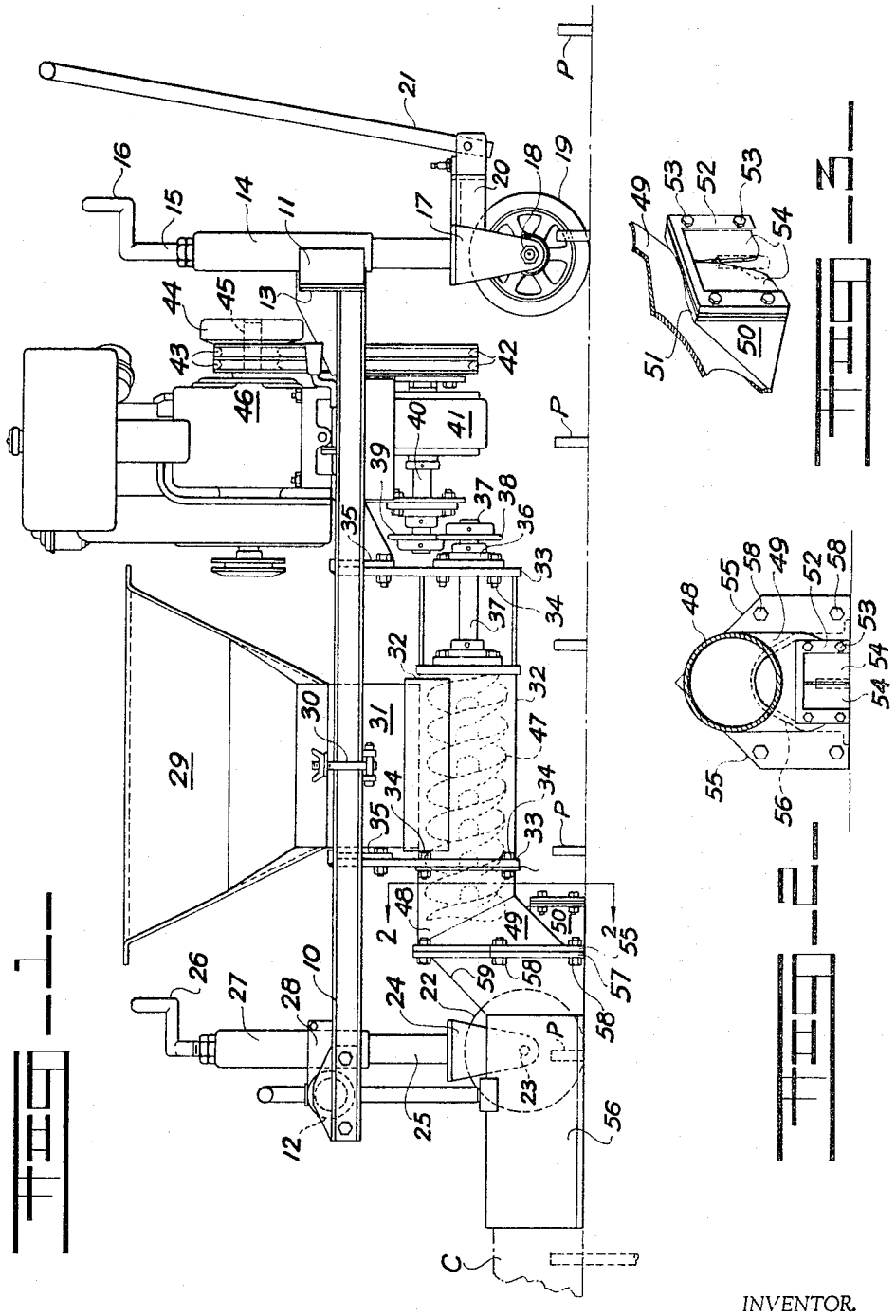
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APPARATUS FOR EXTRUDING CURBING OVER ANCHORING PINS

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# APPARATUS FOR EXTRUDING CURBING OVER ANCHORING PINS

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This invention relates to machines that form curbing by extruding Portland cement or asphaltic concrete mixes having a no-slump characteristic and more particularly to a curb forming machine which will rapidly and efficiently compact and form curbing over and around a series of anchoring pins which have been previously driven into the base material.

The principal object of the invention is the provision of apparatus for extruding curbing which incorporates a novel compaction chamber and curbing form which will operate while being moved over a series of anchoring pins.

A further object of the invention is the provision of apparatus for extruding curbing over anchoring pins wherein the compaction means is arranged to move the material being compacted sidewardly or downwardly into the compaction and curb forming portions of the device.

A still further object of the invention is the provision of apparatus for extruding curbing over anchoring pins which is economical to operate and which produces a highly satisfactory anchored curb.

The apparatus for extruding curbing over anchoring pins disclosed herein comprises an improvement with respect to such machines as have heretofore been known in the art and particularly with respect to the apparatus disclosed in my Patent 3,053,156 issued September 11, 1962.

In said patent a curb building machine is disclosed which produces curbing by extruding suitable material and shapes it with an appropriate curbing form and the machine covered by the patent is widely used commercially. Under ordinary conditions, the curbing produced by the machine adheres to the base material on which it is positioned sufficiently well, but under some conditions as where the curbing is struck repeatedly by vehicles, or where the base material is sandy or where a suitable adhesion between the extruded curb and the base material is not obtained, the curbing breaks away and moves sidewardly and thereby defeats its purpose.

Several proposals have been made to overcome this difficulty; among them, the positioning of a longitudinally extending reinforcing bar within the curb as seen in my copending application, Serial No. 288,071, which reinforced curbing overcomes many of the problems but still does not provide a positive anchoring with respect to the base material.

It has been proposed to drive steel pins downwardly through the completed curbing into the base so as to suitably anchor it, but this action breaks the curbing or results in a misshaped section therein, and additionally, involves considerable labor and expense which are objectionable.

The present invention substantially improves the machine disclosed in the aforesaid patent by enabling it to extrude curbing of various cross sectional configurations

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over a previously driven line of steel pins which are driven into the base material and which may be driven rapidly and inexpensively by stake driving machines such as known in the art. The apparatus for extruding curbing over anchoring pins as disclosed herein then moves along the row of pins with the compaction chamber and curb formed portions of the device progressively enclosing and straddling the pins and extrudes and compacts and forms suitably shaped curbing thereover which is positively anchored to the base material by the pins which are completely covered thereby. The projecting portions of the pins also act to reinforce the extruded curbing.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being the intention to cover all changes and modifications of the example of the invention herein chosen for purposes of the disclosure, which do not constitute departures from the spirit and scope of the invention.

The invention is illustrated in the accompanying drawing, wherein:

FIGURE 1 is a side view of the apparatus for extruding curbing over anchoring pins.

FIGURE 2 is a vertical section on line 2—2 of FIGURE 1.

FIGURE 3 is a perspective view of a portion of the apparatus for extruding curbing over anchoring pins as seen in FIGURE 1.

By referring to the drawings and particularly FIGURE 1, it will be seen that the curb forming machine is similar in many respects to the machine disclosed in my aforesaid patent and comprises a rectangular frame having side rails **10, 10**, transversely positioned front frame members **11, 11** and a transversely positioned rear frame member **12**. The front frame members **11, 11** are mounted for side to side movement on angular cross frame members **13, 13** by bolts and clamping pieces (not shown) and the front frame members **11, 11** mount a pair of vertically positioned cylindrical members **14, 14** through which threaded rods **15, 15** are positioned. The threaded rods **15, 15** are provided with cranks **16** on their uppermost ends. The lower ends of the threaded rods **15, 15** engage telescopically mounted bifurcated sections **17, 17** which extend below the lowermost ends of the cylindrical members **14, 14** and engage axles **18, 18** carrying ground engaging wheels **19**. Each of the bifurcated lower sections **17, 17** has forwardly projecting portions **20, 20** which are connected together by a tie rod (not shown). Each of the forwardly projecting portions **20** is bifurcated and is adapted to recieve a pivoted handle **21** in a detachable manner.

The movable mounting of the front frame members **11, 11** enables the front wheels **19** to be moved to offset position relative to the frame of the machine as is sometimes necessary to avoid running on a tack coat on which the curb is positioned, as well as to provide clearance for anchoring pins driven in the supporting base material. The opposite or rear end of the machine having the transverse frame member **12** which is tubular is normally supported on a pair of ground engaging wheels **22, 22** which are positioned on an axle **23** which is in turn carried on a bifurcated telescopically mounted member **24** engaged by a secondary vertically threaded shaft **25**

which is also provided with a crank 26 on its uppermost end. The telescopically mounted member 24 and the secondary threaded shaft 25 are positioned in a secondary cylindrical member 27 which is secured to a bracket 28. The bracket 28 has an offset portion including a transverse circular passageway through which the tubular frame member 12 extends. Means is provided for securing the bracket 28 to the transverse tubular frame member 12 in various positions whereby the position of the wheels 22 may be altered relative to the rectangular frame. The rear portion of the apparatus is thus supported on ground engaging wheels 22 which may be moved forwardly, backwardly and sidewardly relative thereto and this permits the wheels to be positioned so as to avoid the curb being extruded. A hopper 29 is positioned on the side rails 10 of the rectangular frame and held in position thereon by a pair of clamps 30, 30 one being positioned at each side thereof. The hopper 29 has a bottom 31 which runs downwardly and sidewardly to a discharge opening at one side thereof. The discharge opening communicates with a screw housing 32 which is provided with flanged end portions 33, 33 which are attached by removable fasteners 34, 34 to transverse frame members 35, 35 intermediate the ends of the rectangular frame of the curb building apparatus. The forward flanged end portion 33 carries a journal 36 through which a driven shaft is positioned. A sprocket 38 is positioned on the driven shaft 37. A chain connects the sprocket 38 with a secondary sprocket 39, which is positioned on a secondary driven shaft 40 which is in turn part of a gear box 41 mounted below the rectangular frame of the machine. Sheaves 42 on the drive shaft of the gear box 41 are vertically aligned with sheaves 43 on a centrifugal clutch mechanism 44 which is mounted on a drive shaft 45 of an internal combustion engine 46 which is also carried by the machine.

The shaft 37 heretofore referred to is directly connected with a screw 47 positioned in the screw housing 32, and it will thus be seen that the motion from the internal combustion engine 46 is conveyed by the mechanism described to the shaft 37 which thereby rotates the screw 47 in the screw housing 32 which action will move material from the bottom 31 of the hopper 29 into a compaction chamber 48 communicating with the discharge end of the screw housing 32 and secured thereto by the fasteners 34 heretofore referred to. The compaction chamber 48 is tubular in cross section as best seen in FIGURE 2 of the drawings and encloses the rearmost portion of the screw 47. The screw 47 is arranged so that a portion of the last flight thereof will move the material being compacted downwardly into an angular disposed portion 49 of the compaction chamber 48 which is joined to the first mentioned part of the compaction chamber 48 on a diagonal line which is 62° from horizontal.

It will be observed that a portion of the last flight of the screw 47 extends beyond the end of the compaction chamber 48 and into the angularly disposed portion 49 thereof so that it acts to force the material being compacted downwardly as well as rearwardly. The lower forward angular section of the portion 49 of the compaction chamber has an opening therein and a pair of vertical side walls 50, 50 positioned at either side thereof and extending forwardly therefrom with a member 51 positioned across the top so as to form a rectangular opening to which an inverted U-shaped frame 52 is attached by fasteners 53, 53 as best seen in FIGURES 2 and 3 of the drawings. The inverted U-shaped frame 52 secures a pair of resilient flaps 54, 54 in position across the opening defined by the frame 52 with the flaps 54, 54 abutting one another on a vertical line midway between the sides of the inverted U-shaped frame 52. The top edges of the flaps 54, 54 are clampingly secured to the top member 51 by the horizontal portion of the inverted U-shaped frame 52. The rearmost section of the angularly disposed portion 49 of the compaction chamber is defined by a flange 55, and a curb form 56 which is flanged at its forward end as at 57 is secured thereto by a plurality of fasteners 58.

It will be seen by referring to FIGURES 1 and 2 of the drawings that the forward portion of the curb form 56 has an angularly disposed upper wall 59 which matches the configuration of the angularly formed portion 49 of the compaction chamber so that the material being forced rearwardly and downwardly thereinto will flow downwardly and rearwardly into the curb form 56 where it is finally shaped and compacted to form the completed extruded curb C as seen in FIGURE 1 of the drawings.

It will be seen that as the apparatus for extruding curbing moves forwardly, to the right in FIGURE 1, along a surface in which a row of pins P have been driven, the pins move into the opening formed by the resilient flaps 54 in the U-shaped frame 52 on the front of the compaction chamber. The pins move along the axial center line of the compaction chamber 48 and through the portion 49 and axially of the curb form 56 so as to be completely covered by and embedded in the material being extruded and shaped by the curb form 56.

It will be seen that the compaction chamber 48 with its downwardly angling portion 49 and the foremost portion 59 of the curb form 56 enables the lowermost spaced parallel edges of the curb form 56 to slidably engage the supporting surface on which the curb C is being extruded, while permitting the compaction chamber and more particularly the portion 49 thereof to receive the pins P as the apparatus advances along the line thereof.

The resilient flaps 54, 54 may be formed of rubber or rubber-like material, preferably having a fabric or fabric-like reinforcement, so that the flaps 54, 54 are relatively stiff and capable of resisting any tendency of the material being extruded and compacted from flowing outwardly through said flaps and at the same time being sufficiently resilient that they will move sufficiently to permit the apparatus to move forwardly relative to the pins P which must thereby enter the apparatus through said flaps.

It will occur to those skilled in the art that in the form of the invention illustrated, the compaction chamber 48, its angular portion 49 and the foremost portion 59 of the curb form 56 are critical to the successful operation of the apparatus, and these portions in combination with the screw housing 32, the screw chamber 47 comprise the novelty in the present disclosure.

It will thus be seen that apparatus for extruding curbing over anchoring pins has been disclosed which meets the several objects of my invention, and having thus described my invention, what I claim is:

1. In a curb forming apparatus having a supporting frame, ground engaging wheels on said frame, rotary drive means on said frame, a hopper having a discharge opening at the bottom thereof disposed in said frame, and a screw housing mounted on said frame; a compaction screw in said screw housing, and mechanical driving means for connecting said compacting screw with said rotary drive means, a compaction chamber attached to and communicating with said screw housing, a curb form attached to and communicating with said compaction chamber, said compaction chamber having a first portion positioned horizontally with its axial center line lying on the axis of said compaction screw and a second angularly disposed portion joined thereto at an angle of approximately 62° therefrom for delivering material being compacted therein to a location off center with respect to the axial line of said screw housing and compaction screw, said compaction chamber having on opening in the angularly disposed portion thereof and a movable closure normally closing said opening.

2. The curb forming apparatus set forth in claim 1 and wherein said compaction chamber comprises a tubular member having flange-like collars on its opposite ends.

3. The curb forming apparatus set forth in claim 1 and wherein said curb form has an angular wall forming the portion thereof attached to said compaction chamber and wherein said angular wall is arranged to form an axial extension of said angularly disposed portion of said compacting chamber.

4. The curb forming apparatus set forth in claim 1 and wherein said movable closure comprises a pair of resilient flap secured to the sides of said opening in said angular portion of said compacting chamber.



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