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(54) **RIDE-ON ACTIVE PLANETARY CONCRETE GRINDER**

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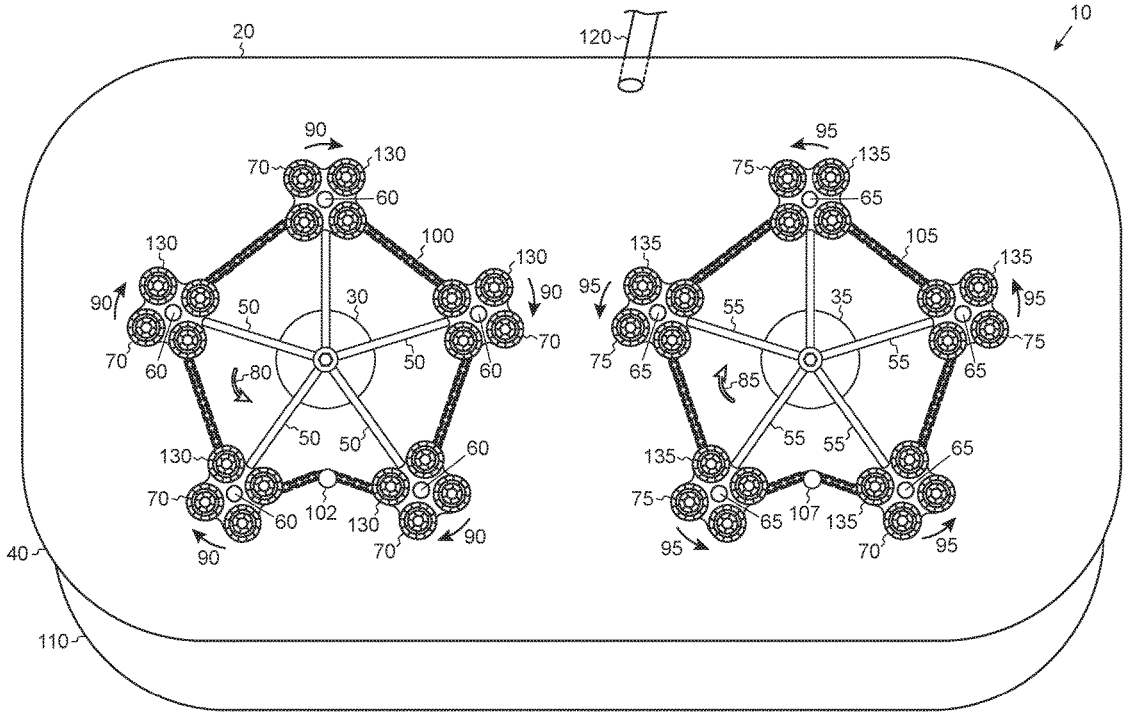
(57) **ABSTRACT**

The invention comprises a new and improved device, system and method of using a ride-on planetary power grinder that may utilize a ride-on power trowel having at least two rotors, at least three arms to the respective at least two rotors, and at least two head assemblies with at least two disc pads for grinding and or polishing.



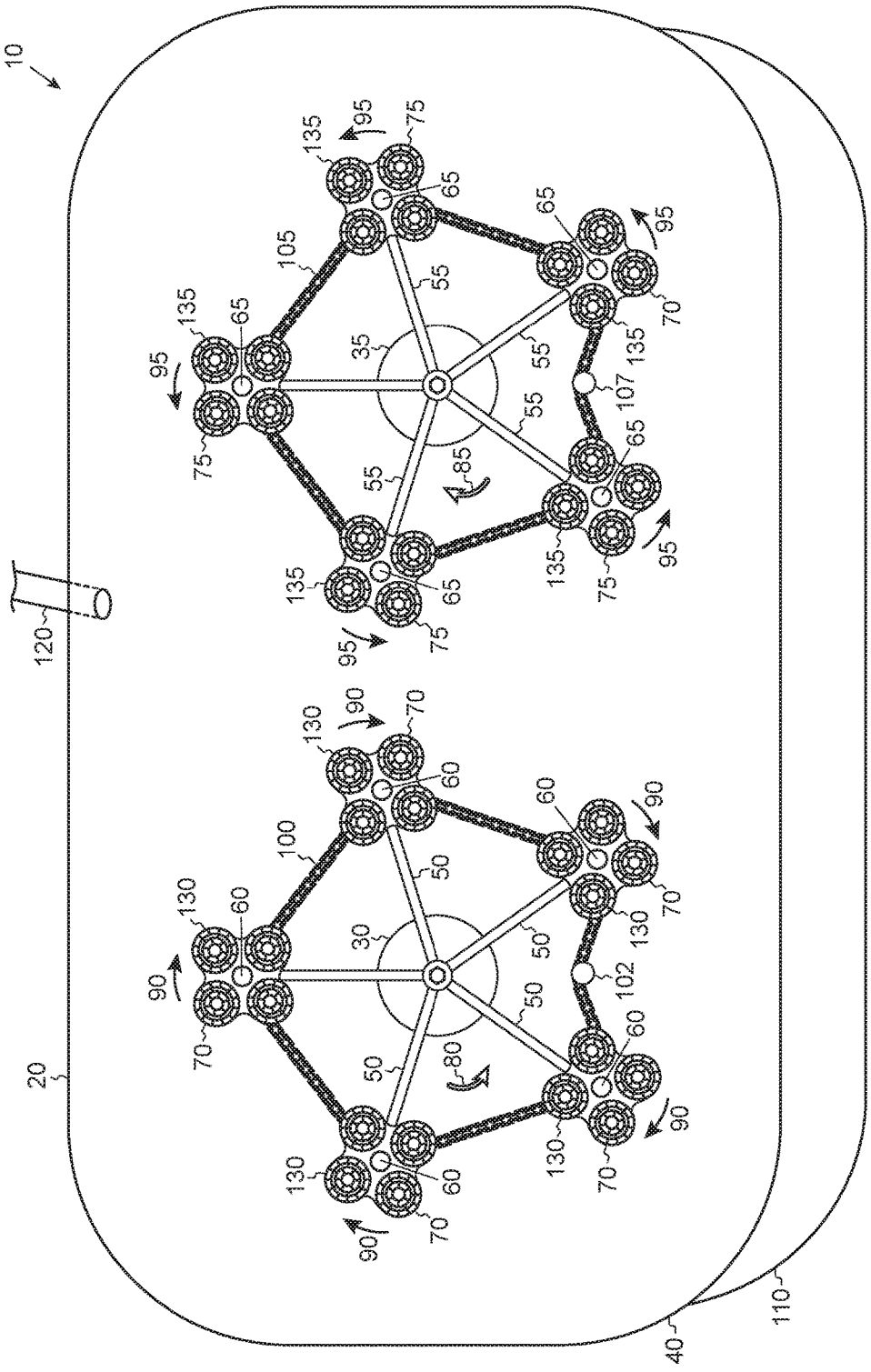

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FIG. 1

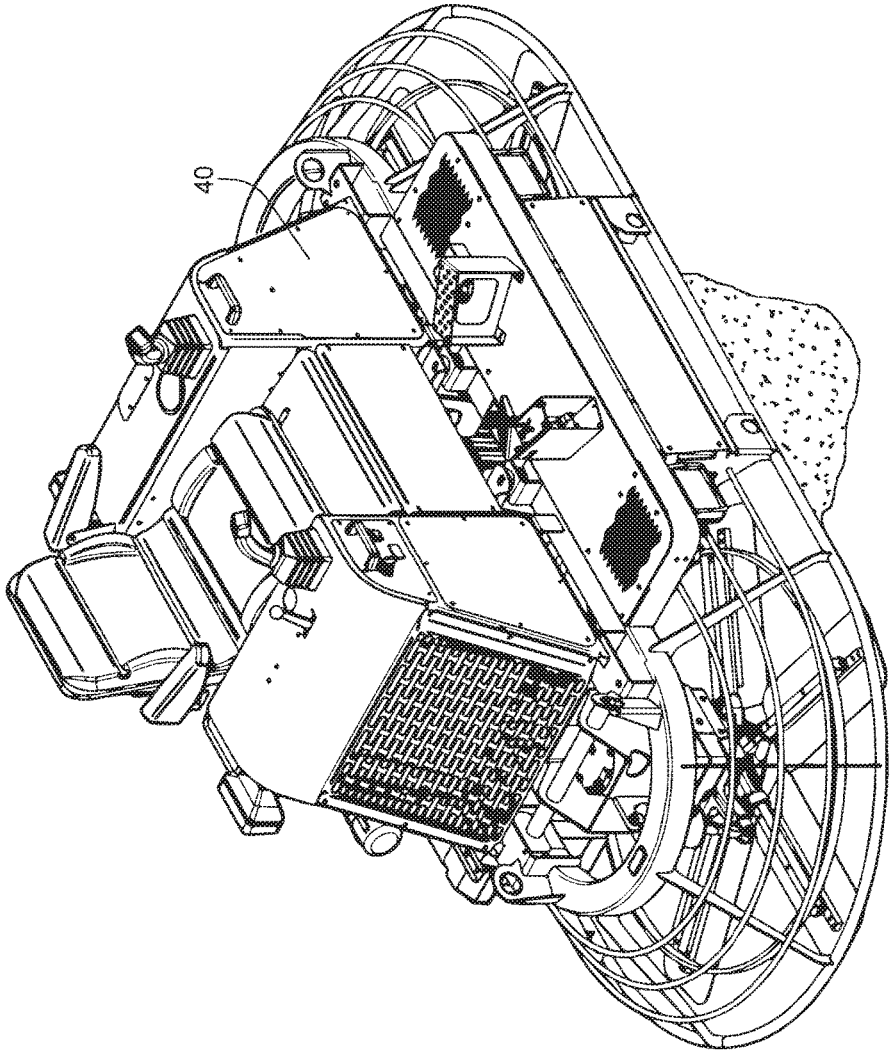

FIG. 2
(PRIOR ART)

RIDE-ON ACTIVE PLANETARY CONCRETE GRINDER

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] Priority is claimed from U.S. Provisional Patent Application Ser. No. 62/445,351 filed on Jan. 12, 2017 and incorporated by reference herein.

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0002] In general, the present invention relates to power grinders associated with grinding concrete slabs into a polished surface. More particularly, the present invention relates to a new and improved device, system and method of using active planetary discs with diamond tooling to be used on the bottom of a ride-on power trowel for grinding.

2. Description of the Prior Art

[0003] Large concrete slab construction, such as found in large warehouse, large "box" stores" and so forth, utilizes numerous types of industrial equipment where speed and efficiency is highly important. A power trowel is a piece of construction equipment used by construction companies and contractors, to apply a relatively smooth finish to concrete slabs, but does not grind or actually polish the surface. Power trowels are also known as a "power float", "helicopter", "trowel machine" or "whirlybird". A ride-on power trowel is a power trowel used by an operator sitting on a seat upon the machinery while controlling the power trowel. These typically have at least two downwardly projecting rotor assemblies utilizing blades that resemble fan assemblies. Ride-on power trowel machines typically range in size from approximately 6 feet to slightly more than 10 feet in width and may produce a troweled area of up to 40 square feet. The largest units weigh more than a ton and can finish about 30,000 square feet per day. These types of machines still leave a relatively rough surface, which is not always desirable.

[0004] If it is desired to have a more ornamental and smoother finish, the surface must be grinded and or polished. A type of grinder is known as a planetary grinder and it consists of a large main disc. Three smaller discs mount to the main disc, and these smaller discs turn at a different speed than the main disc. The smaller discs all lie along the same plane and make contact with the floor simultaneously, while the larger main disc lies on a different plane and does not make contact with the floor. These devices are also much smaller than a ride-on power trowel and do not serve the same function as a power trowel. Typically, they only have one rotor and are half to one third the size of a typical ride-on power trowel.

[0005] There are other power trowel attachments that allow diamond tooling to be used on the bottom of power trowels, but these prior art devices do not provide for active planetary grinding. These prior art devices either just attach to large radius plates and or attach to drivers that spin passively as the larger pan spins.

[0006] The current industry is constantly looking for effective, durable, and cost effective concrete construction devices, systems and methods for implementation of same. Thus, there is a need for a new and improved power grinder that has the size and power of a ride-on power trowel. The current invention provides a new and improved power grinder that utilizes the body of a ride-on power trowel where the prior art fails.

SUMMARY OF THE INVENTION

[0007] In view of the foregoing disadvantages inherent in the known types of power grinders now present in the prior art, the present invention provides a convenient, easily used, and durable construction device, system and method. As such, the general purpose of the present invention, which will be described subsequently in greater detail, is to provide a new and improved device, system and method of using active planetary discs with diamond tooling on a ride-on power trowel, which has all the advantages of the prior art and none of the disadvantages.

[0008] To attain such, the invention may include a new and improved device, system and method of using a ride-on power trowel converted from a blade formation typically associated with use as a trowel configuration into a large scale grinder configuration. The invention may have two main rotors that each may have at least three arms. Each arm may have head assembly, which may rotate opposite of the rotation of the main rotors and may have at least three abrasive disc pads. The rotation may be chain driven. The ride-on power trowel may also include a covered skirt and or water system.

[0009] There has thus been outlined, rather broadly, the more important features of the invention in order that the detailed description thereof that follows may be better understood and in order that the present contribution to the art may be better appreciated. There are, of course, additional features of the invention that will be described hereinafter and which will form the subject matter of the claims appended hereto.

[0010] In this respect, before explaining at least one embodiment of the invention in detail, it is to be understood that the invention is not limited in this application to the details of construction and to the arrangements of the components set forth in the following description or illustrated in the drawings. The invention is capable of other embodiments and of being practiced and carried out in various ways. Also, it is to be understood that the phraseology and terminology employed herein are for the purpose of description and should not be regarded as limiting. As such, those skilled in the art will appreciate that the conception upon which this disclosure is based may readily be utilized as a basis for the designing of other structures, methods, and systems for carrying out the several purposes of the present invention. It is important, therefore, that the claims be regarded as including such equivalent constructions insofar as they do not depart from the spirit and scope of the present invention.

[0011] Further, the purpose of the foregoing abstract is to enable the U.S. Patent and Trademark Office and the public generally, and especially the engineers and practitioners in the art who are not familiar with patent or legal terms or phraseology, to determine quickly from a cursory inspection the nature and essence of the technical disclosure of the application. The abstract is neither intended to define the invention of the application, which is measured by the claims, nor is it intended to be limiting as to the scope of the invention in any way.

[0012] Therefore, it is an object of the present invention to provide a new and improved ride-on power grinder that has the power and size of a ride-on power trowel with a two rotor system and provides active planetary discs whereby the outside attachments spin in the opposite direction of the larger drive plane.

[0013] It is a further object of the present invention to provide a new and improved ride-on power grinder, which is of a durable and reliable construction and may be easily and efficiently utilized, manufactured and marketed.

[0014] An even further object of the present invention is to provide a new and improved ride-on power grinder, which is susceptible to a low cost of application with regard to both materials and labor, and which accordingly is then susceptible to low prices of sale to the consuming industry, thereby making such invention economically available to those in the industry and public in general.

[0015] Still another object of the present invention is to provide a new and improved ride-on power grinder, which provides all of the advantages of the prior art, while simultaneously overcoming some of the disadvantages normally associated therewith.

[0016] While still another object of the present invention is to provide a new and improved ride-on power grinder that is ideal for large concrete slabs where it is desirable to have an ornamental and or smoother surface than unpolished concrete surfaces.

[0017] It is a further object of the present invention to provide a new and improved ride-on power grinder, which may be utilized with a water source and or dry applications.

[0018] Furthermore, it is a further object of the present invention to provide a new and improved ride-on power grinder where the abrasive disk pads rotate counter to the rotation of the drive rotors.

[0019] Yet another object of the present invention is to provide a new and improved ride-on power grinder that may be converted from prior art ride-on trowels.

[0020] Still another object of the present invention is to provide a new and improved ride-on power grinder that reduces drag on the tooling, which may reduce and or eliminate irregular scratching on the surface as well as bring the floor to maximum refinement at a much faster rate.

[0021] These, together with other objects of the invention, along with the various features of novelty, which characterize the invention, are pointed out with particularity in the claims annexed to and forming a part of this disclosure. For a better understanding of the invention, its operating advantages, and the specific objects attained by its uses, reference should be had to the accompanying drawings and descriptive matter in which there are illustrated preferred embodiments of the invention.

[0022] The present invention referred to throughout may be embodied in other specific forms without departing from its spirit or essential characteristics. The described embodiments are to be considered in all respects only as illustrative and not restrictive. Furthermore, each of the methods that have been described should also be considered only as illustrative and not restrictive.

BRIEF DESCRIPTION OF THE PICTORIAL ILLUSTRATIONS, GRAPHS, DRAWINGS, AND APPENDICES

[0023] The invention will be better understood and objects other than those set forth above will become apparent when consideration is given to the following detailed description thereof. Such description makes reference to the annexed pictorial illustrations, graphs, drawings, exhibits and appendices wherein:

[0024] FIG. **1** is a general bottom view illustration of a preferred embodiment of the invention generally depicting the grinder assembly, skirt, and water source on the bottom of a converted ride-on power trowel.

[0025] FIG. **2** is a general front perspective view illustration of a prior art ride-on power trowel with prior art trowels attached.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0026] The current invention may be classified as a system, method, apparatus and or combinations thereof. The following detailed description does not define any aspect in a particular order of importance but rather attempts to organize the following for convenience only. Furthermore, it is contemplated that the invention may be utilized in other applications other than just concrete joint applications. The used terminology should not be considered limiting. It is further understood and contemplated that the current invention may be used in association with other applications and utilities.

[0027] Referring now to the drawings, wherein like reference numerals designate corresponding structure throughout the views, and referring in particular to FIG. **1** and FIG. **2**, reference numeral **10** generally refers to a new and improved construction system, method, apparatus, and or combinations thereof, hereinafter referred to collectively as invention **10**, in accordance with the present invention.

[0028] It is contemplated that invention **10** may include a ride-on power trowel body **40** as known in the art as having a skirt **20**, a first rotor **30** and a second rotor **35**. It is understood that invention **10** contemplates retro fitting existing ride-on power trowels and or manufacturing a device similar to the current ride-on power trowels with the embodiments of the current invention. It is also contemplated that invention **10** may include a kit for converting prior art ride-on power trowel into the current invention.

[0029] First rotor **30** may have arms **50** that rotationally connect to head assemblies **70** such as but not limited to shaft **60**. First rotor **30** head assemblies **70** may rotate in direction **80** while first rotor **30** may rotate in the opposite direction **90**. Head assemblies **70** may be chain **100** driven around rotatable sprocket **102** that may be fixed to the bottom of skirt **20**. It is understood that first rotor **30** direction **80** may be clockwise or counter clockwise and head assembly **70** direction **90** would be opposite. It is also understood that more or less arms **50** are contemplated as well as number of head assemblies **70**.

[0030] Second rotor **35** may have arms **55** that rotationally connect to head assemblies **75** such as but not limited to shaft **65**. Second rotor **35** head assemblies **75** may rotate in direction **85** while first rotor may rotate in the opposite direction **95**. Head assemblies **75** may be chain **105** driven around rotatable sprocket **107** that may be fixed to the bottom of skirt **20**. It is understood that second rotor **35** direction **85** may be clockwise or counter clockwise and head assembly **75** direction **95** would be opposite. It is also understood that more or less arms **55** are contemplated as well as number of head assemblies **75**.

[0031] It is also understood that first rotor **30** and second rotor **35** may generally rotate in opposite directions. Skirt **20** may be covered with a rubber cowling **110** and a water source **120** may be provided for the grinding and or polishing.

[0032] Head assemblies **70** and **75** may include respectively four disc pads **130** and or **135** that may be diamond tool pads and or other bonded abrasive as known in the art. It is understood that disc pads **130** and or **135** may be more or less than four and may be configured in numerous fashions and may be elongated clip for pads **130**. It is also understood that arms **50** and or **55** may be free spring rigid.

[0033] It is therefore contemplated that the current invention may be a planetary grinder and polisher for grinding and polishing cement slabs comprising a ride-on power trowel body with a skirt having a top and a bottom and further having; a first rotor assembly on said bottom of said skirt adapted to rotate in a clockwise direction having at least 3 arms each having a distal end with a rotationally attached head assembly adapted to spin counterclockwise and wherein said head assembly has at least three disc pads adapted to grind and polish cement; a first rotatable sprocket fixed on said bottom of said skirt; a first chain adapted to rotate said at least three assembly of said first rotor assembly in a counterclockwise direction and in communication with said first rotatable sprocket; a second rotor assembly on said bottom of said skirt adapted to rotate in a counter clockwise direction having at least 3 arms each having a distal end with a rotationally attached head assembly adapted to spin clockwise and wherein said head assembly having at least three disc pads adapted to grind and polish cement; a second rotatable sprocket fixed on said bottom of said skirt; and a second chain adapted to rotate said at least three assembly of said first rotor assembly in a clockwise direction and in communication with said first rotatable sprocket.

[0034] Changes may be made in the combinations, operations, and arrangements of the various parts and elements described herein without departing from the spirit and scope of the invention. Furthermore, names, titles, headings and general division of the aforementioned are provided for convenience and should, therefore, not be considered limiting.

I claim:

1. A planetary grinder and polisher for grinding and polishing cement slabs comprising:

a ride-on power trowel body with a skirt having a top and a bottom and further having;

a first rotor assembly on said bottom of said skirt adapted to rotate in a clockwise direction having at least 3 arms each having a distal end with a rotationally attached head assembly adapted to spin counterclockwise and wherein said head assembly has at least three disc pads adapted to grind and polish cement;

a first rotatable sprocket fixed on said bottom of said skirt;

a first chain adapted to rotate said at least three assembly of said first rotor assembly in a counterclockwise direction and in communication with said first rotatable sprocket;

a second rotor assembly on said bottom of said skirt adapted to rotate in a counter clockwise direction having at least 3 arms each having a distal end with a rotationally attached head assembly adapted to spin clockwise and wherein said head assembly having at least three disc pads adapted to grind and polish cement;

a second rotatable sprocket fixed on said bottom of said skirt; and

a second chain adapted to rotate said at least three assembly of said first rotor assembly in a clockwise direction and in communication with said first rotatable sprocket.

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