June 12, 1962 W. F. MIDDLESTADT 3,038,397

DEVICE FOR DEFORMING INSERT IN CONCRETE JOINTS

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Fig. 1.

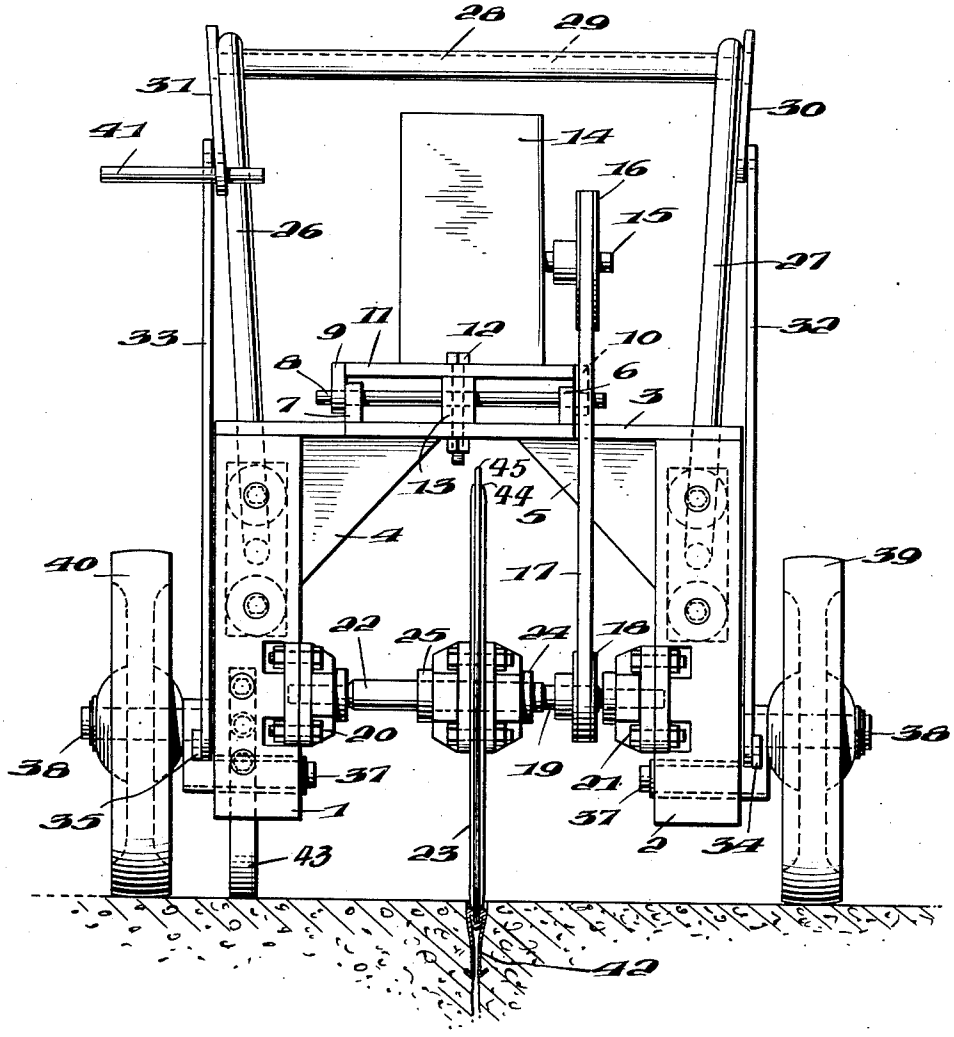
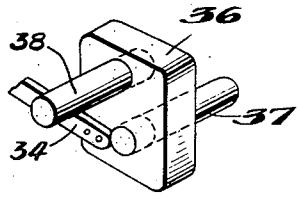


Fig. 4.



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Fig. 2.

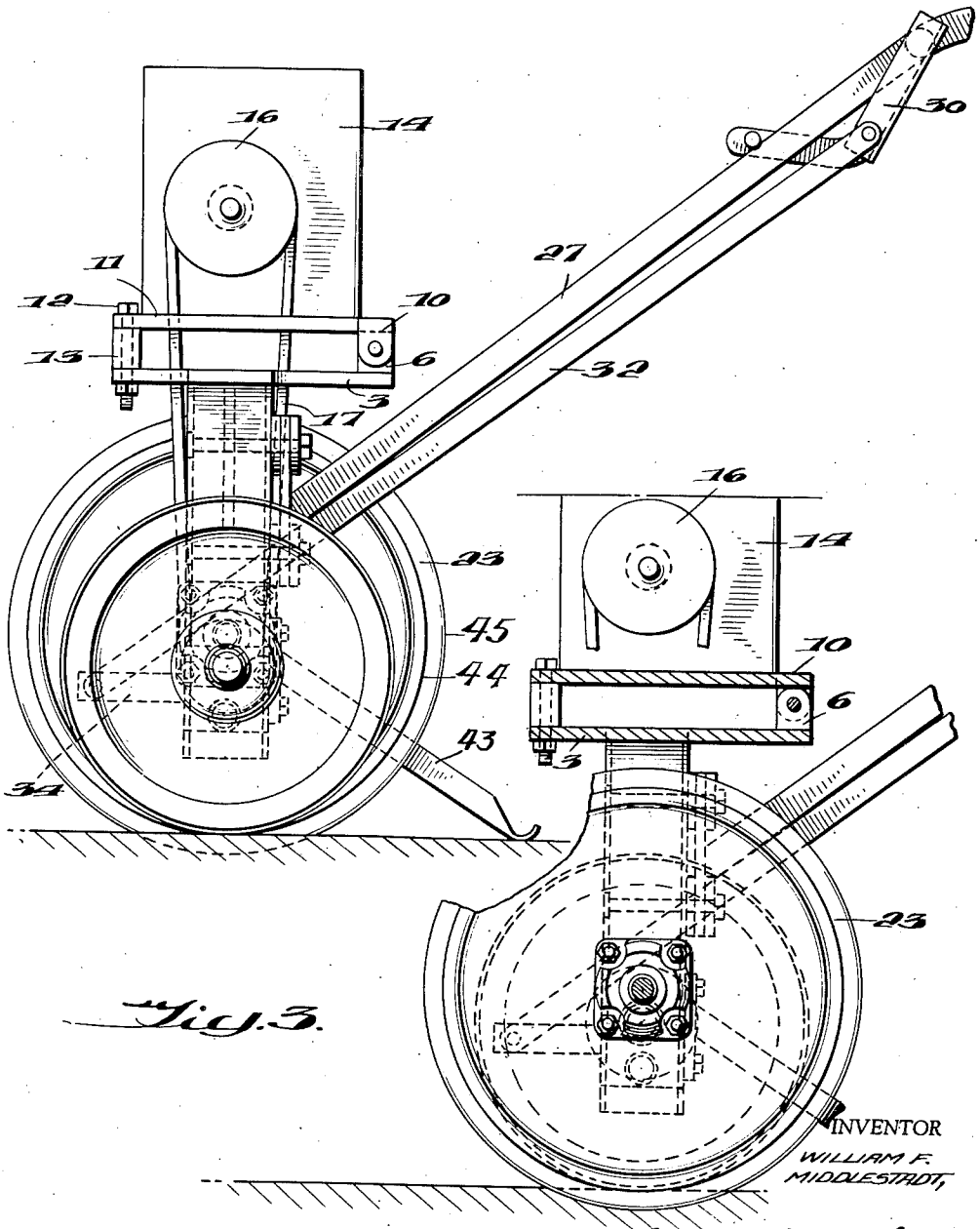


Fig. 3.

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DEVICE FOR DEFORMING INSERT IN CONCRETE JOINTS

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3 Claims. (Cl. 94—39)

This invention relates to a device for deforming insert members in concrete joints and more specifically to an apparatus which is especially designed for use in connection with the method and insert member disclosed and claimed in my co-pending applications, Serial No. 727,160, filed April 8, 1958, now abandoned, and Serial No. 740,858, filed June 9, 1958.

In the co-pending applications referred to above, there is described a method for forming joints in concrete wherein an insert member which may be of a generally tubular form is inserted in the concrete before the concrete has cured. The member is inserted so that the upper surface of the insert is generally level with the surface of the concrete. After the concrete has cured, an apparatus according to the presently disclosed invention is used to deform or depress the upper surface of the insert, so that it is disposed beneath the upper surface of the concrete and forms a bellows-like configuration having an upwardly opening U-shape. The space above the insert member may be filled with sealer and the joint is completed. There are many advantages in this method over prior art methods for forming concrete joints. Many of these advantages relate to the shape of the upper surface of the insert and the apparatus disclosed in the present application is adapted to cause the upper surface to assume the bellows-like configuration referred to.

According to the present invention, there is provided a wheeled frame having a motor mounted on the frame, which motor drives a shaft. The shaft has an eccentric portion and freely journaled on this eccentric portion is a deforming disc which is the element which actually forces the insert member downwardly in the concrete to assume the form previously described. The mounting of this disc causes it to move vertically with a hammering action, as the eccentric shaft is rotated. The supporting wheels for the device are mounted so that they can be raised to a position wherein the deforming disc is operative, or lowered so that the disc is not in engagement with the supporting surface.

An object of the present invention is to provide a device which is adapted to shape an insert member in a concrete joint.

Another object of the present invention is to provide a device in which a deforming disc is eccentrically mounted with respect to a rotating shaft and is fully rotatable on the shaft so that the disc moves with a reciprocating or hammering movement.

Other objects and many of the intended advantages of the present invention will become apparent upon consideration of the following detailed specification in connection with the accompanying drawings wherein:

FIG. 1 is a front elevational view of the present invention,

FIG. 2 is a side elevational view,

FIG. 3 is a side view partially in section, and

FIG. 4 is a perspective view of a detail.

Referring now more specifically to the drawings, there is shown in FIG. 1 a supporting frame comprising uprights 1 and 2, and a cross member 3 secured to the upper ends of the uprights. Brackets 4 and 5 extend between the uprights and the top plate and provide additional support means.

As is shown in FIGS. 1 and 2 the top plate 3 has eyes

6 and 7 secured thereto, and extending upwardly therefrom. A pin 8 extends through the apertures in the members 6 and 7 and journaled on pin 8 are apertured flanges 9 and 10 which extend downwardly from a motor support 11. As is evident from FIG. 2 the supporting means described is located at one end only of the motor support plate 11, and the forward end of the plate is supported by means of bolt 12 having a resilient bushing 13 extending between the plates 3 and 11. It can be seen that by tightening or loosening the bolt 12 so as to compress the bushing to a lesser or greater extent, the relative positions of plates 3 and 11 can be varied.

The motor 14 is fixedly mounted on the plate 11, and this motor may be of any suitable variety and the motor drives a shaft 15 having a pulley 16 mounted thereon. A belt 17 interconnects pulley 16 with a pulley 18, fixedly mounted on a shaft 19. This shaft is freely journaled in journal boxes 20 and 21, mounted in the uprights 1 and 2 respectively. It can be seen that by tightening or loosening the bolt 12, the tension in belt 17 may be adjusted so that the shaft 19 is properly driven by the motor 14.

The shaft 19 has a portion thereof identified by the numeral 22, which portion is slightly eccentric with respect to the axis of rotation of shaft 19. Freely rotatable on this eccentric portion is the deforming disc 23 which is retained in its central position with respect to the shaft by collars 24 and 25 which are rotatable with the shaft. Disc 23 has an enlarged central portion terminating in a shoulder 44 to provide an outer edge portion 45 of reduced thickness. It can be seen that rotation of the shaft 19 by motor 14 will produce motion of the disc with respect to the supporting frame to the extent that the portion 22 of the shaft is eccentric. It is this motion of the disc which causes a hammering action deforming the concrete insert member to the desired shape.

The supporting frame is provided with a handle structure including angularly extending bars 26 and 27 which are suitably secured to the supporting frame and extend upwardly having their outer ends thereof interconnected by a tubular handle bar 28. A rod element 29 extends through the tubular element 28 and through the outer ends thereof and is rigidly connected to links 30 and 31. These links have the opposite ends pivotally interconnected with links 32 and 33. The lower ends of links 32 and 33 are pivotally interconnected with connecting rods 34 and 35 respectively, and the connecting rods have the inner ends thereof rigidly attached to blocks 36 which are more clearly shown in FIG. 4. As seen in FIG. 4, the block 36 is provided with shafts 37 and 38 which are offset with respect to one another. The shafts 38 have the supporting wheels 39 and 40 freely rotatable thereon, and the shafts 37 are journaled in the uprights 1 and 2. By suitable movement of the handle 41 mounted on one link 31, the connecting rods 34 can be moved clockwise as viewed in FIG. 2, and thus cause the supporting wheels 30 and 40 to move downwardly with respect to the axis of rotation of shafts 37. This movement will cause the supporting frame and deforming disc to move upwardly with respect to the supporting surface.

There is shown in FIG. 1 a supporting surface which is of concrete. The frame is provided with a foot 43 which rests on this supporting surface. An insert 42 had been positioned in the concrete before hardening so that the upper surface of the insert was level with the upper surface of the concrete. After curing the presently disclosed apparatus is utilized to depress the insert 42 so that it assumes the bellows-like configuration shown in FIG. 1. The apparatus is operated by moving the device to the joint so that the deforming disc 23 is disposed directly above the insert 42. The handle 41 is then positioned as shown so that the wheels are lowered and the

disc will depress the insert member to the position shown. The outer edge portion **45** of the disc will be forced into the upper surface of the insert member until the shoulder **44** engages the insert as clearly shown in FIG. 1. The rotation of the eccentric shaft **22** will produce a hammering action on the insert and depress it gradually to the final position. It can be seen that the crimping action will be a gradual transition from the initial point of contact of the deforming disc with the final action occurring directly beneath the center of rotation of the disc. By using a large disc a comparatively large wearing surface is provided and it can be seen that with the presently disclosed apparatus a joint can be completed from one side of the pavement to the other without the necessity for turning the machine around.

Obviously many modifications and variations of the present invention are possible in the light of the above teaching. What is claimed as new and desired to be secured by Letters Patent is:

1. A device for deforming a tubular member having an upper surface and side walls, the tubular member adapted to be inserted in concrete, said device comprising a wheeled frame, power means mounted on said wheeled frame, a shaft journalled in said frame, said shaft adapted to be driven by said power means, said shaft having an eccentric portion, a disc freely journalled on said eccentric portion, said disc having an outer edge portion and a shoulder portion adjacent said outer edge portion, said edge portion adapted to engage the upper surface of the tubular member inserted in the concrete and to depress

the upper surface thereof to a position wherein the side walls engage the shoulder portion to form a bellows configuration of the upper surface, the disc rotating as the wheeled frame is advanced along the member, the rotation of the shaft by the power means causing a hammering action by the disc to deform the member in the concrete.

2. A device according to claim 1 and further including means for raising and lowering the wheels with respect to the frame.

3. A device according to claim 1 and further including a belt drive interconnecting the power means and said shaft, said power means being mounted on a platform and means for adjusting the height of said platform to vary the tension in said belt drive.

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