

# FINISHING HARDENED CONCRETE

More and more during recent years architects' specifications are calling for finely finished concrete surfaces on walls, columns, ceilings and floors. At first, contractors used hand rubbing bricks, but finding this technique to be slow and costly for large areas, they turned to various sorts of powered tools. One of the first tools to be used for grinding concrete was the concrete vibrator. The

vibrator head was removed from the flexible shaft and a geared right angle head was substituted with a disc or grinding wheel attached. This is still used to a great extent.

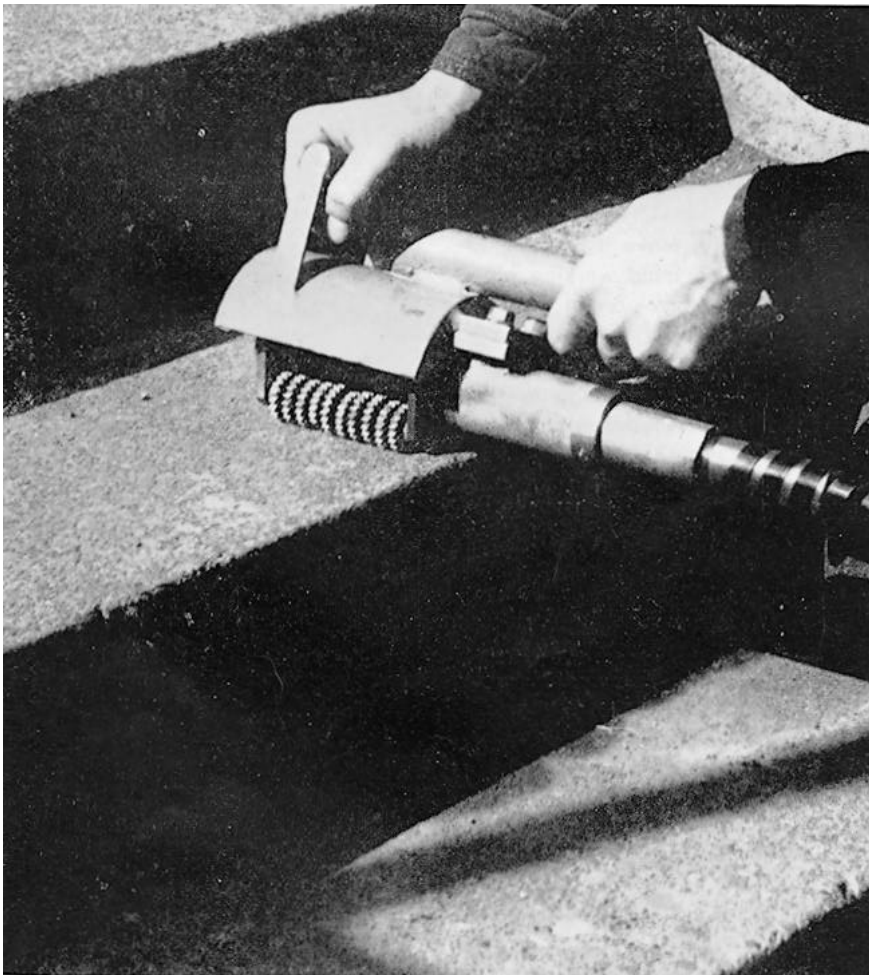
However, vibrators are heavy and concrete men wanted an electric tool just for finishing hardened concrete. Because of this demand, manufacturers developed special lightweight electric flexible shaft tools and grinding discs that have made

the hand rubbing brick obsolete.

There are basically two methods used to smooth off hardened concrete surfaces. They are dry grinding and wet rubbing.

**Dry Grinding.** Dry grinding is done on dry concrete surfaces to remove fins and marks caused by forms. Formerly resinoid abrasive cup grinding wheels were used for this, but recently abrasive discs have been developed that are much lighter than the grinding wheels and do an excellent job. These discs are made up of multiple layers of abrasive-impregnated cotton fiber material bonded together under heat and pressure with strong resin bond. A silicon carbide abrasive is used since this has been found to be the best abrasive for concrete. These discs are usually about 1/4 inch thick, and come in diameters of 7 to 9 inches. They can be applied to the work at an angle of 30 to 40 degrees using the weight of the tool for pressure. These discs can be attached to any type of portable tool and should be operated at from 3,000 to 4,000 rpm.

**Wet Rubbing.** Wet rubbing is accomplished on green concrete by a slow speed grinding wheel or disc, at the same time applying water. The water, plus the rubbing action, brings up a cement paste which results in a very smooth, plaster-like surface. The grinding wheel or disc is used with a right angle head, which has various gear reductions to reduce the grinding speed to 300 to 500 rpm. This wet angle head is provided with an attachment for a water hose so that water can run through the center of the grinding wheel onto the concrete. A conve-



Dry grinding with a flexible-shaft grinding machine to remove fins and form marks from hardened concrete.

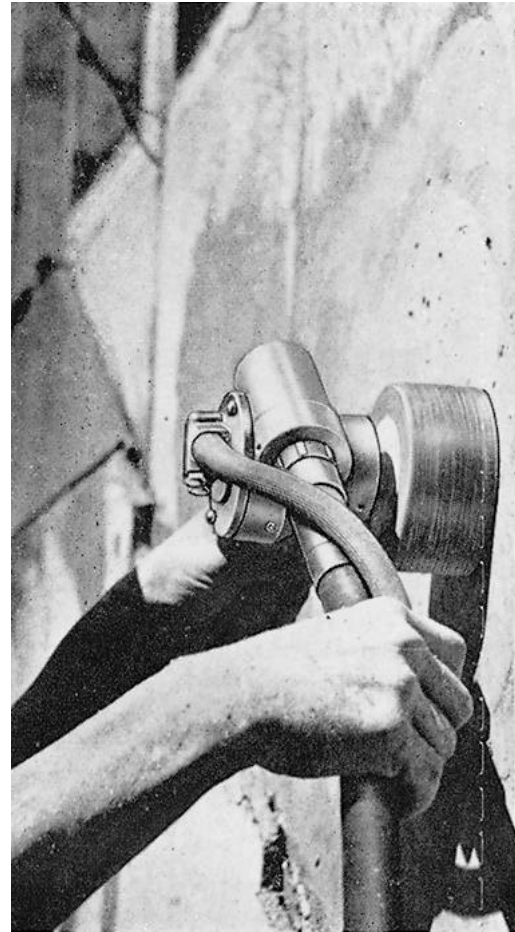
nient button on the angle head allows the operator to apply water and grind at the same time. A pressure tank can be used for the water supply.

Where air holes must be filled and a smooth surface obtained on dry concrete (as distinguished from green concrete), a similar technique can be used. First, however, the operator paints on a coating of cement with an ordinary hand brush. Then the wet cement is rubbed in, applying water where necessary.

For wet rubbing, special resinoid bond abrasive cup grinding wheels are available with a silicon carbide abrasive. Usual sizes are 4 \_ and 6 inches in diameter. A new development that is equally good is the waffle pattern disc with fiber backing through which nylon loops have been sewn to provide a strong adhesion between the silicon carbide abrasive section (1/8 inch thick) and

the backing material. The waffle pattern provides a controlled amount of flexibility so that it hugs the work surface and also serves to clear the ground particles off the work and out of the disc. This waffle pattern type disc should be applied at an angle of about 5 degrees to the surface, using only the pressure created by the weight of the tool.

For dry grinding or wet rubbing floors, the same techniques can be applied as already described. However, manufacturers of rotary trowels have bricks available that can be attached in place of the trowel blades. With this arrangement, large floor areas can be ground quickly and made extremely smooth without requiring the operator to bend over.



UPPER RIGHT: Wet grinding the same section of concrete with a 4 1/2-inch grinding wheel. For this operation a cement slurry is first painted on the wall with a brush, and water is also introduced through the grinding head. The latter has a 10:1 speed ratio to reduce the grinding speed to 340 rpm.

LOWER RIGHT: A number of machines now on the market make it possible to grind the under sides of concrete floors without having to build working platforms. The unit pictured here can be readily adjusted for any normal floor-to-floor height.

BELOW: Conventional rotary trowels can be adapted to dry grinding or wet rubbing hardened concrete floors by replacing the trowel blades with grinding bricks.

