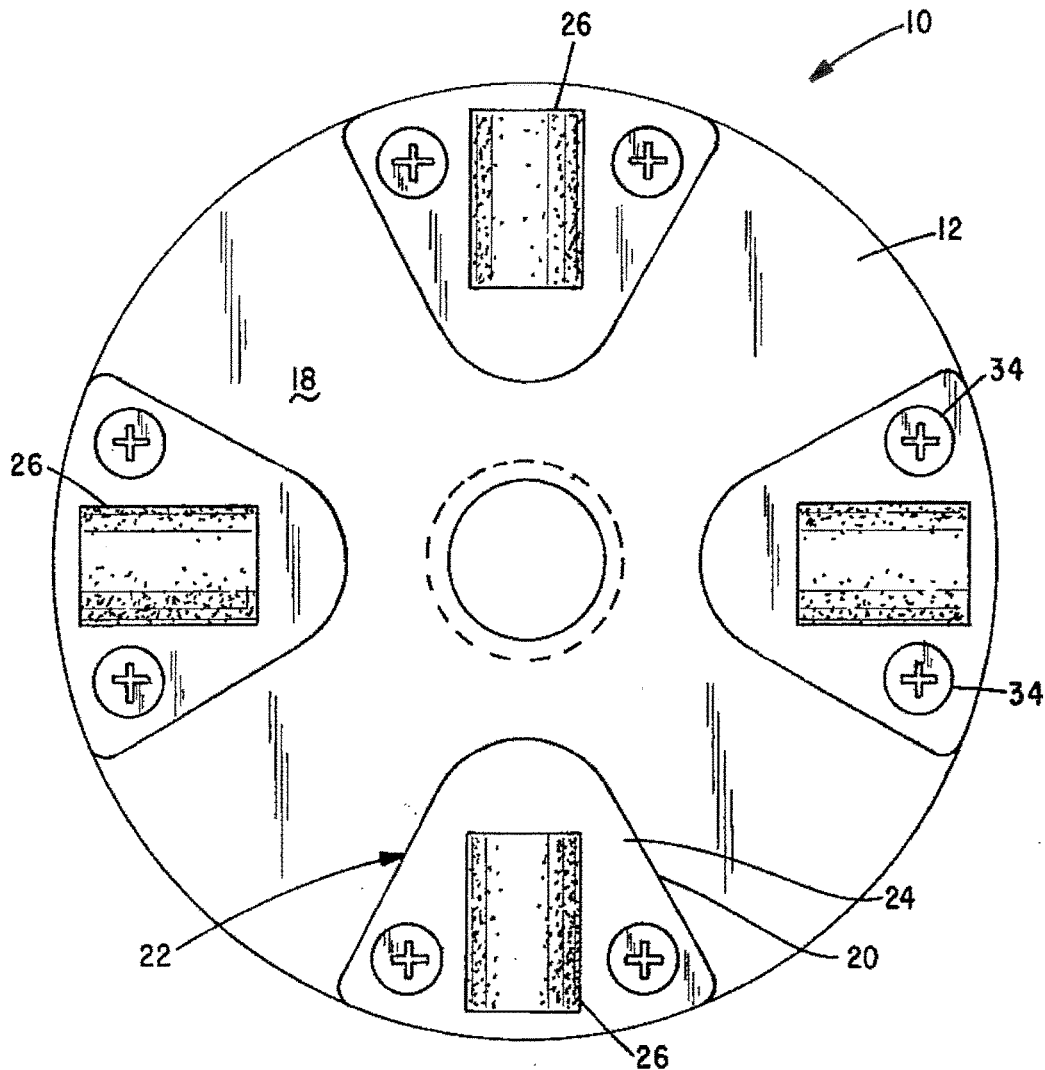




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(19) **United States**(12) **Patent Application Publication**
Stark et al.(10) **Pub. No.: US 2017/0291272 A1**(43) **Pub. Date: Oct. 12, 2017**(54) **CYLINDRICAL ABRASIVE FOR FLOOR
FINISHING MACHINE**(52) **U.S. Cl.**
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Montreal (CA)(57) **ABSTRACT**(72) Inventors: **Harvey Stark**, Montreal (CA); **Pavel
Ikononov**, Laval (CA)(21) Appl. No.: **15/095,463**(22) Filed: **Apr. 11, 2016****Publication Classification**(51) **Int. Cl.**
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A drive plate for a concrete or stone grinding/polishing machine includes one or more abrasive elements in the form of short steel cylinders having diamond crystals captured in a hard and durable brazing alloy. Due to the round profile of the abrasive elements, as the drive plate is rotated by a drive motor, the abrasive elements are able to more readily strip mastic, sealers, glue, or most any thin film topical coating present on concrete or other hard floors.



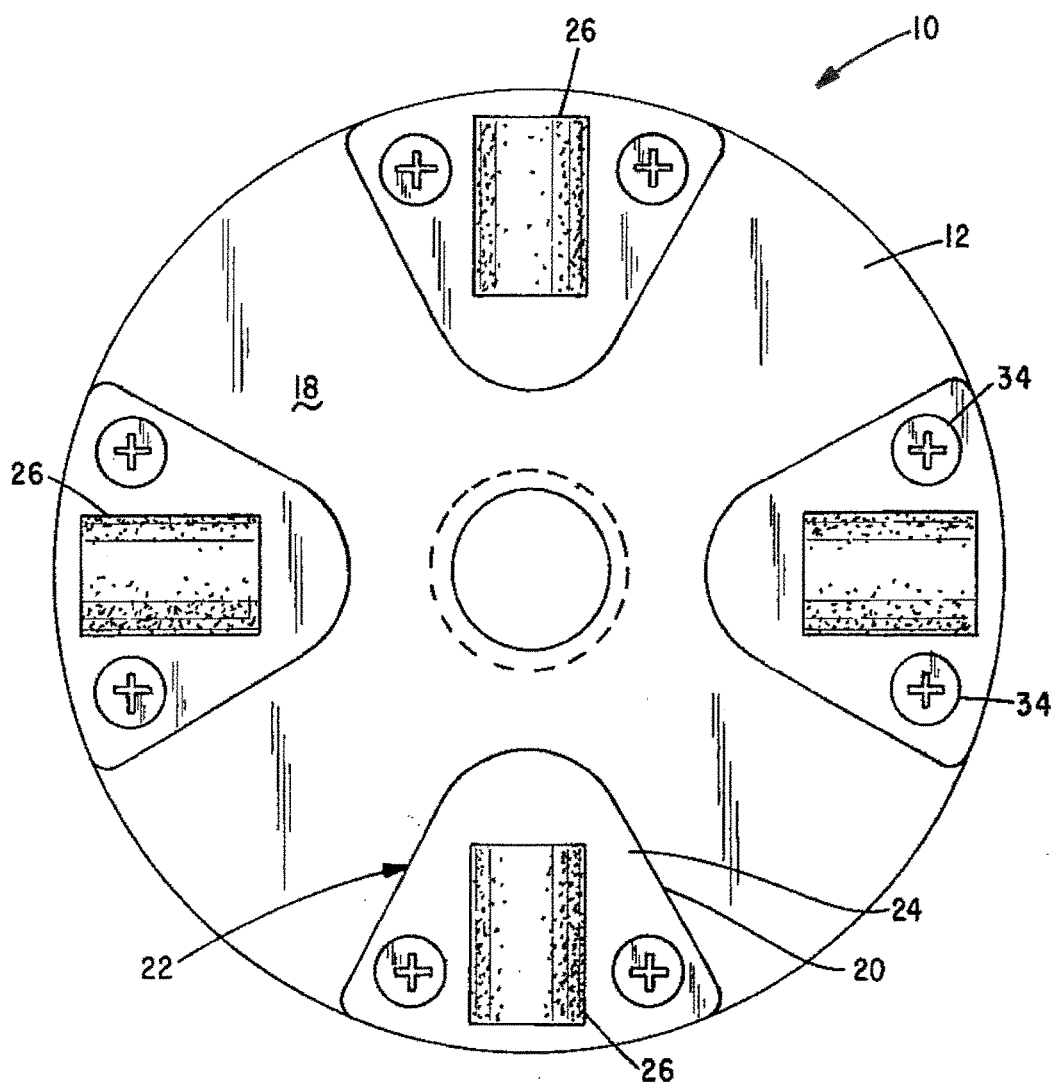


FIG. 1

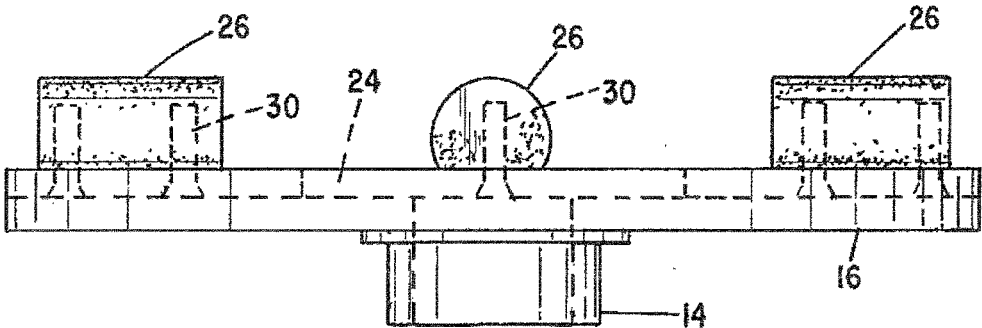


FIG. 2

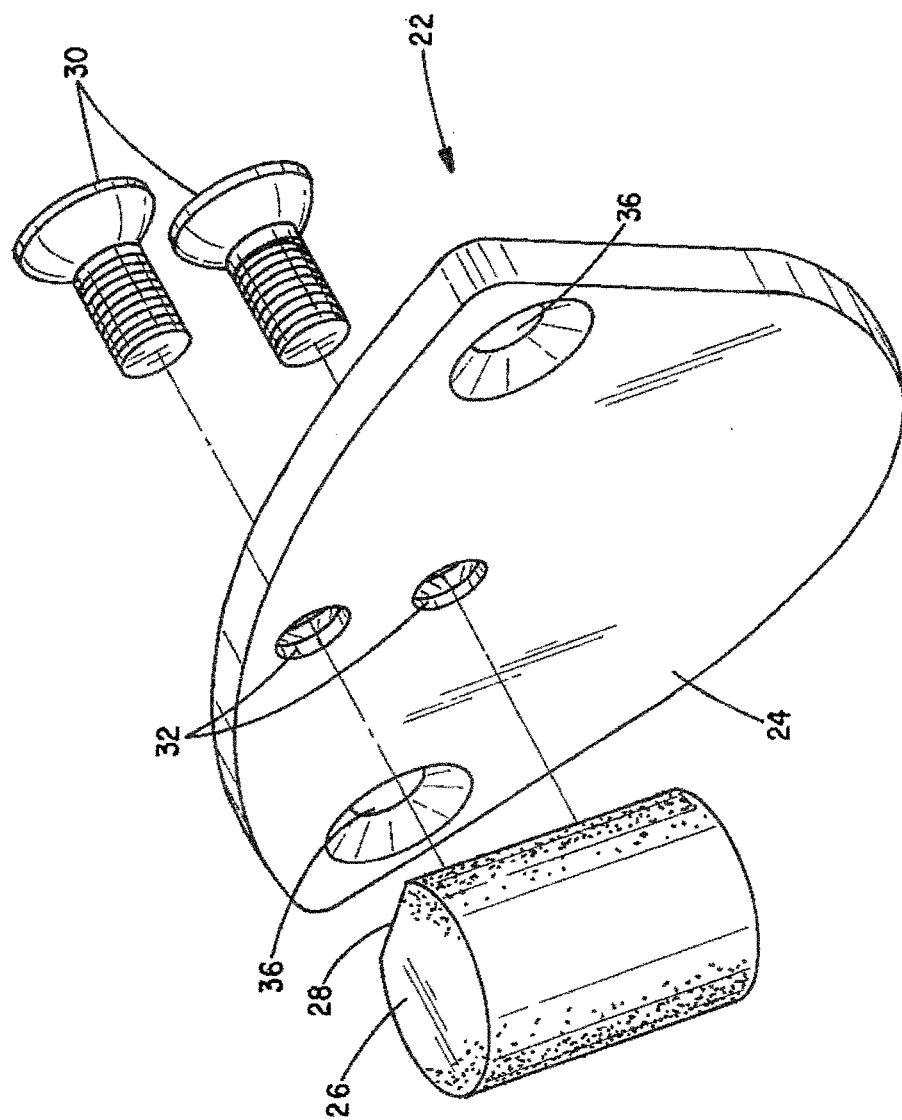


FIG. 3

CYLINDRICAL ABRASIVE FOR FLOOR FINISHING MACHINE

CROSS-REFERENCED TO RELATED APPLICATIONS

[0001] None

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

[0002] None

BACKGROUND OF THE INVENTION

I. Field of the Invention

[0003] This invention relates generally to motor powered floor finishing machines and, more particularly, to an improved abrasive for attachment to a drive plate for such machines, the abrasive being especially adapted for removing mastics, sealers, glue, or most any thin film topical coating from concrete floor surfaces.

II. Discussion of the Prior Art

[0004] The prior art includes many patents and publications describing tools for machining stone or concrete floors. Included are machines for grinding and polishing, as well as for milling or crushing floor surfaces. Further, there are machines especially adapted for cleaning concrete surfaces by removing coatings on them. Such machines typically carry one or more rotatably mounted, motor driven drive plates that, in turn, carry one or more abrasive elements attachable to the motor driven drive plate and adapted to be rotated in relation to a floor surface. The abrasive elements affixed to the drive disc typically include abrasive pads or bars that are made to engage the concrete surface as the drive plate is being driven and the machine is being moved across the floor surfaces. Typical of such patents are the Van Vliet U.S. Pat. No. 7,377,838, the Palushaj U.S. Pat. No. 7,690, 970 and the Anderson U.S. Pat. No. 7,563,156. A major manufacturer and supplier of concrete and stone grinding and polishing machines is Scanmaskin Sverige AB of Lindome, Sweden.

[0005] Prior art machines employ a wide variety of abrasive tools bonded, bolted or otherwise affixed to a circular disc where the abrasive tools have a planar floor-engaging surface. While such tools perform well as far as grinding and polishing concrete and stone floors, they tend not to be particularly effective in removing paint or glue that had been used in adhering commercial carpeting or tile to concrete floors. Once the carpeting or tile is removed, the underlying concrete floor retains a residue of adhesive material that must be removed prior to polishing the concrete floor.

[0006] It is the purpose of the present invention to provide an improved abrasive element attachable to a drive plate for a floor-finishing machine that is especially designed to aid in removing paint, mastic, glues, coatings, sealers, or adhesive residues that may be present on a hard surface.

SUMMARY OF THE INVENTION

[0007] In accordance with the present invention, a motorized floor finishing machine comprises one or more circular drive plates having a central hub projecting out from a first major surface of the circular plate and adapted to be attached

to a motor driven drive shaft. Attached to a second major surface of the circular plate is an abrasive assembly that may comprise a mounting bracket and an abrasive member affixed to the mounting bracket. Alternatively, the abrasive element may be directly attached to the drive plate. The abrasive member comprises a metal bar having a generally circular cross-section over a predetermined arc and where the metal bar has diamond particles adhered by brazing on its arcuate exterior surface.

[0008] It has been found that when cylindrical abrasive tools are mounted with their longitudinal axis parallel to the plane of the drive plate they are considerably more effective in grinding away thin coatings and adhesives than are conventional abrasive tools exhibiting a flat floor engaging surface.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] The foregoing features, objects and advantages of the invention will become apparent to those skilled in the art from the following detailed description of a preferred embodiment, especially when considered in conjunction with the accompanying drawings in which like numerals in the several views refer to corresponding parts.

[0010] FIG. 1 is a bottom plan view of a drive plate incorporating four abrasive assemblies;

[0011] FIG. 2 is a front view thereof; and

[0012] FIG. 3 is an exploded view of one of the abrasive assemblies shown in FIG. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENT

[0013] The description of the preferred embodiment is intended to be read in connection with the accompanying drawings, which are to be considered part of the entire written description of this invention. In the description, relative terms such as "lower", "upper", "horizontal", "vertical", "above", "below", "up", "down", "top", and "bottom", as well as derivatives thereof (e.g., "horizontally", "downwardly", "upwardly", etc.), should be construed to refer to the orientation as then described or as shown in the drawings under discussion. These relative terms are for the convenience of description and do not require that the apparatus be constructed or operated in a particular orientation. Terms, such as "connected", "connecting", "attached", "attaching", "join", and "joining", are used interchangeably and refer to one structure or surface being secured to another structure or surface or integrally fabricated in one piece, unless expressly described otherwise. As used herein, the term "floor treating machine" is meant to include floor grinding, floor polishing, floor burnishing, floor scrubbing and swing machines.

[0014] Referring to FIG. 1 and FIG. 2, there is indicated generally by numeral 10 one configuration of a drive plate for a concrete floor finishing machine such as a grinder or polisher. It is seen to comprise a steel plate 12 having a cylindrical hub 14 affixed to a first major surface 16 thereof where the hub 14 is adapted to receive a drive shaft of a motor for driving the drive plate 12 about a central axis of the hub 14.

[0015] The second major surface 18 of the drive plate 12 may have a plurality of symmetrically arranged recesses, as at 20, milled inward from the surface 18 to form pockets for

receiving abrasive assemblies **22** therein. Alternatively, the second major surface of the drive plate may be flat and void of pockets.

[0016] Referring to FIG. 3, there is illustrated an exploded view of one of the abrasive assemblies **22**. It is seen to comprise a bracket in the form of a metal plate **24** to which is attached an abrasive element **26**. In the drawings, the mounting bracket is shown as being somewhat V-shaped, but with a rounded vertex. However, the bracket shape can be changed along with the shape of the pockets in the drive plate. As seen in FIG. 3, rather than being a rectangular bar, as in the prior art, the abrasive element **26** is generally a right circular cylinder over a major portion of its circumference save for a flat area **28** which is adapted to abut the bracket **24**. As seen in FIG. 3, the abrasive element **26** is shown as being secured to the bracket **24** by screws **30** which pass through apertures **32** in the bracket and into threaded bores formed in the flat surface **28** of the abrasive element **26**. In use, the longitudinal axis of the abrasive element is parallel to the plane of the drive plate **12**. Those skilled in the art will appreciate that the abrasive elements **26** can also be directly affixed to the drive plate **12** without the use of a bracket.

[0017] The abrasive element itself preferably comprises a steel cylinder, the arcuate surface of which is covered by diamond crystals imbedded in a braze alloy which may be applied in the manner described in the Lowder et al U.S. Pat. No. 3,894,673.

[0018] Without limitation, the abrasive element **26** preferably comprises steel cylinder and may have a length dimension in a range of from 0.5 inch to 4 inch with a diameter in the range of 0.5 inch to 1.75 inch.

[0019] The abrasive assemblies **22** are shown mounted in the pockets **20** of the drive plate **12** by bolts **34**, which pass through apertures **36** drilled through the brackets **24** and into tapped holes (not shown) formed in the pockets of the drive plate **12**. As already mentioned, the abrasive elements can be directly bolted onto the drive plate **12**.

[0020] When removing mastic, sealers, glue, or most any thin film topical coating, one of the challenges is surface contact between floor and tool, which generates heat. This heat melts the surface coating, which gums up and clogs the abrasive tool.

[0021] The use of a cylindrical diamond coated surface reduces the contact area with the floor thereby reducing generated heat. Moreover, the active contact spot is in a line, or row of diamonds, which leads to the tool performing a cutting and scraping job as opposed to grinding, the former being more desirable for coating removal. This row of diamonds has a much greater number of cutting elements

than the surface of a conventional rectangular bar segment that has diamonds sporadically embedded and is therefore more efficient and effective.

[0022] Another advantage of the round, cylindrical tool is the wear pattern that occurs during use. As a rectangular bar segment wears, the full surface is in contact with the floor, which not only generates friction and heat, but also directs the abrasive action downwards as opposed to more laterally interfacing with the floor with a single row of diamonds as the tool wears out, as is the case with the cylindrical tool of the present invention.

[0023] This invention has been described herein in considerable detail in order to comply with the patent statutes and to provide those skilled in the art with the information needed to apply the novel principles and to construct and use embodiments of the example as required. However, it is to be understood that the invention can be carried out by specifically different devices and that various modifications can be accomplished without departing from the scope of the invention itself.

What is claimed is:

1. In a motorized floor finishing machine having at least one circular plate having a central hub projecting out from a first major surface of the circular plate and adapted to be attached to a motor driven drive shaft, the improvement comprising: an abrasive member attached to a second major surface of the circular plate, said abrasive member being a metal bar of a predetermined length and having a generally circular cross-section over a predetermined arc with diamond particles brazed on an exterior surface thereof and arranged such that when the abrasive member is attached to the circular plate, a longitudinal axis of the abrasive member is parallel to the plane of the circular plate.
2. The floor finishing machine of claim 1 and further including a mounting bracket for attaching the abrasive member to the circular plate.
3. The floor finishing machine of claim 2 wherein the abrasive member includes a planar surface with at least two threaded bores extending inward from the flat surface and is secured to the mounting bracket by bolts extending through apertures in the mounting bracket and into the threaded bores.
4. The floor finishing machine of claim 1 wherein the diamond particles have a grit in a range of from 16 to 400.
5. The floor finishing machine of claim 1 wherein the metal bar has a length in the range of from 0.5 inch (1.27 cm) to 4.0 inch (10.16 cm) and a diameter of 0.5 inch (1.27 cm) to 1.75 inch (4.45 cm).

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