April 14, 1964 A. TOSETTI 3,128,581

FLOOR GRINDERS

Filed April 3, 1962

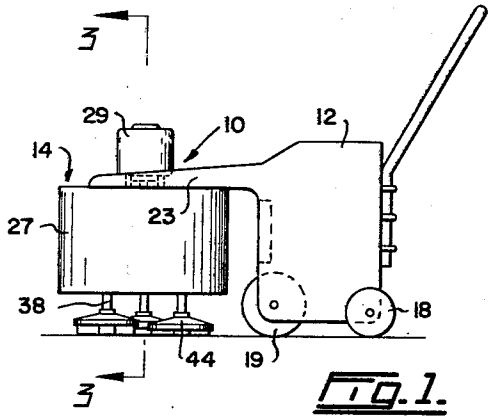


FIG. 1.

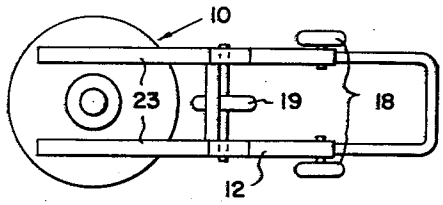


FIG. 2.

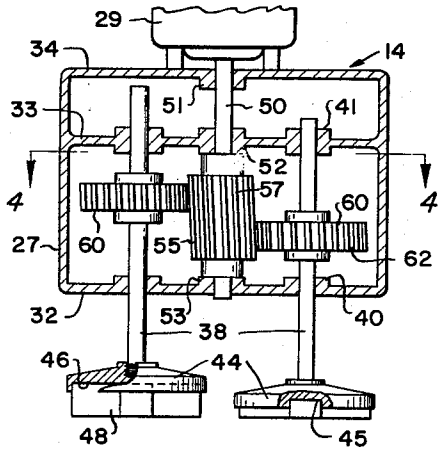


FIG. 3.

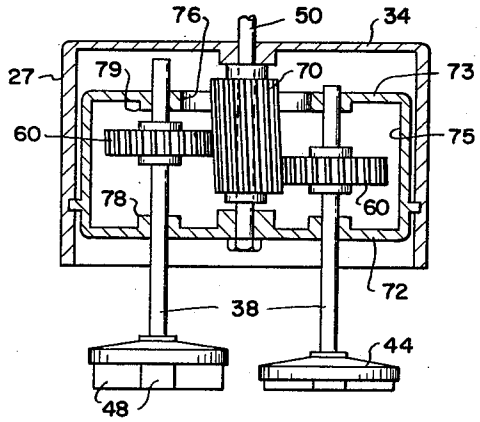


FIG. 6.

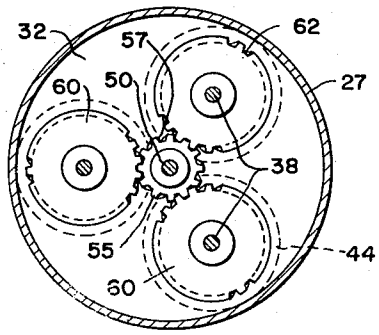


FIG. 4.

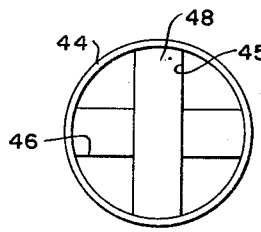


FIG. 5.

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United States Patent Office 3,128,581 Patented Apr. 14, 1964

3,128,581

FLOOR GRINDERS

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Filed Apr. 3, 1962, Ser. No. 184,793
10 Claims. (Cl. 51—177)

This invention relates to grinders for floors, such as terrazo, mosaic, granite and marble floors.

An object of the present invention is the provision of a floor grinder having a plurality of grinding elements, each including one or more standard grinding stones, and each moving downwardly independently of the others as the stones wear away.

Another object is the provision of a floor grinder including a plurality of independent grinding stones all fully bearing on the floor during operation of the machine regardless of the relative wear of said stones.

A further object is the provision of a floor grinding machine so constructed that each of a plurality of grinding stones thereof may be completely used up regardless of the degree of wear of the other stones.

Yet another object is the provision of floor grinding apparatus having a driving arrangement which not only turns a plurality of independent grinding elements, but also imparts a downward component to said elements during operation of the apparatus.

With these and other objects in view the present invention will now be described with reference to the accompanying drawings, in which:

FIGURE 1 is a reduced side elevation of a floor grinder according to this invention;

FIGURE 2 is a top plan view of this machine;

FIGURE 3 is an enlarged vertical section taken on the line 3—3 of FIGURE 1, illustrating a preferred driving arrangement for the grinding elements;

FIGURE 4 is a horizontal section taken on the line 4—4 of FIGURE 3;

FIGURE 5 is an enlarged bottom plan view of a grinding element or holder; and

FIGURE 6 is a view similar to FIGURE 3, illustrating an alternative driving arrangement.

Referring to FIGURES 1 and 2 of the drawings, **10** is a floor grinding machine including a suitable carriage **12** carrying or supporting a grinder **14**. In this example, carriage **12** has a pair of wheels **18** at the back end thereof and a single wheel **19** at its forward end midway between the sides thereof. Suitable supporting means, such as a pair of arms **23**, project forwardly from the carriage and carry the grinder **14**.

Grinder **14** includes a cylindrical casing **27** carried by arms **23** of carriage **12**. Suitable power means, such as an electric motor **29**, is suitably mounted on the top of casing **27**.

FIGURES 3 and 4 illustrate a preferred driving arrangement for grinding elements of grinder **14**. In this example, casing **27** is provided with a bottom **32** and a horizontal support or wall **33** spaced upwardly from said bottom but below the top **34** of the casing. One or more vertical shafts **38**, in this example there are three of these shafts, are each mounted for vertical and rotary movement in bearings **40** and **41** in bottom **32** and support **33**, respectively. A standard holder **44** is fixedly secured to the lower end of each shaft **38**. Each holder has the usual intersecting slots **45** and **46** opening downwardly therefrom into which one or more standard grinding stones **48** removably fit. These stones may be of any size, but the standard stone is usually about 2 inches by 2 inches by 8 inches. Different arrangements of the stones may be used in holder slots **45** and **46**. For example, one whole stone may be inserted in slot **45** and two lengths of stone inserted in slot **46** on the opposite

sides of slot **45**, or a length of stone may be inserted in the portions of each of the slots extending away from the centre of the holder. FIGURE 5 shows a full stone **48** in slot **45** and lengths of a stone in slot **46**.

Motor **29** has a drive shaft **50** extending downwardly therefrom through bearings **51**, **52** and **53** in casing top **34**, support **33** and bottom **32** centrally of casing **27**. A central gear **55** is fixedly mounted on shaft **50** between bottom **32** and support **33**. This gear is relatively wide, as clearly shown in FIGURE 3, and it is formed with teeth **57** that are inclined relative to the axis of the gear and shaft **50**. Each shaft **38** has a relatively narrow lateral gear **60** fixedly mounted thereon and meshing with central gear **55**. Each lateral gear **60** has teeth **62** which are inclined to correspond with the inclination of central gear teeth **57**. If desired, casing **27** may be filled with heavy oil or grease.

When motor **29** is operating, central gear **55** is rotated by shaft **50**. This in turn rotates the lateral gears **60**, shafts **38** and the grinder elements at the lower ends of said shafts formed by holders **44** and stones **48**. When machine **10** is in operation, the grinding stones **48** rest on the floor and keep shafts **38** and their respective gears **60** in proper position within the machine. As the stones wear away, shafts **38** and gears **60** move downwardly, said gears meshing with the central gear **55** at all times. Thus, the stone or stones of each holder wear away independently of those of the other holders so that each stone mantains full contact with the floor regardless of the wear thereof relative to the wear of the other stones. The stones of each holder **44** may be worn down as far as possible regardless of whether the stones of the other holders are new and/or partially worn down. Thus, the individual grinding elements of the shafts **38** move downwardly independently of each other. An important feature of this invention is that the inclination of teeth **57** and teeth **62** of the central and lateral gears impart a downward component to said lateral gears, shafts **38** and holders **44** with their stones **48**. The incline of the teeth is such that the central gear maintains a downward pressure on the lateral gears during the operation of the machine. This results in a downward pressure on the grinding stones making for more even and quicker grinding of the floor.

If desired, a small machine may be made with only one grinding element. This would function in the same manner as the machine described above. The central gear would impart a downward component to said grinding element, and the latter would move downwardly as the grinding stone wore away.

FIGURE 6 illustrates an alternative driving arrangement for shafts **38**, holders **44** and stones **48**. In this example, the bottom **32** and support **33** of casing **27** are omitted. A central gear **70** is fixedly secured to top **34** within and centrally of casing **27**. The motor shaft **50** extends through but is not connected to gear **70** and carries at its lower end a lower support **72** that is rotatable in casing **27** near the lower end thereof. An upper support **73** is located above support **72** and connected thereto to rotate therewith by a large collar **75**. Upper support **72** has a large central hole **76** therein so that said support surrounds but clears central gear **70**. Each vertical shaft **38** is mounted in bearings **78** and **79** carried by supports **72** and **73**, and is rotatable and vertically movable in said bearings.

The alternative machine of FIGURE 6 operates in the same manner as the machine described above, excepting that instead of motor shaft **50** rotating central gear **70**, it rotates supports **72** and **73** which, in turn, move shafts **38** circumferentially around said central gear. As lateral gears **60** mesh with gear **70**, they rotate at this time and

consequently rotate shafts 38, holders 44 and stones 48. Thus, the stones not only rotate around the vertical axes of shafts 38, but they move circumferentially around the common axis of gear 70 and shaft 50. If desired, this alternative may have only one shaft 38 and the elements associated therewith.

What I claim as my invention is:

1. In a machine for grinding floors, a central gear having teeth inclined in an axial direction, a plurality of floating vertical shafts arranged around and radially spaced from said central gear and mounted for rotary movement, a lateral gear having correspondingly inclined teeth fixedly mounted on each shaft and meshing with the central gear, said shafts and their respective lateral gears being free at all times during operation to move up and down, a grinding element mounted on a lower end of each vertical shaft and supporting the latter shaft and the lateral gear mounted thereon, and driving means for causing the vertical shafts and the grinding elements thereof to rotate, the incline of the teeth of the central and lateral gears being such as to impart under the action of said driving means a downward component to the lateral gears, shafts and grinding elements during rotation of said shafts.

2. A machine as claimed in claim 1 in which the central gear is wide enough to permit each lateral gear to move downwardly while continuing to mesh therewith a predetermined distance as the grinding element associated with each lateral gear wears away.

3. In a machine for grinding floors, a central gear having teeth inclined in an axial direction, a plurality of floating vertical shafts arranged around and radially spaced from said central gear and mounted for rotary movement, a lateral gear having correspondingly inclined teeth fixedly mounted on each shaft and meshing with the central gear, said shafts and their respective lateral gears being free at all times during operation to move up and down, a holder mounted on a lower end of each vertical shaft and adapted removably to hold a grinding stone projecting downwardly therefrom, said grinding stone supporting its holder, shaft and the lateral gear mounted on the latter, and driving means for causing the vertical shafts and holders to rotate, the incline of the teeth of the central and lateral gears being such as to impart under the action of said driving means a downward component to the lateral gears, shafts and holders during rotation of said shafts.

4. In a machine for grinding floors, a central gear having teeth inclined in an axial direction, a plurality of floating vertical shafts arranged around and radially spaced from said central gear and mounted for rotary movement, a lateral gear having correspondingly inclined teeth fixedly mounted on each shaft and meshing with the central gear, said shafts and their respective lateral gears being free at all times during operation to move up and down, a grinding element mounted on a lower end of each vertical shaft and supporting the latter shaft and the lateral gear mounted thereon, and power means connected to the central gear to rotate the latter gear and thereby rotate the lateral gears, vertical shafts and grinding elements, the incline of the teeth of the central and lateral gears being such as to impart under the action of said driving means a downward component to the lateral gears, shafts and grinding elements during rotation of said central gear.

5. In a machine for grinding floors, a central gear having teeth inclined in an axial direction, a plurality of floating vertical shafts arranged around and radially spaced from said central gear and mounted for rotary movement, a lateral gear having correspondingly inclined teeth fixedly mounted on each shaft and meshing with the central gear, said shafts and their respective lateral gears being free at all times during operation to move up and down, a grinding element mounted on a lower end of each vertical shaft and supporting the latter shaft and the lateral gear mounted thereon, and driving means for moving the vertical shafts circumferentially around the central gear to cause the lateral gears, shafts and grinding elements to rotate, the incline of the teeth of the central and lateral gears being such as to impart a downward component to the lateral gears, shafts and grinding elements during the circumferential movement of said shafts.

6. A floor grinder comprising a carriage, wheel means mounted on and supporting the carriage, a horizontal central gear mounted on the carriage and having teeth inclined in an axial direction, a plurality of floating vertical shafts arranged around and radially spaced from said central gear and mounted on the carriage for rotary movement, a lateral gear having correspondingly inclined teeth fixedly mounted on each shaft and meshing with the central gear, said shafts and their respective lateral gears being free at all times during operation to move up and down, a grinding element mounted on a lower end of each vertical shaft and supporting the latter shaft and the lateral gear mounted thereon, and driving means for causing the vertical shafts and the grinding elements thereof to rotate, the incline of the teeth of the central and lateral gears being such as to impart under the action of said driving means a downward component to the lateral gears, shafts and grinding elements during rotation of said shafts.

7. A floor grinder as claimed in claim 6 in which the central gear is wide enough to permit each lateral gear to move downwardly while continuing to mesh therewith a predetermined distance as the grinding element associated with each lateral gear wears away.

8. A floor grinder comprising a carriage, wheel means mounted on and supporting the carriage, a horizontal central gear mounted on the carriage and having teeth inclined in an axial direction, a plurality of floating vertical shafts arranged around and radially spaced from said central gear and mounted on the carriage for rotary movement, a lateral gear having correspondingly inclined teeth fixedly mounted on each shaft and meshing with the central gear, said shafts and their respective lateral gears being free at all times during operation to move up and down, a holder mounted on a lower end of each vertical shaft and adapted removably to hold a grinding stone projecting downwardly therefrom, said grinding stone supporting its holder, shaft and the lateral gear mounted on the latter, and driving means for causing the vertical shafts and holders to rotate, the incline of the teeth of the central and lateral gears being such as to impart under the action of said driving means a downward component to the lateral gears, shafts and holders during rotation of said shafts.

9. A floor grinder comprising a carriage, wheel means mounted on and supporting the carriage, a horizontal central gear mounted on the carriage and having teeth inclined in an axial direction, a plurality of floating vertical shafts arranged around and radially spaced from said central gear and mounted on the carriage for rotary movement, a lateral gear having correspondingly inclined teeth fixedly mounted on each shaft and meshing with the central gear, said shafts and their respective lateral gears being free at all times during operation to move up and down, a grinding element mounted on a lower end of each vertical shaft and supporting the latter shaft and the lateral gear mounted thereon, and power means on the carriage connected to the central gear to rotate the latter gear and thereby rotate the lateral gears, vertical shafts and grinding elements, the incline of the teeth of the central and lateral gears being such as to impart under the action of said driving means a downward component to the lateral gears, shafts and grinding elements during rotation of said central gear.

10. A floor grinder comprising a carriage, wheel means mounted on and supporting the carriage, a horizontal central gear mounted on the carriage and having teeth in-

clined in an axial direction, a plurality of floating vertical shafts arranged around and radially spaced from said central gear and mounted on the carriage for rotary movement, a lateral gear having correspondingly inclined teeth fixedly mounted on each shaft and meshing with the central gear, said shafts and their respective lateral gears being free at all times during operation to move up and down, a grinding element mounted on a lower end of each vertical shaft and supporting the latter shaft and the lateral gear mounted thereon, and driving means carried by the carriage for moving the vertical shafts circumferentially around the central gear to cause the lateral gears, shafts and grinding elements to rotate, the incline of the teeth of the central and lateral gears being such as to impart a downward component to the lateral gears, shafts and grinding elements during the circumferential movement of said shafts.

References Cited in the file of this patent

UNITED STATES PATENTS

835,631	Mooney et al.	Nov. 13, 1906
862,747	Miller	Aug. 6, 1907
1,694,738	Geary	Dec. 11, 1928
2,171,060	De Spirt	Aug. 29, 1937
2,289,117	Harrison	July 7, 1942
2,300,138	Steele	Oct. 27, 1942
2,680,260	Danielsson et al.	June 8, 1954
2,930,056	Loppin	Mar. 29, 1960

FOREIGN PATENTS

217,856	Australia	Feb. 7, 1957

OTHER REFERENCES

Schottle et al., 1,091,302, printed Oct. 20, 1960, German application (Kl. 34c 5/04), 2 pp. spec., 1 sheet dwg.