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RENEWABLE RESILIENT GUARD FOR
INSERTABLE VIBRATORY TOOLS
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FIG. 1.

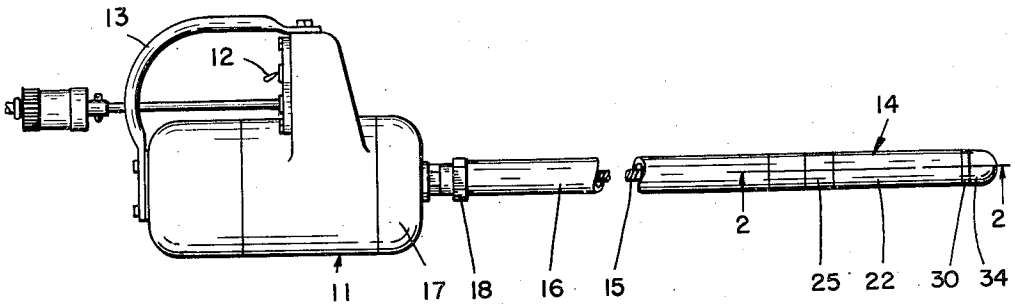


FIG. 2.

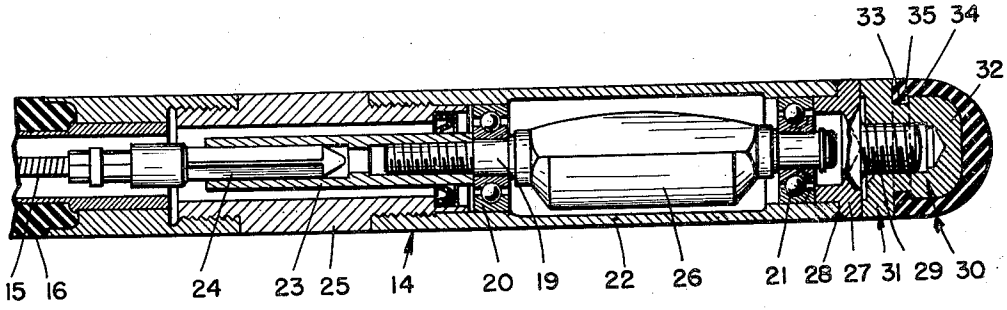
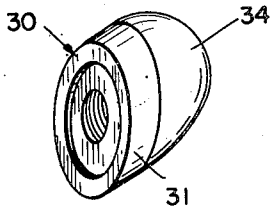


FIG. 3.



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RENEWABLE RESILIENT GUARD FOR INSERTABLE VIBRATORY TOOLS

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2 Claims. (Cl. 259—1)

1

This invention relates to a renewable resilient guard for insertable vibratory tools.

One object of the invention is to provide a resilient guard or nose on an insertable tubular vibrator used particularly in compacting unset concrete. Another object is to provide a wear-resisting nose for an insertable tubular vibrator such as those used for compacting concrete. A further object is to provide an insertable tubular vibrator having a renewable, wear-resisting resilient nose.

These and other objects are attained by my invention which will be understood from the following description and the accompanying drawings in which:

Figure 1 is a side elevational view of one form of insertable tubular vibrator mechanism having a resilient nose;

Figure 2 is a cross-sectional view taken on the line 2—2 of Figure 1; and

Figure 3 is a perspective view of a renewable resilient guard for tubular vibrators.

Tubular insertable vibrators for use in compacting unset concrete have now become standard tools in the construction industry. Because of the severe mechanical abuse and wear to which such tools are subjected, it has heretofore been considered necessary to use the hardest and toughest steel cases and noses on the insertable portions of the vibrators. I have discovered that surface wear resistance of a vibrator may be greatly increased by the use of a guard made of resilient material, such as soft vulcanized rubber, preferably vulcanized in position on the nose piece only of the vibratory tool.

In the preferred form of my invention shown in the drawings, a high speed electric motor 11 having a control switch 12 and a handle means 13 is connected mechanically to an eccentric weight encased vibrator mechanism indicated generally as 14, by means of a flexible drive shaft 15 within a flexible casing 16 which is attached to the motor housing 17 by the coupling 18, the flexible drive shaft 15 being suitably connected to the shaft of the motor. The flexible casing 16 and the flexible drive shaft 15 may be of any desired length, in practice frequently being fifteen to twenty feet long especially when the vibrator is used for compacting concrete placed between high forms such as in walls for buildings. The vibrator 14 consists of a short rigid shaft 19 mounted in ball bearings 20 and 21 which are supported in the cylindrical metal casing 22. The inner end of the shaft 19 is extended by the spline connector 23 which is adapted to removably receive the spline 24 which is attached to the outer end of the flexible drive shaft 15, the spline connection being enclosed within an extension 25 of the cylindrical casing 22. An eccentric weight 26 is mounted on or made integral with the shaft 19 in the space between the bearings. The outer end of the casing 22 is closed by the plug member 27 which is preferably welded at 28 to the periphery of the casing to secure it mechanically as well as to prevent any leakage of water from the outside. The plug member 27 is provided with a threaded stud 29 extending axially from its end, which engages the nose piece 30. The nose piece 30 consists of a metal body member having a diameter at the base 21 equal to the diameter of the casing 22 and also of the plug 27, and is provided with a terminal metal knob 32 with an undercut circumferential groove 33 at the base of the knob. The resilient covering 34 preferably made of soft vulcanized rubber known generally as tire tread stock is arranged to fit over the knob 32 with an inside flange portion 35 fitting into the groove 33, the outer face of the resilient guard being substantially hemispherical in shape. The shaped resilient guard 34 is preferably vulcanized on the knob 32 of the nose piece 30 so that there is strong adhesion between the inside surfaces of the resilient guard 34 and the outside knob 32 and groove 33. The rubber covered nose piece may be used on other forms of insertable tubular vibrators. When the resilient rubber guard has become worn, it is replaced by removing the nose piece 30 from the screw threaded stud 29 and a new nose piece, having a new resilient guard vulcanized on its metal knob 32 is attached to the stud 29.

2

The advantages of my invention will be apparent from the above description. Vibrators of this general type are commonly operated at 10,000 R. P. M. and in use are embedded in gravel, sand and rock, sometimes under considerable pressure. The resilient rubber guard nose attached to the end of a tubular vibrator has been found to have a negligible damping effect upon the action of the vibrator, in contrast to the unsuccessful use of rubber as a protective cover over the entire insertable portion of the vibrator. In addition to the increasing of life for the nose piece of a vibrator, the resilient guard has eliminated the destruction of wood forms in which the unset concrete is vibrated in the making of walls, which occurs when a vibrator end inadvertently comes in contact with the form itself. It will be understood that in normal practice, the vibrator is em-

bedded and surrounded by concrete, but particularly when used in forms for relatively narrow walls, the end of the vibrator frequently is pressed into contact with the side walls of the wood forms. When the nose piece is made of non-resilient material such as steel, the wood forms are rapidly cut, abraded and roughened so that they cannot be re-used. Plywood is frequently used in building such forms and because of its high cost must, in order to be practicable, be re-used in making forms. The use of vibratory tools having my resilient nose pieces has greatly increased the life of plywood forms and thereby decreased the cost of preparing vibrated concrete walls.

I claim:

1. In a vibratory tool having a vibratory mechanism encased in a rigid metal tubular housing and adapted to be inserted in granular material to be compacted, a knob-shaped metal nose piece at the end of said housing, and a resilient vulcanized rubber coating of substantial thickness vulcanized securely in place over the entire surface of the major portion of the outside of said metal nose piece.

2. In a vibratory tool having a vibratory mechanism encased in a rigid metal tubular housing and adapted to be inserted in granular material to be compacted, a knob-shaped metal nose piece at the end of said housing, means to removably attach said metal nose piece from the end of said housing, and a resilient vulcanized rubber coating of substantial thickness vulcanized securely in place over the entire surface of the major portion of the outside of said metal nose piece.

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