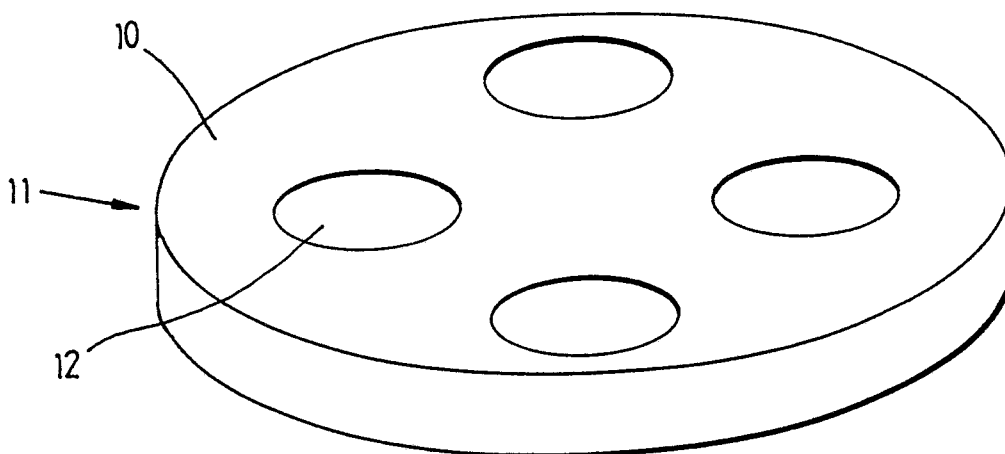




## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification <sup>5</sup> : A47L 11/164, 13/12</p>	<p>A1</p>	<p>(11) International Publication Number: <b>WO 91/07902</b> (43) International Publication Date: 13 June 1991 (13.06.91)</p>
<p>(21) International Application Number: PCT/GB90/00420 (22) International Filing Date: 20 March 1990 (20.03.90) (30) Priority data: 8926569.8                      24 November 1989 (24.11.89) GB (71) Applicant (for all designated States except US): HOME HYGIENE LIMITED [GB/GB]; Brickyard Lane, Studley, Warwickshire B80 7EE (GB). (72) Inventor; and (75) Inventor/Applicant (for US only) : McCORMICK, John, Patrick [GB/GB]; Kiroso House, Kings Coughton, Alcester, Warwickshire B49 5QD (GB). (74) Agent: FORRESTER KETLEY &amp; CO.; Chamberlain House, Paradise Place, Birmingham B3 3HP (GB).</p>		<p>(81) Designated States: AT (European patent), AU, BE (European patent), CH (European patent), DE (European patent)*, DK (European patent), ES (European patent), FI, FR (European patent), GB (European patent), IT (European patent), JP, LU (European patent), NL (European patent), NO, SE (European patent), US.  <b>Published</b> <i>With international search report.</i></p>

(54) Title: METHOD OF AND MEANS FOR TREATING A FLOOR



## (57) Abstract

A pad for use on a floor-polishing machine comprises a circular, non-abrasive body defining a number of openings, each of which contains a relatively abrasive insert (12). The inserts can readily be replaced.

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Title: Method of and means for treating a floor

Description of Invention

The present invention relates to the cleaning of floors and is concerned with the cleaning of floor surfaces which are relatively smooth, in contrast with floor surfaces presented by pile fabrics and other fibrous materials. Cleaning of relatively smooth floor surfaces typically includes rubbing to remove foreign matter from the surface and buffing to establish a shine or other uniform finish on the floor surface.

For cleaning relatively smooth floor surfaces, there are used polishing machines which rotate a pad in contact with the floor surface. Typically, the pad has a fibrous structure and is carried on a carrier which has an array of small hooks or other means for releasably retaining the pad on the carrier. To remove foreign matter from the surface, it is often necessary to employ a pad which has grains of an abrasive at the working surface of the pad, that is the surface which bears on the floor, during use. In this way, ingrained dirt can be removed from the floor. Furthermore, by means of an abrasive pad score marks can be removed from the floor surface. Pads with different abrasive grains are available so that relatively coarse abrasive pads can be used in some cases and relatively fine abrasive pads can be used in other cases.

The procedure for cleaning a floor surface typically involves rubbing the surface with an abrasive pad mounted on a polishing machine, removing the abrasive pad and replacing it with a non-abrasive pad and then rubbing the surface again with the non-abrasive pad. The use of the non-abrasive pad is necessary, in order to achieve a polished finish on the floor surface.

According to a first aspect of the present invention, there is provided a method of treating a surface wherein successive regions of the surface are each subjected to a succession of rubbing strokes and alternate ones of said

strokes are abrasive strokes, the intervening strokes being relatively non-abrasive strokes.

We have found that a succession of strokes in which abrasive strokes alternate with non-abrasive strokes removes foreign matter from a floor surface and achieves a polished finish on the floor. This is surprising, because we have previously found that a polished finish cannot be achieved by rubbing a floor surface with a pad which has abrasive particles at the working surface of the pad.

In performance of a method in accordance with the first aspect of the invention, the floor is preferably rubbed with a pad having at least one relatively abrasive region and at least one relatively non-abrasive region and said regions are moved alternately across a local region of the floor. Thus, the pad may be rotated by a known polishing machine.

According to a second aspect of the invention, there is provided a pad suitable for use in rubbing a floor and having a working surface which bears on the floor when the pad is in use, wherein the working surface includes one or more relatively abrasive regions and one or more relatively non-abrasive regions.

In the preferred pad, the or each relatively abrasive region is spaced or are spaced from the periphery of the pad. The pad may have a single relatively non-abrasive region which surrounds the or each of the relatively abrasive regions.

The or at least one of the relatively abrasive regions of the working surface is preferably presented by an insert which is disposed in an opening formed in a main body of the pad. The insert may be an interference fit in the opening and is preferably freely removable from the opening. By describing the insert as being freely removable, we mean that the insert can be removed by hand without undue difficulty. However, interference between the insert and the main body of the pad is preferably such that the insert will not fall from the main body when the working surface of the pad is raised above the floor.

An insert which is removable from the main body of the pad can be replaced by a further insert. The further insert may have abrasive qualities different from those of the removed insert. Thus, there may be provided for use with the main body a set of inserts having respective different grades or characteristics.

According to a third aspect of the invention, there is provided a pad suitable for use in rubbing a floor and having a working surface which bears on the floor during use of the pad, wherein the pad defines at least one opening extending into or through the pad from the working surface thereof. The opening can receive a suitable insert, for example an abrasive insert.

The opening is preferably spaced from both a centre of the pad and the periphery of the pad. The area of the opening is preferably within the range 2.5% to 10% of the area of the working surface of the pad.

The pad may have a number of openings. In this case, the aggregate area of the openings at the working surface is preferably within the range of 8% to 50% of the area of the working surface.

According to a further aspect of the invention, there is provided a set of pads comprising a larger pad according to the third aspect of the invention and a plurality of smaller pads, each of a size to fit into the opening or a respective opening in the larger pad.

A pad embodying the second and third aspects of the invention and which is used in a method according to the first aspect will now be described, with reference to the accompanying drawing, which shows a perspective view of the pad.

The pad shown in the accompanying drawing has the form of a disc and is preferably cylindrical, having a diameter which is more than ten times the thickness of the pad. The pad is resiliently flexible and compressible. When the pad is in an unstressed condition, the pad has a substantially flat, circular surface 10 called herein the working surface. When the pad is in use, the working surface bears on the surface which is being treated by rubbing with the pad.

That surface of the pad which is opposite to the working surface 10 may be substantially identical with the working surface so that the pad can be used either way up.

The pad shown in the accompanying drawing comprises a main body 11 which defines the periphery of the pad and defines a number of openings which extend from the working surface either into the body or completely through the thickness of the body. In each of these openings, there is fitted a respective insert 12. There may be a single insert in a single opening of the main body. Preferably, a number of inserts are provided. By way of example, four inserts 12 are shown in the accompanying drawing. These inserts are spaced equally around a centre of the main body.

It will be noted that, in the example illustrated, each of the inserts is spaced from the periphery of the main body 11 and is also spaced from the centre of that body. The inserts may lie somewhat nearer to the periphery of the main body than to its centre.

By way of example, circular inserts are shown in the accompanying drawing. The openings and the inserts may have other shapes, for example rectangular. Furthermore, differently shaped inserts may be incorporated in a single pad.

The pad illustrated in the accompanying drawing is intended primarily for use in the treatment of floors. The main body 11 is formed of materials used in the manufacture of known floor treatment pads. Generally, floor-treatment pads are formed of a mass of fibres which are bonded into a coherent body by means of a binder. A variety of binders are used. The binder of the main body 11 is preferably a latex binder. The fibres and the binder are both preferably selected to impart resilience to the body 11.

Each of the inserts 12 also may be constructed a mass of fibres bonded into a coherent body by a suitable binder. The fibres and/or the binder may be the same as or different from that used in the body 11. The fibres and/or the binder may be selected to provide that each insert has a stiffness somewhat greater than that of the body 11. The dimensions of each insert, relative to the dimensions of the corresponding opening in the body 11,

are such that the insert is an interference fit in the body 11. The thickness of each insert may be substantially equal to the thickness of the body 11, in a case where each opening extends completely through the thickness of the body.

Either that part of the working surface 10 which is presented by the body 11 or that part of the working surface which is presented by at least one of the inserts 12 has an abrasive character. In the example illustrated, that part of the working surface which is presented by the body 11 is non-abrasive and each of the inserts 12 has an abrasive character. As in known, abrasive floor-treatment pads, the abrasive character is imparted by the presence of grains of abrasive material at the working surface of each insert 12. Such abrasive particles are bound to the fibres of the pad by the binder. The abrasive particles may be incorporated in the binder, prior to binding of the fibres to one another. The size and other characteristics of the abrasive particles may be varied according to the type of floor on which the pad is to be used and other circumstances of use. Typically, the abrasive particles are present only at and immediately adjacent to the surface of each insert 12 and are not present throughout the entire thickness of the insert. The same or different abrasive particles may be present at the opposite working surface of the insert. Alternatively, each insert may have an abrasive character at one working surface and a non-abrasive character at the opposite working surface.

Each insert 12 is an interference fit in the corresponding opening in the body 11. Some resilient deformation of the body and/or of the insert may be necessary during insertion and removal of the insert from the body. The body grips the insert sufficiently to ensure that the insert will not fall from the body when the working surface of the pad is raised from a floor surface. The insert can readily be removed from the body 11 by hand. For example, if a portion of the body 11 immediately adjacent to an insert is compressed, the peripheral surface of the insert will be exposed. This facilitates grasping of the insert by hand and withdrawal of the insert. A replacement insert can be fitted by the application of gentle pressure to the insert. The peripheral surfaces of the inserts 12 and the corresponding boundary surfaces of the openings in the body 11 are substantially perpendicular to the working surface

of the pad, when the pad is unstressed. It would be within the scope of the invention for the peripheral surfaces of the inserts to be somewhat inclined to the working surface of the pad or of stepped form, in order to retain the insert more securely in the body 11.

We prefer to use removable inserts to provide the relatively abrasive regions of the working surface 10. It is then possible to substitute for the inserts further inserts having different characteristics. Furthermore, an insert which has become worn so that its abrasive character is impaired significantly can be replaced by a fresh insert without discarding the main body 11. However, it would be within the scope of the invention to provide a unitary pad having a working surface with at least one relatively abrasive region and at least one relatively non-abrasive region. For example, the pad may be formed as a single body of bonded fibre with abrasive particles bonded to the fibres in local regions only of the working surface of the pad. Alternatively, the pad may be constructed of a main body and inserts which are permanently bonded to the main body. It would also be within the scope of the invention for the main body 11 to have an abrasive character and the inserts to be relatively non-abrasive.

In a case where the main body of the pad has a non-abrasive character and the inserts are abrasive, the aggregate area of the relatively abrasive regions of the working surface of the pad is preferably within the range 2.5% to 50% of the area of the relatively non-abrasive region of the working surface. More preferably, the relatively abrasive regions have an aggregate area which is within the range 10% to 40% of the area of the non-abrasive region of the working surface. In a case where a number of inserts are provided in respective openings in the working surface, the area of each opening at the working surface is preferably within the range 2.5% to 10% of the relatively non-abrasive region of the working surface.

During use of the pad, the pad is rotated with at least a part of the working surface in contact with the floor surface or other surface which is to be treated. The part of the working surface at which contact is established includes both abrasive and non-abrasive regions. Thus, a local region of the



surface which is being cleaned is subjected to a succession of rubbing strokes in which abrasive strokes alternate with non-abrasive strokes.

The features disclosed in the foregoing description, or the accompanying drawing, expressed in their specific forms or in terms of a means for performing the disclosed function, or a method or process for attaining the disclosed result, as appropriate, may, separately or in any combination of such features, be utilised for realising the invention in diverse forms thereof.

**CLAIMS:**

1. A method of cleaning a surface wherein successive regions of the surface are each subjected to a succession of rubbing strokes and alternate ones of said strokes are abrasive strokes, the intervening strokes being relatively non-abrasive strokes.
2. A method according to Claim 1 wherein the surface is rubbed with a pad having at least one abrasive region and at least one relatively non-abrasive region and wherein said regions are moved alternately across each of said regions of the surface to be cleaned.
3. A pad suitable for use in rubbing a floor and having a working surface which bears on the floor when the pad is in use, wherein the working surface includes one or more relatively abrasive regions and one or more relatively non-abrasive regions.
4. A pad according to Claim 3 wherein the or each relatively abrasive region is or are spaced from the periphery of the pad.
5. A pad according to Claim 3 or Claim 4 having a single relatively non-abrasive region wherein the or each relatively abrasive region is surrounded by the non-abrasive region.
6. A pad according to any one of Claims 3 to 5 wherein the or at least one of the relatively abrasive regions of said working surface is presented by an insert disposed in an opening formed in a main body of the pad.
7. A pad according to any one of Claims 3 to 5 comprising a body which presents a part of the working surface and defines at least one opening

extending into or through the body from the working surface and further comprising an insert in the opening or one of the openings.

8. A pad according to Claim 6 or Claim 7 wherein the insert is an interference fit in the opening and is freely removable from the opening.

9. A pad according to any one of Claims 3 to 8 wherein the area of the relatively abrasive region or the aggregate area of the relatively abrasive regions of the working surface is within the range 2.5% to 50% of the area of the relatively non-abrasive region.

10. A pad according to any one of Claims 3 to 9 wherein the or each relatively non-abrasive region of the working surface is presented by a body of fibrous material bonded by a latex binder into a coherent, resiliently flexible body.

11. A pad suitable for use in rubbing a floor and having a working surface which bears on the floor when the pad is in use, wherein the pad defines at least one opening extending into or through the pad from the working surface thereof.

12. A pad according to Claim 11 wherein the opening is spaced from a centre of the pad.

13. A pad according to Claim 11 or Claim 12 wherein the opening is spaced from a periphery of the pad.

14. A pad according to any one of Claims 11 to 13 wherein the area of the opening is within the range 2.5% to 10% of the area of the working surface.

15. A pad according to any one of Claims 11 to 13 which defines a plurality of openings and wherein the aggregate area of the openings is within the range 8% to 50% of the area of the working surface.
16. A pad according to any one of Claims 11 to 15 wherein said opening is substantially cylindrical.
17. A pad according to any one of Claims 11 to 15 wherein said opening is substantially rectangular.
18. A set of pads comprising a larger pad according to any one of Claims 11 to 17 and a plurality of smaller pads, each of a size to fit into the opening or a respective opening in the larger pad.
19. A floor-cleaning pad substantially as herein described with reference to and as shown in the accompanying drawing.
20. Any novel feature or combination of features disclosed herein or in the accompanying drawing.

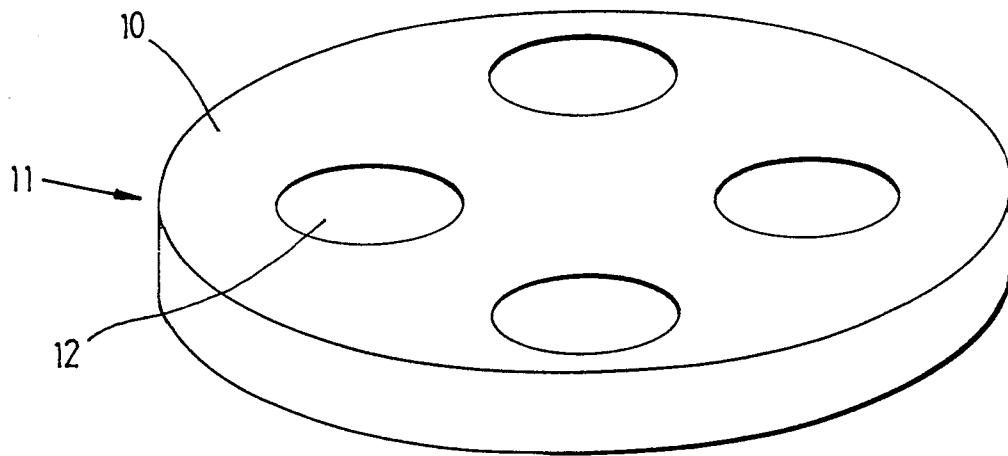


FIG. 1

# INTERNATIONAL SEARCH REPORT

International Application No PCT/GB 90/00420

<b>I. CLASSIFICATION OF SUBJECT MATTER</b> (if several classification symbols apply, indicate all) <sup>6</sup>		
According to International Patent Classification (IPC) or to both National Classification and IPC <b>IPC5: A 47 L 11/164, 13/12</b>		
<b>II. FIELDS SEARCHED</b>		
Minimum Documentation Searched <sup>7</sup>		
Classification System	Classification Symbols	
IPC5	A 47 L	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in Fields Searched <sup>8</sup>		
(This area is left blank in the original document)		
<b>III. DOCUMENTS CONSIDERED TO BE RELEVANT<sup>9</sup></b>		
Category *	Citation of Document, <sup>11</sup> with indication, where appropriate, of the relevant passages <sup>12</sup>	Relevant to Claim No. <sup>13</sup>
X	US, A, 4418438 (CUTLER) 6 December 1983, see the whole document  --	1-5
X	FR, A, 1121812 (A.K. MACKENZIE ET AL) 27 August 1956, see figure 11  --	1-3
A	US, A, 2311135 (S. STEINMETZ ET AL) 16 February 1943, see the whole document  --	1-20
A	FR, A, 35139 (C-E GOURJON) 3 December 1929, see the whole document  --  -----	1-20
* Special categories of cited documents: <sup>10</sup>		
"A" document defining the general state of the art which is not considered to be of particular relevance	"E" earlier document but published on or after the international filing date	"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
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<b>IV. CERTIFICATION</b>		
Date of the Actual Completion of the International Search  6th July 1990	Date of Mailing of this International Search Report  19. 07. 90	
International Searching Authority  EUROPEAN PATENT OFFICE	Signature of Authorized Officer  H. DANIELS	

24/05/90

**ANNEX TO THE INTERNATIONAL SEARCH REPORT  
ON INTERNATIONAL PATENT APPLICATION NO. PCT/GB 90/00420**

SA 35493

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US-A- 4418438	06/12/83	NONE	
FR-A- 1121812	27/08/56	NONE	
US-A- 2311135	16/02/43	NONE	
FR-A- 35139	03/12/29	NONE	

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