April 30, 1940. M. E. WHITEMAN 2,198,929

CEMENT FLOOR FINISHER

Filed May 3, 1939

Fig. 1

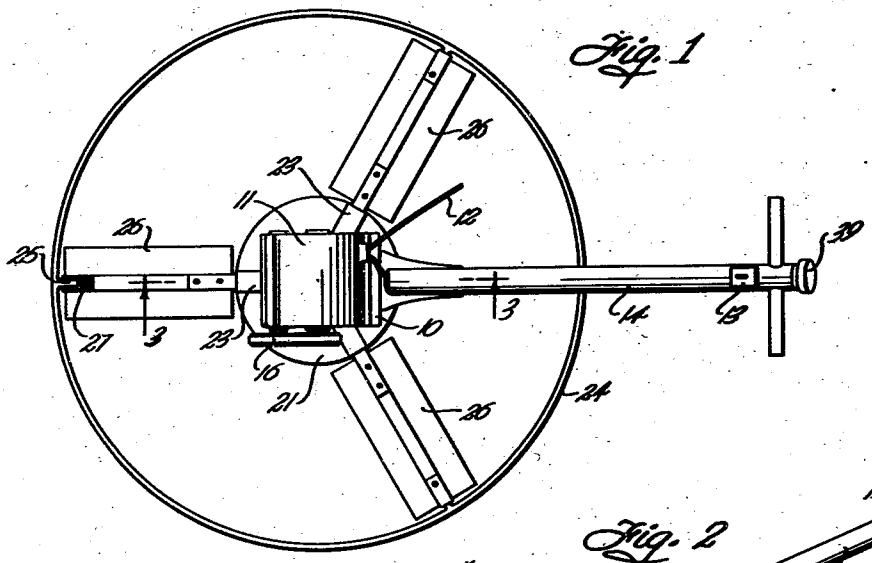




Fig. 2

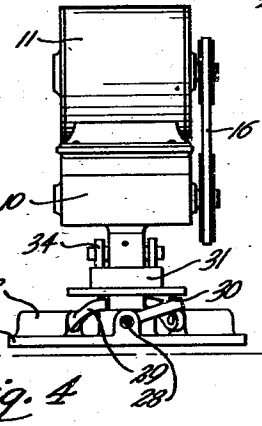


Fig. 4

Fig. 5

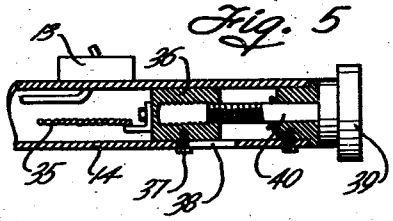
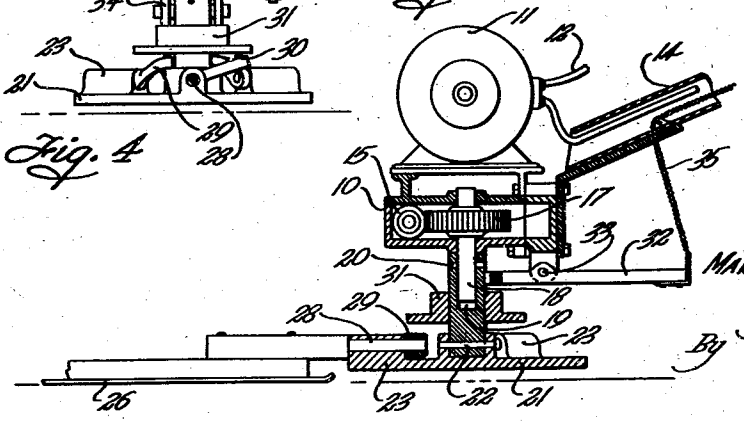


Fig. 3



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Patented Apr. 30, 1940 2,198,929

UNITED STATES PATENT OFFICE

2,198,929

CEMENT FLOOR FINISHER

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Application May 3, 1939, Serial No. 271,527

9 Claims. (Cl. 94—45)

This invention relates to a machine for finishing or surfacing cement floors, pavements, and the like.

An object of the invention is to provide a machine which will surface cement by machine trowelling. The surfacing of cement floors, pavements, and the like heretofore has been generally done by hand wherein the finisher surfaces the cement by manipulating a finishing trowel thereover. During such manipulation the finishing trowel is slightly tilted in the direction of its movement and as it passes over the cement, applies or forms the smooth finished surface. It has heretofore been proposed to supplant this hand labor with a machine capable of applying or forming this finished surface. However, machines heretofore devised have generally proven unsuccessful because of the inability to form the desired smooth surface. This is mainly due to the fact that the machine-driven trowels in such machines are incapable of being tilted with respect to the surface of the cement or if given a tilt with respect to such cement the degree of tilt of the trowels cannot be varied while the machine is in operation.

During the finishing operation with the trowel there is a tendency for the water content of the cement to work toward the surface. Thus, toward the end of the finishing operation there is usually more water content on the surface than at the start of the finishing operation. This increase of water content in the cement as the finishing operation progresses requires that the tilt of the trowel relative to the surface be slightly varied.

It is an object of the present invention to provide a cement floor finisher wherein there are a plurality of motor-driven trowels that are caused to pass over the surface of the cement floor to produce the finished surface, and wherein the trowels are tiltably mounted so that they may impart the desired smooth surface to the cement.

More specifically, an object of the invention is to provide a cement floor finisher having tiltable trowels so designed and arranged that the tilting may be adjusted or varied easily and while the machine is in operation. Thus, as the finishing operation proceeds and the water content in the cement works its way toward the surface, the trowels may be easily and quickly adjusted to accommodate themselves to the changing condition or consistency of the cement being finished.

With the foregoing and other objects in view, which will be made manifest in the following detailed description and specifically pointed out in the appended claims, reference is had to the accompanying drawing for an illustrative embodiment of the invention, wherein:

Figure 1 is a top plan view of the preferred form of cement floor finisher embodying the invention;

Fig. 2 is a view in side elevation of the same and may be considered as having been taken in the direction of the arrows 2 upon Fig. 1;

Fig. 3 is a sectional view taken substantially upon the line 3—3 upon Fig. 1;

Fig. 4 is a view in front elevation of the cement floor finisher; and

Fig. 5 is a partial view in vertical section of the upper end of the handle.

Referring to the accompanying drawing wherein similar reference characters designate similar parts throughout, the improved cement floor finisher comprises a suitable gear case 10 on which is mounted a suitable source of power such as an electric motor 11 supplied with electric current through conductors 12. An electric switch 13 is mounted on the handle 14 which is attached to the gear case and this switch is preferably located near the upper end of the handle for convenience in turning on or shutting off motor 11.

Within the gear case I have shown a worm 15 which is driven by means of a belt 16 off the motor. The worm meshes with a worm wheel 17 on a vertical shaft 18. The lower end of the shaft 18 extends into a socket 19 which is pinned thereon as by pin 20. On the lower end of a socket there is a circular plate 21 attached to the socket as by a pin 22. The plate 21 provides three equally spaced bearings 23.

In the above-described construction the shaft 18 and the socket 19 together may be considered as a vertical motor driven shaft driven by motor 11. While a worm wheel is preferably employed so as to secure a speed reduction it will be appreciated that any other suitable type of driving connection between motor 11 and the vertical shaft may be substituted therefor if found desirable.

A ring 24 is arranged concentrically around the plate 21. This ring has three pins 25 thereon extending radially inward and which are equally spaced from each other. Three trowels 26 are equally spaced from each other and are radially arranged between plate 21 and ring 24. On the backs of these trowels there are attached outer bearings 27 which receive the pins 25 and inner bearing pins 28 which extend into bearings 23. Arms 29 are pinned on the inner ends of the pins 28. These arms act as cranks capable of turning or tilting the trowels 26 about their radial axes. The upper ends of the arms are equipped with small adjusting screws 30 engageable with the under surface or face of a thrust collar 31 fitting around socket 19.

A lever 32 is pivotally mounted as at 33 on the gear case and has its inner end bifurcated to

form a shifting yoke or fork. The ends of lever 32 may be equipped with rollers 34 bearing on the upper surface or face of the thrust collar. The outer end of the lever 32 has a cable 35 attached thereto which is trained up through the hollow handle 14 where the cable is connected to a nut 36. A screw 37 extends into the nut through a slot 38 in the handle so that the nut is slidably keyed in the handle. A knob 39 carrying a threaded stem 40 is mounted on the end of the handle 14 with the threaded stem 40 threaded into nut 36.

The operation and advantages of the improved cement finisher are as follows. On closing switch 13 the motor 11 is energized to drive the vertical rotary shaft. The vertical rotary shaft causes the carrier plate 21 to rotate and the trowels 26 are thus rotated about the vertical shaft as a center. Tilting of the trowels is accomplished by turning knob 39 which retracts nut 36 and causes lever 32 to have its outer end lifted. This forces the thrust collar 31 downwardly and causes the arms 29 on the inner ends of the trowels to be simultaneously swung downwardly. The trowels are thus simultaneously tilted. The trowels are held in tilted or adjusted positions as long as knob 39 remains in adjusted position. The tilting action may take place at any time while the machine is in operation or while stationary. Thus, if the consistency of the cement varies or if it is changed by the finishing operation, adjustment of the trowels can be readily accomplished to compensate therefor.

On reversely rotating knob 39 which would advance nut 36 the weight of the machine on the trowels will cause them to return to positions more closely approaching the horizontal.

In manipulating the machine over a cement floor that is to be finished the machine can of course be pushed or pulled by means of the handle. I find, however, it can also be readily moved in a sidewise manner by either lifting slightly or pushing downwardly on the handle. Thus, if the trowels shown in Fig. 1 are driven by the motor in a clockwise direction lifting on the handle 14 will be effective to cause the machine to work itself toward the left. Conversely, if the handle 14 is pressed downwardly slightly, the tendency is for the machine to work itself toward the right. In this manner by either pushing or pulling on the handle or slightly elevating it or depressing it the machine will cause itself to progress in the direction desired across the cement floor that is being finished.

From the above-described construction it will be appreciated that the improved cement finisher will successfully supplant hand finishing of cement floors. The trowels of the machine can be tilted and adjusted at any time during the operation to produce the desired "floating" and finished surface. While the number of trowels shown is three and this number is preferred, it will be understood that the number of trowels employed may vary and where desired the number of trowels may be either decreased or increased. As each arm 29 is equipped with its own adjusting screw for engagement with the thrust collar 31 the trowels may be accurately adjusted so as to be simultaneously tilted to the same degree.

Various changes may be made in the details of construction without departing from the spirit or scope of the invention as defined by the appended claims.

I claim:

1. A cement floor finisher comprising a plurality of trowels, means for rotating the trowels over the surface of the floor, and means for tilting the trowels about their longitudinal axes during rotation and holding them in their tilted positions.

2. A cement floor finisher comprising a plurality of trowels, means for rotating the trowels, said trowels being tiltably mounted, and means for adjusting the tilt of the trowels during rotation and holding the trowels in tilted positions.

3. A cement floor finisher comprising means providing a carrier, means for rotating the carrier about a vertical axis, trowels tiltably mounted upon the carrier, and means for simultaneously varying the tilt of the trowels during rotation thereof by the carrier and holding the trowels in tilted positions.

4. A cement floor finisher comprising means providing a carrier, means for rotating the carrier about a vertical axis, trowels tiltably mounted upon the carrier and radially arranged with respect to the axis of rotation of the carrier, and means for simultaneously varying the tilt of the trowels during rotation thereof by the carrier and holding the trowels in tilted positions.

5. A cement floor finisher comprising a vertical shaft, means for rotating said shaft, a plurality of trowels radially arranged with respect to the shaft and adapted to be rotated thereby, each trowel being tiltably mounted, a thrust collar on the shaft, arms on the trowels actuated by the thrust collar, and means for varying the position of the thrust collar on the shaft whereby the tilt of the trowels may be varied.

6. A cement floor finisher comprising a vertical shaft, means for rotating said shaft, a plurality of trowels radially arranged with respect to the shaft and adapted to be rotated thereby, each trowel being tiltably mounted, a thrust collar on the shaft, arms on the trowels actuated by the thrust collar, means for adjusting each arm with respect to the thrust collar, and means for varying the position of the thrust collar on the shaft whereby the tilt of the trowels may be varied.

7. A cement floor finisher comprising a motor-driven, vertical shaft, a thrust collar thereon, a plurality of trowels radially arranged with respect to the shaft adapted to be rotated thereby, each trowel being tiltable about its radial axis, means operable by the thrust collar for simultaneously varying the tilt of all the trowels, and means for shifting the position of the thrust collar relative to the shaft.

8. A cement floor finisher comprising a motor-driven, vertical shaft, a ring arranged around the bottom of the shaft, a plurality of trowels radially arranged between the shaft and the ring, and means mounting the inner ends of the trowels on the shaft and their outer ends on the rings whereby the trowels may be rotated by the shaft.

9. A cement floor finisher comprising a motor-driven, vertical shaft, a ring arranged around the bottom of the shaft, a plurality of trowels radially arranged between the shaft and the ring, means tiltably mounting the inner ends of the trowels upon the shaft and the outer ends of the trowels on the ring, a thrust collar on the shaft, means for shifting the thrust collar relative to the shaft, and means operable by the shifting of the thrust collar for simultaneously tilting the trowels about their radial axes.

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