March 3, 1931. H. L. MYERS 1,795,262

BASE MACHINE

Filed Feb. 11, 1928 4 Sheets-Sheet 1

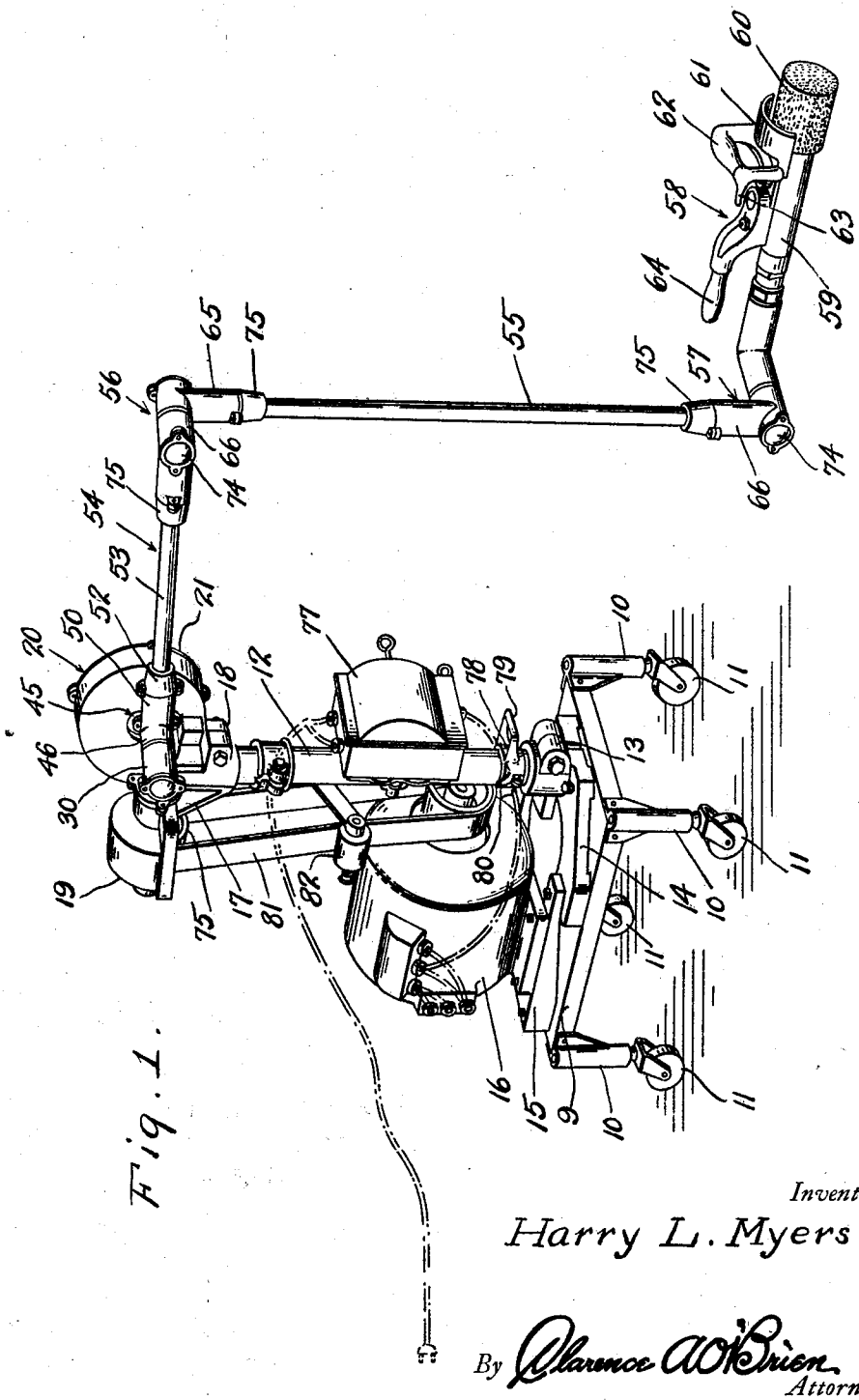


Fig. 1.

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BASE MACHINE

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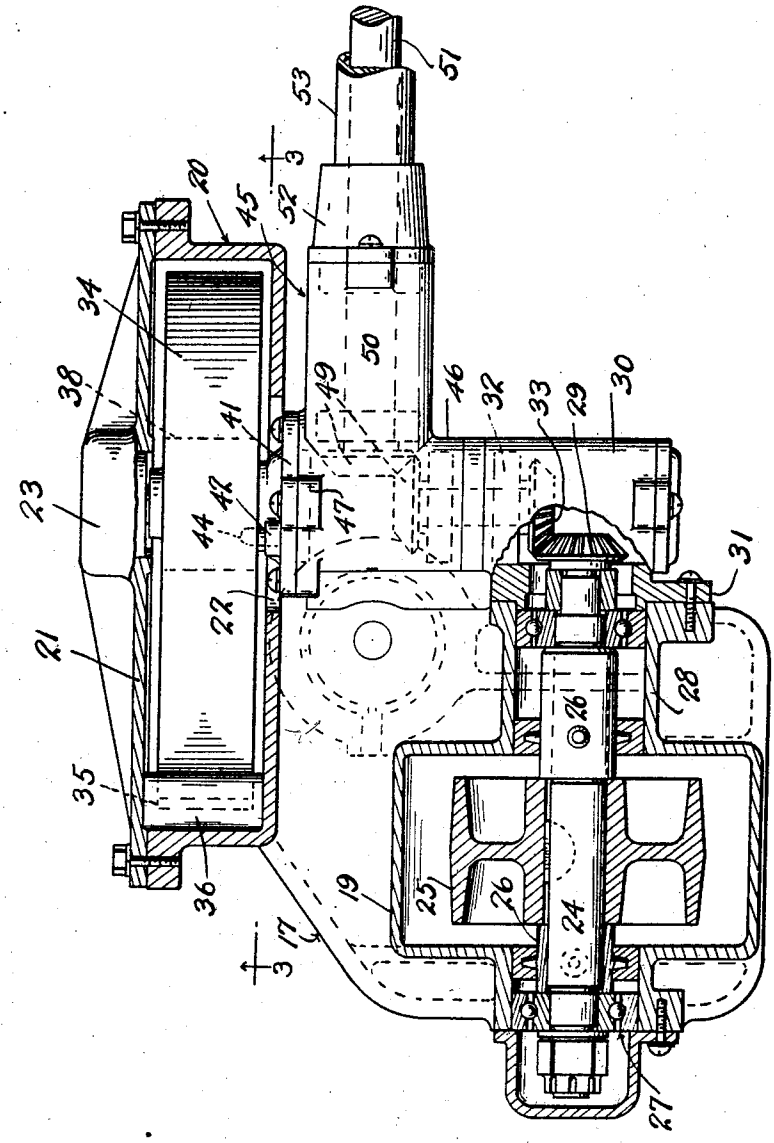


Fig. 2.

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BASE MACHINE

Filed Feb. 11, 1928 4 Sheets-Sheet 3

Fig. 7.

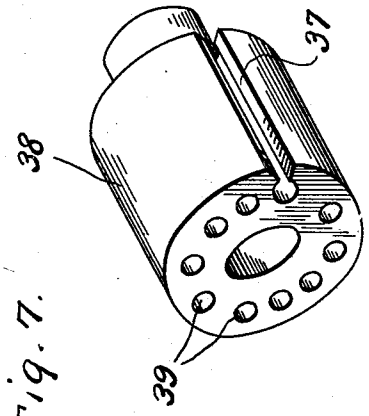
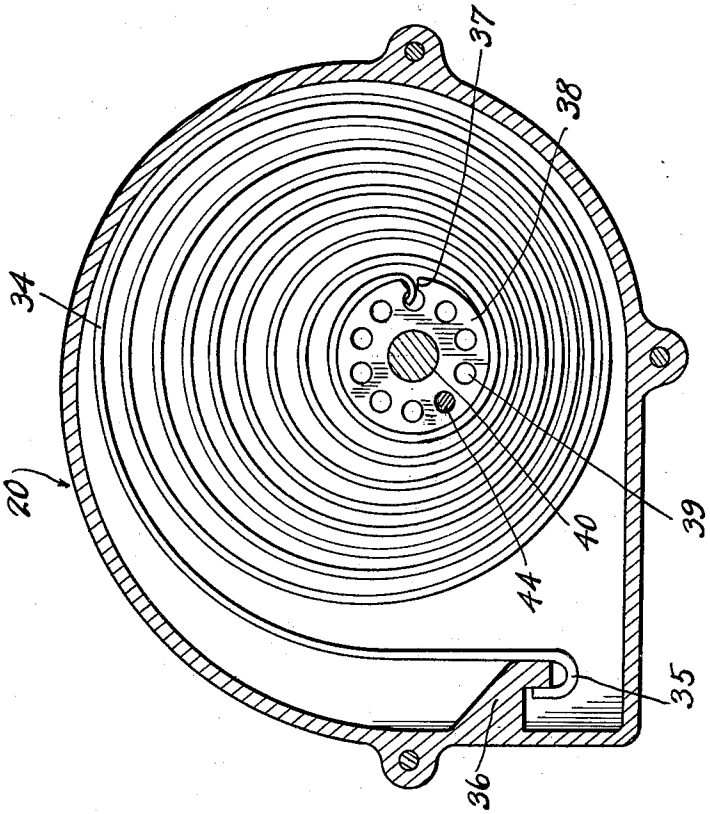


Fig. 8.



Fig. 3.



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BASE MACHINE

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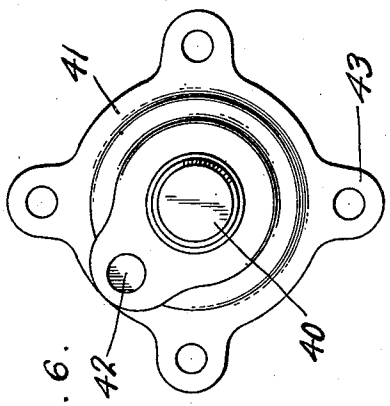


Fig. 6.

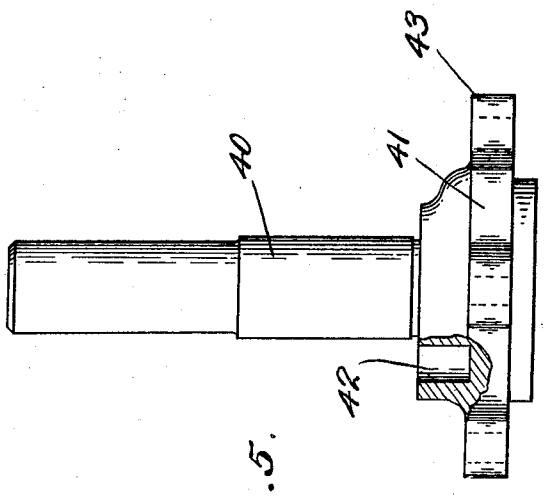


Fig. 5.

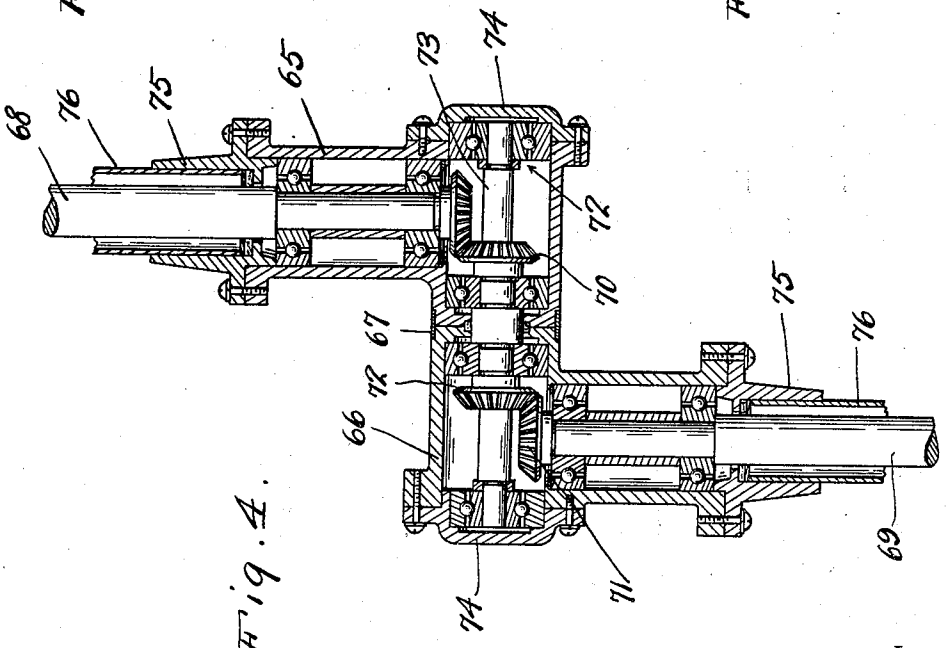


Fig. 4.

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Patented Mar. 3, 1931

1,795,262

UNITED STATES PATENT OFFICE

HARRY L. MYERS, OF TOLEDO, OHIO, ASSIGNOR TO THE AMERICAN FLOOR SURFACING MACHINE COMPANY, OF TOLEDO, OHIO

BASE MACHINE

Application filed February 11, 1928. Serial No. 253,605.

This invention relates to an improved electrically operated base machine, expressly constructed for scraping, polishing and otherwise conditioning terrazzo base, wainscoting, walls, stair work, and analogous structures.

Briefly, the invention has more particular reference to a machine of the elevated type including gear driven power transmission means suspended above the surface.

My principal object is to provide a machine of this class which is characterized by compactness and convenience of arrangement of parts, an exclusive power transmission balancing device, a positive short belt drive, a special power transmission embodying a plurality of swinging rigidly connected arms by an enclosed gear structure, and flexibility of operation, to make for efficiency in operation.

What I have endeavored to do beyond what has already been done in this art, is to provide what is known in the trade as a geared base machine embodying a new and dependable organization of details, which cooperate in providing a structure which is positive in operation, efficient in performance, capable of fulfilling the requirement of a machine of this class, modernized, well developed from a manufacturing standpoint, and therefore commercially eligible as a competitive machine in the trade.

The advantages, derived from the structural improvements embodied in this machine, will be enumerated following the detailed description, and will be made apparent at the latter description proceeds.

In the drawings:—

Figure 1 is a perspective view of the complete geared base machine as constructed in accordance with the present invention.

Fig. 2 is an enlarged fragmentary sectional and elevational view through the upper portion of the machine, particularly the especially designed casting.

Fig. 3 is a vertical section taken approximately upon the plane of the line 3—3 of Fig. 2.

Fig. 4 is a sectional and elevational view of one of the special geared joints of the power transmission machine.

Fig. 5 is an enlarged view of an axle for a spring drum.

Fig. 6 is an end elevational view of the part shown in Fig. 5.

Fig. 7 is a perspective view of said spring drum.

Fig. 8 is a perspective view of a coupling pin between the drum and its mounting.

Attention is first invited to Fig. 1, wherein the complete machine is shown. The reference numeral 9 here designates what is broadly referred to as a support and what is specifically referred to as a truck. The truck is of general rectangular design, and includes corner legs 10, equipped with swivelled casters 11.

The truck, which is made of pressed steel, is so proportioned, that the caster wheels are spaced far enough apart, and the platform is low enough to overcome any tendency of the machine to be top heavy.

Rising from the center of one end of the truck is a vertical standard or column 12 fastened by a clamp 13 to the special mounting members 14, which are bolted or otherwise fastened to this end portion of the truck. Also bolted to the truck, we find spaced parallel rails 15 on which an appropriate electric motor 16 is mounted. The electrical motor is equipped with a small pulley as shown.

As before intimated, I provide an especially designed casting on the upper end of the standard, the casting being generally represented by the numeral 17. The casting includes a tubular clamp 18 which embraces the upper end of the standard, and off to one side, it is formed with a substantially semi-circular pulley shield 19. It also embodies an integral spring housing 20 which, as shown in Fig. 2 is open on one side with the open side closed by a removable cover plate 21.

The spring housing is disposed vertically and formed in one side with an opening as at 22. The cover plate is formed with a bearing 23 opposite this opening 22, to serve a purpose to be hereinafter described. As shown better in Fig. 2, the casting is made to accommodate a pulley shaft 24 on which

the pulley 25 is mounted, this extending through appropriately anchored bushings 26 and being journaled in suitable roller bearings 27.

The pulley shaft extends through a casing portion 28, of the casting, the extended end carrying a beveled gear 29 located in a cylindrical gear housing 30. Incidentally, this gear housing is bolted through the medium of a flange 31, to the casting and it accommodates a complemental pulley shaft 32 having a beveled gear 33 in mesh with the beveled gear 29.

Before proceeding further, I wish to call attention to Fig. 3, wherein it will be observed that a spring 34 is enclosed in the aforesaid spring housing 20. The spring has one end provided with a hook 35, separably connected with an anchoring lug 36, formed in the housing. The opposite end of the spring is separably connected with a slot 37 in a spring drum 38. The spring drum is here provided with circumferentially spaced longitudinal bores or sockets 39 for tensioning the spring.

Referring now to Figs. 6 and 7, we observe the spring drum mounting comprises an axle 40 on which the drum is rotatably mounted, the axle being provided with a head 41 and an eccentric portion equipped with a pin receiving socket 42. The head is provided with apertured lugs 43. As shown in Fig. 2, a pin 44 (see Fig. 8 also), is fitted into the socket 42, and is adapted for selective reception in any one of the bores 39 of the spring drum. Obviously, by changing the position of the pin, the tension of the spring 34 can be regulated.

The principal purpose of the pin however, is to provide a coupling between the drum and the head 41. Referring again to Fig. 2, it will be seen that the reference character 45 designates a hollow elbow whose short branch 46 is disposed in alinement with the cylindrical gear casing 30 and the opening 22 in the spring drum housing. In fact, this branch 46 has swivel connection with the part 30, and the opposite open end has connection with the aforesaid head 41 of the spring drum mounting. To this end, the branch 46 is provided with outstanding ears 47, bolted or otherwise fastened to the corresponding portions 43 on the heads 41.

The branch 46 accommodates intermeshing bevel pinions or gears 49, and a complemental branch 50 accommodates a solid shaft 51 of the power transmission means. In this connection, attention is invited to the fitting or coupling 52, which receives an end portion of the shaft tubing or casing 53.

Referring again to Fig. 1, a clear observation of the flexible power transmission means may be had. This means is not "flexible" in the ordinary sense that the word is used in describing a flexible drive shaft. At the same time, the flexibility of the arrangement is evident.

For purposes of convenience, the power transmission means is specifically known as being made up of rigid sections connected together by geared joints. The horizontal section is represented by the reference character 54, and the vertical section by the character 55. The numeral 56 designates one geared joint broadly, and the numeral 57 another geared joint.

The numeral 58 designates generally a novel grinding head employed in association with this machine, the same including a casing 59 accommodating the shaft (not shown) of the cylindrical abrasive 60, and carrying an arcuate guard 61, hand grip 62 equipped with a supporting hook 63, and a complemental handle or hand grip 64.

In Fig. 4, I have detailed one of the geared joints and by referring to this figure, it will be seen that the reference numeral 65 designates a right angular member and numeral 66 a complemental member of somewhat the same design. The adjacent ends of these members are disposed in abutting relation, for relative swivelling motion, a dust guard or band 67 being provided at this point.

The shafts 68 and 69 carry bevel gears 70 and 71 respectively, meshing with complemental bevel gears 72, on the small interconnecting shaft 73. Appropriate bearings are of course provided with intermediate spacing sleeves and removable closures 75 are also provided to facilitate assembling. With this arrangement, it is obvious that the intergeared shafts serve to positively transmit motion from the source of power through the power transmission means, while at the same time permitting rolling of the gears upon each other, to accomplish the relative swinging motion of the rigid sections or arms.

Each joint includes the retention collars 75 receiving the shaft tubing 76. Attention is yet to be called to a suitable electric switch box 77 on the intermediate portion of the standard 12, and a special fixture 78 on the lower end portion of the standard including a hand grip 79 and a supporting hook 80, upon which the previously mentioned hook 63 on the grinding head 58 is suspended.

The practicability and efficiency of the machine may be better appreciated by a consideration of the following advantages, viz:—

Compactness and convenience

Inventive and engineering skill combined with careful designing serves to make the geared base machine herein illustrated efficient, yet very compact. The truck, which is made of pressed steel, is so proportioned that the caster wheels are spaced far enough apart and the platform is sufficiently close to the

surface to overcome any tendency of the machine to be top-heavy. The general design gives the machine the natural tendency to follow along behind the operator. Should there be any resistance, the handle or hand grip which is conveniently located on the lower portion of the standard, is within easy reach of the operator, so that he does not have to jump up and pull the machine along. Incidentally the operator usually occupies a kneeling posture while using the machine. Hence, the convenience of this arrangement.

In addition, the handle is placed sufficiently low to overcome the possibility of tipping the machine over accidentally. Then too, as described, combined with this handle, is a hook on which the grinding head can be hung, when not in use, and when transporting the machine from one room to another. Furthermore, the switch box is located on the standard near the center so that it is within easy reach of the operator to permit him to stop the machine in an instant, if necessary.

Exclusive balancing device

This is one of the outstanding features of the invention, and it broadly embodies the housing, and adjusting spring drum, associated with the power transmission means. The spring is so tensioned as to relieve the operator of "carrying", the overhanging weight of the suspended driving shafts and tubing. As intimated this spiral spring reaction for counter-balancing, is placed at the first swivel joint or at the top of the standard. The spring thus arranged counterbalances the overhanging weight and responds to the operator's every movement, leaving him free to merely guide the grinding head. This consequently releases him of unusual strains, and facilitates manipulation of the grinding head.

The short belt drive

This includes the short belt 81, passing over the pulley on the electric motor and over the aforesaid pulley 25, and an automatic spring operated belt tightener 82 is associated therewith. As a safeguard against damage to the gears, should anything prevent their free and normal movement, and also as a simple and efficient power transmission, the machine is therefore equipped with this short belt drive. This delivers power from the motor to the first swivel joint and the toggle joint system, and the automatic belt tightener, insures steady full power and compensates any differences in the belt length when the electric power conditions necessitate change of motors.

Further, provision is made to accommodate various motors through the aforesaid adjustable rails which support the motor and which lend themselves to the different spacings of the bolts in the base of motors. In changing motors, the belt drive eliminates alinement difficulties that frequently occur when motors are geared direct to the machine.

Power transmission and toggle joint

Ordinary so-called toggle joint machines have the entire weight of the driving shaft casings and housings swivelled on the revolving drive shaft, and the alinement of the gears could not be maintained because of the rapid wear in all the parts including the swivelling joints themselves.

Furthermore, the shafts are made of cold rolled steel which are not only heavy, but are unadapted for the high speed requirements of machines of this class and they therefore cannot possibly run true. The swivel joints also wear very fast and permit grit to get into the gears and thus hasten wear of the gears. All of these difficulties are substantially overcome in the arrangement herein described and shown by using hollow seamless steel tubing for the shaft extensions which are accurately machined to run perfectly true and fitted with hollow end shafts on which the ball bearing is mounted.

The drive shaft and the gears are mounted on independent bearings, and the swivel joints are also mounted on intermediate bearings, which are installed in such a unique manner, that an accurate alinement is indefinitely maintained.

In conclusion, it is obvious that the swivelling motion and relative freedom of movement between the parts of the transmission and grinding head, permits the arrangement to fulfill the requirements of a device of this class. Not only this, it is to be noted that in constructing the power transmission means with the geared joints so made, that they gradually step over toward one longitudinal edge of the truck, thus disposing the grinding head in alinement with the longitudinal edge, the power being taken off from the center of the truck. This places the grinding head in the most natural position, to prevent undue angling of the truck with respect to the wall surfaces.

These and other advantages and features of the invention have doubtless been made apparent from the description and drawings.

Having thus described my invention, what I claim as new is:—

1. A base machine comprising a portable truck, a motor supported on said truck, a standard on the truck rising above said motor and including fixed driving mechanism at its upper end, an operating connection between said driving mechanism and the motor, outwardly extending elevated power transmission mechanism operatively connected with said first named mechanism and including relatively swingable pendulous parts, and a spring balance device associ-

ated with the upper end portion of said standard and with the adjacent portion of the extended power transmission mechanism to maintain the latter in a suspended floating state.

2. In a base machine of the class described, a portable wheel supported truck including a relatively low platform, a motor supported on said truck, a vertical standard connected to and rising from the truck at one end of the motor and having its upper end extending above the motor, a head on the upper end of said standard including bearings, drive shafts mounted in said bearings, a pulley associated with one of said drive shafts, a second pulley carried by the motor shaft, a belt trained over said pulleys, a horizontally disposed power transmitting section connected at its inner end to the head on said standard and extending outwardly beyond the adjacent end of the truck, a depending pendulous section supported from the outer end of said first section, and spring balance means associated with the inner end of said first named section and said head for maintaining both of said sections in yielding suspended relationship.

3. A base machine comprising a portable support, a motor arranged thereon, a vertical standard connected to and rising from the support and extending above the motor, drive shafts mounted in bearings on the upper end portion of said standard, a pulley associated with one of the drive shafts, an additional pulley associated with the motor, a belt trained over said pulleys, a surface treating device, power transmission means associated with said device and a complemental one of said drive shafts, said power transmission means being composed of sections, the sections being of rigid form and swivelly connected together and including a horizontal section projecting outwardly beyond the standard, and a vertical section depending from the outer end of said horizontal section, said surface treating device being rockably connected to the lower end of said vertical section, and a spring balance device associated with said transmission means and serving to hold the latter in a yieldable suspended state to permit unhampered manipulation of the surface treating device, and to relieve the operator of the weight of the hanging sections of said transmission means.

In testimony whereof I affix my signature.

HARRY L. MYERS.