Jan. 21, 1969 J. C. ROGGE ET AL 3,422,579

FLOOR MACHINE

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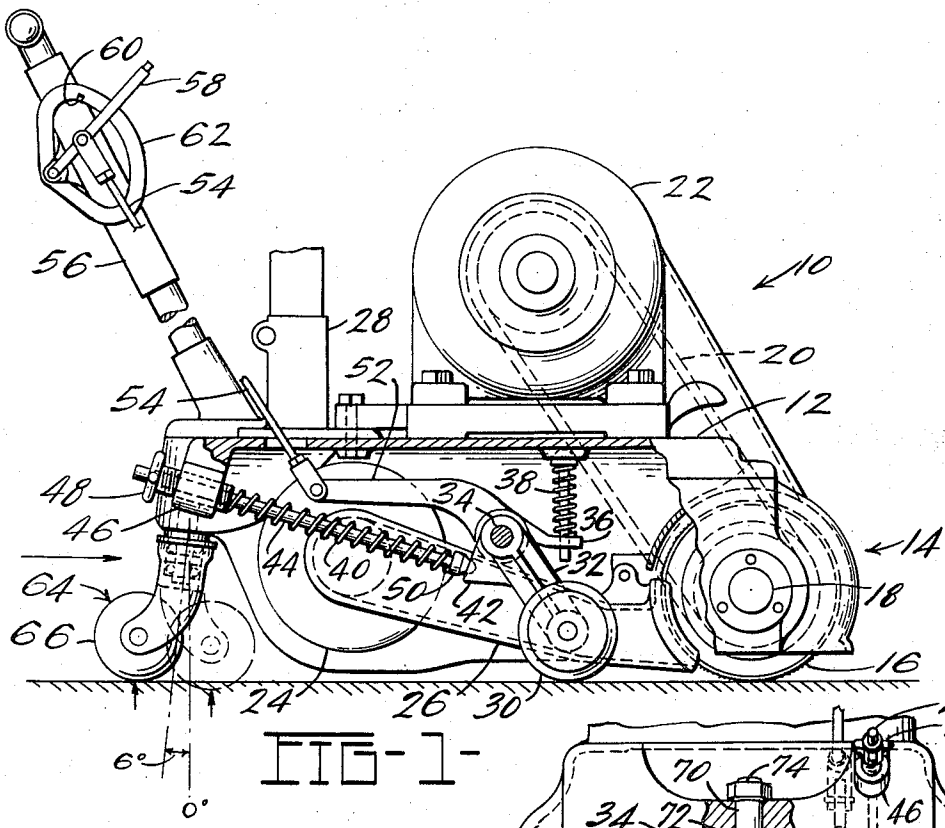


FIG-1-

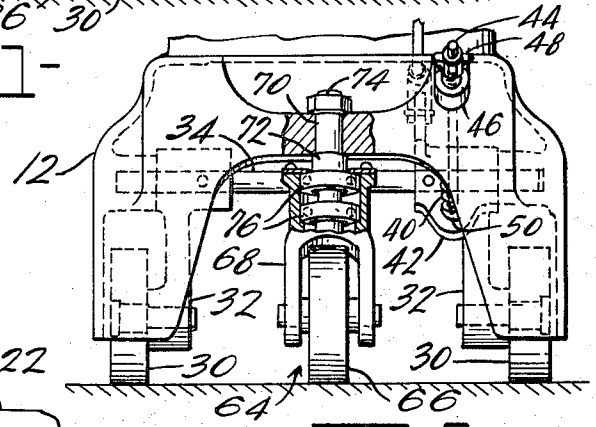


FIG-3-

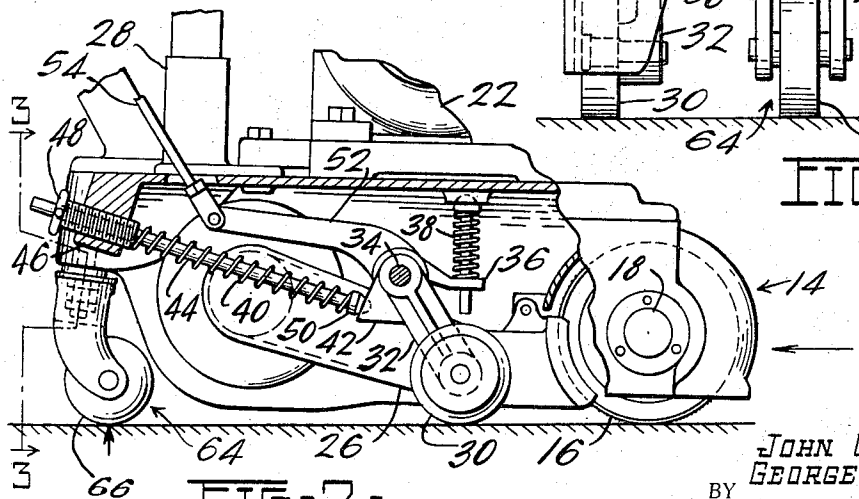


FIG-2-

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FLOOR MACHINE

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Int. Cl. B23b 23/00

This invention relates to a floor machine and particularly to a floor sander capable of uniformly applying pressure on the sanding unit thereof.

A number of floor sanders are presently known in the art. One highly efficient and productive sander is of the type disclosed in Myers Patent 2,031,665. This sander includes a sanding unit in the form of a sanding drum located toward the front of the machine, a rear caster, and a pair of intermediate resiliently-supported wheels which can be adjusted to control the pressure on the sanding unit or drum.

In the operation of a floor sander of this type, the sander is moved back and forth in parallel paths over the length of the floor, the sander being pushed in one direction and pulled in the other without being turned around at each end. The sander is capable of taking relatively deep cuts and a large area can be properly sanded in a relatively short period of time. While the machine is highly productive, the depth of cut made by the sanding unit has been found to vary slightly depending upon whether the machine is being pushed or pulled. It has been discovered that this variation apparently is due to the fact that the rear caster rotates 180° when the direction of movement is changed. When the machine is pushed, the point of contact of the caster and the floor is farthest to the rear whereas when the machine is pulled, the point of contact is closest to the supporting wheels and the sanding unit. Stated another way, the caster is more directly under the sanding machine when the machine is pulled and, consequently, more of the weight of the sanding machine is supported by the caster when pulled than when pushed. Since the weight of the machine determines the pressure on the sanding unit and the depth of cut made by the sanding unit when moved over the floor, the pressure on the unit will be less when the caster is under the machine than when it is turned 180° and is farthest to the rear. Consequently, the pressure and the depth of cut of the sanding unit are less when the machine is pulled than when it is pushed.

In accordance with the invention, it has been found that the above problem can be alleviated by placing the caster axle at a slight angle so that the axle lies in a vertical plane which extends longitudinally through the machine but with the axle slanting toward the machine. In this manner, the caster is higher when in the rear position with the machine being pushed than when in the forward position with the machine being pulled. When the machine is pulled with the caster in the lower position, the rear of the machine is raised and the front end will be lower, with the resiliently-mounted supporting wheels serving as a pivot. More pressure thereby is placed on the sanding unit at the front of the machine. With a proper angle for the caster, more pressure is placed on the sanding unit when the machine is pulled thereby to compensate for the lesser pressure on the sanding unit

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due to the fact that more of the weight of the machine is supported on the caster.

It is, therefore, a principal object of the invention to provide a floor sanding machine capable of providing a more uniform depth of cut for a sanding unit carried thereby.

Another object of the invention is to provide a floor sanding machine of the type having a sanding unit, a rear caster, and intermediate resiliently-mounted supporting wheels, with the caster positioned at an angle such as to place more pressure on the sanding unit when the machine is pulled and thereby compensate for the lesser pressure applied to the sanding unit by the weight of the machine.

Other objects and advantages of the invention will be apparent from the following detailed description of a preferred embodiment thereof, reference being made to the accompanying drawings, in which:

FIG. 1 is a side view in elevation, with parts broken away and with parts in section, of a floor sanding machine embodying the invention;

FIG. 2 is a fragmentary view of a rear portion of the machine showing the rear caster in another position; and

FIG. 3 is a rear fragmentary view in section taken generally along the line 3—3 of FIG. 2.

Referring particularly to FIG. 1, a floor sanding machine according to the invention is indicated at **10**. The machine includes a main frame or body member **12** and a sanding unit **14** specifically shown in the form of a sanding drum **16** which is mounted on an axle **18** and rotatably carried near the front end of the frame **12**. The drum is driven through a belt **20** by a heavy-duty motor **22** mounted on top of the frame **12** at an intermediate portion of the machine. The motor can also drive a blower in a housing **24** which communicates with the space around the sanding drum **16** through a duct **26** and exhausts through a discharge nozzle **28** which can be connected with a large dust-collecting bag (not shown).

A pair of truck wheels **30** movably carry the machine and can support a portion of the weight thereof. The wheels **30** are mounted on arms **32** which are affixed to a supporting shaft **34** journalled in side portions of the frame **12**. Preferably, two arms **36** extend forwardly from the supporting shaft **34** and are urged downwardly by coil springs **38** located between the arms **36** and the frame **12** under the motor **22**. The springs **38** thereby urge the shaft **34** and the arms **32** in a clockwise direction as shown in FIG. 1 so as to force the wheels **30** downwardly against the floor. A coiled expansion spring **40** opposes the springs **38**, acting against a plate member **42**, which is affixed to the shaft **34**. The spring **40** is positioned around a rod **44** which is slidably carried in a bushing **46** which is pivotally carried by the frame **12**. An adjusting screw **48** is threaded into the bushing **46** and can be turned in or out to vary the tension on the spring **40** which is mounted between the end of the screw **48** and a shoulder **50** at the end of the rod **44**. The spring **40** operates to urge the plate **42** and shaft **34**, along with the arms **32** in a counterclockwise direction against the action of the springs **38** so that the force of the wheels **30** against the floor can be varied by the adjusting screw **48**.

The positions of the wheels **30** can be manually adjusted through a lever arm **52** which is pivotally connected to a rod **54** extending upwardly beside a push-handle **56** to an operating handle **58**. When the handle **58** is moved

upwardly to a notch 60 of a guide 62, the wheels 30 are moved down sufficiently to completely remove the sanding drum 16 from the floor so that the machine can be moved about when being transported to and from its storage situs, for example. Otherwise, the handle 58 is positioned in an intermediate position so as to enable the force on the wheels 30 to be controlled entirely by the springs 38 and 40. In such position, the screw 48 preferably is adjusted so that the wheels 30 carry a relatively small portion of the weight of the sanding machine. However, if it is desired that a lighter cut be taken by the drum 16, the screw 48 can be unscrewed so as to decrease tension of the spring 40 and enable the force of the springs 38 to have a greater effect and enable more of the weight of the machine to be carried by the wheels 30. The handle 58 can be moved downwardly to the opposite end of the guide 62 temporarily, if desired, to place more pressure on the sanding unit at a particular location on the floor.

A rear caster 64 supports part of the weight of the machine and enables the machine to be guided by the operator as it is moved forward and backward over the length of the floor being sanded. The caster includes a caster wheel 66, a yoke 68 which rotatably carries the caster wheel 66, and an axle 70 which enables the yoke 68 to be rotatably carried by the frame 12 of the machine. In this instance, the axle 70 is affixed to the frame 12 by a shoulder 72 and a nut 74 and the yoke 68 then rotates relative to the axle 70 by bearings 76. Of course, the axle 70 could equally well be affixed to the yoke 68 and be rotatably carried by bearings mounted in the frame 12.

Heretofore, with sanders of the type under consideration, when the machine is moved in a forward direction or to the right in FIG. 1, the caster wheel 66 is in its rear position farthest from the machine and from the wheels 30. This position is shown in solid lines in FIG. 1. On the other hand, when the machine is being pulled, or moved to the left in FIGS. 1 and 2, the caster 64 pivots 180° so that the caster 66 is now in a position more directly under the machine and closest to the wheels 30. Hence, when the sanding machine 10 is being pushed forwardly along the floor, the caster is as shown in FIG. 1. When the end of the path is reached, the operator swings the machine slightly to the side and begins pulling it in a path parallel to the first path, in which case the caster is in the position of FIG. 2.

It has been found that when the machine is pushed, the depth of cut of the sanding drum 16 is slightly greater than when the machine is pulled. The reason for this apparently is due to the fact that less of the weight of the machine is carried by the caster 64 when it is in the position farthest to the rear than when it is in a position more directly under the machine and closest to the wheels 30. With more weight carried on the caster in the second position, of FIG. 2, less of the weight of the machine will be carried by the drum 16 with the result that the pressure on the drum 16 is less when the machine is being pulled than when it is being pushed. Hence, when the machine is pushed, the depth of cut is slightly greater than when the machine is pulled.

It has been discovered in accordance with the invention that the caster and specifically the axle or axis 70 thereof can be located at a slight angle to compensate for the change in the weight distribution of the machine and enable the drum 16 to take a uniform cut whether the machine is being pulled or pushed. In accordance with the invention, the axle 70 is positioned so as to lie in a vertical plane extending longitudinally through the machine but slanting at a slight angle toward the machine. With the axle 70 at an angle, the caster wheel 66 is slightly higher when in the rear position than when in the position closer to the wheels 30, as represented by two arrows at the point of contact of the wheel and the floor in FIG. 1. Consequently, when the machine is pulled and the caster 64 is in the position closer to the wheels 30, the caster wheel 66 is slightly lower so as to raise the rear portion of the machine. Since the wheels 30 tend to act as a pivot point for the machine, this means that the front end of the machine and the drum 16 will be urged downwardly, tending to cause the sanding unit to take a greater cut and thereby compensate for the fact that more of the weight of the machine is carried by the caster 64 when the machine is being pulled than when it is being pushed. Oppositely, when the machine is being pushed and the caster is in the rear position, the caster wheel is higher. This lowers the rear portion of the machine and tends to raise the front portion, thereby compensating for the fact that less weight is carried by the caster and more is carried by the sanding unit.

It will be appreciated that the particular angle at which the caster axle is located will depend upon the particular machine on which it is used. The particular angle will depend upon the distances between the caster 64 and the wheels 30 as well as the distance between the wheels 30 and the sanding unit 16. The weight distribution of the machine and other factors also will have an effect upon the angle. Solely by way of example, with an American Standard 12 Floor Sanding Machine available from American-Lincoln Corporation of Toledo, Ohio, the caster axle can slant forwardly at an angle of four to eight degrees to the vertical and preferably six degrees to produce the desired effect.

Various modifications of the above described embodiment of the invention will be apparent to those skilled in the art, and it is to be understood that such modifications can be made without departing from the scope of the invention, if they are within the spirit and the tenor of the accompanying claims.

We claim:

1. A floor sanding machine having a sanding unit at one portion, a caster spaced from said one portion, and resiliently mounted wheels therebetween, the weight of said sanding machine being supported on all three of said sanding unit, caster, and whees, said caster moving 180° between a position away from said wheels and a position nearer said wheels when the direction of the sander is reversed, said caster including a caster wheel, a yoke rotatably carrying said caster wheel, and an axle carrying said yoke for pivotal movement relative to said machine, said axle lying in a vertical plane extending longitudinally through the sanding machine but tilting at an angle toward said wheels so that said caster wheel is higher when pivoted away from said wheels than when pivoted nearer said wheels.

2. A floor sanding machine according to claim 1 characterized by said sanding unit constituting a sanding drum at the front end of said machine and rotatably carried thereby.

3. A floor sanding machine according to claim 1 characterized by said resiliently mounted wheels having spring means urging said wheels toward the floor and additional spring means urging said wheels in the opposite direction.

4. A sanding machine according to claim 3 characterized further by said additional spring means being manually adjustable.

5. A floor sanding machine according to claim 1 characterized by ball bearing means positioned between said yoke and said axle to enable said yoke to pivot relative to said axle.

6. A floor sanding machine having a sanding unit at one portion, a caster spaced from said one portion, and means movably supporting said sanding machine therebetween, the weight of said sanding machine being placed on all three of said sanding unit, said caster, and said moving means, said caster moving between a position away from said moving means and a position nearer said moving means when the direction of the sander is reversed, said caster being pivotally mounted for movement around an axis which lies in a vertical plane extend-

ing longitudinally through the sanding machine but tilting at an angle toward the sanding machine, so that said caster is higher when away from said moving means than when nearer said moving means.

7. A sanding machine according to claim 6 characterized by said axis slanting at an angle between about four degrees and about eight degrees.

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