

M. L. SCHLUETER.
FLOOR SURFACING MACHINE.

APPLICATION FILED DEC. 7, 1904.

2 SHEETS—SHEET 1.

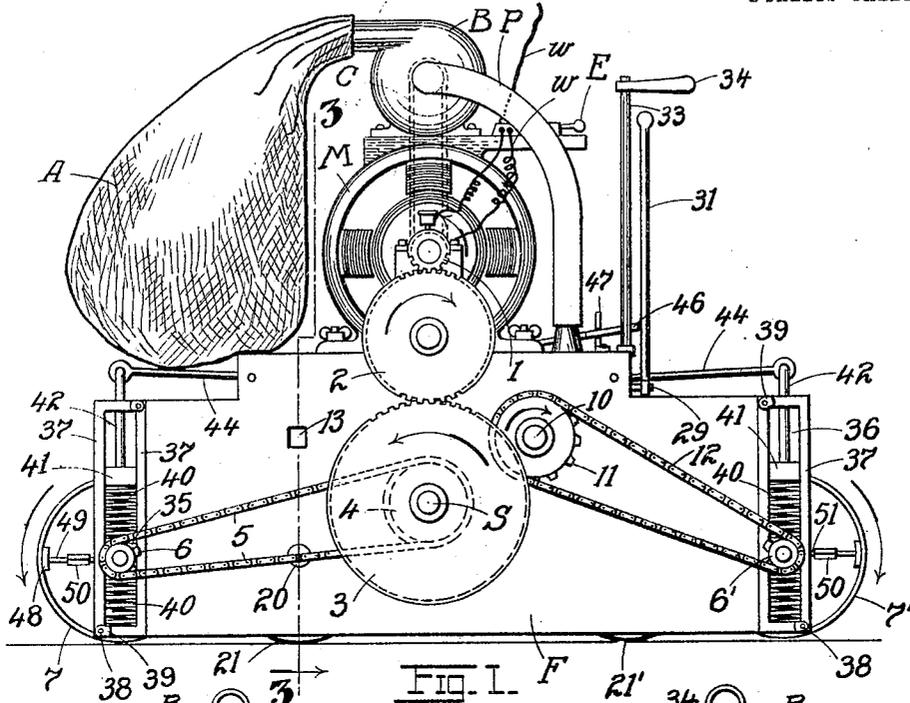


FIG. 1.

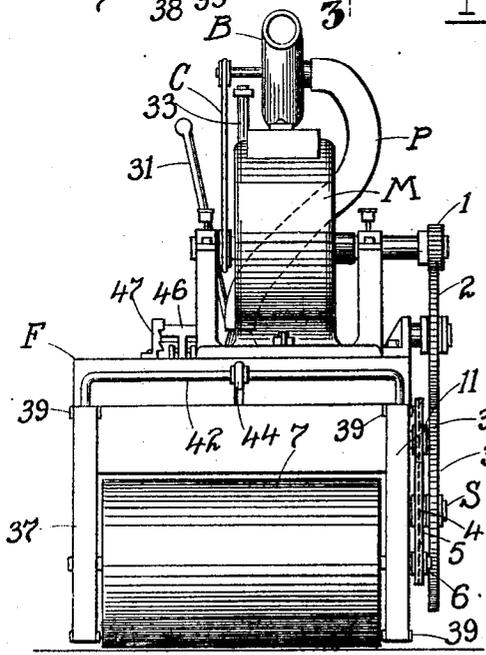


FIG. 2.

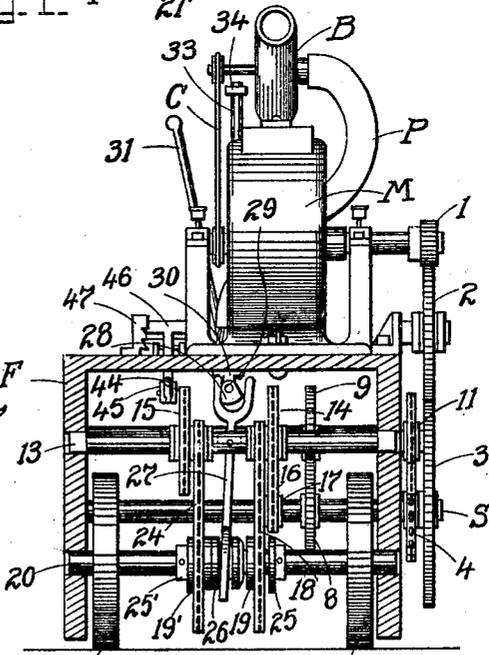


FIG. 3.

Inventor

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By

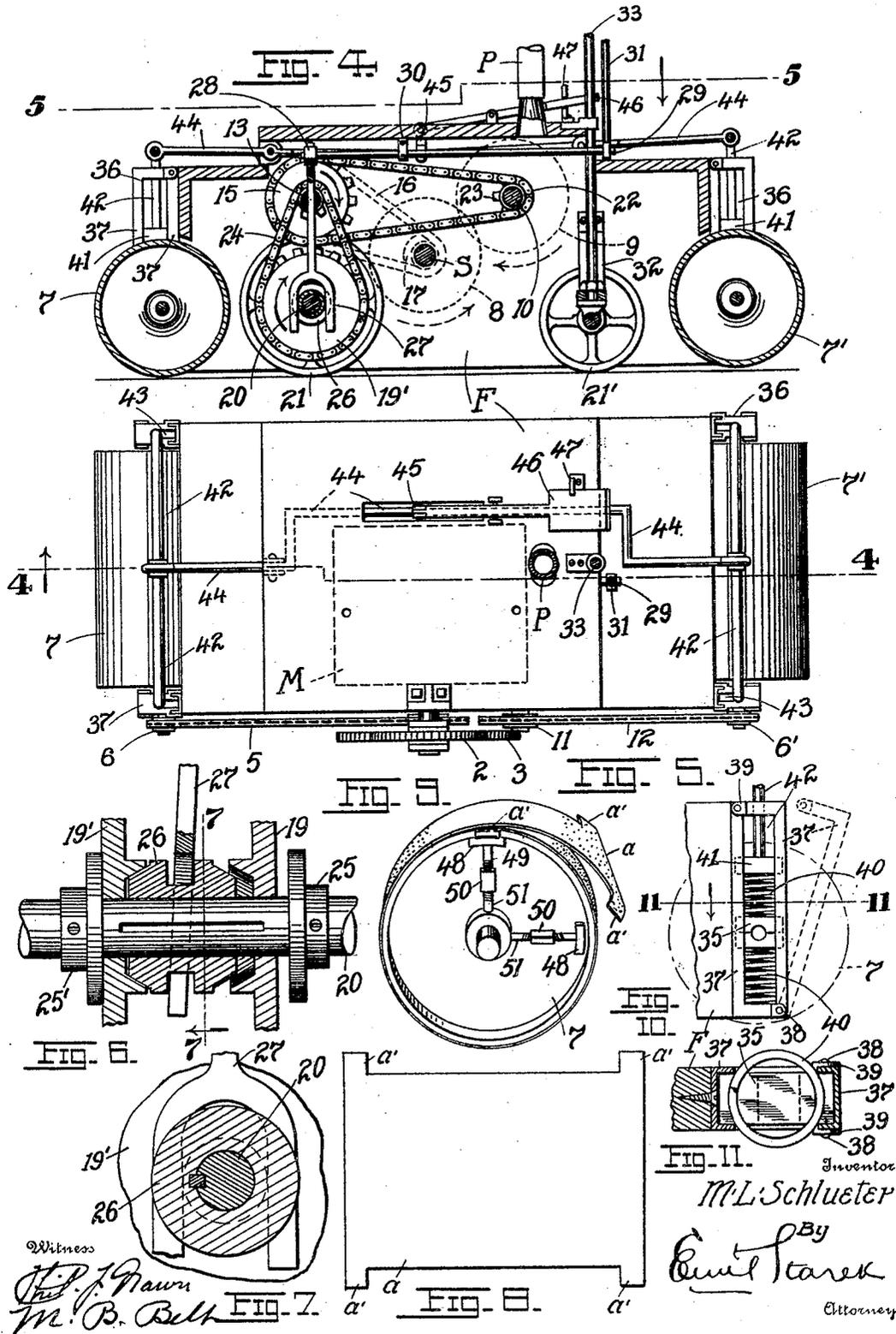
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2 SHEETS—SHEET 2.



UNITED STATES PATENT OFFICE.

MAX L. SCHLUETER, OF ST. LOUIS, MISSOURI.

FLOOR-SURFACING MACHINE.

No. 798,455.

Specification of Letters Patent.

Patented Aug. 29, 1905.

Application filed December 7, 1904. Serial No. 235,906.

To all whom it may concern:

Be it known that I, MAX L. SCHLUETER, a citizen of the United States, residing at St. Louis, State of Missouri, have invented certain new and useful Improvements in Floor-Surfacing Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention has relation to improvements in floor-surfacing machines; and it consists in the novel construction and arrangement of parts more fully set forth in the specification and pointed out in the claims.

In the drawings, Figure 1 is a side elevation of the machine. Fig. 2 is a front or end elevation thereof. Fig. 3 is a vertical cross-section on line 3 3 of Fig. 1. Fig. 4 is a longitudinal vertical section on line 4 4 of Fig. 5, the motor and blower being removed. Fig. 5 is a horizontal section on line 5 5 of Fig. 4. Fig. 6 is an enlarged view of the clutch. Fig. 7 is a cross-section on line 7 7 of Fig. 6, showing the feather of the clutch. Fig. 8 is a plan of the blank sheet wrapped about the abrading cylinder or drum. Fig. 9 is a perspective of the abrading or surfacing drum with the abrading-sheet partially wrapped thereover. Fig. 10 is an enlarged elevational view of the bearing for the surfacing-drum and way therefor, and Fig. 11 is a cross-section on line 11 11 of Fig. 10.

The object of my invention is to construct a floor-surfacing machine which will insure uniform results for any given area operated on, such uniformity resulting from the ready adjustment of the pressure of the operating rollers or drums against the surface operated upon. By "surfacing-machine" I of course contemplate not only sandpapering-machines, but any polishing or finishing machine, its particular character depending on the nature of the abrading or operating surface with which the rollers or drums are provided.

A further object is to construct a machine in which the operating rollers or drums can be readily set to any degree of pressure against the floor, and, finally, to construct a machine possessing further and other advantages better apparent from a detailed description of the invention, which is as follows:

Referring to the drawings, F represents a suitable frame or housing of the machine on top of which is mounted an electric motor M, to which the power is supplied by the wires *w w*, leading overhead to any source of elec-

tric energy. (Not shown.) E represents a switch for turning on or off the power thus supplied, all as well understood in the art. Leading from the top of the frame is a pipe P, whose upper end communicates with a fan B, discharging into a sack A. The fan is driven from the motor by a belt connection C.

The above features are well understood, and no special detailed description is required therefor, as they form no part of my present invention.

Carried at one end of the shaft of the motor is a pinion 1, which meshes with a gear-wheel 2, mounted on the side of the frame F, the gear-wheel 2 meshing in turn with a larger gear 3 at the adjacent end of the main operating-shaft S, mounted transversely between the depending sides of the frame or housing F. The shaft S rotates constantly in one and the same direction, as indicated by the arrows in Fig. 1. On the shaft S, adjacent the gear 3, is secured a sprocket-wheel 4, from which passes forwardly a sprocket-chain 5 over the terminal sprocket-pinion 6 at the adjacent end of the shaft of the surfacing or abrading roller or drum 7. From the connections described this drum 7 rotates in the same direction as the gear-wheel 3, this rotation being toward the lower edge or bottom of the frame or housing F. On the shaft S, within the frame F, is secured a gear-wheel 8, which meshes with a second gear 9 on a second shaft 10 on a higher plane, but parallel with the shaft S, this gear connection imparting to the shaft 10 a rotation contrary to that of the shaft S. The shaft 10 is provided at one end with a sprocket-wheel 11, from which leads a chain 12 over a sprocket-pinion 6' at the adjacent end of the shaft or axis of a second drum 7', the latter, from the connections described, also rotating toward the bottom or lower edge of the frame F. The drums 7 7' by thus rotating in the directions respectively indicated therefor sweep the particles and dust abraded by them into the interior of the housing or frame F, whence they are drawn up through the pipe P by the action of the fan B and deposited into the bag or receptacle A.

As above stated, the shaft S and the motor-shaft revolve constantly in the same direction; but as the machine operates over the surface or floor to be finished and polished it becomes necessary to drive the machine over the floor first in one direction and then the other. This is accomplished by the following gear mech-

anism: In the same horizontal plane there-
with and directly in front of the shaft 10 is
mounted a stationary axle 13, over which
loosely rotate two sets of step sprocket-wheels
14 15, respectively. From the larger section
of the sprocket-wheel 14 leads a chain 16,
which in turn passes over a sprocket-pinion
17 on the shaft S, the latter thus imparting
rotation to the sprocket 14 in the same direc-
tion with itself. Now from the smaller sec-
tion of the sprocket 14 leads a chain 18, which
in turn passes over the sprocket-wheel 19,
whose hub loosely revolves about a shaft 20,
(parallel to the shaft S,) mounted on the frame
F and carrying the drive-wheels 21 21'. The
hub of the gear-wheel 19 forms one mem-
ber of a clutch and is coupled to the shaft 20
in a manner presently to be explained. For
the present, however, it is sufficient to state
that from the connections described the
sprocket 19 will revolve in the same direction
as the shaft S. From the larger section of
the sprocket-wheel 15 leads a chain 22, which
passes over a sprocket-pinion 23 on the shaft
10, which latter shaft, as already described,
rotates in a direction opposite to the shaft S,
so that from the connections described the
sprocket 15 will likewise rotate in a direction
opposite to that of the shaft S. Leading
from the smaller section of the sprocket 15
leads a chain 24 to a sprocket-wheel 19', like-
wise loosely mounted on the shaft 20, said
sprocket 19', as obvious, rotating in the same
direction of the sprocket 15—that is to say,
opposite to that of the shaft S and opposite
to that of the sprocket 19. Like the hub of
the latter, however, that of the sprocket 19'
also constitutes one section of a clutch which
is capable of being coupled to the shaft 20.
It will thus be apparent that the direction of
rotation imparted to the wheel-shaft 20 will
depend on which of the two sprocket-wheels
19 19' is coupled thereto, it being understood
that the direction of travel of the machine
depends on the direction of rotation imparted
to the wheel-shaft. On the outside of each
wheel 19 19', fixed to the shaft 20, is a collar
25 25', against which the hub of the adjacent
wheel can be forced into frictional engage-
ment, so as to practically couple the said
wheel to the shaft. This is accomplished as
follows: Slidably feathered to the shaft 20,
between the sprockets 19 19' and rotatable
therewith, as is usual in this class of devices,
is a clutch member 26, between whose termi-
nal heads the same is loosely spanned by the
adjacent end of a vertically-disposed clutch-
lever 27, pivoted to the axle 13, the short
arm of the lever being forked, the fork mem-
bers receiving between them a cam-head 28,
carried at the forward end of a rocker-bar
29, mounted in suitable brackets 30, the rear
end of the rocker-bar being controlled by a
lever 31 directly in front of the platform oc-
cupied by the operator standing on the ma-

chine. By oscillating the lever 31 to the
right or left the bar 29 is rocked accordingly,
thereby oscillating the cam-head 28 first in
one direction and then the other. This in
turn oscillates the clutch-lever 27 in one di-
rection or the other, thus shifting the clutch
26 in proper direction to cause the same to
force either one wheel 19 or the other 19'
against its corresponding collar 25 25' on the
shaft 20, imparting rotation to the latter first
in one direction and then the other at the will
of the operator, and thus driving the machine
over the floor in any desired direction. The
wheels 21 are positively driven and may be
denominated as the "front" wheels. The rear
wheels 21' of course serve merely to support
the rear end of the machine. They are car-
ried by the rear truck 32, which is mounted
pivotally, so as to be capable of a limited
horizontal oscillation to permit the necessary
steering of the machine. This is accomplished
by the steering-staff 33, coupled to said truck
and provided with a handle 34. No claim is
made to this feature, as the same is well un-
derstood in the art.

The shafts or axes of the surfacing drums
or rollers 7 7' are carried in sectional bearing-
blocks 35, the latter being free to move up
and down in suitable ways 36 at the opposite
corners of the frame F. The ways 36 are
formed by two angle-irons or angle-pieces 37,
which are united at their diagonal opposite
corners by pins 38, passing through lugs or
ears 39, formed at the end of one angle-iron
and embracing the body portion of the adja-
cent angle-piece. On either side of the blocks
35 and confined within the ways are coiled
springs 40, (or their equivalent,) which may
be compressed to any degree by the plungers
41, carried at the ends of the terminal arms
of a U-shaped frame 42, said arms passing
through open slots 43, formed in the angle-
pieces at the upper ends of the ways 36, the
said frame 42 being pivotally connected at its
center with the adjacent end of a bent lever
44, pivoted to the housing F. The adjacent
ends of the respective levers 44 are pivotally
connected by a link 45 to the adjacent end of
a pedal-lever 46, pivotally mounted on top of
the machine-frame F, said lever being oper-
ated by the foot of the operator and locked
in any position to which the same has been
tilted by a toothed rack 47. By depressing
the rear end of the foot-lever the forward end
draws on the link 45, the latter thus forcing
the outer ends of the levers 44 downward and
depressing the frames 42 42 and their cor-
responding plungers 41. The latter in turn
compress the springs 40, depressing the block-
bearings 35 and forcing the drums firmly (but
yieldingly) against the floor to be operated
on. By making the ways 36 out of two sec-
tions of angle-irons 37 and by removing the
top pin 38, by which they are connected, one
section can be swung out of the way in the

event occasion arises to disassemble the parts. By thus swinging the outer section 37 outwardly (the slot 43 permitting said outward swing, Fig 10) the parts may be readily dis-

5 assembled and as readily assembled, as is obvious, or in the event it is desirable to introduce new springs or new bearings into the ways the advantage of the construction referred to at once becomes apparent.

10 While the pedal-lever 46 is used to depress or force the abrading-drums 7 7' against the floor, yet by the interposition of the springs 40 and the movable bearings 35 between said drums and lever it is apparent that when the lever is once set and held to any tension (by the toothed rack 47) the drums will yield to any unevenness of the surface operated on, and a uniform abrasion or finish of the surface results. Again, by the interposition of

20 the said springs all jarring of the machine disappears, the drums operating smoothly with least vibration and yielding to any resistance which the surface may offer at unexpected moments.

25 Primarily the machine is intended for sandpapering the floor, and initially there is prepared a sheet of sandpaper in the form of a blank *a*, substantially as shown in Fig. 8, said blank having corner-wings *a'*. This blank is

30 wrapped about the periphery of the drum and allowed to overlap about a quarter of the drum's periphery, the wings *a'* being subsequently folded around the terminal peripheral flange of the drum so as to bear against the inner surface of said flange or shell of the drum. Thus wrapped the sheet is held in position by the curved head 48 of a screw-threaded stem 49, which enters an adjusting-nut 50, passed about a second stationary stem 51, projecting from the axis of the drum. By turning the nut 50 in the proper direction the adjustable stem 49, with its head 48, is forced against the inwardly-folded wings *a'*, whereby the sandpaper sheet is held firmly in place.

45 Of course in lieu of sandpaper and at the conclusion of the sandpapering operation any other character of sheet may be wrapped about the drum, depending on the nature of the operation to which the floor is to be subjected. By "surfacing-machine" is herein meant any kind of finishing, polishing, or sandpapering machine.

50 In operating the machine the operator causes one or the other of the sprockets 19 19' to be coupled to the shaft 20, whereupon the machine advances in one direction or the other, it being understood that the motor is running and that the main shaft S is rotating, imparting rotation in proper direction to the drums 7 7'. By depressing the foot-lever 46 the drums are brought into yielding contact with the floor, and the surfacing or sandpapering of the floor takes place. This contact may be slight or great, depending on the

65 degree to which the lever 46 has been de-

pressed. The scrapings and dust will be drawn by the exhaust fan or blower B into the sack A, whence it may be emptied from time to time. By turning the switch E in proper direction the power may be cut off, as is ob-

70 vious. I do not, of course, wish to limit myself to the precise details here shown, as they may in a measure be departed from without in any wise departing from the spirit of my invention.

Having described my invention, what I claim is—

1. In a floor-surfacing machine, a machine-frame, a suitable drum, vertical ways at opposite ends of the frame, bearing-blocks confined in the ways and supporting the drum, coiled springs on opposite sides of the respective bearing-blocks, a plunger for each upper spring, frames having terminal arms coupled to the plungers, levers connected to the frames, a link coupling the adjacent ends of the levers, and a pedal-lever connected to the link, the parts operating substantially as, and for the purpose set forth.

2. In a floor-surfacing machine, a suitable machine-frame, vertical ways at each end thereof, sliding bearings mounted in said ways, springs confined in the ways above and below the bearings, a drum mounted in the bearings at each end of the machine, suitable gearing for rotating the drums toward the lower edge of the frame, drive-wheels for the machine, gearing for driving the same in either direction, an exhaust-fan, a suitable motor for the gearing and fan, U-shaped frames having terminal arms, a plunger at the end of each arm bearing against the upper springs of the sliding bearings, levers connected to the frames, a link coupling the adjacent ends of the levers, and a pedal-lever connected to the link, the parts operating substantially as, and for the purpose set forth.

3. In a floor-surfacing machine, a suitable drum, vertical ways composed of two separable sections, bearing-blocks confined in the ways and supporting the drum, one of said sections being adapted to be pivotally swung out of engagement with the adjacent section, coiled springs on opposite sides of the respective bearing-blocks, a plunger for each upper spring, a U-shaped frame having terminal arms coupled to the plungers, the upper end of the swinging section of the way being provided with an open slot for the passage of the arm of the U-shaped frame, and means coupled to the frame for raising or depressing the same at the will of the operator, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

MAX L. SCHLUETER.

Witnesses:

EMIL STAREK,
M. B. BELT.