

March 24, 1942.

R. F. KNEISLEY ET AL

2,277,236

SURFACING MACHINE

Filed March 19, 1940

2 Sheets-Sheet 1

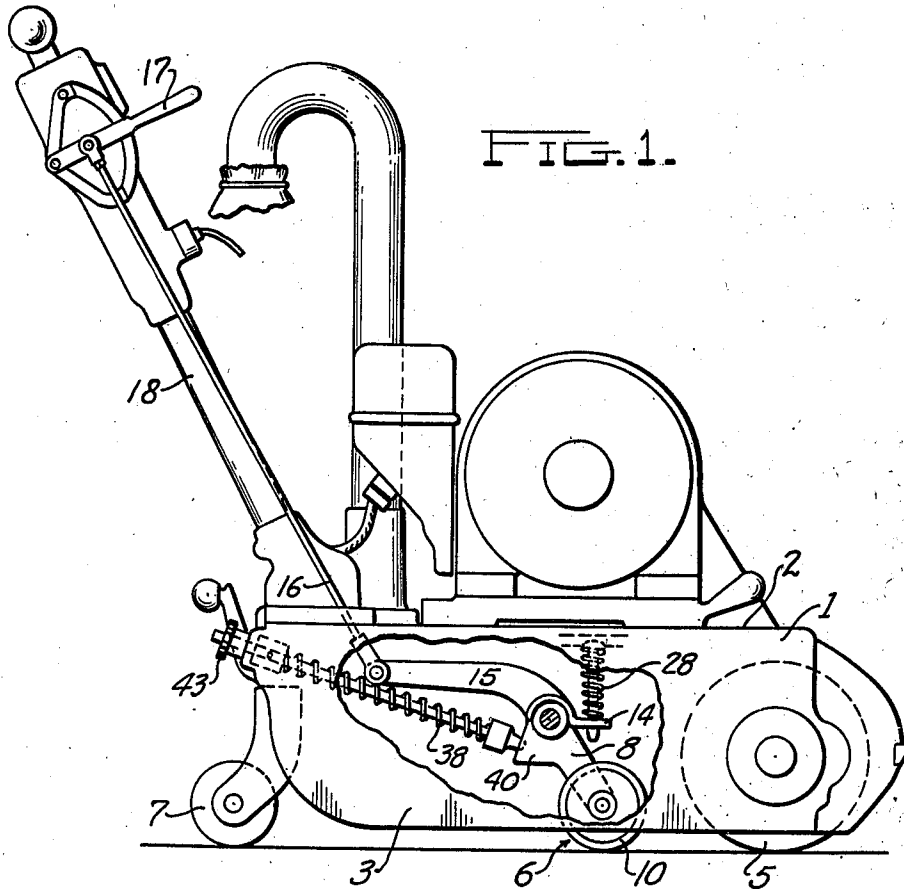


FIG. 1.

FIG. 6.

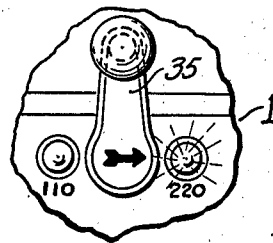
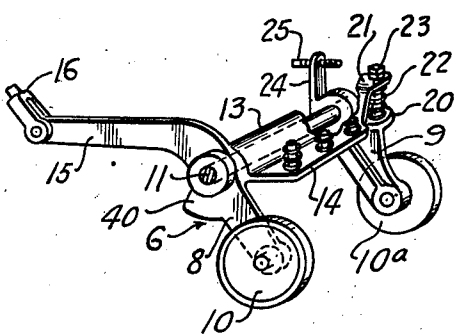


FIG. 5.



334

Inventor
Richard F. Kneisley
Otto M. St. John

Over & Over

Attorneys

March 24, 1942.

R. F. KNEISLEY ET AL

2,277,236

SURFACING MACHINE

Filed March 19, 1940

2 Sheets-Sheet 2

FIG. 2.

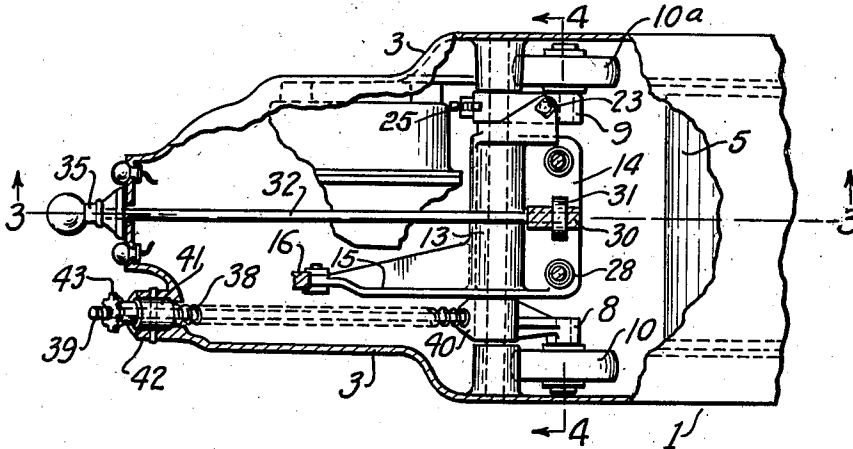


FIG. 3.

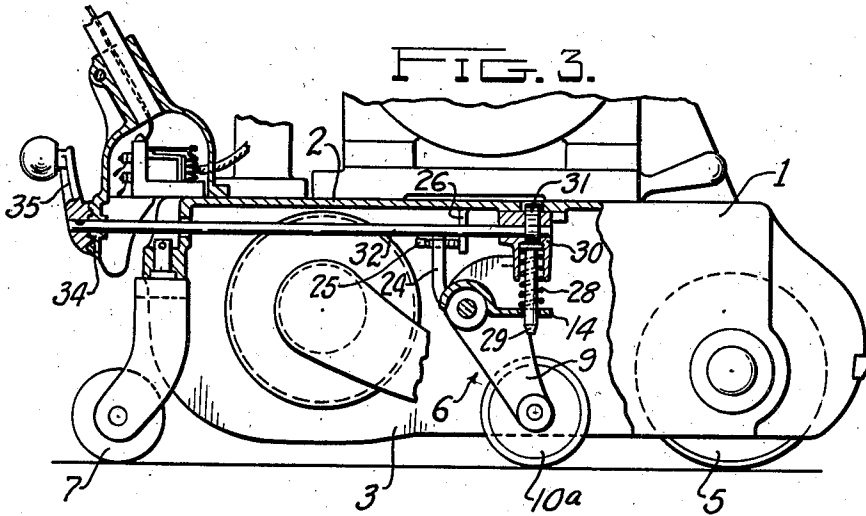
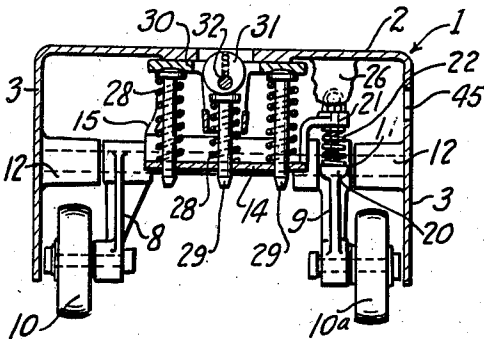


FIG. 4.



Inventor
Richard F. Kneisley
Otto M. St. John

Avon & Avon,

Attorneys.

UNITED STATES PATENT OFFICE

2,277,236

SURFACING MACHINE

Richard F. Kneisley and Otto M. St. John, Toledo, Ohio, assignors to The American Floor Surfacing Machine Company, Toledo, Ohio, a corporation of Ohio

Application March 19, 1940, Serial No. 324,760

12 Claims. (Cl. 51-176)

This invention relates to portable surfacing machines primarily of the sanding drum type, and is intended for use in connection with new construction work and also in refinishing or reconditioning existing, and frequently very old, buildings.

For efficient operation of machines of this character, it is desirable to equip them with motors of relatively large power output, and in practice the size of the motor is usually limited only by the capacity of the average electric equipment in general use. In many residences, and in some other buildings, especially the older ones, the available power service is of rather limited capacity. Furthermore, these machines are successively operated on different jobs, in some of which a 220 volt circuit is available, while in others a 110 volt circuit only is available.

Under most conditions where it is necessary to operate on a 110 volt circuit, or under any condition where the supply is rather limited, the normal electrical energy demand of a properly powered sanding machine is excessive and produces a voltage drop in the electrical distribution system, which in turn seriously affects the operation of the motor. When such a voltage drop is encountered, the motor draws an excessive amount of current which may blow the fuses in the distribution line or in the machine itself. It may also over-heat the electrical wiring in the building and may tend to over-heat the motor, and in some cases burn it out, and also cause the motor to lose speed with a consequent loss in efficiency and operation.

The object of the present invention is to overcome the above-mentioned difficulties in an efficient and economical manner and without sacrificing motor power under unfavorable conditions. This is accomplished by the provision of simple and efficient means which is quickly and easily adjusted to vary the abrading drum pressure on the floor to suit the power conditions under which operating. If the machine is operating on a 110 volt circuit, the drum pressure is reduced over that used when operating on a 220 volt circuit, so as to decrease the power of wattage consumed by the machine. As the wattage is reduced, the current demand of amperage decreases, and hence the voltage drop of the system becomes less, and as a result the above-mentioned difficulties are minimized.

A further object of the invention is the provision of simple and efficient means for preventing the tendency of skidding or side slipping of the machine when the sanding drum pressure on

the floor is increased by relieving the truck supporting action.

A further object of the invention is the provision of simple, efficient and easily accessible means for relatively adjusting the supporting truck wheels of the machine to level them with respect to the sanding drum action.

The invention is fully described in the following specification, and one embodiment thereof illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a machine embodying the invention, with a part broken away; Fig. 2 is a plan view thereof, with the top parts removed and a portion of the frame and interior parts broken away; Fig. 3 is a central longitudinal vertical section on the line 3-3 in Fig. 2, with parts in full and parts broken away; Fig. 4 is a fragmentary vertical section on the line 4-4 in Fig. 2; Fig. 5 is a perspective detail of the frame supporting truck, with the parts in assembled relation and with parts broken away, and Fig. 6 is a fragmentary rear end view of the machine, showing the control for the truck pressure adjustment employed when changing the machine for use in connection with circuits of different voltage.

Referring to the drawings, 1 designates the machine frame, which is of inverted U-form in cross-section to provide the deck 2 and depending sides 3. The customary sanding drum 5 is mounted between the forward ends of the sides 3, with its axis transverse to the frame 1, and at the rear of this the frame 1 is supported by the truck 6 and rear caster wheel 7. The truck 6, as usual, is disposed adjacent to the drum 5 in advance of the longitudinal center of gravity of the machine, so that a raising or lowering of the truck wheels will vary the pressure of the sanding drum on the floor, as well understood in the art.

The truck 6, in the construction and adjustment of which the present invention resides, comprises two spaced downwardly directed rocker arms 8 and 9 carrying respective wheels 10 and 10a at their lower ends and mounted at their upper ends on a cross shaft 11 for independent vertical rocking action. The shaft 11 is mounted at its ends in frame bosses 12, and its axis is parallel to those of the wheels 10, 10a. The sleeve portion of the arm 8, which receives the shaft 11, has an extension 13 at its inner side extending to and serving as a spacer for the two truck arms. A shelf 14 projects forward from the sleeve extension 13 and receives the desired

thrust of pressure springs 28, as hereinafter described, to urge downward pressure of the wheels 10 and 10a against the surface over which operating to tend to raise the drum 5 and reduce its operating pressure.

The customary control arm 15 extends rearwardly from the upper end of the truck arm 8 and is connected by rods 16 to a hand controlled lever 17 on the upper end portion of the machine handle 18 in such a manner that an application of downward pressure to the lever handle will raise the truck wheel and reduce its pressure on the floor, which in turn permits an increase, by gravity action, of the abrading pressure of the drum.

The truck arm 9 is provided on its front edge near its top with a pad 20, and between this and an upwardly and outwardly projecting lip 21 on the adjacent end of the shelf 14 is disposed a coiled compression spring 22 to communicate a yielding downward pressure from the truck arm 8 and its shelf 14 to the truck arm 9. A stop screw 23 is threaded through the lip 21 and extends down through the spring 22 in position to coast with the pad 20 and impart a positive movement to the arm 9 from the lip 21 when the spring has been compressed a predetermined extent.

Yielding downward pressure is applied to the truck arm 8 and its wheel 10, in the present instance, by three coiled compression springs 28, arranged side by side, crosswise of the machine and interposed between the under side of the frame deck 2 and the truck shelf 14 and held in position by pins 29. The thrusts of the upper ends of the springs 28 are against the shouldered heads of the pins 29, and the upper end thrusts of the two outer pins 29 are against the under side of the frame deck 2, in the present instance, through extensions of a bearing bracket 30, while the lower ends of the pins 29 pass through and are guided by registering apertures in the shelf 14. The center spring 28 of the set has the same mounting, except that its pin 29 is somewhat shorter and bears against the periphery of a rotatable disk cam 31 carried by a control shaft 32. An adjustment of the tension of the center spring 28 is effected by a turning of the cam 31, the spring 28 being of predetermined minimum tension when the short side of the cam 31 is in engagement with the pin head, as shown in Fig. 4, and being of predetermined greater tension when the cam 31 has been given a half turn, so that the peripheral portion thereof having the longest radius is in engagement with the pin 29. The shaft 32 is journaled at its forward end in the bracket 30 and the cam 31 and the upper end of the coacting pin 29 are guided in portions of such bracket, as shown. The rear end of the shaft 32 extends through a bearing 34 at the rear end of the frame 1 and carries a hand crank 35. This crank, when in upright position, as shown in Figs. 3 and 6, is set for operation of the machine on a 220 volt circuit where maximum pressure of the sanding drum on the work surface is desirable. When given a half turn the large side of the cam acts on the tension pin 29 to increase the downward pressure of the truck 6 against the work surface and effects a corresponding reduction of the drum pressure against such surface, such as is desirable when operating on a 110 volt circuit.

Two volt indicating lights are associated with the handle 35, as shown in Fig. 6, so that when the handle is in upright position an arrow thereon points to the lamp in the 220 volt circuit, and when the handle is in lowered position the arrow

points to the light indicating the 110 volt circuit. These lights are connected with a circuit selector in any well known manner (not shown), so that when the machine is connected with a 110 or 220 volt circuit, the corresponding lamp is lighted.

The downward pressure of the springs 28 on the truck 6 is opposed by a tension adjusting spring 38, which encircles a rod 39 and has its forward end thrust against the forward headed end of the rod 39, which latter bears forwardly against a boss 40 on the truck arm 8. The rear end of the rod 39 passes freely through a sleeve 41 anchored in a rear end frame bearing 42 (Fig. 2), and carries a threaded adjusting nut 43 in forward thrust engagement with said sleeve 41, as well understood in the art. It is apparent that an adjustment of the nut 43 effects an adjustment of the pressure tension of the truck wheels against the working surface.

In the operation of the machine, it is desirable and customary when operating on a 220 volt circuit to cause the drum 5 to act against the work surface with the pressure of approximately seventy-four pounds and to reduce such pressure to approximately fifty pounds when operating on a 110 volt circuit. Such change in drum pressure is quickly effected by a turning of the pressure control handle 35 to one or the other of its operating positions. In the present instance, when the control handle 35 is in upright position, the short side of the cam 31 is against the center pressure pin 29 and the normal operating truck pressure is thereby reduced to that which is suitable for operating on a 220 volt circuit, and in which case the drum pressure is approximately seventy-four pounds. In this case the 220 volt circuit indicating light is lighted and the control handle arrow points to it, thus indicating to the operator not only the voltage of the operating circuit, but also if the drum pressure is proper for use in connection with such circuit. If the machine is operating on a 110 volt circuit, this fact is indicated by the left hand signal light, in the present instance, and the operator then places the control handle 35 in proper position to indicate that the proper adjustment of the cam 31 has been made to reduce the drum pressure to approximately fifty pounds, or that suitable for such circuit. Should the operator desire at any time to increase the drum pressure, he applies downward pressure to the operating handle 17, thus effecting an upward rocking of the truck so as to entirely release the supporting pressure of the wheel 10 from the work surface and effect a partial but not entire release of the pressure of the wheel 10a from such surface. When the truck arm 8 is rocked to raise it from truck supporting position, the tension of the spring 22 is reduced due to the raising of the truck shelf 14 and its lift 21, and this permits a lessening of the pressure of the wheel 10a against the work surface. It is important, however, that the pressure of such wheel be not entirely released from the work surface, as otherwise a skidding or side slipping action of the machine takes place during an abrading action. It is found in practice that if both truck wheels are raised from engagement with the work surface during an abrading operation of the machine, such operation will tend to swing the machine one way or the other from a straight course and render it difficult for the operator to maintain such course. It has further been found, however, that if one truck wheel is permitted to remain in contact with the work surface, but with a reduced pres-

sure when a heavy pressure abrading action is desired, such skidding or side swinging action is prevented. It is, therefore, desirable, in actuating the truck to relieve its supporting pressure, that the truck arms be relatively movable and that provision be made for one truck wheel to remain in reduced pressure contact with the work surface when the other truck wheel is raised. This is accomplished through the positioning of the compression spring 22 between the two truck members 8 and 9, which acts to hold the wheel 10a in contact with the work surface during a pressure releasing movement of the wheel 10. When the pressure control lever 17 is raised to lower the truck wheels and effect a release of the drum pressure against the work surface, the truck member 8 is positively moved through its connection with the control lever and the truck member 9 is yieldingly moved through the spring connection 22. When such spring has been compressed sufficiently to cause the screw 23 to move into engagement with the pad 20, the further lowering movement of both truck members 8 and 9 will be positive and uniform. The lowering movement of the two truck members 8 and 9 is limited by engagement of the stop screw 25 with the frame ear 26 and this may be adjusted to suit conditions, as also the point of engagement of the screw 23 with the pad 20. The screws 23 and 25 are easily accessible through a side opening 45 in the frame (Fig. 4), so as to facilitate relative adjustment of the truck arms 8 and 9 during a leveling of the truck with respect to the drum action, which adjustment is necessary at intervals during use of the machine.

It is apparent from the foregoing that three advantages result from the truck construction, mounting and pressure adjustment shown, namely, (1) a varying of the drum working pressure to suit the voltage of the operating circuit in which connected, this being accomplished by a turning of the control handle 35, so as to effect an increase or lessening of the truck pressure to suit the drum pressure desired; (2) a maintaining of one truck wheel in slight pressure coaction with the working surface when the pressure of the other truck wheel has been entirely removed, and thereby preventing skidding or side slipping of the machine during a heavy abrading operation, this being accomplished by the permissible limited relative rocking movement of the truck arms 8 and 9 and the applying of yielding pressure between the two through the interposed spring 22, and (3) the ease with which the truck may be adjusted to level it with respect to the drum, which is accomplished through an adjustment of the stop screws 23 and 25 to limit the relative rocking movements of the two truck arms.

We wish it understood that our invention is not limited to any specific construction, arrangement or form of the parts, as it is capable of numerous modifications and changes without departing from the spirit of the claims.

Having thus described our invention, what we claim as new, and desire to secure by United States Letters Patent, is:

1. In a drum type surfacing machine, a pressure adjusting truck having two relatively rockable transversely spaced supporting wheels, control means operable to positively raise and lower one of said wheels to vary the drum working pressure, and a yielding connection between said wheels urging a downward movement of one

wheel when the other positively operated wheel is lowered.

2. In a drum type surfacing machine, a pressure adjusting truck having two transversely spaced rocker arms carrying truck wheels, said arms being mounted for limited relative rocking movements, means operable to effect a positive rocking of one of said truck arms, and a yielding connection between said truck arms for applying yielding downward pressure to one when the other positively operated arm is swung downward to increase its machine supporting pressure.

3. In a drum type surfacing machine, a pressure adjusting truck including two truck arms carrying supporting wheels, said arms being mounted for limited relative rocking movements, adjustable means for limiting the rocking movements of one truck arm relative to the other, a yielding pressure-applying connection between said arms to cause one to yieldingly lower when the other is positively lowered, and means operable to impart positive rocking movements to one of said arms.

4. In a drum type surfacing machine, a pressure adjusting truck including a cross shaft, relatively rockable truck arms mounted on said shaft and each carrying a supporting wheel, an operating connection with one of said arms to effect adjustment thereof, a yielding connection between the arms to cause a yielding lowering of one with the other, and easily accessible adjustable means operable to limit the relative rocking movements of said arms a predetermined extent.

5. In a drum type surfacing machine, a pressure truck having a pair of arms carrying pressure wheels, said arms being mounted for limited relative rocking movements and having opposed thrust parts spaced transverse to the rocking axis of the arms, means manually operable to positively swing one arm upward to raise it from supporting engagement with a working surface, and spring means interposed between said opposing parts and operable to cause a yielding pressure of one truck wheel against the working surface when the other wheel is raised thereby serving to prevent skidding or side swinging of the machine during heavy abrading operation.

6. In a drum type surfacing machine, a truck adjustable to control the drum working pressure, a plurality of compression springs acting against the truck to urge a downward pressure thereof on the surface over which operating, cam means manually operable in connection with at least one of said springs to effect a predetermined adjustment of its tension, and means yieldingly resisting a downward pressure movement of the truck a predetermined extent.

7. In a drum type surfacing machine, a truck adjustable to control the drum working pressure, spring means acting on said truck to urge its downward pressure against a surface over which operating, a rotatable cam operable in engagement with said means to vary the tension thereof, a manual control for said cam, and means yieldingly resisting a downward pressure movement of the truck a predetermined extent.

8. In a drum type surfacing machine, a truck for traveling on a surface to be abraded and adjustable to control the drum working pressure on said surface, said truck having two relatively movable laterally spaced cooperating support members, means for applying a yielding downward pressure to one of said members, and means yieldingly connecting said first member to the

second member to apply a yielding downward pressure from the first to the second member.

9. In a drum type surfacing machine, a truck for traveling on a surface to be abraded and adjustable to control the drum working pressure on said surface, said truck having two relatively movable cooperating laterally spaced support members, means applying a yielding downward pressure to one of said members, means acting between said members to apply a yielding downward pressure from one to the other, and means yieldingly resisting a downward pressure movement of said first member.

10. In a drum type surfacing machine, a truck for traveling on a surface to be abraded and adjustable to control the drum working pressure on said surface, said truck having two relatively movable laterally spaced cooperating support members, means exerting a yielding downward pressure on one of said support members, means acting between said members to apply a yielding downward pressure from said first to the second member, means yieldingly resisting the downward pressure of said first means, and separate means for adjusting the tension of said first and last means.

11. A drum type surfacing machine for use with a two voltage motor, including a frame, a surfacing drum carried by the frame, a truck movably carried by the frame and engageable with the surface over which the machine is operated to adjustably control the drum working pressure, yielding means reacting between the

frame and truck, to urge downward pressure of the latter and thereby the drum against the surface over which the machine is operated, mechanical means to adjust the pressure of said yielding means to vary the tension thereof according to the voltage in connection with which the machine is to be used so that the drum will exert against the floor predetermined pressures respectively in accordance with the voltage, manually controlled means located remotely from the pressure adjusting means of the yielding means for operating the pressure adjusting means of the yielding means, mechanical means connecting the manually controlled means to the pressure adjusting means to effect actuation of the latter by said manually controlled means, means to mount the manually controlled means for movement in opposite directions to occupy two predetermined positions according to the direction of movement thereof, and means responsive to the operating electric current and having spaced parts to indicate the voltage in connection with which the machine is being used and the position to which the manually controlled means is to be moved to adapt the machine for the operating voltage.

12. A drum type surfacing machine in accordance with claim 11, wherein the means to adjust the pressure of the yielding means includes a rotary member and wherein the manually controlled means consists of a pivoted lever.

RICHARD F. KNEISLEY.
OTTO M. ST. JOHN.