

Nov. 7, 1933.

W. S. FINNELL

1,933,846

FLOOR MACHINE

Filed Aug. 29, 1928

3 Sheets-Sheet 1

Fig. 1.

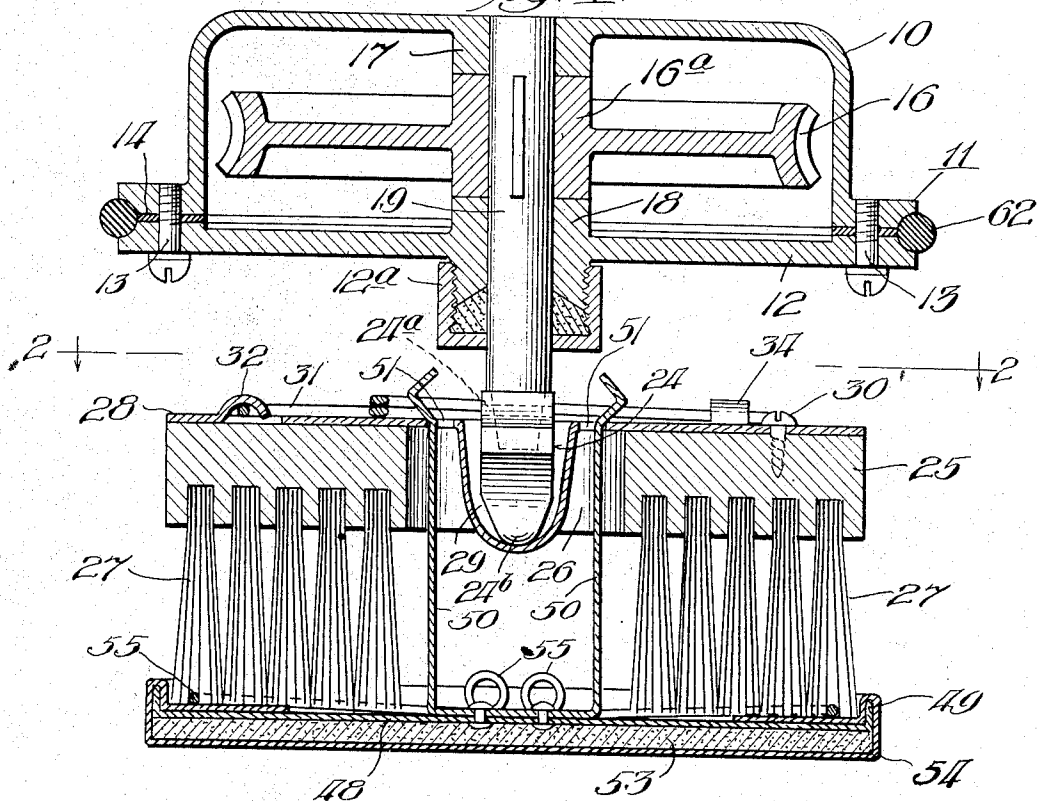
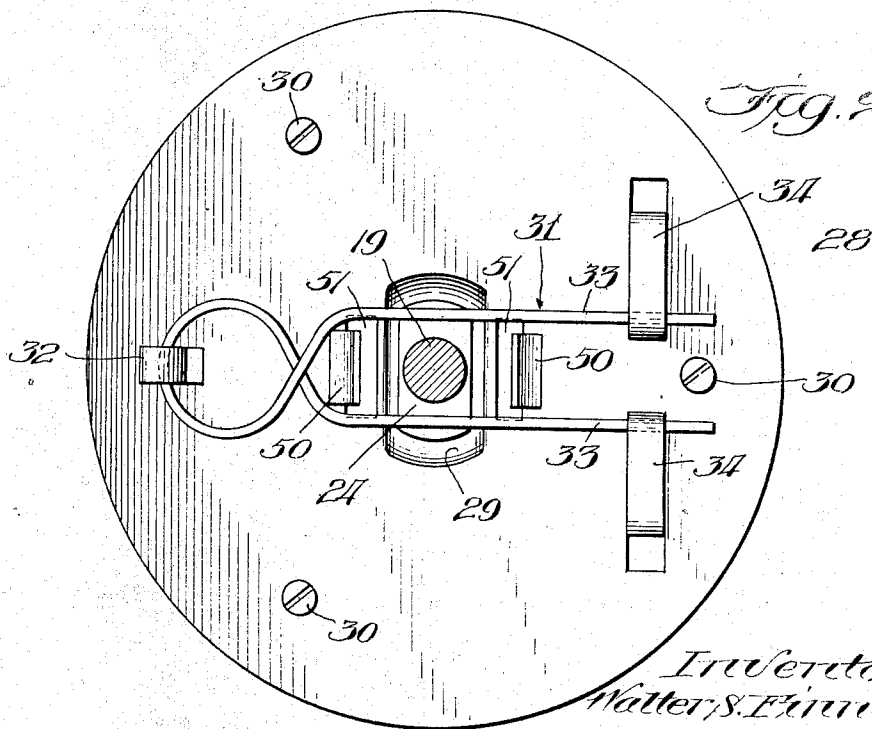


Fig. 2.



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Fig. 3.

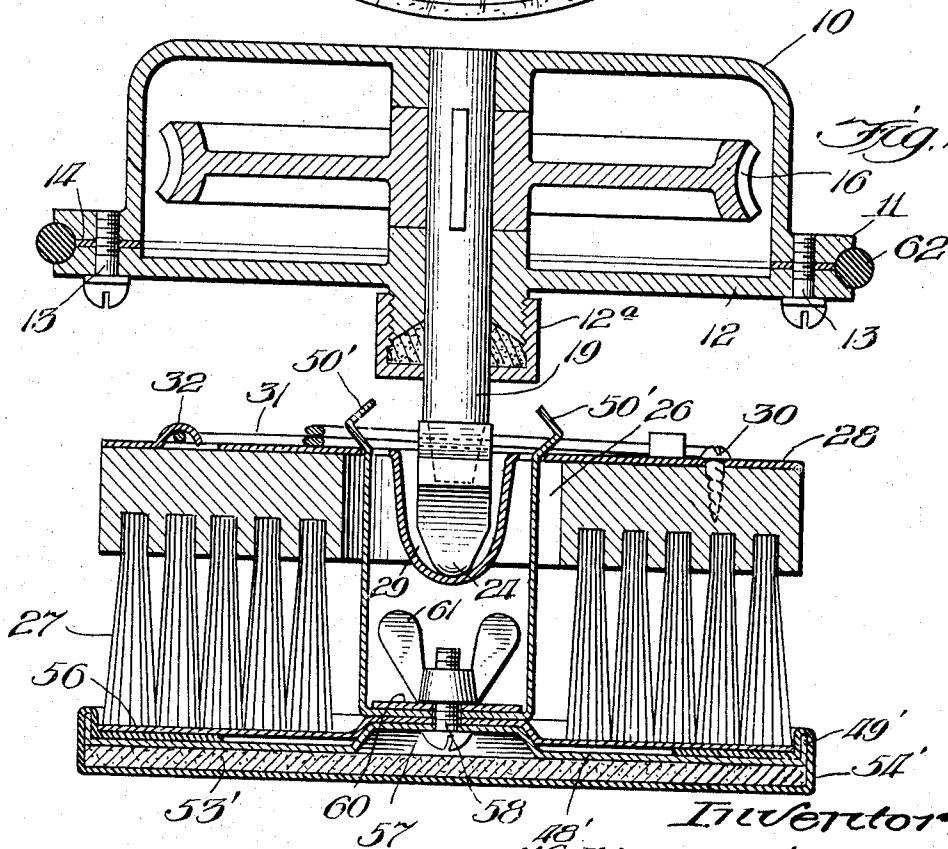
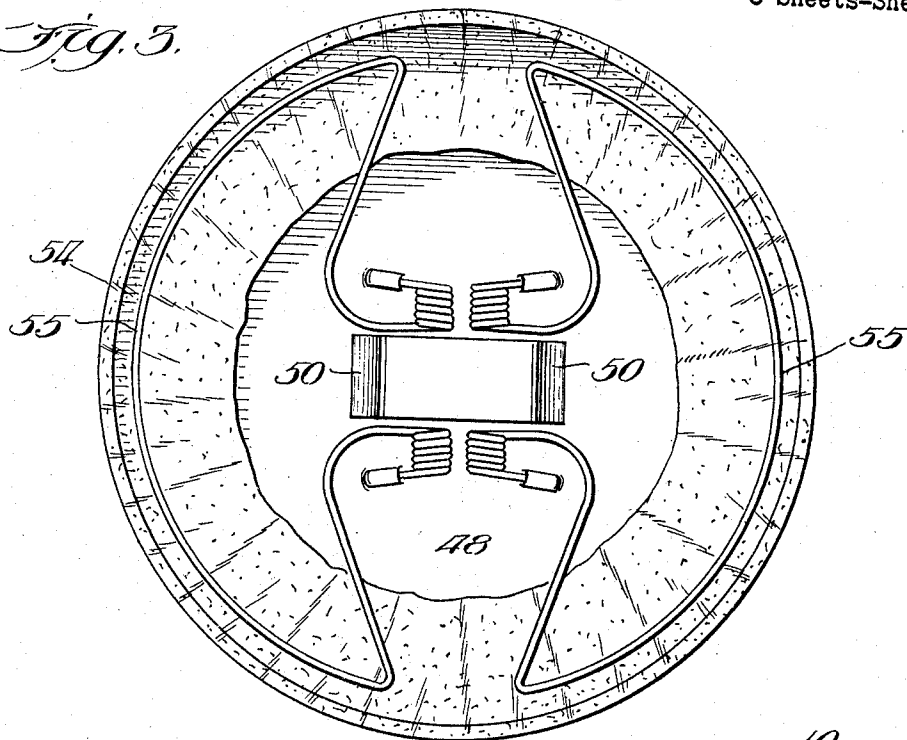


Fig. 4.

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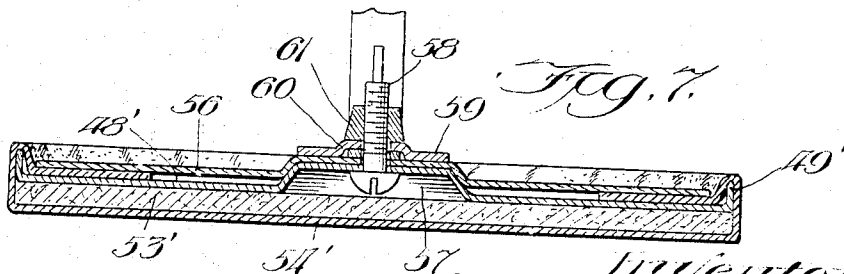
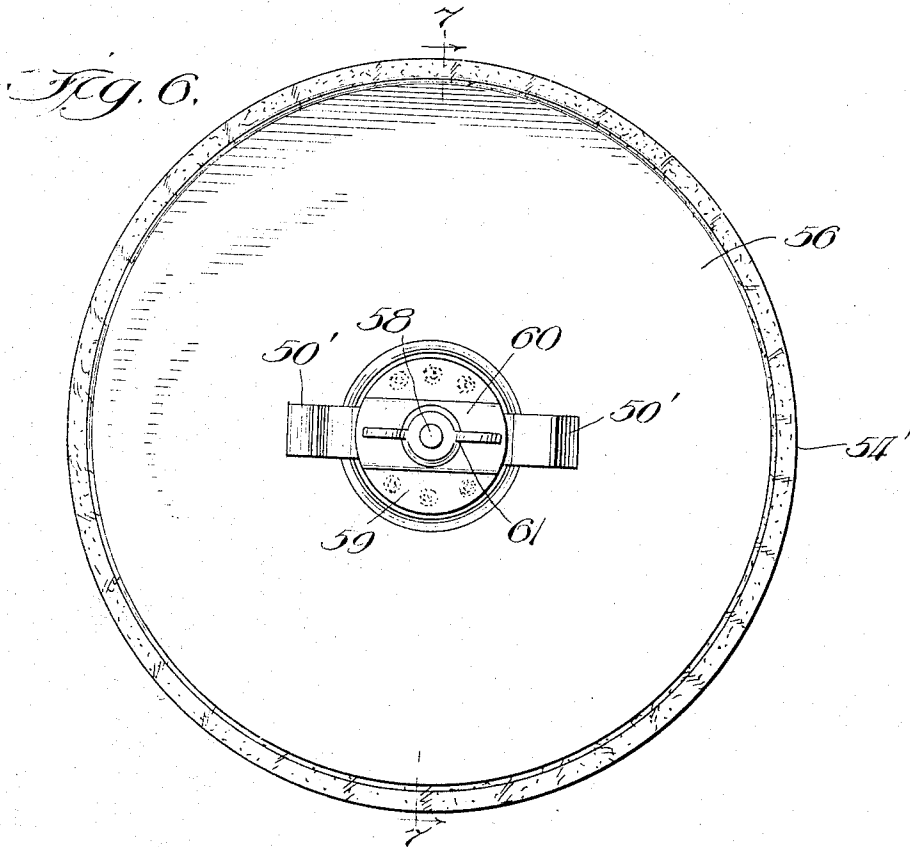
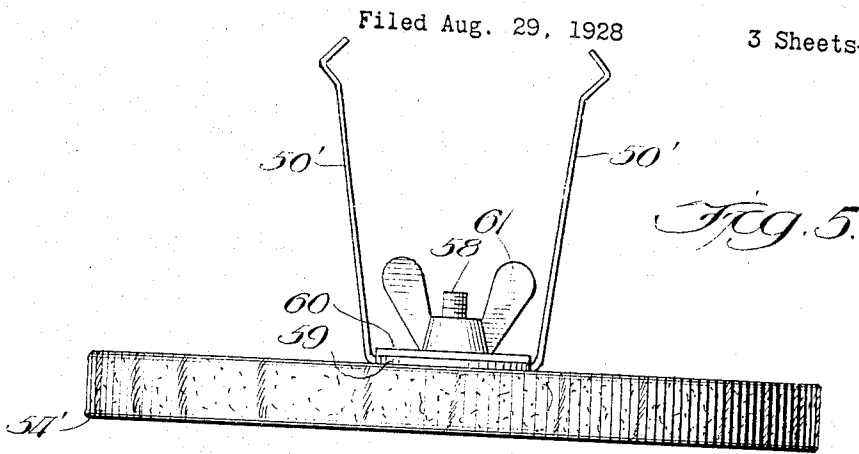
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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

1,933,846

FLOOR MACHINE

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Application August 29, 1928. Serial No. 302,747

8 Claims. (Cl. 51-177)

My invention relates to floor machines and has to do especially with a machine for household use which may be used for scrubbing, sanding, waxing and polishing floors. One form of a machine of this character is shown and described in my co-pending application Serial No. 240,110, filed December 15, 1927, for Floor machines, on which Letters Patent No. 1,881,431 were granted October 11, 1932, of which this application is a continuation as to all matter common to the two applications.

One of the objects of my invention is to provide a simple, cheap and highly efficient machine of this character which is of such size as to require very little storage space and which is light in weight and exceedingly easy to handle.

Another object is to provide means for readily and quickly converting the machine for scrubbing, sanding, waxing or polishing. To this end I provide a detachable member adapted to be supported by a brush device in contact with the floor surface, such member embodying flexible elements yieldingly engageable with the brush device to effect a driving connection therebetween which permits adjustment of the member in all directions, vertical and otherwise, relative to the brush device to compensate for irregularities in the floor surface under treatment.

Other objects and advantages will become apparent as this description progresses and by reference to the drawings wherein,—

Figure 1 is a lateral vertical section through a floor machine embodying my invention;

Fig. 2 is a plan sectional view taken substantially on line 2—2 of Fig. 1;

Fig. 3 is a top plan view of the detachable floor-treating member shown beneath the brushes in the structure of Fig. 1;

Fig. 4 is a view similar to Fig. 1 showing another form of floor-treating structure embodying my invention;

Fig. 5 is a separated elevational view of the form of detachable floor treating member shown in Fig. 4;

Fig. 6 is a top plan view of a structure shown in Fig. 5; and

Fig. 7 is a vertical section taken substantially on line 7—7 of Fig. 6.

In the drawings, I have shown two forms of apparatus embodying my invention, each of which is compact and neat in appearance. The form shown in Figs. 1 to 3, inclusive, comprises a driving mechanism which includes a housing having a top section 10 with a horizontal flange 11 at its bottom edge, and a flat bottom section 12

which is secured to the flange 11 by a plurality of screws 13. The housing is adapted to be filled with a lubricant and a gasket 14 is inserted between the flange 11 and bottom plate 12 to prevent leakage of the lubricant at that point. This housing is adapted to contain gearing driven, preferably, by an electric motor and the gearing may be suitable for the driving of two brush structures such as shown and described in my above-identified original application. The gearing for driving one brush structure comprises, more specifically, a worm gear 16 having a hub 16^a supported between the bearings 17 and 18 formed on the top and bottom housing sections 10 and 12, respectively. This gear is keyed to the shaft 19 which is also journaled in the bearings 17 and 18 and this shaft projects downwardly through the bottom plate 12 for a purpose which will become obvious hereinafter.

A suitable worm driven by the electric motor, or other power means, may be employed for driving the worm gear 16 as shown and described in said original application.

The projecting end of the shaft 19 is slightly tapered to receive a flat-sided driving head 24 which has an octagonal shape whereby its upper edges are tapered downwardly and its lower edges are tapered upwardly. This head is secured to the shaft 19 by a pin 24^a so that it will rotate therewith, or, if desired, the head may have a suitable threaded connection with the shaft 19 instead of the arrangement just described. The usual stuffing box 12^a is associated with the shaft 19 of the housing to prevent leakage of the lubricant.

The driving head 24 is associated with a brush device which comprises a circular brush head 25 formed, preferably, of wood with an opening 26 through its central portion. This brush head carries a plurality of brush bristles 27 mounted in any desired manner, but spaced at the center to provide access therethrough to the opening 26 in the brush head.

A circular metal plate 28 having its central portion depressed to form a flat-sided pocket 29 shaped similarly to the driving head 24 is secured to the top of the brush head 25 by a plurality of screws, or other suitable devices 30. This pocket 29 is adapted to receive the driving head 24 so that upon rotation of the gear shaft 19 corresponding movement will be transmitted to the brush device. This pocket is of greater length and width than the driving head and its bottom portion is rounded to receive the rounded end 24^b of the driving head whereby the brush device

is free to tilt in all directions relative to the driving head to compensate for irregularities which may be present in the floor surface.

To provide a connection between the brush device and the driving mechanism which permits of ready attachment and detachment of the brush device as well as insuring that these structures will remain connected during operation, I provide a spring connector 31 adapted to be carried by the metal plate 28. This spring connector is, preferably, bent to the form shown in Fig. 2 so that the arms 33 thereof tend to spring toward each other. The loop end of this connector is attached to the metal plate 28 by a lug 32 preferably struck upwardly from the plate and then bent downwardly as indicated in Fig. 1. The ends of the spring arms 33 are confined and held in a predetermined spaced relation by spaced lugs 34 struck upwardly from the plate 28 and then bent downwardly as indicated in Fig. 1. The tendency of the arms 33 to spring inwardly toward each other is limited by these retaining lugs. With this construction, the brush device may be readily and quickly attached to the driving head by merely inserting the lower end of the driving head between the spring arms forcing the brush device toward the driving head, during which movement the spring arms are yieldingly moved apart to receive the driving head. When the driving head is fully inserted in the pocket 29, the arms 33 spring back together again as they engage the upper tapered edges of the driving head. To detach the brush structure, said structure is moved away from the driving head, the spring arms 33 spread apart and permit withdrawal of the driving head, the upper tapered edges of the driving head aiding in this action as will be well appreciated.

The structure so far described may be readily used for scrubbing and polishing purposes, depending upon the character of the brush bristles employed. Assuming that the brush device is suitable for scrubbing, the scrubbing fluid is applied to the floor surface by hand or in any other desired manner. The brush is then rotated to carry out the scrubbing operation. In using the brush device for polishing the floor the operation is the same as in scrubbing, except that a suitable polishing brush is substituted for the scrubbing brush.

An important feature of my invention is the provision of means for readily converting the machine for either scrubbing or sanding or waxing or polishing the floor surfaces. To this end, I provide a detachable member, one form of which is shown in Figs. 1 to 3, inclusive. This member (Figs. 1 to 3 inclusive) comprises a circular metal plate 48 which is substantially the diameter of the brush device and which has a peripheral upstanding flange 49. A pair of upstanding spaced and flexible attaching lugs 50 are carried by the central portion of the plate 48 so that when the plate is positioned, as indicated in Figs. 1 and 2, these lugs will extend upwardly between the brush bristles and through the opening 26 in the brush head. The free ends of these upstanding lugs 50 are bent outwardly and then inwardly to provide opposed V-shaped surfaces. The metal brush plate 28, at the opposite sides of the driving head receiving-pocket, is provided with slots 51 adapted to receive the upstanding lugs 50 so that the rotary motion of the brush device will be transmitted to the plate 48.

The slots 51 are so located that, when the upstanding lugs 50 are inserted between the brush

bristles and through the opening 26 in the brush head, on the opposite sides of the driving head receiving-pocket, the inwardly tapered end portions of said lugs will engage the slots. As these lugs are forced inwardly toward the brush device, their ends will be forced inwardly toward each other and will then spring away from each other as the V-shaped end portions pass through said slots. This arrangement is such that the detachable member will remain connected to the brush device during operations and at times when the machine may be lifted from the floor, but will, at the same time, permit ready attachment and detachment of the member by merely pushing the same inwardly toward the brush device and by pulling it outwardly therefrom in a manner which will be readily understood.

It will be appreciated that this detachable member which is used for sanding or waxing or polishing is cushioned against the floor surface by the brush bristles and that the upstanding lugs 50 are so connected to the brush device that the member may adjust itself vertically and tiltably in all directions to accommodate irregularities in the floor surface.

The plate 48 is adapted to receive on its under side a soft pad 53 formed, preferably, of a felt material over which is passed a floor treating element 54 which may take the form of a piece of sandpaper or burlap material or a polishing cloth, depending upon the treatment to be given the floor surface. The burlap material is, preferably, used in waxing the floor and may consist of two layers of burlap between which the wax material is placed so that, as the burlap is rotated upon the floor surface, the heat generated will melt the wax and cause it to readily flow through the burlap material into contact with the floor surface. The treating element 54 is secured upon the plate 48 by passing the same up over the peripheral flange 49 and down upon the upper surface of such plate. The upper surface of the plate carries a plurality of spring clips 55 (Figs. 1 and 3) which serve to hold these overlapping edges tightly in place.

In Figs. 4 to 7 inclusive, I have shown another form of means for converting the machine for sanding, waxing and polishing. In this form of my invention, I also employ a circular metal plate 48' which is substantially the diameter of the brush device and which has a peripheral upstanding flange 49'. A soft pad of felt material 53' is mounted on the underside of the plate 48' and a floor treating element 54' (which may be sandpaper, burlap material or polishing cloth) is passed over the felt material and the plate 48' as clearly indicated in Fig. 7. The element 54' is sufficiently flexible and is of such size as to pass over the upstanding flange 49' on the plate and overlap the top surface thereof.

The element 54' is held in place as follows: A circular disk 56 of a size adapted to fit within the peripheral flange 49' is adapted to be mounted upon the top of the plate 48' and upon the overlapping edges of the material 54'. The central portion of the plate 48' is cupped to provide a central recess 57 having an opening which receives a screw 58. This screw is, preferably, securely fastened to the plate 48' in the position indicated in the drawings, by welding or other suitable means. The disk 56 is provided with a similarly-cupped central portion to permit the same to fit snugly upon the corresponding portion of the plate 48'. This portion is also provided with an opening through which the screw 58 is passed.

The cupped portion of this disk supports up-
standing spring arms 50' which are similar in
construction, mounting and purpose, to the
spring arms 50 of the form of Figs. 1 to 3. These
arms, as shown, may constitute the legs of a U-
shaped member which is secured to the disk 56
by a small plate 59 having a channeled portion
60 straddling the base of the spring arms. The
disk 59 may be secured to the disk 56 by welding
or any other suitable means. Both the disk and
base portion of the spring leg are provided with
openings through which the outer end of the
screw 58 projects, and a thumb nut 61 is adapted
to be screwed upon the projecting end of this
screw to tightly clamp the disk 56 and the parts
carried thereby to the plate 48'. In doing this,
the floor treating element 54' is clamped tightly
between the members 48 and 56 and is held
against removal during operation. This arrange-
ment provides a very rigid structure which may
be quickly assembled and disassembled for the
changing of the material 54' according to the use
to which the machine is to be put. The con-
struction and operation of this form, other than
above described, is the same as that of the struc-
ture shown in Figs. 1 to 3, inclusive.

From the foregoing it will be readily appreci-
ated that my invention provides a highly efficient
arrangement for scrubbing, sanding, waxing or
polishing the floor. The apparatus may be used
with brush devices alone for scrubbing the floor,
or for adding a high polish thereto. The de-
tachably member, including the plate 48, may be
applied to the brush device for sanding, or wax-
ing or polishing the floor. The structure as a
whole is exceedingly simple in construction and
is very easy to operate. Floors may be readily
treated by an unskilled person. The machine is
of such shape that it may readily move about the
floor and beneath objects without danger of in-
juring the same. As an aid in this connection, I
also employ a rubber bumper 62 which extends
around the gear housing in a groove between the
upper and lower sections thereof. In addition
to the foregoing, the machine is of such small
size that it requires a minimum of storage space.

While I have shown only two embodiments of
my invention, it will be understood that various
changes in details and arrangements of the parts
may be made without departing from the spirit
and scope of my invention as defined by the
claims which follow:

I claim:

1. In a floor machine, the combination of a
brush device including a brush head carrying
bristles and having an opening through the center
thereof, a disk carried by said head and hav-
ing a portion depressed into said opening to form
a flat sided pocket and having slots at the sides
of said pocket, driving mechanism for said de-
vice including a flat-sided head adapted to be
inserted in said pocket, a member seated against
said bristles, a floor treating element associated
with said member, and a driven connector be-
tween said member and brush device for moving
said member therewith comprising upstanding
yielding arms having irregularly shaped end por-
tions adapted to pass through said slots.

2. In a floor machine, the combination with a
brush holder and brush means carried thereby,
of means for adjusting the machines for sanding,
waxing and polishing, which comprises a mem-
ber removably engageable and rotative with said
brush holder, another member detachably con-
nected to said first member, means for detach-

ably connecting said members together, and a
floor treating element carried by said connected
members in contact with the surface under treat-
ment and detachably secured in place by the
securement-together of said members, said mem-
bers and elements being yieldably supported
against said brush means.

3. In a floor machine, the combination with
a brush holder and brush means carried thereby,
of means for adapting said machine for sanding,
waxing, polishing and the like, which comprises
a plate member removably engageable and rota-
tive with said brush holder, another plate mem-
ber removably connected to said first member,
and a floor treating element mounted upon said
latter member and extending between said mem-
bers, means detachably and rigidly securing said
two members together to clamp said element to
said other member, said element being engage-
able with the surface under treatment, and said
members and element being yieldably supported
by said brush means.

4. In a floor machine, a brush structure, and
means removably carried by said brush structure
for adapting the machine for sanding, waxing,
polishing, and the like, said means comprising
a disk, a floor treating member carried by said
disk in contact with the floor under treatment,
a pad between said disk and member, a second
disk detachably secured to said first disk and for
holding said member in place on said first disk,
and a plurality of lugs carried by said second
disk and removably engageable with said brush
structure by passing the same through openings
in said brush structure.

5. An attachment for floor treating machines
embodying brush structure comprising a plate
member having means for loosely and removably
engaging and supporting the same on said brush
structure and for rendering said member self-
adjustable relative to said structure during op-
eration, a second plate member detachably con-
nected to said first member for movement there-
with, a floor treating element carried by said sec-
ond member in engagement with the surface un-
der treatment, means for detachably securing
said two plate members together to clamp said
element upon said second plate member, and
cushioning means between said second-named
member and element.

6. An attachment for floor treating machines
comprising a member having an upstanding pe-
ripheral flange, a flexible floor treating element
carried by said member, pad means between said
member and element, said element being so shaped
as to enclose said pad means and overlap said
flange, another member mounted upon said first
member within the confines of said upstanding
flange and seated upon the portion of said ele-
ment which overlaps said flange, means for de-
tachably securing said members together, and
means detachably connected to said members by
said securing means for effecting removable en-
gagement of said members and element as a unit
with said floor machine.

7. A sanding, waxing, and polishing attach-
ment for a floor machine comprising a member,
an attaching unit including opposed spring fin-
gers normally sprung outward away from each
other, the outer ends of said fingers having op-
posed V-shapes, another member, means for de-
tachably securing said members and spring fin-
ger unit together, and a floor treating element
mounted upon said second member and secured

thereto by the securing together of said members and unit.

8. An attachment for a floor treating machine, comprising a circular disk having an upstanding peripheral flange, a floor treating element carried by said member and having an end portion overlapping said flange, another circular member mounted upon said first member and upon the

overlapping end portion of said element, a clamp between said two members for securing the same tightly together, and attachment-actuation elements carried by said second member and engageable with said machine for movement thereby, said latter elements being adapted for self-interlocking engagement with said machine.

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