ABRASIVE SHEET INCLUDING AN ABRASIVE LAYER

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ABSTRACT

An abrasive sheet includes a fabric base, a first adhesive layer applied to the fabric base, a netted web attached to the first adhesive layer and having a plurality of web openings therein, a second adhesive layer applied to the netted web, an abrasive layer having a plurality of abrasive particles spread on the second adhesive layer, and a third adhesive layer applied to the abrasive layer. A method of making the abrasive sheet is also disclosed.
ABRASIVE SHEET INCLUDING AN ABRASIVE LAYER

CROSS-REFERENCE TO RELATED APPLICATION

This application claims priority of Taiwanese application No. 097144124, filed on Nov. 14, 2008.

BACKGROUND OF THE INVENTION

1. Field of the Invention
   This invention relates to an abrasive sheet, more particularly to an abrasive sheet including an abrasive layer.

2. Description of the Related Art
   Referring to FIG. 1, a conventional sheet of sandpaper 100 is formed by applying an adhesive to a fabric base 11 so as to form a first adhesive layer 12, and spreading a plurality of abrasive particles 13 on the first adhesive layer 12, followed by uniformly applying the adhesive to the abrasive particles 13 so as to form a second adhesive layer 14. However, since the abrasive particles 13 are very small in size and densely distributed, the spacing and depth among the abrasive particles 13 are also very small. In use, dust particles resulting from sanding of an object are likely to clog the spacing and depth among the abrasive particles 13 and cannot be removed easily, thereby reducing roughness and abrading efficiency of the sandpaper 100.

3. Description of the Invention
   Referring to FIG. 2, another conventional sandpaper 200 is formed by applying an adhesive to a fabric base 21 so as to form a first adhesive layer 23, followed by attaching an abrasive web 22 to the first adhesive layer 23. The abrasive web 22 is formed by spreading a plurality of abrasive particles on a web sheet and has a plurality of web holes 221. The abrasive web 22 has an uneven surface, with a relatively large difference between high and low surface points due to the presence of the web holes 221. Therefore, the dust particles resulting from a sanding process using the sandpaper 200 can be easily removed from the sandpaper 200.

4. Summary of Invention
   According to one aspect of the present invention, an abrasive layer comprises: a fabric base; a first adhesive layer applied to the fabric base; a netted web attached to the first adhesive layer, and having a plurality of web openings therein; a second adhesive layer applied to the netted web; an abrasive layer having a plurality of abrasive particles spread on the second adhesive layer; and a third adhesive layer applied to the abrasive layer.

5. The Invention
   According to another aspect of the present invention, an abrasive sheet having high durability is made by a process that comprises: applying a first adhesive layer to a fabric sheet; attaching a netted web to the first adhesive layer, the netted web having a plurality of web openings so as to create an uneven surface on the netted web; applying a second adhesive layer to the uneven surface of the netted web, the second adhesive layer having an uneven surface substantially corresponding to the uneven surface of the netted web; spreading on the second adhesive layer a plurality of abrasive particles so as to form an abrasive layer, the abrasive layer having an uneven surface substantially corresponding to the uneven surface of the second adhesive layer, the abrasive particles filling the web openings of the netted web; and applying a third adhesive layer to the abrasive layer, the third adhesive layer having an uneven surface substantially corresponding to the uneven surface of the abrasive layer.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGS. 1 to 6 illustrate the steps of the process of applying a layer of abrasive particles 13 to an uneven surface 14 of a sheet 15, starting at the step of applying a layer of adhesive 16 to a fabric base 17, and continuing through the process of applying a layer of abrasive particles 18 to the surface 14 of the adhesive 16, and finally applying a layer of adhesive 19 to the surface 14 of the layer of abrasive particles 18. The process is repeated a number of times, as indicated by the arrows, to produce a sandpaper 20 with a plurality of abrasive particles 13 spread over the surface 14 of the sandpaper 20.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIGS. 3a to 3f illustrate an abrasive sheet 300 of a preferred embodiment according to this invention. The abrasive sheet 300 includes a fabric base 31, a first adhesive layer 41, a netted web 50, a second adhesive layer 42, an abrasive layer 60, and a third adhesive layer 43.

In this embodiment, the fabric base 31 is formed in the shape of a quadrangle. Alternatively, depending on actual requirements, the fabric base 31 can be formed in the shape of a circle, strip, polygon, or ring.

The first adhesive layer 41 is uniformly applied to the fabric base 31.

The netted web 50 is attached to the first adhesive layer 41, and has a plurality of web openings 52 therein. In this embodiment, the netted web 50 is a woven web. The web openings 52 are formed in the shape of a quadrangle. Alternatively, the web openings 52 can be formed in the shape of a circle, oval, triangle, or polygon depending on actual requirements.

The second adhesive layer 42 is uniformly applied to the netted web 50 and has an uneven surface corresponding to an uneven surface profile of the netted web 50.

The abrasive layer 60 has a plurality of abrasive particles 601 uniformly spread on the second adhesive layer 42 such that an abrasive surface conforming with the uneven surface of the second adhesive layer 42 is formed. In this embodiment, the abrasive particles 601 are made of emery and have an arbitrary shape. It is worth mentioning that, in FIG. 4, in order to clearly show the abrasive particles 601 which are distributed at both high and low surface points of the uneven surface of the second adhesive layer 42, portions
of the abrasive layer 6 within the web openings 52 are omitted and are shown as being bare. Actually, the web openings 52 are filled with the abrasive particles 601. The abrasive web 50 is connected to the fabric base 31 through the first adhesive layer 41.

[0022] The third adhesive layer 43 is uniformly applied to the abrasive layer 60 and fills the clearances among the abrasive particles 601 so as to improve adhesion strength of the abrasive particles 601. The third adhesive layer 43 also has an uneven surface conforming to the abrasive surface of the abrasive layer 60.

[0023] The abrasive sheet 300 is made by a method including the steps: (a) preparing the fabric sheet 31, an adhesive, the netted web 51 and the abrasive particles 601; (b) applying the adhesive to the fabric sheet 31 so as to form the first adhesive layer 41; (c) attaching the netted web 50 to the first adhesive layer 41 such that the netted web 50 is connected to the fabric base 31; (d) applying the adhesive to the netted web 50 so as to form the second adhesive layer 42; (e) spreading on the second adhesive layer 42 the abrasive particles 601 so as to form the abrasive layer 60; and (f) applying the adhesive to the abrasive layer 60 so as to form the third adhesive layer 43.

[0024] By forming the abrasive surface conforming with the uneven surface of the netted web 50, the abrasive sheet 300 has a rough surface with a relatively large distance between high and low surface points, thereby alleviating the problem of clogging the abrasive sheet 300. Moreover, as the web openings 52 are provided with the abrasive particles 601, the fabric base 30 can be protected from being damaged by the dust particles produced upon sanding or grinding an object. In addition, by virtue of the first, second, and third adhesive layers 91, 42, 43, clearances among the abrasive particles 601 can be filled, thereby enhancing adhesion strength and durability of the abrasive sheet 300.

[0025] With the invention thus explained, it is apparent that various modifications and variations can be made without departing from the spirit of the present invention. It is therefore intended that the invention be limited only as recited in the appended claims.

What is claimed is:
1. An abrasive sheet comprising:
a fabric base;
a first adhesive layer applied to said fabric base;
a netted web attached to said first adhesive layer, and having a plurality of web openings therein;
a second adhesive layer applied to said netted web;
an abrasive layer having a plurality of abrasive particles spread on said second adhesive layer; and
a third adhesive layer applied to said abrasive layer;
wherein said web openings are filled with said abrasive particles.
2. The abrasive sheet of claim 1, wherein said fabric base is formed in the shape of a quadrangle, circle, strip, polygon, or ring.
3. The abrasive sheet of claim 1, wherein said netted web is a woven web.
4. The abrasive sheet of claim 1, wherein said web openings are formed in the shape of a quadrangle, circle, oval, triangle or polygon.
5. An abrasive sheet having high durability, which is made by a process that comprises:
applying a first adhesive layer to a fabric sheet;
attaching a netted web to the first adhesive layer, the netted web having a plurality of web openings so as to create an uneven surface on the netted web;
applying a second adhesive layer to the uneven surface of the netted web, the second adhesive layer having an uneven surface substantially corresponding to the uneven surface of the netted web;
spreading on the second adhesive layer a plurality of abrasive particles so as to form an abrasive layer, the abrasive layer having an uneven surface substantially corresponding to the uneven surface of the second adhesive layer, the abrasive particles filling the web openings of the netted web; and
applying a third adhesive layer to the abrasive layer, the third adhesive layer having an uneven surface substantially corresponding to the uneven surface of the abrasive layer.

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