Cleaning Trends

Floor Machine History—Evolution to Innovation

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For many in-house professionals, facility managers, and building service contractors (BSCs), floor machines become so valuable that they are like a part of the family. But, as with many cleaning tools, little is known about early floor machines, how they have evolved, and what is on the horizon.

The first useful electric-powered floor machines date back to the early 1900s. Coincidentally, this was the same time that the Hoover Company introduced a vacuum cleaner light enough, powerful enough, and inexpensive enough for professional cleaners to consider buying.

Pushing and Pulling

The first floor machines were known as “divided-weight” machines. With these machines, the bulk of the weight of the machine was on its rear wheels, which remained on the floor during operation. The buffer rolled in a push-pull fashion over the floor for both scrubbing and polishing.

These early machines used brushes made of Tampico and Bassine, vegetable fibers used for centuries for floor scrubbing and polishing. To polish floors, carnauba wax would be applied to the floor then polished to a shine by going back and forth over the floor with the buffer.

Divided-weight machines lacked sufficient speed, weight, and pressure over the brush to produce a high-gloss shine. The major benefits for the user were that the machines were easier and faster to use than polishing a floor by hand.

These early machines reached speeds of 175 rotations per minute (RPM), the speed often found on buffers today. Early tests indicated that speeds above 200 RPM caused the cleaning solution to spray from the brush because of centrifugal force. Not only was this spraying marring customer walls and furniture, the effectiveness of the scrubbing solution decreased as it was flung from beneath the machine.

Swinging into the 1920s

It was not long before manufacturers realized that the more pressure on the brush, the better would be the scrubbing and polishing action. This led to the “swing” machine, which centered its weight on the brush; the rear wheels lifted off the floor during operation.

Getting accustomed to these new machines took some time. Often the cleaning professional’s first time on a swing buffer was more like riding a wild bull at a rodeo. These machines seemed to have a mind of their own, and if the nearest wall was where they wanted to go, only training and skill could stop them.

Because using the swing machine was a completely new technique, it was met with considerable reluctance at first. However, as improved floor finishes were introduced requiring a more versatile machine, BSCs realized that swing machines were needed. They also found that they could substantially improve worker productivity with the new machines—once workers got the hang of them.

The Wet Look and Rock ‘n’ Roll

Throughout the mid-1900s, it was the floor chemical manufacturers that were driving the need for faster and heavier floor machines that would work better with their new products. But by the late 1950s, equipment manufacturers began taking the lead, introducing the first high-speed, or variable speed, floor machines. The operator could adjust these machines to rotate at 175 to 350 RPM, depending on his or her needs.

As floor machines, new polymer technology used to produce the floor finish, and pads began to advance in unison, the level of shine produced took on more of a “wet look” than ever before. This shine could be maintained by regular “spray buffing,” which meant maintenance crews were able to develop a complete floor maintenance system, not requiring the custodians to strip and refinish floors quite as often. BSCs, their customers, and facility managers appreciated this, and high-speed machines quickly became the new floor cleaning standard.
Floor technology continued to advance, further extending the length of time required between refinishing. By the 1970s, rotation speeds of 750 to 1,000 RPM were common. Because of the higher RPM, some floor finishes “fractured” or “powdered” under the faster machines and often pads would quickly degrade because of the speed. Improved floor pads were introduced, and innovative chemicals produced an even higher-gloss shine. Ultimately, the pad and chemical manufacturers introduced products that would hold up well with electric machines producing 1500 to 2000 RPMs.

**Watch for “Low Areas”**

Hard surface floors are often installed over newly laid concreted floors which have a tendency to settle unevenly. If a standard VCT floor is installed over the cement, it may become slightly uneven as the cement below settles. The problem this creates when refinishing the floor is that it is difficult for the standard rotary buffer to remove finish and dirt build-up in these areas. Finish and solution can build up in these areas causing them to darken. In time, these areas make the floor look uneven as if it has waves.

**Blown Fuses, Battery Packs, and Propane**

Floor equipment manufacturers realized that ultra high-speed machines produced the best shine. But roadblocks soon emerged in the form of blown fuses. Sufficient amperage to power the faster, heavier machines was usually not available.

To address this problem, manufacturers turned to battery-powered machines. Using battery-powered machines at large facilities such as retail stores, hospitals, and large grocery stores, floor maintenance crews could improve their floors’ appearance without the need to bolster power amperage. Removing power cords also helped reduce safety concerns.

Battery packs did solve problems initially, but because the batteries produced a short run time and substantially increased the weight of the machines—making them difficult to transport—a new power supply was sought. By the early 1980s, propane-powered buffers became a viable alternative. Several manufacturers began adding propane buffers to their product line, often purchasing the propane units from other manufacturers and private labeling them under their own name.

Propane units became quickly popular because of their extended run time, their consistent rotation speeds of 2,000 RPM, and the increased pad pressure—up to thirty pounds—that they produce on the floor. This pad pressure is double that of battery and electric machines. All of these advances increased productivity significantly.

The propane unit’s productivity and “wet look” results created the new standard for the industry. However, they had limitations:

- High noise levels
- Increased equipment maintenance needs
- Exhaust emissions, which prevented them from being used in many facilities

**The Future Is Cylindrical**

The evolution of floor care has been like a slow freight train pulling out of the station. “In the future, in large floor areas such as factories and shopping centers, we will see riding equipment becoming more common,” said Tom Sawyer, of Mid-Michigan Supply Company in Jackson, MI. “This will include riding autoscrubbers and burnishers.”

However, for more typical floor maintenance work, Sawyer believes that cylindrical machines will become increasingly popular. Cylindrical floor care machines have counterrotating brushes on each side and rotate at 1,000 RPM at 3.5 psi (pounds per square inch), which is five times the contact pressure provided by a rotary machine and works well in most floor care situations.*

Cylindrical machines are designed to line up right against baseboards and walls to provide excellent edge cleaning. In tests at Colorado State University, custodial supervisor Janet Vigil said, “I used it to strip a hallway that was damaged pretty severely. It worked well in getting into the doorways, and there was no splattering of slurry against walls or even the baseboards.”

The cylindrical machines, though “smooth as a Cadillac” to operate according to Sawyer, still has spot removing power. In tests at Iowa State Prison, maintenance supervisor John Gultrop said that he was very impressed with how the cylindrical machine was able to remove spots and stains, which the standard rotary machine had not been able to remove.

Sawyer said that the cylindrical machine he used was versatile and worked on a variety of different floor types.”It had a very low profile, and it was easy to get in and around restroom partitions, counters, and benches where many machines cannot go.” Similar to what was reported at Colorado State University, there was no need to “tape-off” edges and baseboards to protect them from the machine’s solution splatter, a common problem when stripping with a rotary machine.

This compactness makes the machine ideally suited for environments such as hospitals, nursing homes, kitchens, school classrooms, hotels, and so on. “I would try it in office type areas,” added Vigil.

Cylindrical machines have multidirectional capabilities. This means that they can be operated side to side or back and forth in a straight line. The machine Sawyer used comes equipped with a 0.8-gallon/3-litre solution tank or a larger 2.6 gallon/10-litre tank is available as an option. The tank allows the operator to re-wet an area while stripping and adds about 20 pounds to the machines, both increasing worker productivity. An add-on weight for even heavier scrubbing or buffing is also available.

“The cylindrical brushes themselves are quite an innovation,” said Sawyer. According to the manufacturer, they can out last 100 conventional pads and do not need to be cleaned, or obviously replaced, as often. This is a major savings for the facility manager or BSC.

“I believe cylindrical floor machines are the floor care systems for the 21st century,” said Sawyer. “Your first test drive will sell you on them. They incorporate the best of the floor machines that have come before but are lighter, more versatile, much easier to maneuver, and more productive than any machine before.”

* Specification provided by Tornado Industries.

**About David Frank**

David Frank is known as “the high impact speaker who motivates.” Every year he presents over 100 seminars specifically designed for the cleaning industry. He is a nationally recognized authority with over 25 years of experience in cleaning system design, motivation, leadership, facility management, indoor air quality and numerous other topics for cleaning organizations. He is the president of KnowledgeWorx, a consulting and training firm dedicated to developing leaders at all levels of the cleaning industry. A visionary and leader, he has worked with the foremost cleaning organizations, manufacturers and distributors, gathering experience from all levels of the industry. David is an active member of the International Sanitary Supply Association who has served on the Indoor Air Quality committees for the Carpet & Rug Institute and Underwriters Laboratories to establish standards for healthy building designs, cleaning standards, and environmental remediation. He brings a wealth of information, ideas and knowledge that will take your organization to the next level of business development.