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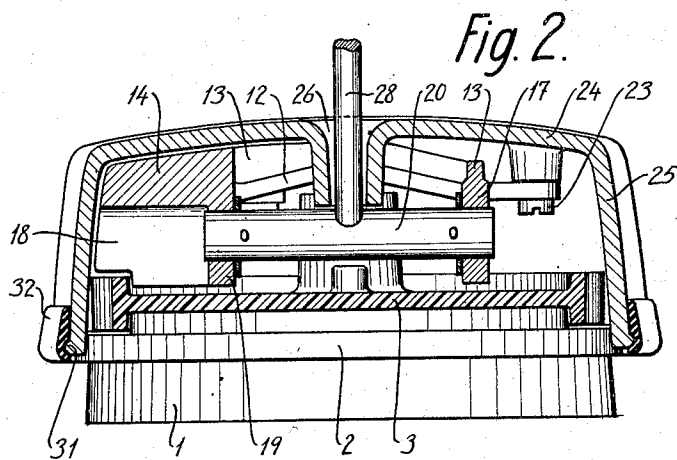
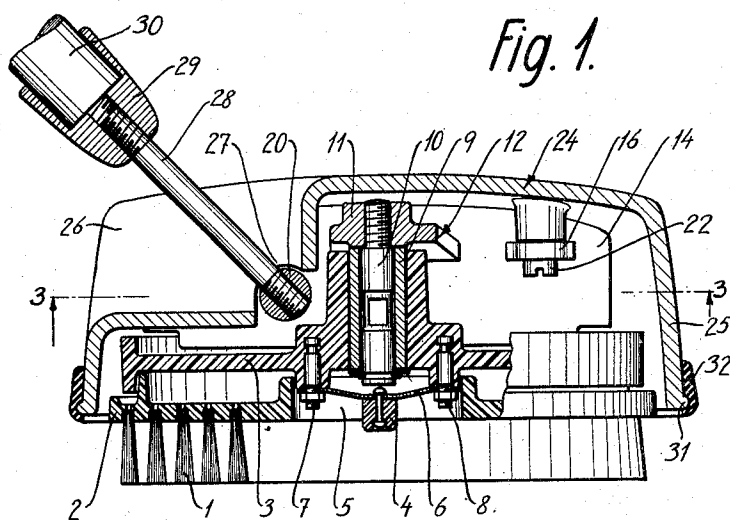
KNUD-ERIK V. O. G. HASTRUP

2,777,140

SURFACE WORKING DEVICES

Filed Dec. 23, 1952

2 Sheets-Sheet 1



INVENTOR:

K. E. V. O. G.

Hastrup

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KNUD-ERIK V. O. G. HASTRUP

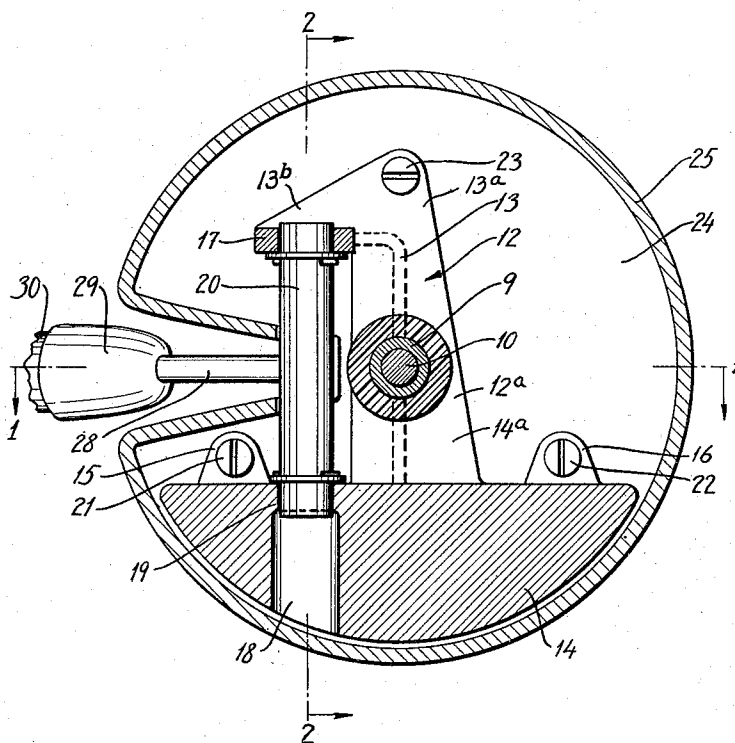
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Fig. 3.



INVENTOR:
H. E. V. O. G. HASTRUP

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SURFACE WORKING DEVICES

Knud-Erik Vilhelm Oluf Gnatt-Hastrup,
Copenhagen, Denmark

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6 Claims. (Cl. 15—49)

The present invention relates to floor-treating tools.

The term "floor-treating tools" as used here and in the following specification shall be understood to comprise any floor treating machine having brushes, polishing members, scrubbing members or scouring members.

The invention aims to provide a floor-treating tool of any of the classes here referred to in which a rotation of the floor-treating member that engages the surface of the floor is obtained automatically when the tool is subjected to a reciprocating movement.

A further purpose of the invention is to provide a tool having a floor-treating member capable of supporting the tool on the surface of the floor and being subjected to such a friction offset relative to its center of rotation that said friction alone will be sufficient to cause a rotation of the floor-treating member when the tool is subjected to a reciprocable movement.

The main object of the invention is to provide a surface working device of the type described which operates without subjecting the device to canting actuations.

A further object of the invention is to provide a device of the said type which is simple in design and cheap in manufacture and easy to manipulate.

These and other objects of the invention will be evident from the following description taken in conjunction with the accompanying drawing, in which—

Fig. 1 shows a sectional view of one manner of construction of a surface working apparatus according to the invention, taken along the line 1—1 in Fig. 3,

Fig. 2 is a vertical section along the line 2—2 in Fig. 3, and

Fig. 3 is a horizontal section along the line 3—3 in Fig. 1.

In the drawing, 1 indicates bristles secured in a holder 2 so as to form a flat operative surface. The holder is retained in a disc 3 by means of an elongated pivotal connecting bar member 4 inserted within an elongated aperture or slot 5 in the lower surface of the holder 2. The turn buckle 4 is pivotally attached centrally to a leaf spring 6 the ends of which are fixed by means of screws 7 and 8 to disc 3. The holder 2 having the slot 5 therein is retained to the disk 3 by first inserting the pivotal connecting bar 4 of the holder 2 through the slot 5, rotating member 4 on its pivotal connection on the spring 6 so that it is disposed at right angles to the slot 5 in gripping engagement with the undersurface of holder 2 as seen in Figure 1.

The center portion of the disc 3 has a vertically disposed tubular bearing 9 for rotatably supporting a shaft 10, the upper end of which by screw-threads is secured to a body or a carrier member 12 in a middle portion 11 thereof having enlarged cross section. This carrier member 12 includes in the embodiment illustrated an elongated middle portion 12a provided with a longitudinal rib 13. Thus the body or carrier member 12 is by means of the bearing 9 supported on the structure comprising the disc 3, the holder 2 and the brushes or bristles 1 in such a manner that mutual relative rotation is allowed

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between the body or carrier structure and the disc structure.

The body structure comprises besides the middle portion 12a parts extending at either side thereof referred to as 13a and 14a respectively. The portion 13a further has a projection 13b in which a bearing 17 is formed. The body portion 14a has adjacent its end an enlarged portion 14 forming a weight member having its center of gravity disposed laterally offset with respect to the central shaft or spindle 10. In the member 14 a bore 18 is provided the one end of which at 19 forms a bearing in alignment with the bearing 17 so as to receive a spindle 20.

The body portion 14 furthermore is provided with projections or lugs 15 and 16 in spaced relationship at either side of the center portion 14a.

The lugs 15 and 16, and the end portion 13a of the carrier member 12 have holes for screws 21, 22 and 23 respectively by means of which the carrier member is attached to a casing 24 having an exterior circumferential wall 25 that extends down to substantially enclose the holder. The casing 24 has at one side a slot 26 for the passage of a handle shaft portion 28 that is rigidly secured to the spindle 20 to allow it to swing vertically and has perpendicular thereto a cut-away portion 27 that provides space for the center portion of the spindle 20. The other end of the handle shaft portion 28 is fixed in a holder 29 for an elongated handle 30 that is only indicated in the drawings but forms an extended handle by means of which the apparatus can be pushed and pulled forth and back over the floor surface. The portion 27 is so shaped that the handle 30 and rod 28 can swing up and down by swinging the spindle 20 in its bearings 17 and 19.

The lower edge of the casing 25 is provided with an external bead 31 by means of which a rubber band 32 is held in position along the exterior edge of the casing.

The handle member 30 has preferably such a length that the apparatus can be handled by the operator in an upright position. The weight of the portion 14 is so adapted, and the portion so positioned in relation to the other parts of the apparatus that the center of gravity of the entire apparatus is laterally disposed relatively to the rotational axis of the shaft 10; this displacement is approximately one sixth of the diameter of the holder 2.

The mode of operation of the apparatus described is substantially as follows:

The apparatus is placed on the floor resting on the bristles or brushes 1. Hereby the body structure can as explained here above rotate relatively to the floor treating structure constituted by the brushes and by swinging the handle 30 the entire body structure and exterior housing supported on the bristle structure will rotate about the central axis of the apparatus, viz. the spindle 10.

In any position of the body structure the weight member 14 will still have its center of gravity laterally offset, relatively to the mutual axis of rotation and to the plane formed by the handle as it swings with the spindle so as to thereby cause an eccentric directed pressure on the bristle structure with the result that pulling or pushing the machine by means of the handle 30 this eccentrically directed force will automatically cause the bristle structure to rotate when the machine is reciprocated over the floor surface, because the eccentrically directed force will cause that part of the bristle surface that lies vertically under the weight member to engage the floor surface with a friction that is larger than that friction with which the remaining part of the bristle structure engages the floor surface.

It will be understood that the embodiment illustrated shall serve as an example only and that modifications are possible within the scope of the invention. Thus, the invention is not limited to the combination with a brush

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member, and any other rotating polishing scouring or scrubbing member may be employed. The handle shaft does not need to be arranged to swing up and down though this arrangement is preferred. Further, the casing may be omitted. The displacement of the centre of gravity may be produced in any other appropriate manner than by means of the enlarged portion 14, e. g. the casing 24, 25 may be provided with a thickened portion for the same purpose.

I declare that what I claim is:

1. In an apparatus for treating floor surfaces in combination: a floor treating member arranged for rotatable movement about a vertical axis and having a floor treating surface perpendicular thereto capable of supporting said apparatus on said floor surface, a carrier member supported on said floor treating member and rotatable relatively thereto about said vertical axis, a spindle, a handle member connected to said spindle and extending perpendicularly therefrom, a pair of aligned bearings provided in said carrier member rotatably supporting said spindle in position normal to the vertical axis to allow said handle member to swing vertically when moving said apparatus over the floor surface by pushing and pulling said handle member and a weight member firmly connected with said carrier member with the center of gravity of the weight member being in lateral offset relationship with respect to the vertical axis and a vertical plane extending through the longitudinal axis of the handle member.

2. In apparatus for treating floor surfaces in combination: a floor treating member arranged for rotatable movement about a vertical axis and having a floor treating surface perpendicular to said axis capable of supporting said apparatus on said floor surface, a carrier member supported above said floor treating member, bearing means between said floor treating member and said carrier member to allow mutual relative rotation between said carrier member and said floor treating member, handle means connected with said carrier member laterally offset with respect to said vertical axis to enable said apparatus to effectuate a reciprocable movement by pushing and pulling said handle means in its longitudinal direction and a weight member firmly connected with said carrier member, the weight member having its centre of gravity in offset lateral relationship with respect to the vertical axis and a vertical plane extending through the longitudinal axis of said handle means.

3. In floor treating apparatus in combination: a disc member arranged for free rotatable movement about a vertical axis that substantially coincides with the center of said disc, said disc having a floor treating surface capable of supporting said apparatus on said floor surface, a carrier member supported above said disc member and being rotatable relatively thereto about said vertical axis, a weight member firmly connected with said carrier member, the weight member having its center of gravity laterally offset relatively to said vertical axis and a handle member operatively connected with said carrier member extending in such radial relationship relatively to said vertical axis that the center of gravity of said weight member is offset from a vertical plane passing through the longitudinal axis of the handle member so that reciprocable movement of said apparatus in the longitudinal direction of said handle member will cause a laterally offset load on said floor treating surface sufficient to cause rotating thereof in response to said reciprocable movement.

4. In floor treating apparatus the combination comprising a floor treating member, a holder for said floor treating member and capable of supporting said appa-

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ratus with said floor treating member engaging a floor portion, a casing member overlying said holder, said holder being freely rotatably supported about a vertical axis of rotation in said casing, an upwardly extending handle portion on said casing in radial offset relationship relative to the vertical axis of rotation of the holder, the longitudinal axis of said handle portion being maintained in a single vertical plane intersecting the vertical axis of rotation of said holder, and a weight member supported in a fixed offset lateral relationship from the vertical plane formed by the intersection of the longitudinal axis of the handle portion and the axis of rotation of said holder for maintaining the center of gravity of the floor treating apparatus in an offset relationship from the axis of rotation of the holder for increasing the relative frictional resistance to movements of the floor treating member on one side thereof and causing rotation of said holder in response to a reciprocating movement of said handle portion.

5. A machine for treating floor surfaces comprising in combination: a floor treating member having a floor treating surface capable of supporting said machine on said floor surface and arranged for rotatable movement about an axis vertical to said floor surface, a carrier member supported on said treating member, said carrier member having bearing means for said treating member, to allow a relative rotation between said carrier member and said treating member about said vertical axis, a handle portion, a connection between said handle portion and said carrier member stiff in tangential direction relatively to said vertical axis to enable said treating member to effectuate a reciprocable movement by pushing and pulling said handle portion, and a weight member firmly connected with said carrier member with the center of gravity of the weight member being in offset lateral relationship with respect to the vertical axis and a vertical plane extending through the longitudinal axis of the handle portion.

6. In a floor treating apparatus in combination: a floor treating member, a holder for said floor treating member being freely rotatable about a substantially vertical axis when said apparatus is supported on a floor with said floor treating member in engagement with the floor surface, a carrier member overlying said holder, means connecting said holder and said carrier member to allow a mutual rotation thereof, a handle portion, means connecting said handle portion with said carrier member to prevent relative rotation between the handle portion and the carrier member by pulling and pushing said handle portion, and a weight member connected to said carrier member, the weight member having its center of gravity laterally offset relative to the direction of the reciprocable movement of said carrier member caused by pulling and pushing said handle portion to subject said floor treating member to an increased lateral pressure relatively to its axis of rotation whereby said floor treating member will rotate automatically when said carrier member is reciprocated.

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