May 8, 1934. P. VINELLA 1,958,077

FLOOR SURFACING MACHINE

Filed Jan. 2, 1932 3 Sheets-Sheet 1

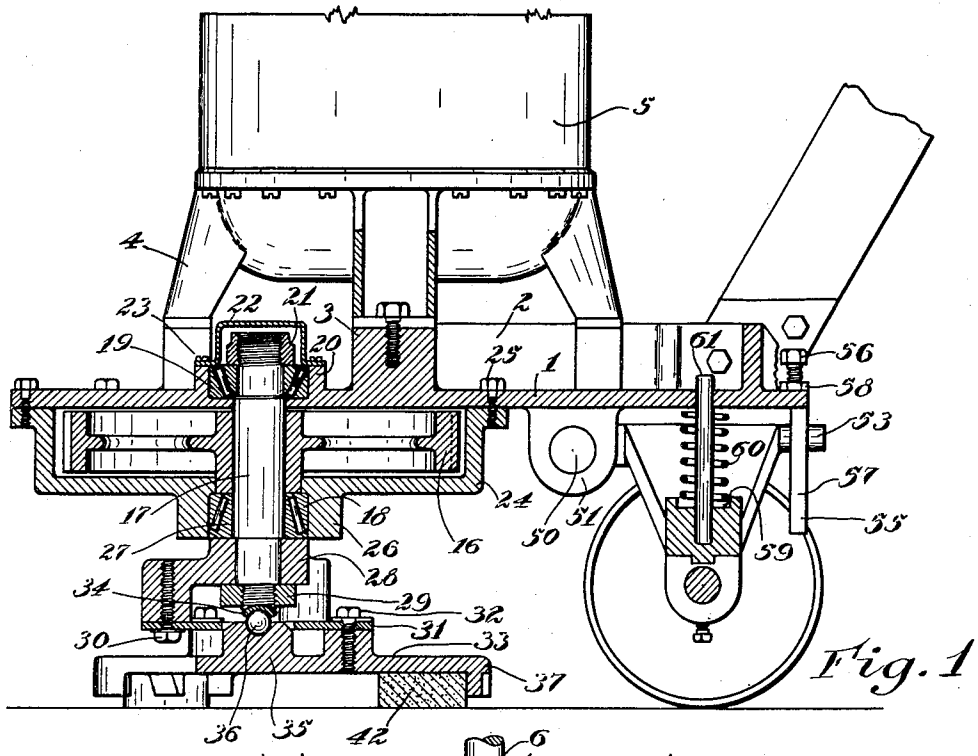


Fig. 1

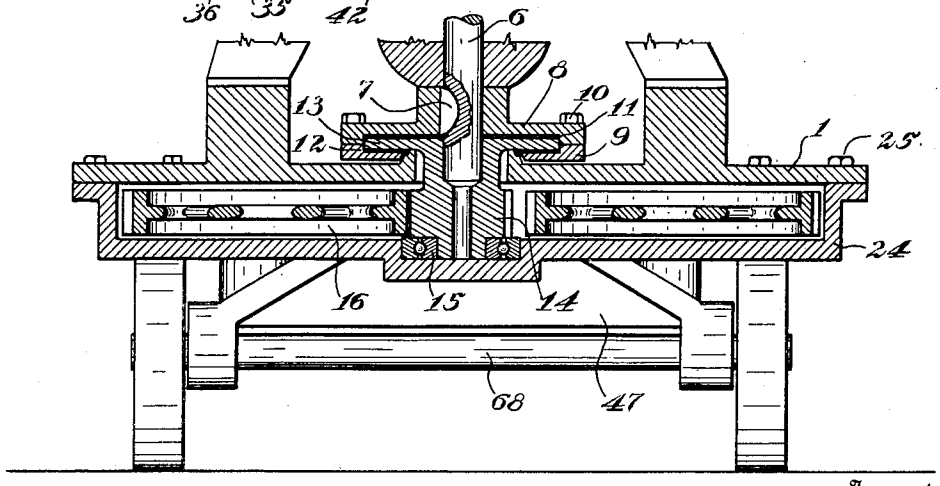


Fig. 2

Inventor

Peter Vinella

By D. O. Johnson

Attorney

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FLOOR SURFACING MACHINE

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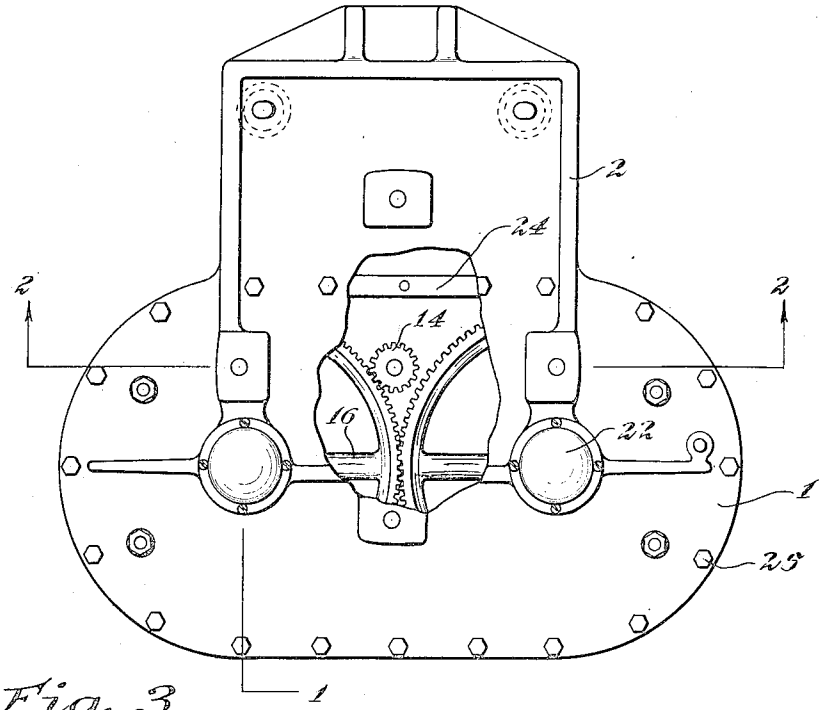


Fig. 3

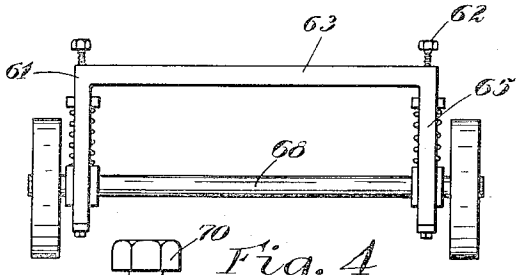


Fig. 4

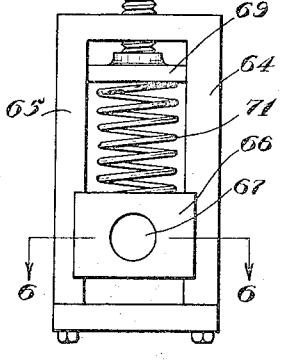


Fig. 5

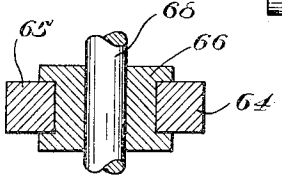


Fig. 6

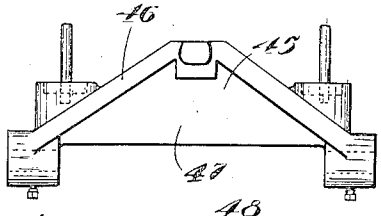


Fig. 7

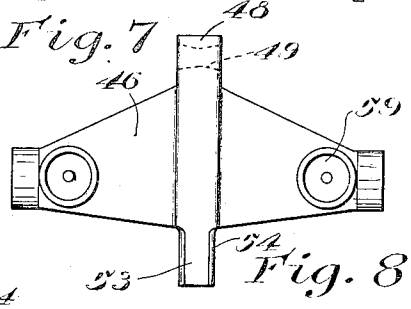


Fig. 8

Inventor

Peter Vinella

By D. S. Johnson

Attorney

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FLOOR SURFACING MACHINE

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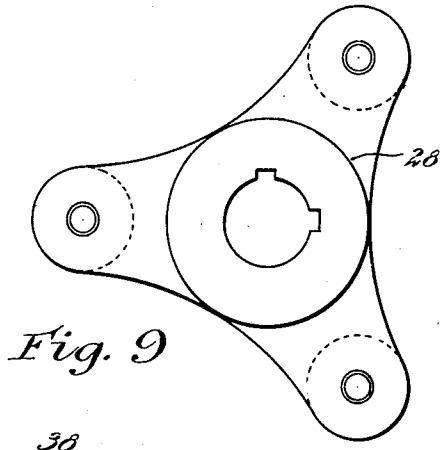


Fig. 9

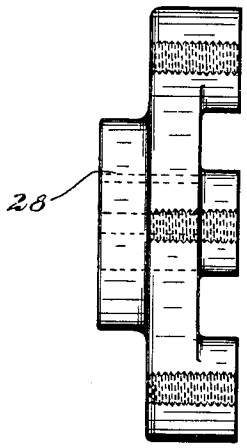


Fig. 10

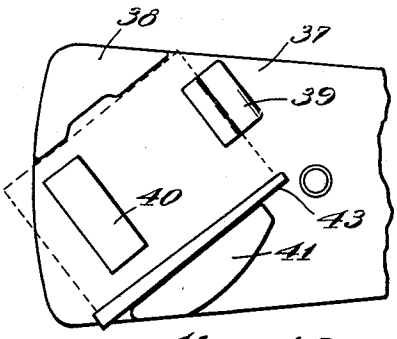


Fig. 12

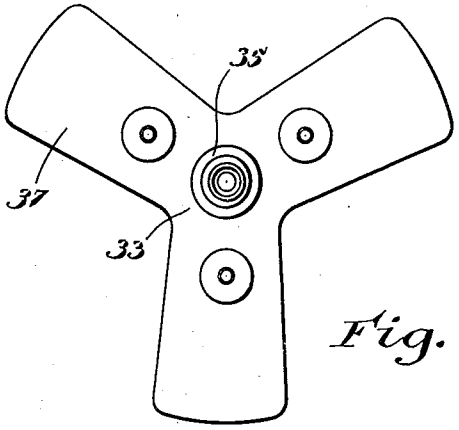


Fig. 11

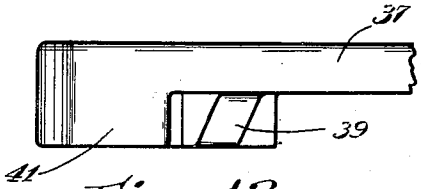


Fig. 13

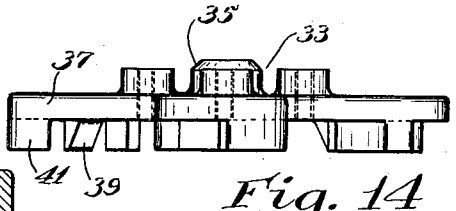


Fig. 14

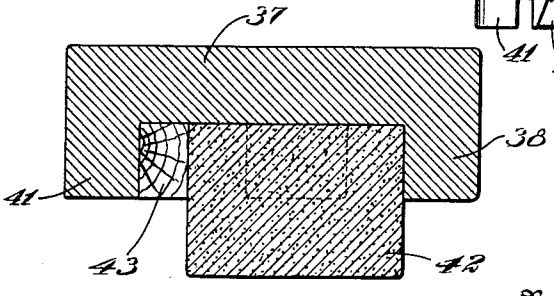


Fig. 15

Inventor

Peter Vinella

By

Attorney

Patented May 8, 1934 1,958,077

UNITED STATES PATENT OFFICE

1,958,077

FLOOR SURFACING MACHINE

Peter Vinella, Minneapolis, Minn.

Application January 2, 1932, Serial No. 584,408

2 Claims. (Cl. 51—177)

The present invention relates to a terrazzo floor grinding mechanism.

In the grinding of terrazzo floors it sometimes happens that a pipe or other object is imbedded in the flooring material and projects upwardly therefrom. If the rotating grinding heads of a terrazzo floor grinding mechanism are inadvertently moved so as to strike such an object, it usually causes a breakage of some portion of the machine, usually stripping of the driving gear between the motor and the grinding head.

An object of the present invention is to make an improved and simplified terrazzo floor grinding mechanism.

In order to attain this object, there is provided, in accordance with one feature of the invention, a motor mounted upon a supporting frame and connected by means of a friction clutch to a grinding head driving gear encased in a gear housing formed integrally with a supporting frame. This grinding head driving gear is in meshed engagement with a second grinding head driving gear, also encased in said gear housing. A laterally tilting wheeled carriage is secured to the frame and held in position by means of springs in accordance with one embodiment of the invention, while a modified form of the invention comprises a rigid carriage with a wheel axle resiliently supported therein and provided with adjusting means by means of which the tension on the wheels may be controlled.

These and other features of the invention will be more fully brought out in the following description and the accompanying drawings, wherein:

Figure 1 is a longitudinal sectional view through a mechanism embodying the invention, the line of section being indicated by the line 1—1 on Figure 3, the upper portion of a driving motor and of a handle being broken away.

Figure 2 is a transverse vertical sectional view on the line 2—2 of Figure 3, the upper portion of the motor being broken away.

Figure 3 is a top view of the device with the motor removed and a portion of a frame plate broken away to show the gear arrangement.

Figure 4 is a view in front elevation of a modified form of a carriage.

Figure 5 is an enlarged end view of the carriage shown in Figure 4 with the wheels and axles removed therefrom.

Figure 6 is a sectional view on the line 6—6 of Figure 5, showing the axle in place.

Figure 7 is a view in rear elevation of a preferred form of supporting carriage.

Figure 8 is a top view of the carriage shown in Figure 7.

Figure 9 is a top view of a driving spider for a grinding head.

Figure 10 is a side view of the spider shown in Figure 9.

Figure 11 is a top view of a grinding head.

Figure 12 is a lower view of one of the arms of the grinding head shown in Figure 11.

Figure 13 is a side view of the arm shown in Figure 12.

Figure 14 is a side view of the spider shown in Figure 11; and

Figure 15 is a sectional view on the line 15—15 of the arm shown in Figure 12 as it would appear with a grinding stone in position therein.

Referring to the drawings in detail, a plate 1, preferably of cast metal, has a rim 2 cast integrally therewith around the sides and rear end thereof to act as a reinforcement and to serve as a tool holder for the tools necessary in operating the machine. Four motor support bosses 3 are cast integrally with this plate to extend upwardly therefrom and upon the bosses are bolted legs 4 which support a driving motor 5. The shaft 6 of the driving motor has keyed thereto, as by means of a Woodruff key 7, a disk 8 having a downwardly projecting flange around the periphery thereof. An annular member 9 of the same diameter as the disk 8 is bolted thereto by means of bolts 10 around the periphery of these members. A clutch facing disk 11 of suitable material such as that used in brake linings and a second member 12, of similar material, are mounted, one above and one below a clutch disk member 13, so as to frictionally grip the clutch disk member and cause it to normally rotate with the member 8 and the member 9. The lower end of the motor shaft 6 is mounted in a recess in the upper portion of the member 13 so as to be rotatable therein, although it is apparent that normally the shaft 6 will rotate the member 13, due to the frictional engagement of the clutch plate 13 by the members 8 and 9. Formed integrally with the clutch plate 13 is a pinion 14, the lower end of which is rotatably mounted in a ball bearing 15. The pinion 14 is in driving engagement with a grinding head drive gear 16, which is mounted upon a shaft 17 which is rotatably mounted on roller bearings 18 and 19. The upper roller bearing 19 is mounted in a cup-shaped depression formed by an annular ridge 20 on the top of the upper plate 1, and a nut 21 is threaded onto the upper end of the shaft 17 to hold the roller

bearing in position. A cap 22 is mounted on the annular ridge 20 and covers the upper end of the shaft 17 to protect it from dust. This cap is held in position by means of screws 23. A gear housing member 24, preferably of cast metal, is secured to the lower face of the front portion of the frame plate 1 and is bolted thereto as by means of bolts 25. A gasket, not shown, which may be of paper or other suitable material, provides a grease-tight seal between the frame plate 1 and the gear housing member 24. A pair of annular recesses 26 are provided in the lower face of the gear housing 24, and in these are mounted roller bearings in which the shafts 17 are rotatably mounted. A three-armed spider 28, shown in detail in Figures 9 and 10, is keyed to the lower end of the shaft 17 and is held in position thereon by means of a nut 29. The arms of the spider 28 are connected as by means of screws 30 to a flexible disk 31 to the lower surface of which is connected, as by means of cap screws 32, a grinding head 33. This construction provides a flexible driving connection between the spider 28 and the grinding head 33. The lower end of the shaft 17 is provided with a recess lined with bearing metal 34 and the upper portion of a raised central portion 35 of the grinding head is also provided with a cup-shaped recess in which is mounted a bearing ball 36 which seats in the recess in the lower end of the shaft 17. This provides a universal connection between the shaft 17 and the grinding head 33 with the ball connection taking the thrust to which the joint is subject in use. Each of the arms 37 of the grinding head is provided with downwardly projecting portions 38, 39, 40, and 41 (see Figure 12), which are positioned to receive a grinding stone 42 therein, the grinding stone being securely locked in position as by means of a wooden wedge 43 driven between the member 41 and the grinding stone 42.

A wheel support for the rear of the machine frame member 45, preferably of cast metal, having downwardly sloping and tapering side portions 46, with a transversely positioned vertical reinforcing rib 47 formed integrally therewith. A forwardly projecting portion 48 is provided with a transverse opening 49 therethrough. This opening is tapered outwardly both ways from its center so as to permit a limited lateral tilting of the carriage with respect to a pin 50 (see Figure 1). The forwardly projecting portion 48 is mounted between a pair of lugs 51 and a shaft 52 of a diameter equal to the smallest diameter of the opening 49 and secures the portion 48 in position between these lugs. The member 48 is constructed to have a loose fit between the lugs 51 so as to permit a limited amount of lateral tilting movement between the frame 1 and the member 45. A portion 53 projects rearwardly from the member 45 and is provided with curved side portions 54. This rearwardly projecting portion is mounted to be free for vertical slidable movement in a slotted opening 57 in a downwardly projecting portion 55 of the frame member 1. A bolt 56 having threaded engagement with the frame member 1 extends downwardly into the upper end of the slotted opening 57 to limit the upward movement of the portion 53 therein. A locknut 58 is threaded onto the bolt 56 to secure the bolt in adjusted position. A pair of annular recesses 59 are provided, one on each side of the member 45 to receive coil springs 60 therein. A pin 61 is mounted in the center of each of the recesses 59 and extends upwardly through slotted openings in the plate 1. The coil springs 60 rest against the lower surface of the plate 1 and tend to keep the plate 1 normally level. When an uneven portion of floor is encountered during a grinding operation, the springs permit a limited lateral tilting of the frame with respect to the wheels, so that the grinding heads remain in alinement with the floor surface.

A modified form of carriage is shown in Figures 4, 5, and 6. In this construction a frame 61 has a transverse upper portion 63 which is firmly bolted to the lower surface of the plate 1, as by means of bolts 62. From each outer end of the transverse portion 63 are a pair of downwardly projecting arms 64 and 65 in parallel, spaced relation. A slidable block 66 is mounted between each of these pairs of arms, each of these blocks being provided with an opening 67 in which an axle 68 is mounted. A slidable plate 69 is swiveled to a bolt 70 threaded through each end of the member 63 between the arms 64 and 65. A coil spring 71 is mounted to be held in compression between each of the plates 69 and the blocks 66 to resiliently position the axle 68.

I claim:

1. A floor grinding mechanism having a frame, a pair of oppositely rotatable grinding heads mounted thereon, power drive means mounted on said frame and operatively associated with said grinding heads to rotate said heads in opposite directions upon energization of said drive means, a laterally tiltable and vertically adjustable wheeled carriage mounted to partially support said power drive means, and resilient means mounted between said carriage and said frame to normally hold said frame in lateral alinement with the base of said wheeled carriage.

2. In a terrazzo floor grinder having a frame, a pair of oppositely rotatable grinding heads carried thereby, and power drive means operatively connected to said grinding heads; a wheeled supporting structure comprising a transversely disposed pivot member, a wheel support member pivotally mounted thereon with freedom for limited lateral tilting movement, a vertically slotted opening positioned rearwardly from said pivot member, a projection carried by said wheel support member positioned to ride in said slotted opening, adjusting means mounted to limit the movement of said projection in said slot, spring means mounted to resiliently maintain said wheel support member in a laterally equalized position with respect to said frame, and a pair of wheels rotatably mounted, one on each side of said wheel support member.

PETER VINELLA.