembled pallet and may also rest on the floor, thus forming an enclosed annular chamber into which the concrete mix is poured from the top. A vibrator V may be attached to one or both of the molds, but is shown here for illustrative purposes as being secured to the outer mold. The vibrator is conventional and may be of the type shown and described in my U.S. Patent No. 2,926,411, issued on March 1, 1960. It is believed sufficient to say for purposes of this disclosure that these vibrators impart high impact forces which are capable of settling no-slump concrete even in very small forms.

The top of the pipe is not shown but would be formed in a conventional manner, such as, by the use of a tamping ring to give a bell-shape to the top end of the pipe.

The sections S of the pallet each may have a radially extending lug 3 adjacent each of its ends. Apertures 4 extend through these lugs and when the apertures of adjacent lugs are in alignment, bolt means 5 are inserted therethrough for rigidly securing the sections together.

The legs L of the sections also have bolt apertures 6 for receiving bolt means 7.

In smaller sizes of pipes, that is, those having thinner walls, there may be insufficient room in a radial direction to accommodate bolt means 5 and their associated lugs 3; and in these smaller sizes these particular bolt means may be dispensed with.

The pallet is first cast as a single piece, and it is then drilled and the guide pins 8 then located. The single ring thus formed is then cut in half to form the section shown; these sections are then bolted back together and the pallet is then machined to an exact diameter.

Thus, the sections are very accurately fitted together so that no parting line will be apparent in the finished pipe and no flash will be left to be subsequently smoothed off.

For the purpose of accurately aligning the sections, each section has a guide pin 8 and a complementary hole 9 adjacent its end which are adapted to be in precise alignment with a corresponding hole and pin on the adjacent section end. These complementary and interengaging locating and guide means carried on the ends of the sections insure the production of an accurately formed and uniform spigot end on each length of pipe.

Although these locating means are shown as being on both the lugs 3 and the legs L, on smaller sizes of pipe the lugs 3 may be eliminated, as previously mentioned.

The pallet sections include an upper, radially outward extending flange 10 having a surface 11 which defines a shoulder 12 (FIG. 5) on the finished section of pipe. The outer diameter of flange 10 is such that its periphery 13

forms a snug fit with the inner diameter of the outer mold O. This fit prevents leakage of mix or any appreciable moisture and because the sections are rigidly secured together, they will not bind against the outer mold due to pressure of the mix in the form tending to force them apart.

The pallet also includes a lower, radially inwardly extending flange 14 which has a surface 15 that defines the extreme end of the finished pipe. The inner end 16 of this flange is adapted to snugly encircle the inner mold I and prevent leakage therebetween.

The inner wall 16 of the pallet which is located between flanges 10 and 14 is inclined inwardly in a downward direction, and this forms an outwardly converging end on the finished pipe which easily slips into a complementary shaped bell end (not hown) of an adjacent pipe length.

Intermediate the length of the wall 16 is located a radially, inwardly extending rib 20 having tapered side walls 21 and 22. This rib is formed integrally as a part of the pallet and acts as a groove forming means which produces the groove 25 in the finished pipe.

During the pouring operation, the rib 20 cannot be shifted or dislodged, and there is no necessity of additional parts to secure the rib in position. High vibration forces will not affect the position of the rib but rather will contribute to a nicely formed groove because of direct conduction of the vibratory forces through the rib. Neither will axial withdrawal of the molds have any affect on the rib.

The pallet can be removed after removal of the bolt means and simply by radially pulling the pallet sections from the finished pipe. The integral rib separates easily from the pipe along with the rest of the section and is easily cleaned therewith. There are no parts to become lost, and inaccurate reassembly of the pallet is impossible.

The present invention has resulted in very good production rates and a uniform and high-quality pipe.

Various modes of carrying out the invention are contemplated as being within the scope of the following claims particularly pointing out and distinctly claiming the subject matter which is regarded as the invention:

I claim:

1. End form means adapted to fit entirely between the

annular space formed between inner and outer concentric cylindrical forms for molding the spigot end of concrete pipe and comprising, two arcuate and integrally formed sections which when assembled together define a cylindrical form having a lower flange extending radially inwardly to define the end of said pipe and also having an upper flange extending radially outwardly to define a shoulder for said spigot end, an annular rib formed integrally with said sections and within said cylindrical form and located between said flanges to define said peripheral groove in said pipe, each section having an attaching lug adjacent each of its ends, complementary guide means carried by said lugs for accurately locating said sections relative to one another, and means on said sections for detachably securing said arcuate sections rigidly together.

2. In apparatus for forming the spigot end of a concrete pipe of the type comprising inner and outer concentric cylindrical molds vertically positioned to define an annular space therebetween into which concrete can be poured, a pallet located completely and snugly within said space and at the lower end of said concentric molds, the improvement residing in, but unsecured thereto said pallet comprising at least two arcuate sections which when assembled define a circular and generally hollow pallet, each section having an attaching lug adjacent each of its ends, complementary guide means carried by said lugs for accurately locating said sections relative to one another, and an annular rib formed integrally in said sections so as to define a radially inwardly extending groove forming means on the inside of said pallet, and means carried by said sections for detachably securing said sections rigidly together.

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