July 13, 1926. 1,591,997

M. G. POND

FLOOR SURFACING MACHINE

Filed Oct. 6, 1924 2 Sheets-Sheet 1

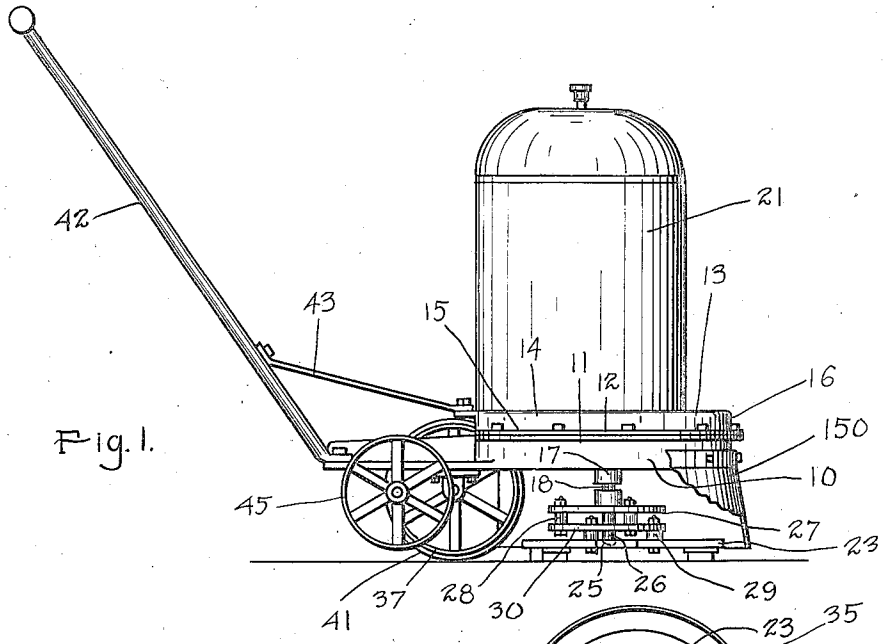


Fig. 1.

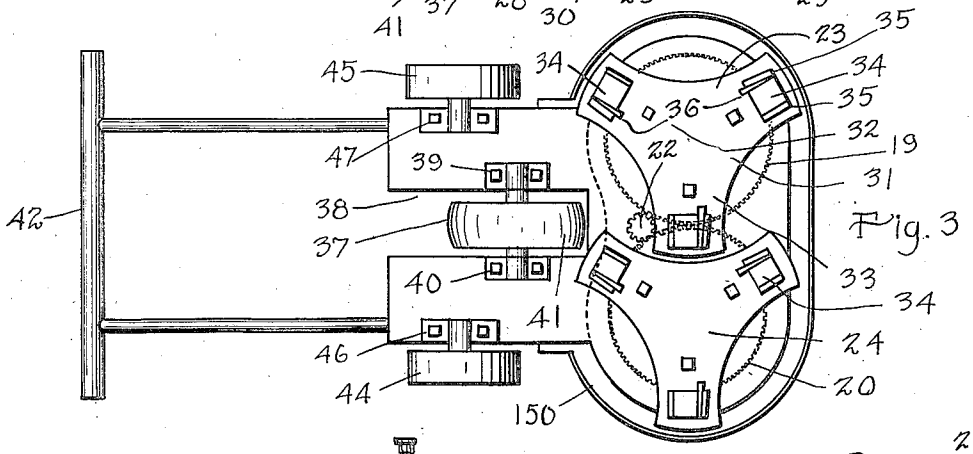


Fig. 3

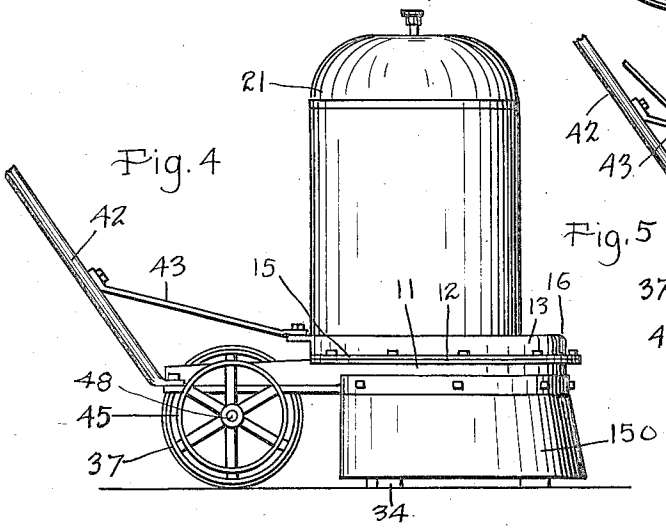


Fig. 4

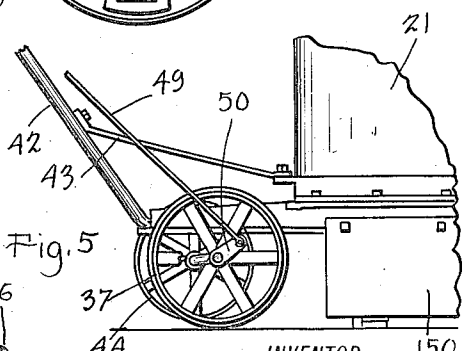


Fig. 5

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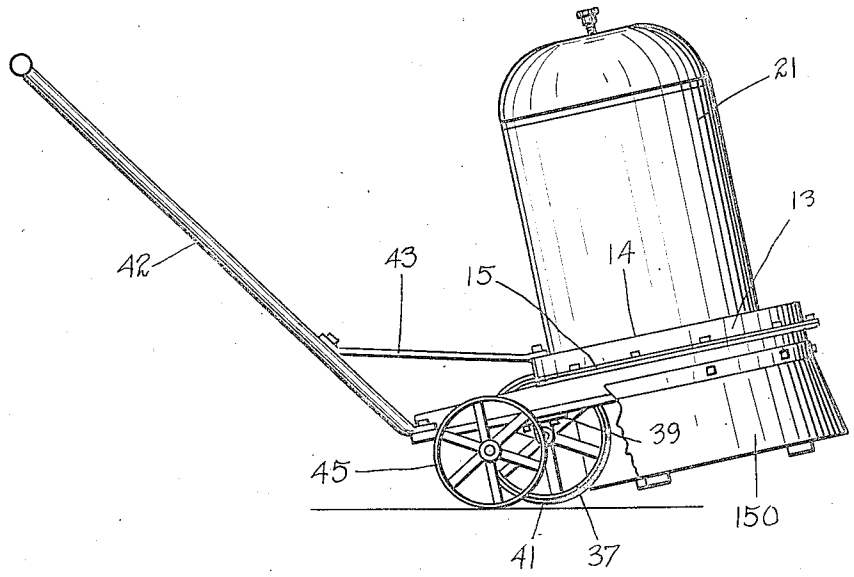


Fig. 2

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UNITED STATES PATENT OFFICE.

MERRITT G. POND, OF MINNEAPOLIS, MINNESOTA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO ADVANCE MACHINE CO., INC., OF MINNEAPOLIS, MINNESOTA, A CORPORATION OF MINNESOTA.

FLOOR-SURFACING MACHINE.

Application filed October 6, 1924. Serial No. 741,991.

My invention relates to floor surfacing machines and has for its object to provide a machine adapted to adjust itself to the contour of the floor upon which it is being used, so as to give uniform pressure throughout the grinding surface of the device.

Another object resides in providing two intermeshing plates having grinding elements thereon, which plates are driven by intermeshing gears, one of which is driven from a pinion secured to the shaft of a motor.

A still further object is to provide universal joints between the grinding plates and their driving elements, so that the same bear down uniformly upon the surface to be ground.

Another feature of the invention resides in providing a single supporting wheel in conjunction with the frame of the device and said grinding disks which carries a portion of the weight of the device and also permits of readily directing and steering the machine.

Another object of the invention consists of providing auxiliary supporting wheels which when the device is in operative position are not in engagement with the floor but which upon raising the grinding disks away from the floor, come into engagement wherewith to assist in supporting the structure in conjunction with said single wheel, or independently thereof if desired.

Other objects of the invention reside in the detailed construction thereof as disclosed in the following drawing, specification and claims.

In the drawings illustrating my invention in one form:

Fig. 1 is a side elevational view of my invention in operative position with a portion removed.

Fig. 2 is a view similar to Fig. 1 showing the same device with the grinding members in disengagement with the floor.

Fig. 3 is a bottom view of the device shown in Fig. 1.

Fig. 4 is a view similar to Fig. 1, illustrating a modification of the invention.

Fig. 5 is a fragmentary view of a modification of the invention.

In floor surfacing machines where a number of rotary grinding members are used, it is highly essential that uniform pressure be had upon all of the members, in order that a uniform cut be taken for the entire width of the cutting surface. At the same time it is desirable to provide auxiliary supporting means which permit of lateral adjustment so that the grinding members may properly adjust themselves to cut uniformly across the width of the grinding surface. I accomplish these results by employing a single supporting wheel having preferably a crowned or a narrow face and also in using in conjunction therewith auxiliary supporting wheels which are adapted to come into engagement with the floor when the machine is swung on the single wheel to bring the grinding surfaces out of engagement with the ground as becomes essential in the transporting of the machine from one locality to another.

In the drawings in Figs. 1, 2 and 3, I have shown a supporting frame —10— substantially planiform in formation which is provided with an upturned edge —11— having an outwardly extending flange —12—. Upon this frame —10— is positioned a cover —13— having a downwardly extending edge —14— formed with a flange —15— which is adapted to rest upon the flange —12—, and is bolted thereto. By means of this construction an enclosure or casing is formed which is indicated in its entirety at —16— and which contains the gearing for driving the grinding plates as will be presently described.

On the under side of the frame member —10— is formed two spaced bearings —17— in which are journalled shafts —18—. These shafts extend up into the casing —16— and have attached to them a pair of intermeshing gears —19— and —20—. On the top of cover —13— is positioned an electric motor —21— which has a pinion —22— secured to the end of its driving shaft. This motor is of the vertical type and the pinion —22— extends down into the casing —16— where it meshes with the gear —20— already referred to. By this means the two shafts —18— are driven in opposite directions at a greatly reduced speed.

Upon the ends of the shafts —18— are mounted two grinding plates —23— and —24— which are attached thereto as follows. In the center of each of these plates is

formed a hollow socket —25— in which is seated a lug —26— attached to the end of shaft —18— in any suitable manner and which is rounded at its end to fit into said socket. Securely fastened to the shafts —18— are flanges —27— which are spaced from the gears —19— and —20—. These flanges carry three equi-spaced studs —28— which are attached to flexible disks —30— positioned midway between the flanges —27— and the plates —23— and —24—. In a similar manner a corresponding number of studs —29— are employed which are attached to the plates —23— and —24— and to the disks —30— in staggered relation to the studs —28—. In this manner the thrust or force imparted to the plates —23— and —24— is transmitted through the lugs —26— and sockets —25— in said plates while a universal rotary motion is given said plates through disks —30— and the structure attached thereto which serve as universal joints in driving said plates.

For grinding purposes the plates —23— and —24— are each formed with three outwardly extending arms —31— —32— and —33— which intermesh each other as best shown in Fig. 3. These arms carry carborundum stones —34— which are held in place between ridges —35— formed on said plates, by means of wedges —36— securely driven between said ridges and stones. As the motor —21— rotates, the plates —23— and —24— rotate in opposite directions, the stones —34— grinding the surfaces with which they come in contact. It will be noted that the stones on one plate travel in a path overlapping those in the other plate so that a cut is secured which extends throughout the entire width of the combined grinding plates.

As can be seen in Fig. 1, the device is supported on a single wheel —37— as well as the grinding plates —23— and —24— when in its operative position. A recess —38— is formed in the frame —10— between which this wheel is positioned, bearings —39— and —40— secured to the under side of said frame, serving as journals for the axle of said wheel. To permit the plates —23— and —24— to follow the contour of the floor, the wheel —37— is formed with a crowned face —41— or the same may be made quite narrow.

In moving the device a handle —42— is provided which is attached to the frame —10— and braced by braces —43— to the cover —13—. By this means the entire machine may be guided about the floor while the grinding or surfacing is taking place.

When it is desired to disengage or raise the grinding plates —23— and —24— from the floor, the entire machine is swung back on the wheel —37— as shown in Fig. 2. To prevent the machine from toppling over, two auxiliary wheels —44— and —45— are employed which have their axes in about the same plane above the floor as wheel —37— but which wheels are of lesser diameter so that the same do not normally engage the floor while the machine is in operation. These two wheels are journalled in bearings —46— and —47— which are rearwardly positioned relative to wheel —37— and which are attached to the underside of frame —10— the same as bearings —39— and —40—. As the handle —42— is lowered, these wheels engage the floor which steadies the machine and permits the same to be wheeled about from place to place. When it is desired to replace the grinding stones —34— the handle —42— is lowered until it touches the floor which gives free access to the underside of the machine.

In Fig. 4, I have shown a modification of the invention in which the wheels are all mounted on a single shaft —48—. In this case the wheels —44— and —45— are also smaller than the wheels —37— so that in operation these wheels do not engage the floor. As soon as the machine is tipped up, one or the other of these wheels comes into engagement with the floor to assist in supporting the machine, the machine tilting a little to one side or the other.

If desired the wheels —44— —45— and —37— may be mounted on a single axle —51— and the wheels —44— and —45— eccentrically positioned thereon relative to wheel —37— as shown in Fig. 5. By manipulating a lever —49— pivoted to an arm —50— secured to shaft or axle —51— the same can be rotated to bring the wheels —44— and —45— in engagement with the ground.

My invention is advantageous in that it provides a simple and efficient construction. By employing a single supporting wheel the machine automatically adjusts itself to the contour of the floor thereby smoothly and uniformly grinding the same. There are a minimum number of parts to get out of order and the machine is so designed that the weight of the motor serves to bear down upon the grinding plates when in operation and to hold the structure in raised position when the handle has been tilted back.

Having described my invention in a particular form and having disclosed the same as applicable to a single use, I desire to have it understood that the same may be constructed in other ways and put to uses other than those recited within the scope of the following claims:

1. A floor surfacing machine comprising a frame, a motor mounted thereon, a grinding device mounted on said frame and driven by said motor and a single supporting wheel of a width less than that of the

grinding device for supporting said frame and motor in conjunction with said grinding device and a pair of wheels mounted on said frame normally raised above the floor and being adapted to engage the floor upon raising said grinding device.

2. A floor surfacing machine comprising a frame, a motor mounted thereon, a grinding device mounted on said frame and driven by said motor and a single supporting wheel of a width less than that of the grinding device. for supporting said frame and motor in conjunction with said grinding device and a pair of wheels mounted on said frame rearwardly of said single wheel and normally elevated above the floor.

3. A floor surfacing machine comprising a frame, a casing formed at the forward portion of said frame, a motor mounted on said casing, a pair of grinding plates journalled below said frame near the forward part thereof, transmission mechanism within said casing for driving said plates from said motor, said frame being formed with a rearwardly extending central recess starting at said casing, a supporting wheel having a crowned face journalled to said frame and positioned within said recess, a pair of auxiliary supporting wheels rearwardly positioned relative to said first supporting wheel and normally elevated above the floor and a handle extending rearwardly from the rear portion of said frame.

4. A floor surfacing machine comprising a frame, a motor mounted thereon, a pair of grinding plates mounted on said frame and simultaneously driven by said motor and a single supporting wheel positioned between said grinding plates and rearwardly therefrom.

5. A floor surfacing machine, comprising a frame, a motor mounted thereon, a pair of grinding plates mounted on said frame and simultaneously driven by said motor, a single supporting wheel positioned between said grinding plates and rearwardly therefrom, being of a width less than either of said grinding plates for supporting said grinding plates in operating position, and auxiliary wheels for supporting said machine with the grinding plates thereof in elevated position.

6. A floor surfacing machine comprising a frame, a motor mounted thereon, a pair of grinding plates, means for driving said grinding plates from said motor and for flexibly supporting the same relative to one another, a single supporting wheel positioned between said grinding plates for permitting flexure of the plates relative to one another, and a pair of auxiliary wheels rearwardly positioned of said supporting wheel and above the plane of said plates, adapted to engage the floor when the machine is tilted back upon said supporting wheel to hold said grinding disks in elevated position.

7. A floor surfacing machine comprising a frame, a motor mounted at the forward portion of said frame, a pair of grinding plates journalled below said frame near the forward part thereof, means for flexibly supporting and driving said plates from said motor, a supporting wheel journalled to said frame and positioned between said plates rearwardly thereof, a pair of auxiliary supporting wheels rearwardly positioned relative to said first supporting wheel and normally elevated above the floor, and a handle extending rearwardly from the rear portion of said frame.

8. A floor surfacing machine comprising a frame, a motor mounted thereon, a grinding device mounted on said frame and driven by said motor, a single supporting wheel for supporting said frame and motor in conjunction with said grinding device, a pair of wheels mounted on said frame normally raised above the floor, the center of gravity of said machine lying between said single wheel and said grinding device causing said machine normally to rest upon said grinding device and single supporting wheel, and a handle extending rearwardly of the machine for tilting said machine back upon said pair of wheels so as to raise said grinding device above the floor.

9. A floor surfacing machine comprising a frame, a motor mounted on said frame, a grinding device mounted on said frame and driven by said motor, a single supporting wheel positioned rearwardly therefrom for supporting said grinding device in operative position, and auxiliary supporting means normally raised above the ground adapted to come into supporting position upon tilting said machine so as to raise said grinding device above the ground, the center of gravity of said machine falling between said grinding device and said single supporting wheel.

10. A floor surfacing machine comprising a frame, a motor mounted thereon, a pair of grinding plates mounted on said frame and simultaneously driven by said motor, and a single supporting wheel positioned between said grinding plates and rearwardly therefrom, the center of gravity of said machine falling between said grinding plates and said single supporting wheel.

In testimony whereof I affix my signature.

MERRITT G. POND.