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(54) **METHOD AND APPARATUS FOR STRIPPING AND CLEANING FLOORS**

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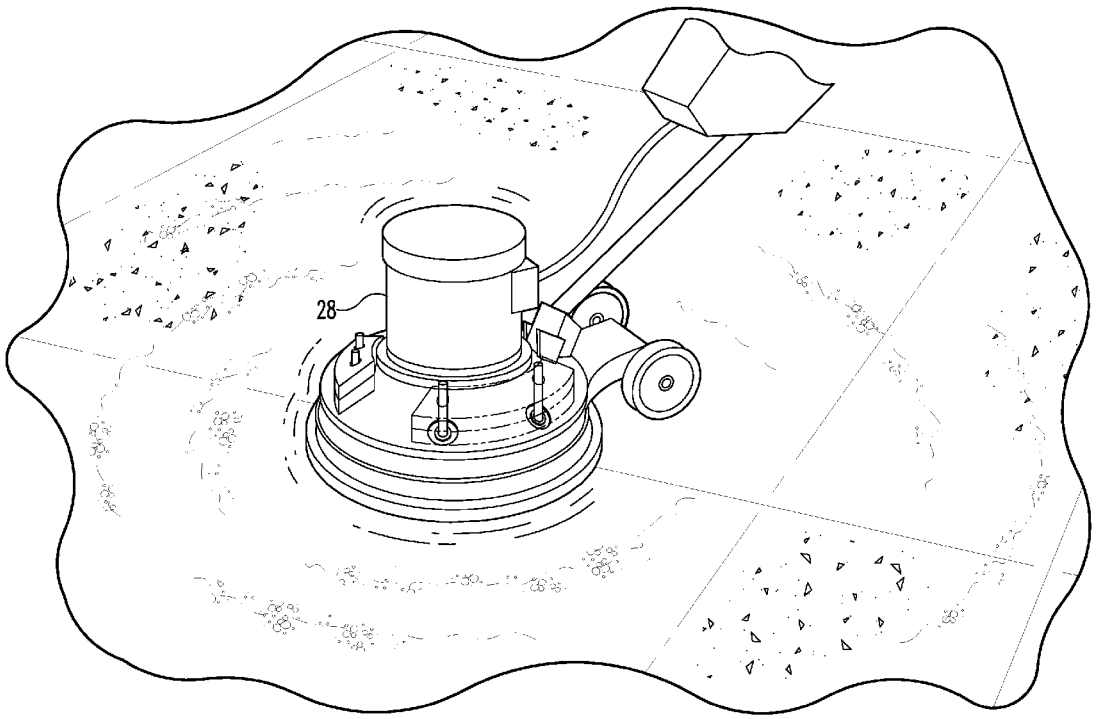
(57) **ABSTRACT**

Floor stripping and buffing methods and apparatus including a circular drive board, at least one pad operationally attached to the circular drive board, and at least one abrasive media embedded in the at least one pad, where the at least one pad has at least one raised pad portion. Other aspects include at least one foam layer between the circular drive board and the at least one pad, where the at least one pad is made of the at least one abrasive media, at least one foam layer between the circular drive board and the at least one pad, at least one mounting adapter formed through the at least one pad, a rotary stripping machine connected to the stripping apparatus via the mounting adapter, at least one heeling weight connected to the stripping machine, and where the at least one media is removable and rechargeable.



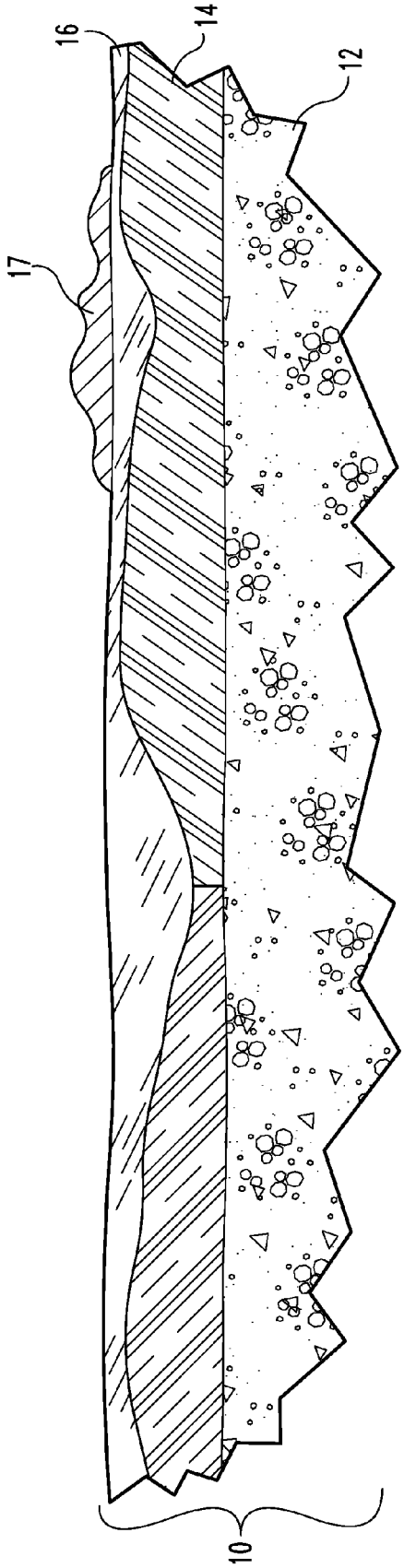


Fig. 1

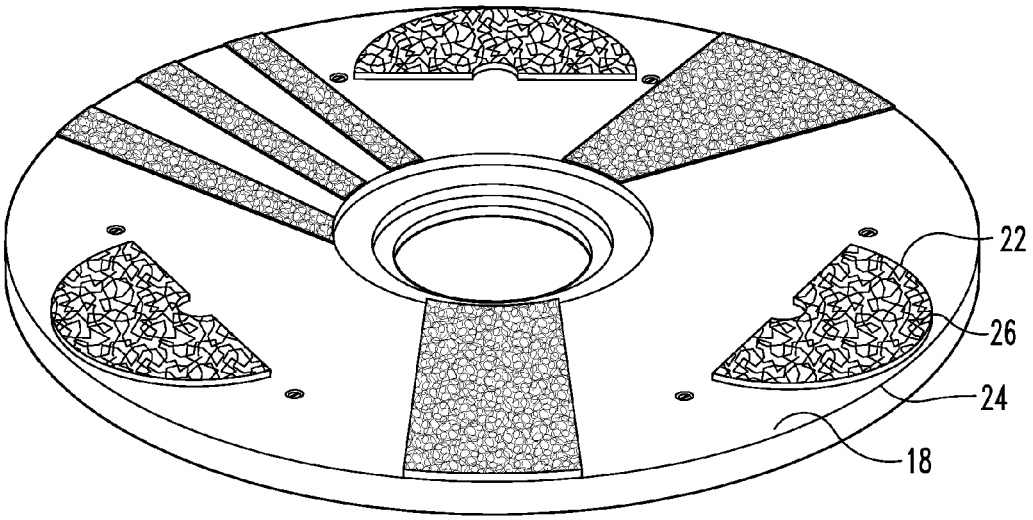


Fig. 3

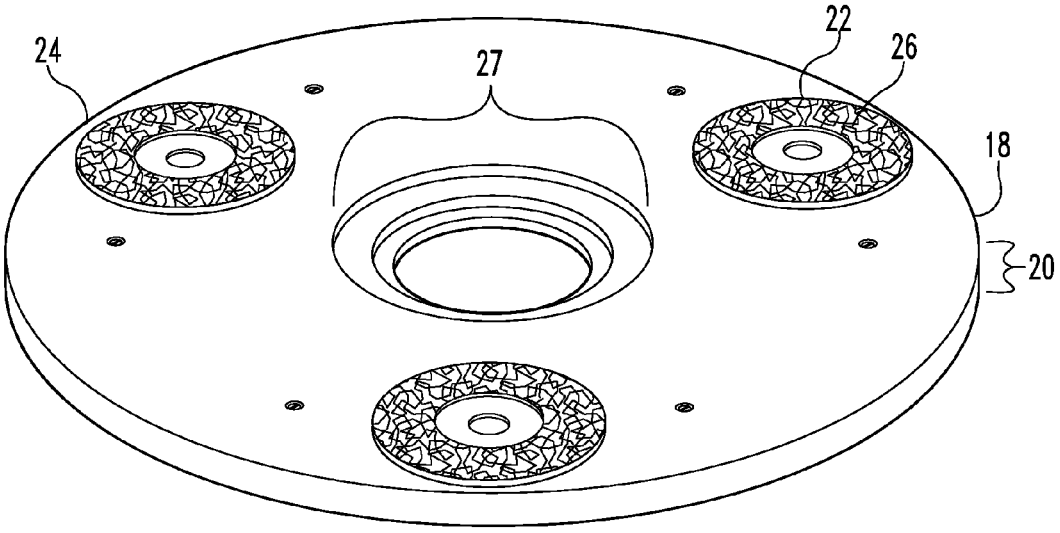


Fig. 2

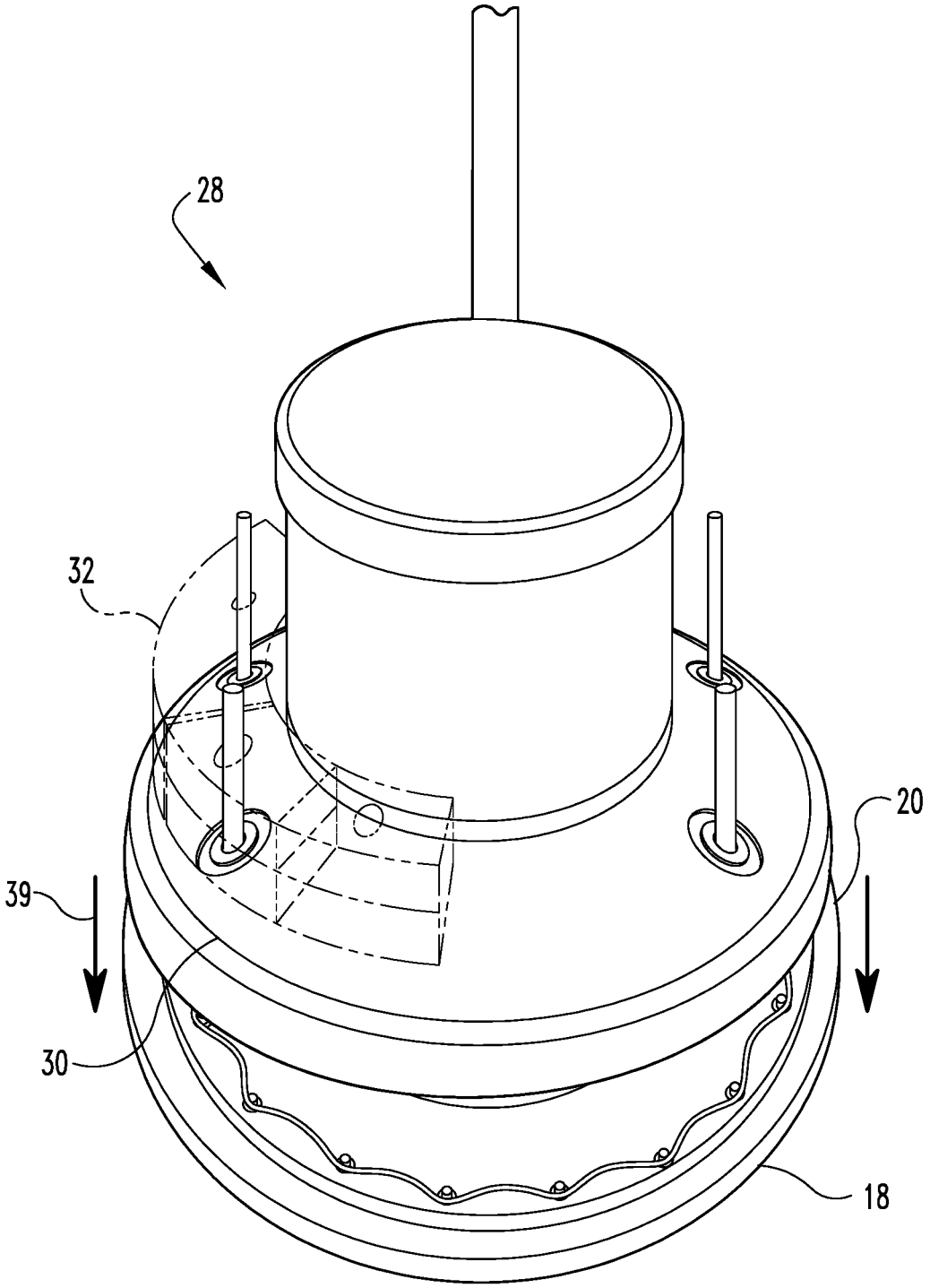


Fig. 4

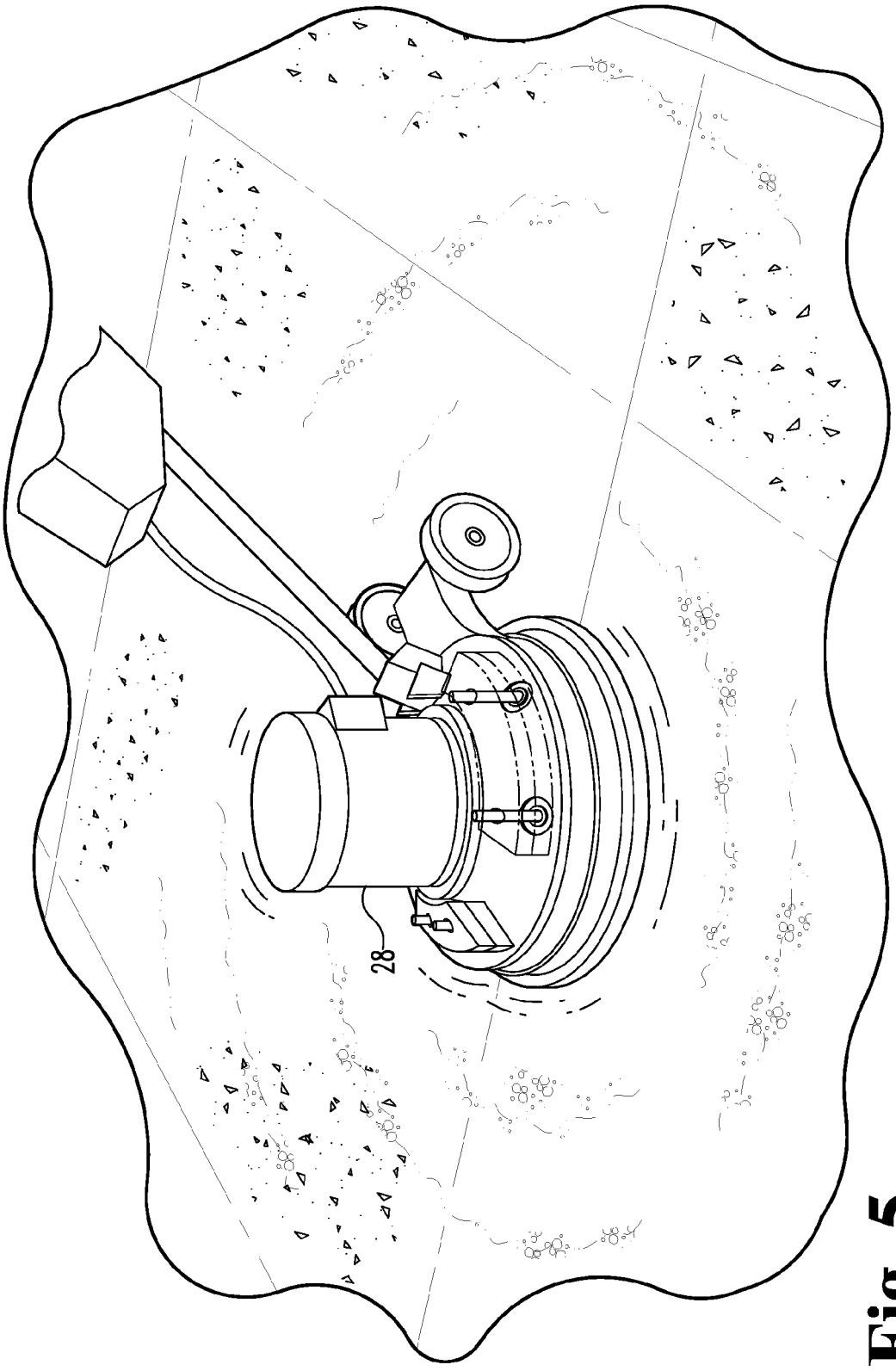


Fig. 5

Fig. 6

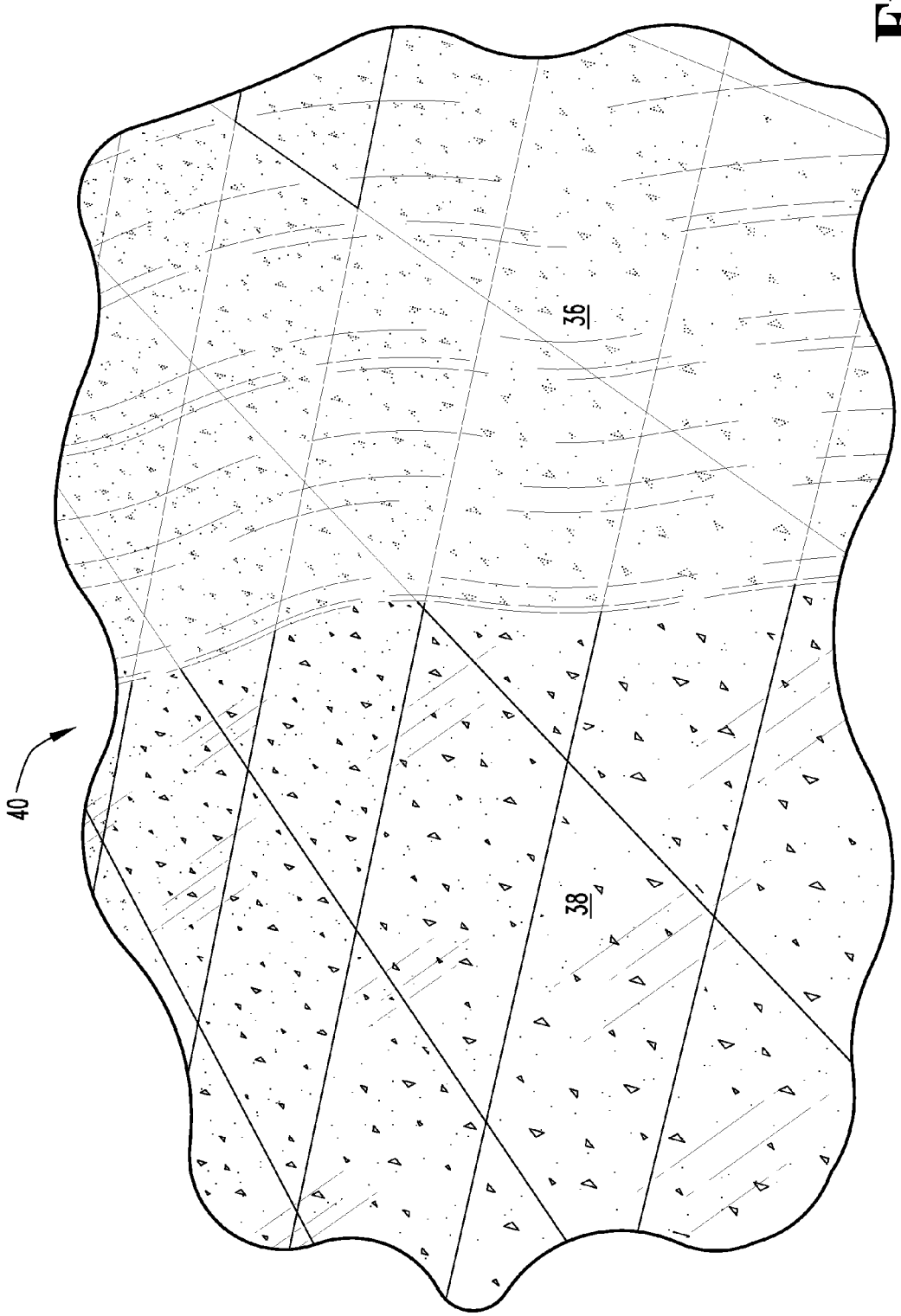
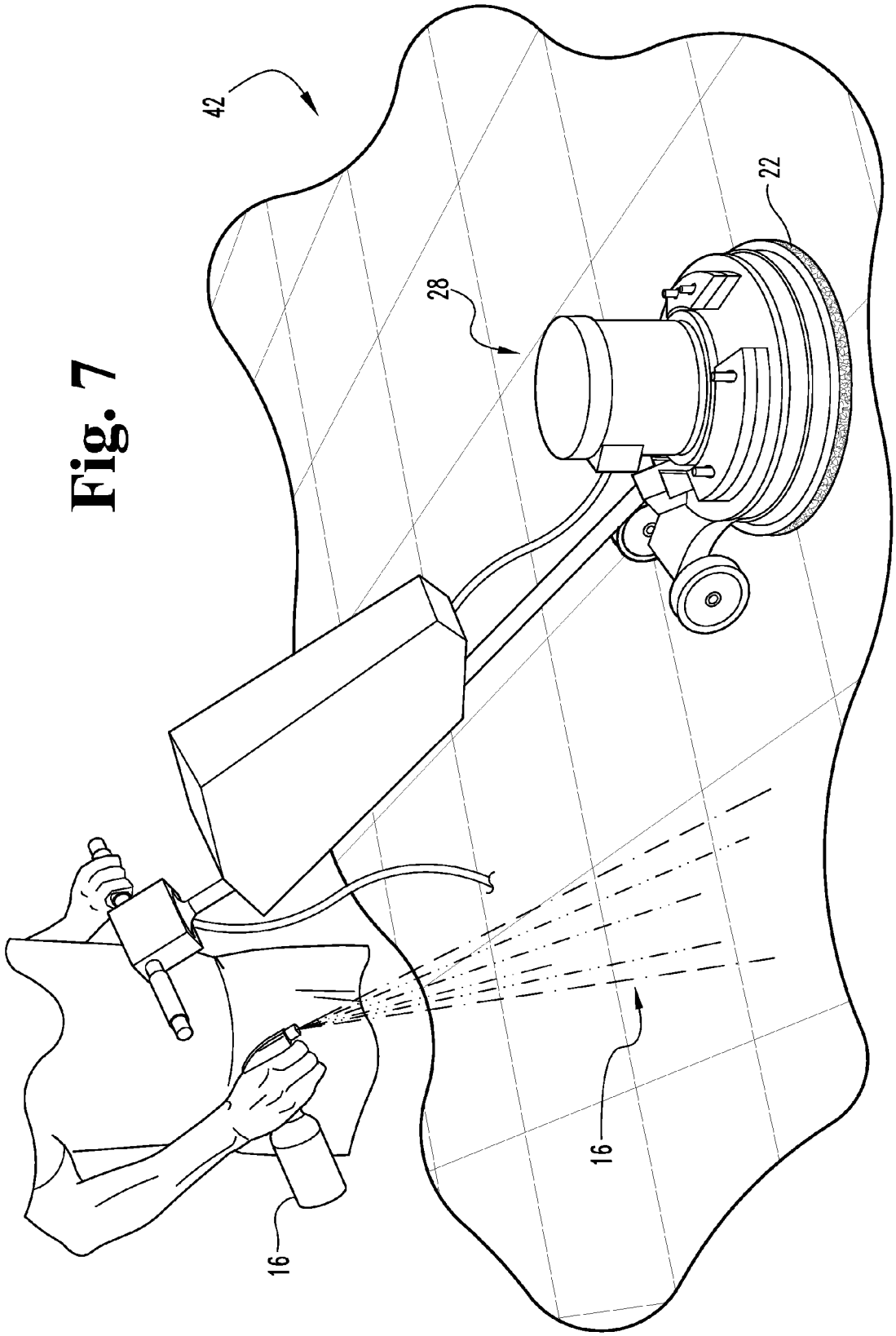


Fig. 7



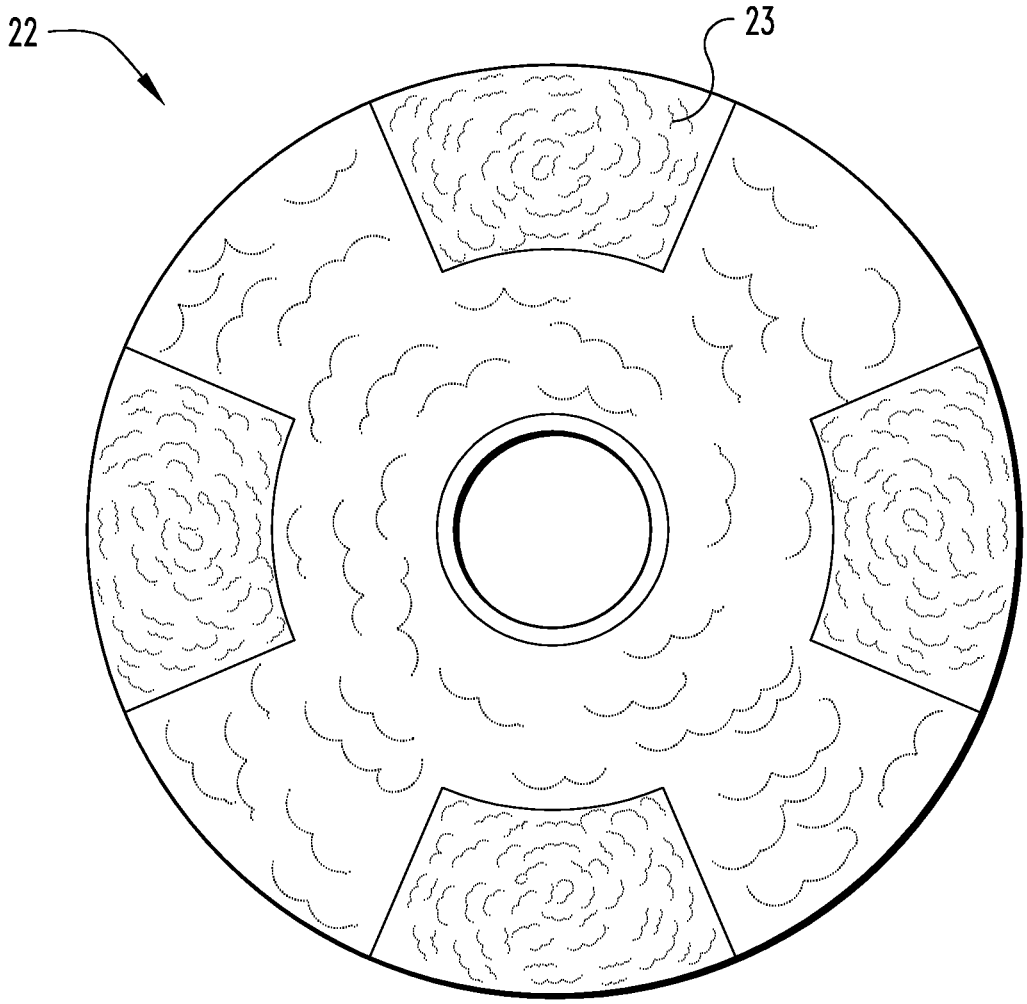


Fig. 8

METHOD AND APPARATUS FOR STRIPPING AND CLEANING FLOORS

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit under 35 U.S.C. §119(e) of U.S. Patent Application No. 62/251,978, filed Nov. 6, 2015, which is incorporated herein by reference in its entirety.

TECHNICAL FIELD

[0002] The invention relates generally to the field of flooring maintenance and, specifically, to a floor stripping head having segmented contact pads distributed equidistantly about its outer circumference and a method for using the same.

BACKGROUND

[0003] Vinyl tile floors, as the name suggests, include a plurality of adjacent vinyl squares positioned to completely cover the underlying subsurface, which may be bare concrete, terrazzo, hardwood, or the like. Vinyl tile floors may be attractive because the vinyl tiles are relatively easy to clean, resist wear, and are a quick, simple and cheap surface finish. A wax coating is typically applied over the tiles, and so during cleaning the dirty wax must be stripped off and the tiles cleaned prior to the application of fresh, clean wax.

[0004] In many cases, the subsurface under the vinyl tiles is not perfectly flat. Further, wear of the vinyl tiles preferentially occurs wear foot traffic is heaviest, further contributing to the 'waviness' of the vinyl tile surface. This 'waviness' interferes with the wax stripping process, as the spinning circular scrubbing pad that defines the head of commercial stripper machines encounters the crests of the vinyl waves, but does not extend down into the troughs, resulting in an inconsistent stripping of the floors, leaving areas that are still dirty and that continue to accrue dirt and grime, absent stripping by hand.

[0005] Thus, a need remains for method of maintaining a vinyl flooring surface, and particularly a worn and wavy or rippled vinyl flooring surface, that is more efficient and less maintenance intensive.

[0006] The present novel technology addresses these needs.

SUMMARY

[0007] The invention relates generally to the field of flooring maintenance and, specifically, to a floor stripping head having segmented contact pads distributed equidistantly about its outer circumference and a method for using the same.

[0008] The details of one or more embodiments of the subject matter described in this specification are set forth in the accompanying drawings and the description below. Other features, aspects, and advantages of the subject matter will become apparent from the description, the drawings, and the claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] FIG. **1** is a side schematic view of a stripper grinding and removing dirty wax from a vinyl surface according to the prior art.

[0010] FIG. **2** is a perspective view of a circular drive board with circular abrasive pads symmetrically oriented thereupon according to a first embodiment vinyl floor stripping system.

[0011] FIG. **3** is a perspective view of the circular drive board with non-circular abrasive pads symmetrically oriented thereupon according to the embodiment of FIG. **2**.

[0012] FIG. **4** is a perspective view of the circular drive board of FIG. **2** engaging to a stripping machine.

[0013] FIG. **5** is a perspective view of the polishing machine of FIG. **4** stripping wax from a vinyl tile floor.

[0014] FIG. **6** is a perspective view of the floor of FIG. **5**.

[0015] FIG. **7** is a perspective view of the floor of FIG. **6** being waxed and buffed.

[0016] FIG. **8** is a top plan view of an alternate embodiment segmented abrasive pad for connection to the circular drive board of FIG. **2**.

[0017] Like reference numbers and designations in the various drawings indicate like elements.

DETAILED DESCRIPTION

[0018] Before the present methods, implementations, and systems are disclosed and described, it is to be understood that this invention is not limited to specific synthetic methods, specific components, implementation, or to particular compositions, and as such may, of course, vary. It is also to be understood that the terminology used herein is for the purpose of describing particular implementations only and is not intended to be limiting.

[0019] As used in the specification and the claims, the singular forms "a," "an" and "the" include plural referents unless the context clearly dictates otherwise. Ranges may be expressed in ways including from "about" one particular value, and/or to "about" another particular value. When such a range is expressed, another implementation may include from the one particular value and/or to the other particular value. Similarly, when values are expressed as approximations, for example by use of the antecedent "about," it will be understood that the particular value forms another implementation. It will be further understood that the endpoints of each of the ranges are significant both in relation to the other endpoint, and independently of the other endpoint.

[0020] "Optional" or "optionally" means that the subsequently described event or circumstance may or may not occur, and that the description includes instances where said event or circumstance occurs and instances where it does not. Similarly, "typical" or "typically" means that the subsequently described event or circumstance often though may not occur, and that the description includes instances where said event or circumstance occurs and instances where it does not.

[0021] In the current art, vinyl tile floors **10**, as the name suggests, include a plurality of adjacent vinyl squares **12** positioned typically to completely cover the underlying subsurface **14**, which may, for example, be bare concrete, terrazzo, hardwood, or the like. Vinyl tile floors **10** may be attractive because the vinyl tiles **12** may be relatively easy to clean, resist wear, and may be a quick, simple, and cheap surface finish. However, a wax coating **16** typically may be applied over the tiles **12**, and so during cleaning the dirty wax **16** typically must be stripped off and the tiles **12** cleaned prior to the application of fresh, clean wax **16**.

[0022] In many cases, the subsurface **14** under the vinyl tiles **12** may not be perfectly or even substantially flat.

Further, wear of the vinyl tiles **12** may preferentially occur where foot traffic is heaviest, further contributing to the 'waviness' of the vinyl tile surface **10**. This 'waviness' typically may interfere with the wax **16** stripping process (depicted in FIG. **6**), as the spinning circular scrubbing pad that defines the head of commercial stripper machines encounters the crests of the vinyl waves, but does not extend down into the troughs, resulting in an inconsistent stripping of the surface **10**, leaving areas that may be still dirty and that continue to accrue dirt and grime, absent stripping by hand. These features are depicted in FIG. **1**.

[0023] As illustrated in FIGS. **2-8**, a first embodiment of the present novel technology relates to a stripping apparatus **11** for stripping vinyl tile **12** and/or like surfaces, and a method for using the same. While the examples focus on vinyl tile surfaces **10**, similar surfaces (e.g., stone, wood, laminate, etc.) that require stripping, waxing, buffing, and/or the like may be likewise treated.

[0024] Specifically, as illustrated in FIG. **2**, apparatus **11** may consist of one or more circular drive boards **18** having a high-density foam layer **20** (or, in some implementations, no foam layer **20** at all) fitted with a plurality of circular abrasive stripping and/or polishing discs or pads **22**, typically positioned respectively at the equidistantly (such as three pads **22** each located respectively at the twelve, four, and eight o'clock positions; four pads **22** spaced at twelve, three, six, and nine o'clock positions, etc.) around the drive board **18**.

[0025] In some other implementations, a single pad/base layer **22** having raised pad portions **23** distributed equidistantly therearound may be connected to the board **18** (see FIG. **8**). Pad **22** typically may be connected to board **18** permanently and/or temporarily. For example, pad **22** may be connected via adhesives, grooves, hook-and-loop type fabric, fasteners (e.g., screws, bolts, etc.), and/or any other attachment mechanism.

[0026] In some further implementations, a multilayered and/or preferentially cushioned/deposited pad **22** may be used to achieve specific stripping and/or buffing patterns, depths, rates, and/or the like. For example, higher density foam layers **20** may be used where a surface **10** may have only minor waviness, whereas a lower-density foam layer **20** may be used where a surface may have greater waviness (allowing greater flexibility along crests and troughs).

[0027] In some implementations, the stripping/polishing discs **22** may be, but are not limited to, between about ten inches and twenty inches in diameter (more typically between about twelve inches and eighteen inches in diameter) and between about one-eighth inch and one and a half-inches thick (more typically between about three-eighths inch and seven-eighths inch), and may be typically positioned substantially at, or in some implementations slightly inwardly from (such as about one-fourth inch inward), the drive board edges **24**.

[0028] Pads **22** typically may be made from, or include, abrasive media **26** such as steel wool, silica, carbon, metal, ceramic, wood, fiber, and/or the like, but typically may act in a scouring fashion using a polyester, nylon, abrasive granules, and/or the like rather than an extreme grinding fashion. The drive board **18** typically may be made of sufficiently rigid material so as not to deform or cup during polishing, and board **18** and/or pad **22** typically may connect to one or more floor polishing machines **28** via mounting hole adapter **27**.

[0029] In some further implementations, pads **22** may be configured in modified patterns and/or shapes/sizes, such as depicted in FIG. **3**. In one example, apparatus **11** may first be layered with a nonwoven polyester fabric substantially covering foam layer **20**, followed by one or more layers of raised portions **23** made of nylon fibers cut into strips, discs, rectangles, triangles, and/or the like. Other examples may layer raised portions **23** in staggered fashions, have variable raised portion **23** heights, densities, and/or compositions (e.g., a first portion **23** being one-eighth inch thick, a second portion **23** being one-fourth inch thick, a third portion **23** being one-half inch thick, and/or the like), and/or the like. In still further examples, pads **22** may be segmented into raised pad portions **23** and then spaced on pads **22**, such that the elevation of the raised pad portion **23** areas may be double, triple, and/or similarly multiplied thickness of base pad **22**.

[0030] In some implementations, the discs/pads **22** and/or abrasive media **26** may be removable, replaceable, and/or rechargeable. For example, one or more pads **22** may be temporarily attached to board **18** and/or foam **20** with hook-and-loop fabric, removable adhesive, stitching, and/or the like, which may be allow the pads to be selectively and/or automatically (e.g., stitches may wear out after period of use). This may, for example, allow for differing wear rates of pads **22**, raised portions **23**, edges **24**, media **26**, and/or the like, without the need to discard an entire board **18**, layer **20**, and/or pad **22**, which may only have substantial wear on a subset of the material. In other implementations, pad **22**, raised portions **23**, and/or media **26** may be recharged by resurfacing, reembedding, and/or the otherwise refreshing the materials of the component. These configurations may also allow for increased efficiency via wear indication, customizable media **26** and/or the like selections, and/or surface **10** preferences.

[0031] Typically, a relatively light amount of pressure may be applied (such as one-hundred sixty to one-hundred eighty pounds, as opposed to a typical grinding pressure of about three hundred to five hundred pounds applied with a full-size polishing disc) to the segmented polishing discs or pads **22**. Specifically, the drive board **18** may be connected to a relatively lightweight rotary stripping machine **28** and run at a medium to slow speed, such as between about one-hundred seventy five to two-hundred twenty five revolutions per minute (rpm). Additionally, the machine **28** typically may have a tendency to heel to the right (or left, if the board **18** rotates in a counter-clockwise direction) and will typically be weighted to enhance the heel, rather than conventionally weighted to counter-balance the heel, thus creating an enhanced heel quadrant that does most of the work.

[0032] Enhancing the heel of the stripper/polisher **28** gives rise to the effect of the segmented pads **26** contacting the vinyl tiles **12** and layered waxed **16** and/or sedimentary dirt and grime buildup portions **17** of the wavy vinyl flooring surface **10** at a shallow angle, such that the pads **22** and/or abrasive media **26** dig out and excavate or shave the surface **10** with a proportionally larger shearing force, rather than a more perpendicularly applied force, as is typically characteristic of stripping. This results in a surface **10** having embedded grime and dirty wax materials removed at substantially the same rate to yield a surface **10** uniformly free of grime and/or wax buildup and resulting in a substantially more flush clean surface **10** than is the case with prior art systems and methods. Comparatively, with traditional stripping forces applied, the surface **10** is cleaned at the wave

crests with greater efficiency, which leaves dirty wax **16** and grime **17** in the troughs and/or on the surface **10**. This overly aggressive removal of the material results in a less attractive surface **10** that must be stripped and rewaxed more frequently with less than optimal results, assuming the removal does not also damage the vinyl tiles **12** underneath, which may necessitate costly replacement of the tiles **12** and/or subfloor **14**.

[0033] Further, in some additional aspects, the present novel apparatus **11** and method may be used to substantially improve stripping and/or buffing of vinyl surfaces **10** that may be created having textured and/or contoured profiles. For example, vinyl tiles **12** created to look like textured wood, stone, having faux grout lines, and/or otherwise nonflat surfaces may be more effectively and/or safely stripped and/or buffed using apparatus **11**. In effect, where crests and/or troughs are built in and/or desired for vinyl tiles **12**, the present novel apparatus **11** may allow stripping and/or buffing far more easily and effectively than conventional, linear pads.

[0034] In yet other implementations, apparatus **11** may greatly enhance the effectiveness of stripping/buffing at surface **10** edges. Where current machines and/or pads are not able to effectively remove wax **16** and/or buildup **17** along edges of surfaces **10**, walls, and/or transitions, the present novel technology's increased edge stripping/buffing effectiveness greatly increases an operator's ability to work in such areas without needing to resort to manual stripping/buffing or use of smaller machines. In some use cases, between the greater effectiveness of the apparatus **11** in general and lessening the need to resort to alternatives to work these problem areas, the present novel apparatus may reduce the time required to complete a job by half or more.

[0035] In some further implementations, machine **28** may further be fitted with one or more weights **32** to enhance one or more heels (e.g., right-front heel quadrant **30**) for stripping and/or buffing. This may, for example, allow for faster, more efficient, and/or more specific stripping compared to an unweighted and/or insufficiently weighted machine **28** in certain use cases.

[0036] For the first stripping step **40** (typically depicted in FIG. **6**), the work surface **10** is typically treated with two to four passes, until the dirty wax layer **16** and/or buildup portions **17** has palpably decreased in thickness, giving the stripper **28** and/or operator the feedback that the abrasive pads **22** and/or medias **26** are no longer doing substantial work. In other words, it typically may be the number of passes with the rotating stripping media **26** that do the wax removal work, not the amount of pressure applied to the stripping media **26**, which provide stripping of wax **16** and/or grime **17**. Further, in some instances, excess downward force **39** applied to the stripping media **26** may move the apparatus **11** out of optimization and retard the stripping process. This process typically may be depicted in FIG. **6**, with stripped floor portion **36** to the right and dirty floor portion **38** to the left.

[0037] The next, application step **42** (typically depicted in FIG. **7**) in the process is similar to stripping step **40**, but instead of removing dirty wax **16** and grime **17**, one or more layers or coatings of new wax **16** may be applied to the vinyl tiles **12** (e.g., via a paste, bar, liquid, and/or the like) and then polished and buffed in with a polisher/buffer disc **22**. The buffer disc **22** typically may likewise have a set of segmented, raised buffer pads **23** extending from base pad **22** and positioned equidistantly around the outer portion of base pad **22**, and in turn the circular drive board **18** and/or foam layer **20** to which base pad **22** is connected (see FIG. **8**). The positioning of raised buffer pads **23** typically may allow for the same distribution of forces to apply the new wax **16** to both the crests and troughs of wavy or rippled vinyl flooring surfaces **10**. Once polished to the appropriate finish, tiled surface **10** typically may be maintained by mopping with a detergent solution.

[0038] While this specification contains many specific implementation details, these should not be construed as limitations on the scope of any inventions or of what may be claimed, but rather as descriptions of features specific to particular embodiments of particular inventions. Certain features that are described in this specification in the context of separate embodiments may also be implemented in combination in a single embodiment. Conversely, various features that are described in the context of a single embodiment may also be implemented in multiple embodiments separately or in any suitable subcombination. Moreover, although features may be described above as acting in certain combinations and even initially claimed as such, one or more features from a claimed combination may in some cases be excised from the combination, and the claimed combination may be directed to a subcombination or variation of a subcombination.

[0039] Similarly, while operations are depicted in the drawings in a particular order, this should not be understood as requiring that such operations be performed in the particular order shown or in sequential order, or that all illustrated operations be performed, to achieve desirable results.

[0040] Thus, particular embodiments of the subject matter have been described. Other embodiments are within the scope of the following claims. In some cases, the actions recited in the claims may be performed in a different order and still achieve desirable results. In addition, the processes depicted in the accompanying figures do not necessarily require the particular order shown, or sequential order, to achieve desirable results. In certain implementations, multitasking and parallel processes may be advantageous.

[0041] While the invention has been illustrated and described in detail in the drawings and foregoing description, the same is to be considered as illustrative and not restrictive in character. It is understood that the embodiments have been shown and described in the foregoing specification in satisfaction of the best mode and enablement requirements. It is understood that one of ordinary skill in the art could readily make a nigh-infinite number of insubstantial changes and modifications to the above-described embodiments and that it would be impractical to attempt to describe all such embodiment variations in the present specification. Accordingly, it is understood that all changes and modifications that come within the spirit of the invention are desired to be protected.

What is claimed is:

1. A floor stripping apparatus, comprising:

a circular drive board;

at least one pad operationally attached to the circular drive board; and

at least one abrasive media embedded in the at least one pad;

wherein the at least one pad has at least one raised pad portion.

2. The apparatus of claim **1**, further comprising:

at least one foam layer disposed between the circular drive board and the at least one pad.

3. The apparatus of claim **1**, wherein the at least one pad is made of the at least one abrasive media.

4. The apparatus of claim **1**, wherein the at least one raised pad portion is elevated between one-eighth inch and one inch above the at least one pad.

5. The apparatus of claim **1**, further comprising:

at least one mounting adapter formed through the at least one pad.

6. The apparatus of claim **5**, further comprising:

a rotary stripping machine operationally connected to the circular drive board via the at least one mounting adapter.

7. The apparatus of claim **6**, further comprising:

at least one heeling weight operationally connected to the rotary stripping machine.

8. The apparatus of claim **1**, wherein the at least one abrasive media is removable and rechargeable.

9. A method for refinishing floors, further comprising the steps of:

performing at least one stripping pass over a flooring surface having wax deposited thereupon with a rotary stripping machine and a pad, wherein the pad has at least one raised portion thereupon to strip the wax from the flooring surface until there is a palpable decrease in thickness of the wax on the flooring surface; and

applying at least one layer of new wax to the flooring surface and buffing the new wax onto the flooring surface with the pad until the flooring surface is waxed again;

wherein the at least one raised portion of the pad contours over crests and into valleys of the flooring surface.

10. The method of claim **9**, further comprising the steps of:

equipping the rotary stripping machine with the pad.

11. The method of claim **9**, wherein the rotary stripping machine is lightweight.

12. The method of claim **9**, further comprising the steps of:

equipping the rotary stripping machine with at least one heeling weight.

13. An improved flooring pad, comprising:

at least one base layer; and

at least one raised pad portion layered on the at least one base layer;

wherein the at least one raised pad portion contours uneven surfaces.

14. The pad of claim **13**, further comprising:

at least one foam layer operationally connected to the at least one base layer.

15. The pad of claim **14**, wherein at least one raised pad portion is a plurality of raised pad portions spaced equidistantly on the at least one base layer.

16. The pad of claim **13**, wherein at least one pad portion is temporarily attached to the at least one base layer and removable therefrom.

17. The pad of claim **13**, wherein the at least one raised pad portion profile is selected from the group consisting of at least one circle, at least one half circle, at least one stripe, at least one wedge, and combinations thereof.

18. The pad of claim **13**, wherein the at least one at least one base layer is selected from the group consisting of polyester, nylon, abrasive grains, and combinations thereof.

19. The pad of claim **13**, wherein the at least one raised pad portion is selected from the group consisting of polyester, nylon, abrasive grains, and combinations thereof.

20. The pad of claim **13**, wherein the at least one raised pad portion is integral with the at least one pad.

* * * * *