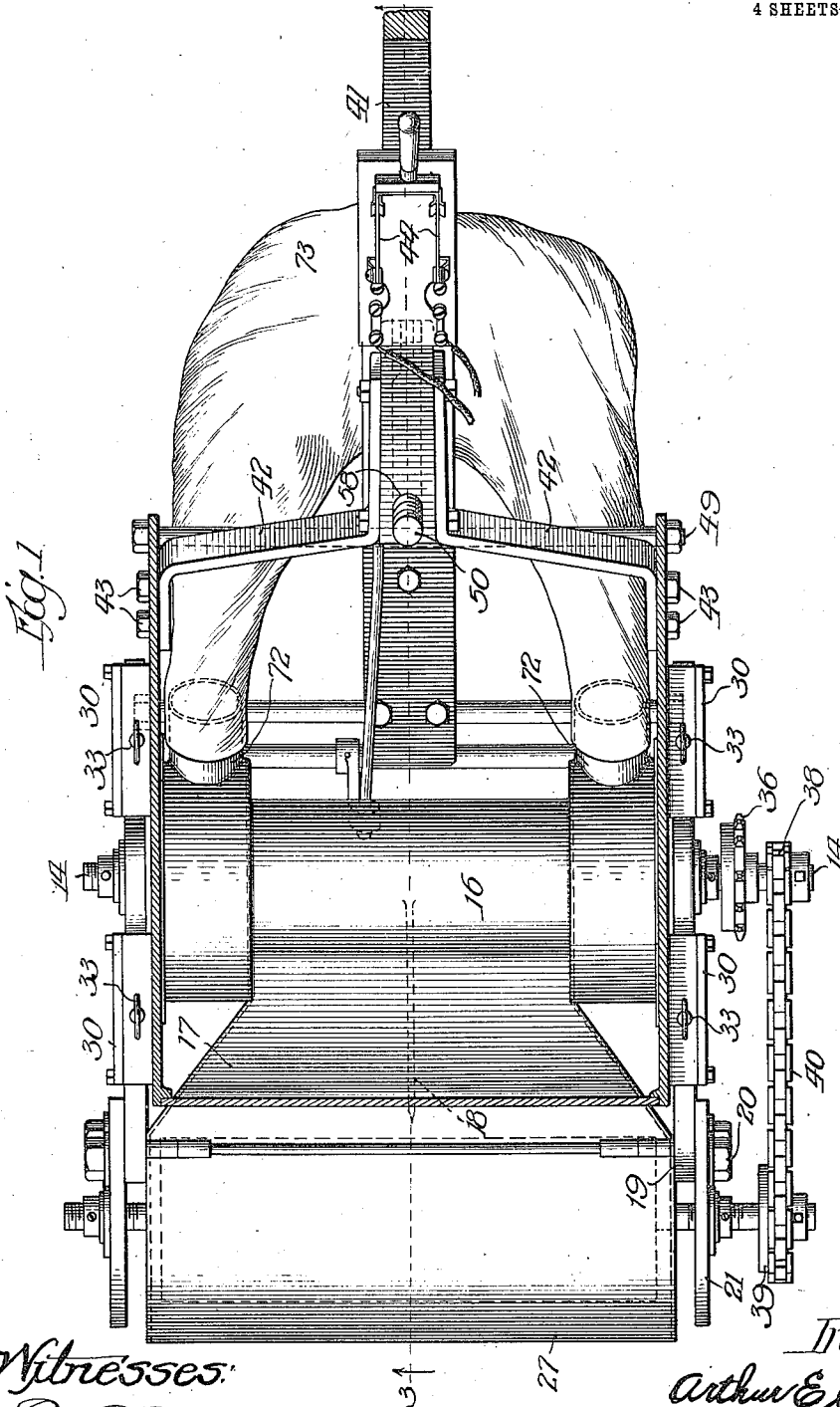


A. E. CHAPPELL.
SURFACING MACHINE.
APPLICATION FILED APR. 24, 1911.

1,041,240.

Patented Oct. 15, 1912.

4 SHEETS—SHEET 1.



Witnesses:
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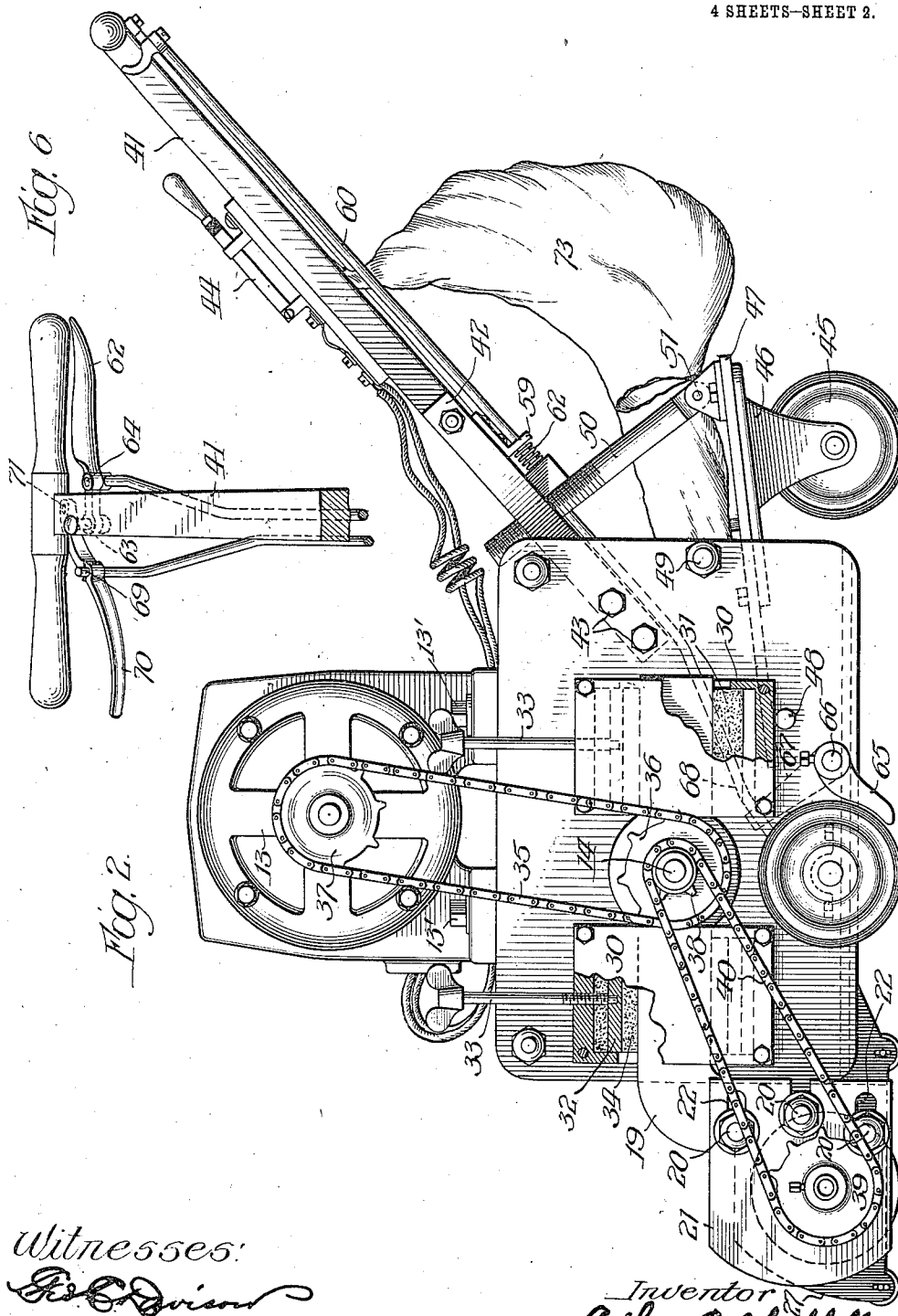
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4 SHEETS—SHEET 2.



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4 SHEETS—SHEET 3.

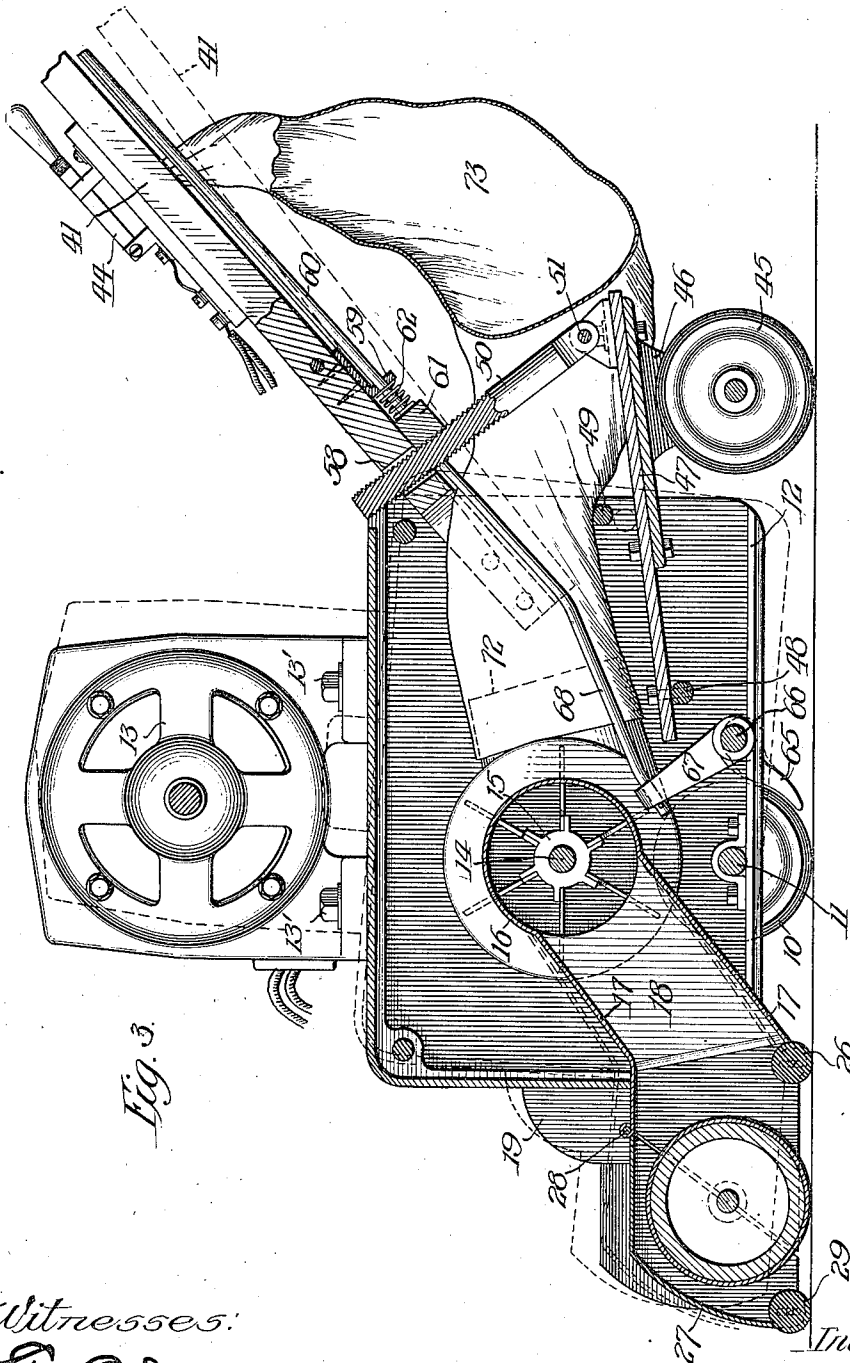


Fig. 3.

Witnesses:

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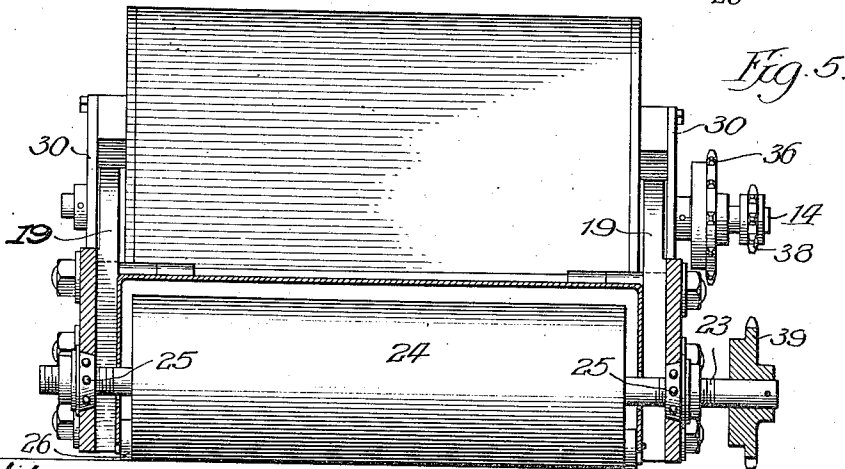
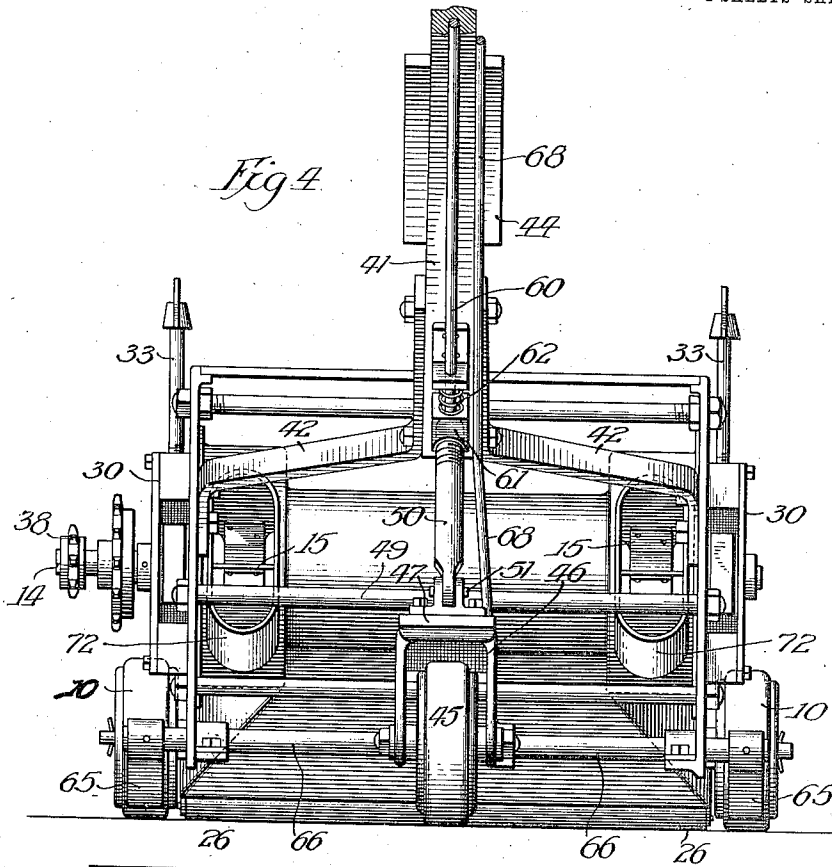
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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

ARTHUR E. CHAPPELL, OF CHICAGO, ILLINOIS.

SURFACING-MACHINE.

1,041,240.

Specification of Letters Patent.

Patented Oct. 15, 1912.

Application filed April 24, 1911. Serial No. 622,950.

To all whom it may concern:

Be it known that I, ARTHUR E. CHAPPELL, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Surfacing-Machines, of which the following is a specification.

This invention relates to surfacing machines particularly adapted for producing a smooth surface on floors, bowling alleys and the like, and it has for its object the provision of a machine of this character light enough to be manually propelled when not in operation but adapted to be self-propelled by the surfacing device when operating and carrying an electric, gas or other preferred type of motor for operating the machine and a fan for collecting the loose material produced by the surfacing device.

The invention also aims to produce a surfacing machine which shall be strong and durable and efficient in its operation and in which the position of the surfacing device can be readily adjusted by the operator to regulate the depth of the cut and which will automatically retain the surfacing device in adjusted position irrespective of the pressure applied to the handle of the machine, thereby securing a uniformity of finish.

A further object is to so mount the surfacing device on the main frame of the machine that its ends can be independently adjusted on the frame toward and from the surface to be operated upon and so that limited independent movement of the ends is permitted to enable the device to pass over obstructions or inequalities in the floor surface.

Still other objects are to drive the surfacing device from the motor through an intermediate shaft so that the vibrations of the motor are not transmitted to the surfacing device and to locate the suction fan immediately back of and as close as possible to the surfacing device whereby the greatest efficiency is secured.

Other aims and objects and many of the advantages of my invention will be apparent from the following description when taken in connection with the accompanying drawings illustrating a preferred embodiment thereof.

Referring to the drawings—Figure 1 is a plan view of a surfacing machine embodying my invention. Fig. 2 is a side elevation thereof. Fig. 3 is a longitudinal sectional

view on the line 3—3 of Fig. 1. Fig. 4 is a rear view of the machine. Fig. 5 is a front view partially in section; and Fig. 6 is an elevation of the outer end of the operating handle.

On the drawings, 10 designates a pair of supporting wheels rotatably mounted on the transverse shaft 11 upon which is rockingly mounted the main frame 12. An electric motor 13 is preferably secured by bolts 13' or otherwise on the top of the frame, as shown. A shaft 14 is journaled preferably by means of ball bearings in the frame above the supporting shaft 11 and a pair of fans 15 is fixed on the shaft adjacent either end thereof; a casing 16 being provided to inclose the fans, said casing being extended forwardly into a throat or chute 17 through which the dust, cuttings, etc., produced by the surfacing device are drawn by the fans. The throat is preferably divided by a centrally disposed partition 18 to form two passageways each communicating with one of the fans whereby the material is distributed between the two fans to increase the effective suction.

A pair of arms 19 projects forwardly from the main frame, their outer ends being downturned beyond the frame, each of said downturned ends being perforated to receive fastening bolts 20 by means of which bearing members or plates 21 are adjustably secured thereto, said plates being provided with slots 22 to permit longitudinal adjustment of the plates. A shaft 23 carrying an abrading roller 24 or other surfacing device, is suitably mounted by means of ball bearings 25 in the plates or bearing members 21; this surfacing device being adapted to travel forwardly over the surface to be operated upon, revolving in the meantime at high speed to produce a smooth finish on the surface being worked. The bottom end of the throat 17 is preferably provided with a small roller 26 and a hood 27 hinged at 28 to the top of the throat and supported by the sides of the throat is also provided adjacent its forward end with a similar roller 29. These rollers are capable of vertical movement in slots in the sides of the chute so that they will yieldingly contact with the floor when the surfacing device is in operative position and close the chute at the front and rear of the surfacing device to produce a stronger suction around the device and also to prevent the bottom of the chute from scraping

the floor. The hood may be turned back or unhinged whenever access to the surfacing device is desired and by loosening the bolts 20 and turning back the hood the surfacing device may be removed from the machine and replaced by a new or a different device. It will thus be apparent that the throat and hood are supported independently of the surfacing device and that limited movement of the surfacing device may take place relatively to the throat and hood.

The arms 19 are provided with openings adapted to fit over lugs projecting laterally from the sides of the frame in which the fan shaft 14 is journaled in ball bearings, the arms being thus pivotally connected to the frame in order that their outer ends may be adjusted independently upwardly or downwardly on the frame to properly position the surfacing device relatively thereto. Guides or boxes 30 are provided both in front of and at the rear of the fan shaft through which the arms extend and in the lower ends of these boxes are arranged yielding buffers 31 preferably made of felt against which the lower edges of the arms are adapted to press and above the arms are arranged plungers 32 adapted to be adjusted by means of hand-screws 33; these adjustable plungers cooperating to maintain the outer ends of the arms at the proper height relatively to the frame to level the surfacing device with the floor. Yielding buffers 34, of felt or other similar material, are preferably interposed between said plungers and the upper edges of the arms. It will thus be evident that by turning down the rear screw 33 and turning up the forward screw to depress and elevate the rear and forward plungers 32, respectively, the forward ends of the arms 19 may be raised and that by reversing this adjustment the forward ends of the arms may be lowered; this construction enabling each arm to be adjusted independently on the frame and the yielding buffers serving to yieldingly retain the arms in adjusted position. A firm but flexible support for the surfacing device is thus secured which permits it to follow the contour of the floor. It will be noted that the arms oscillate about the fan shaft from which the surfacing device is driven so that the oscillatory movements of the device are not interfered with by the drive chain.

The fan shaft is driven by means of a chain 35 from the motor; the sprocket wheels 36 and 37 mounted on the fan shaft and motor shaft, respectively, being preferably of the same size so that the fan is driven at the same speed as the motor. A sprocket wheel 38 is also secured on the fan shaft in alinement with a sprocket wheel 39 on the end of the shaft 23, whereby the surfacing roll is driven through the intermedi-

ary of the chain 40 from the fan shaft, the sprocket wheels 38 and 39 being preferably so proportioned that the surfacing device shall be driven at lower speed than the fan. A handle 41 is mounted in a yoke 42 which is secured to the sides of the main frame by bolts 43 or other preferred fastening means and upon the top of the handle in accessible position to the operator, is mounted a switch 44 which controls the operation of the motor. The handle is utilized to guide the machine over the surface to be treated and also to tilt the main frame about its supporting shaft 11 to lower the surfacing roll into the operative position shown in full lines in Fig. 3.

It will be observed that the supporting shaft 11 is mounted in front of the center of gravity of the machine thereby normally retaining the surfacing device clear of the floor and in order that the rear end of the main frame may be supported in elevated position to maintain the surfacing roll in operative relation to the floor, I have provided means for positively holding said frame in any position to which it may be tilted, thereby insuring a uniform action of the surfacing roll and relieving the operator of the labor of constantly pressing down or lifting up on the handle as is necessary with some machines heretofore employed. For this purpose I have provided a rear supporting wheel 45 mounted in a bracket or standard 46 upon the upper face of which is secured a supporting member or bar 47. The inner end of this supporting member is bolted or otherwise fixedly secured to a rock shaft 48 mounted in the sides of the main frame of the machine. The supporting member projects rearwardly from this rock shaft, as shown, and when the surfacing roll is raised to inoperative position so that the frame assumes the position shown in dotted lines in Fig. 3, the rear end of the frame is supported upon this supporting member by a transversely extending rod 49 which engages with the upper face of the supporting member. A rack 50 preferably in the form of a threaded rod is pivotally mounted at 51 on the outer end of the supporting member 47, its free end projecting upwardly through the aperture 58 in the handle. Beneath the handle there is mounted in a bearing 59 a rod 60 carrying at its lower end a serrated block 61 normally urged by an expansion spring 62 into engagement with the rack 50, whereby the frame of the machine is automatically locked in any position to which it may be tilted about the supporting shaft 11. An operating lever 62 pivoted on a bolt 63 near the outer end of the handle is pivotally connected at 64 with the end of the rod 60 so that by pulling outwardly on the lever the locking block 61 may be withdrawn from en-

gagement with the rack to permit the frame to be tilted to any desired position. It will be evident that this construction permits a fine degree of accuracy in the adjustment of the surfacing roll relatively to the surface to be treated and that this adjustment is maintained by reason of the automatic locking of the frame to the rack which is supported directly from the rear supporting wheel, the weight of the machine back of the main supporting shaft 11 being sufficient to prevent the frame from tilting forwardly. The rear wheel thus serves to gage the depth of cut of the surfacing device and also guides the machine forwardly in a straight line, it being obvious, of course, that the rear wheel is lifted off from the floor when the machine is to be turned from a right line movement.

Brake members 65 are fixedly secured on a transversely extending rock shaft 66 in position to engage with the supporting wheels 10 when desired, whereby the operator can readily control the forward movement of the machine. A lever 67 is fixed to said shaft intermediate its ends and is attached at its free end to a rod or link 68 pivotally connected at 69 with a lever 70 pivoted at 71 to the outer end of the handle. When it is desired to apply the brakes a rearward pull is exerted upon the lever 70 by the operator, which rocks the shaft 66 and applies the brake member 65 to the faces of the supporting wheels 10 with the requisite degree of pressure. The exhaust pipes 72 from the fans are connected with a receptacle or bag 73 which is supported from the handle, this bag being preferably made of textile fabric which permits the air to escape between its meshes but screens the dust and floor cuttings therefrom and retains the same until the bag is removed from the machine and emptied.

It is believed that the construction, operation and many advantages of my invention will be apparent from the foregoing without further description and it will be obvious that various mechanical changes in the size, shape, proportion and arrangement of the various parts may be resorted to without departing from the spirit or sacrificing any of the material advantages of the invention.

I claim:

1. In a surfacing machine, the combination of a pair of supporting wheels, a main frame rockingly supported on said wheels, a surfacing roll rotatably mounted on said frame near the forward end thereof, a wheel supporting the rear end of said frame, means for adjusting the rear end of the frame relatively to said wheel, and means for automatically locking the frame in adjusted position to maintain the surfacing roll in operative relation to the floor.

2. In a surfacing machine, the combina-

tion of a pair of supporting wheels, a frame rockingly supported thereby, a surfacing roll carried by the forward end of said frame, a supporting wheel adjustably connected with said frame at the rear of said pair of supporting wheels, means for adjusting said frame relatively to said rear wheel whereby to adjust the position of said surfacing roll, a locking block mounted to automatically lock said frame in adjusted position relatively to said wheel, and means for releasing said block.

3. In a surfacing machine, the combination of a pair of supporting wheels, a frame rockingly mounted thereon, a surfacing device rotatably and yieldingly mounted in said frame, a rear supporting wheel connected with said frame and adapted to support the rear end thereof, a handle for rocking said frame on said pair of wheels and relatively to said rear wheel to adjust the position of the surfacing device, means for automatically locking said frame to said rear wheel whereby the surfacing roll is maintained in adjusted position and manual means for releasing said locking means.

4. In a surfacing machine, the combination of a pair of supporting wheels, a frame rockingly mounted thereon, a surfacing device mounted upon the forward end of said frame, a rearwardly extending supporting member pivotally connected with said frame behind said pair of wheels, a rear supporting wheel secured to the free end of said supporting member, an adjustable connection between said supporting member and the frame whereby the position of said frame may be varied to adjust the position of said surfacing device, a lock fixed with respect to the frame and adapted to automatically lock said frame in adjusted position relatively to the supporting member, and manually controlled means for releasing said lock.

5. In a surfacing machine, the combination of a rockingly mounted frame, a surfacing device carried thereby, a supporting member pivotally connected with said frame, a supporting wheel attached to said supporting member, a handle for adjusting the position of said frame, a ratchet mounted on the free end of said supporting member, and projecting through said handle, means carried by the handle for automatically engaging with said ratchet to lock the frame in adjusted position and manual means releasing said lock.

6. In a surfacing machine, the combination of a pair of supporting wheels, a main frame rockingly supported thereby, a rearwardly extending supporting member pivotally connected with said frame, a handle secured to said frame whereby the frame may be rocked on its supporting wheels relatively to said supporting member, a ratchet

connected with the free end of said supporting member, and manually controlled means mounted on said handle to automatically engage said ratchet and lock the frame in the position to which it has been rocked by means of said handle.

7. In a surfacing machine, the combination of a pair of supporting wheels, a main frame rockingly mounted thereon, forwardly extending arms adjustably mounted on and supported by said frame, a surfacing device carried by the forward ends of said arms, a handle for rocking said main frame on its supports, a rear supporting wheel, and adjustable connections between said wheel and said frame whereby said frame is positively retained in any position to which it may have been rocked by said handle to position the surfacing device relatively to the surface to be worked.

8. In a surfacing machine, the combination of a pair of supporting wheels, a main frame rockingly mounted thereon, a pair of forwardly projecting arms adjustably and yieldingly carried by said frame, a surfacing roll carried by said projecting arms, means for actuating said roll, a handle for rocking said frame on its supports to adjust the position of said surfacing roll, and means for automatically locking and retaining said roll in its adjusted positions.

9. In a surfacing machine, the combination of a pair of supporting wheels, a frame mounted to rock thereon, a pair of forwardly projecting arms pivotally carried by said frame, means for adjusting each of said arms independently of the other about their pivots, a surfacing roll carried by said forwardly projecting arms, means for rocking said frame on its supports to adjust the position of said surfacing roll, and means for locking said frame in adjusted position.

10. In a surfacing machine, the combination of a pair of supporting wheels, a frame rockingly carried thereby, a pair of forwardly projecting arms pivotally mounted on said frame, a surfacing device carried by said projecting arms, and means for adjusting the position of said arms on the frame, said means having yielding provisions permitting limited independent movement of said arms relatively to the frame.

11. In a surfacing machine, the combination of a main frame, a pair of forwardly projecting arms pivotally mounted on said frame, a surfacing roll carried by said arms, means for adjusting the arms on the frame independently of each other, and yielding means permitting limited independent movement of said arms relatively to the frame.

12. In a surfacing machine, the combination of a pair of supporting wheels, a frame pivotally mounted thereon, a fan mounted in said frame, a pair of arms projected forwardly from said frame, a surfacing device

carried by said arms, a motor for actuating said fan and surfacing device, a handle rigidly connected to said frame, a rear supporting wheel rockingly connected with the frame, a rack connected with said wheel, a manually controlled lock mounted on said handle and adapted to engage with said rack to lock the frame in tilted position, a brake adapted to engage said supporting wheels, and means carried by said handle for operating said brake.

13. In a surfacing machine, the combination of a main frame, a fan rotatably mounted in said frame, a motor supported on said frame, connections from said motor to said fan for rotating the same, a surfacing device, supporting means therefor mounted to permit movement of the surfacing device in an arc about the fan shaft, and means whereby said surfacing device is operated from said fan shaft.

14. In a surfacing machine, the combination of a main frame, a fan rotatably mounted therein, a surfacing device carried upon the forward end of said frame, a hood disposed over said surfacing device, a throat connecting said hood with the fan, and rollers loosely mounted on said hood and the lower end of said throat to yieldingly contact with the floor and close the openings between the lower edges of the throat and the floor in front of and at the rear of said surfacing device.

15. In a surfacing machine, the combination of a pair of supporting wheels, a frame rockingly carried thereby, a pair of independently movable arms pivotally and yieldingly mounted on said frame, and a surfacing device carried by said arms.

16. In a surfacing machine, the combination of a main frame, a motor carried thereby, a fan shaft mounted in said frame, a surfacing device yieldingly mounted on the forward end of said frame, driving connections between the motor and said fan shaft, and driving connections between the fan shaft and the surfacing device whereby the surfacing device is driven from the motor without receiving the vibrations of the motor.

17. In a surfacing machine, the combination of a main frame, a fan shaft mounted therein, a motor carried by said frame above the fan shaft, operative connections between said motor and fan shaft whereby said shaft is driven from the motor, a surfacing device adjustably mounted to move about the fan shaft as a center, and driving connections between said fan shaft and said surfacing device whereby the surfacing device is driven indirectly from the motor and does not receive the vibrations of said motor.

18. In a surfacing machine, the combination of a frame, a surfacing device adjust-

ably and yieldingly carried by said frame, a motor mounted on the frame, an intermediary shaft mounted in the frame, driving connections from said motor to said intermediary shaft, driving connections from said intermediary shaft to the surfacing device, and means for adjusting said surfacing device relatively to the frame, said intermediary shaft serving to absorb the vibrations of the motor whereby the same are not transmitted to the surfacing device.

19. In a surfacing machine, the combination of a main frame, a shaft mounted therein, a pair of arms mounted to oscillate upon said shaft, a surfacing device carried by the projecting ends of said arms, adjusting means for yieldingly adjusting the position of said arms about said shaft, a cover projecting downwardly in front of and at the rear of said surfacing device, and means loosely carried by said cover for yieldingly contacting with the floor whereby to close the openings between the lower edges of the cover and the floor.

20. In a surfacing machine, the combination of a frame, a surfacing device yieldingly carried thereby, a fan mounted in said frame, a hood disposed over said surfacing device, a throat connecting said hood with said fan, and rollers loosely carried by the hood in position to yieldingly contact with the floor and close the openings between the lower edges of the hood and the floor in front of and at the rear of said surfacing device.

21. In a surfacing machine, the combination of a pair of supporting wheels, a frame rockingly carried thereby, a pair of arms projecting forwardly from said frame, a surfacing device carried by the free ends of said arms, and means mounted on the frame for adjusting each of said arms independently of the other.

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