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(54) **Cleaning cloth and a mop using the same**

(57) The invention provides a cleaning cloth (10) for cleaning dirty surfaces wherein the cloth (10) has two major surfaces (12,14) of different roughnesses, on opposite sides thereof, characterized in that the cloth is

formed by a continuous weaving or knitting process utilizing at least two different filaments (18,20) wherein an non-scratch abrasive monofilament (20) is knitted into at least one of the surfaces.

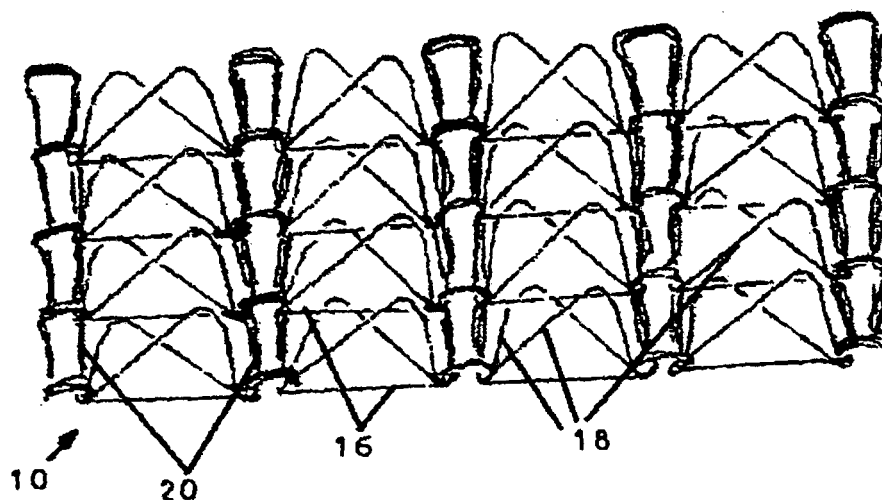


Fig. 1

Description

[0001] The present invention relates to the cleaning of surfaces, typically of floor surfaces.

[0002] More particularly, the invention provides a dual-use cleaning cloth, usually used in the wet state to clean all home surfaces, and car windows, including but not limit to floors, tiles, baths, toilets, wood and metal surfaces, glass surfaces etc, one side of the cloth being arranged to absorb loose dirt while the opposite side of the cloth is arranged to remove dirt adhering to the surface being cleaned.

[0003] The invention also relates to a mop carrying the dual-use cloth as will be described.

[0004] Almost all cloths in use today for cleaning surfaces are of a rough textile weave, both sides of the cloth having similar surfaces. Such cloths are quite satisfactory for general use but are not effective in removing dirt adhering to the surface being cleaned.

[0005] Early attempts at solving the problem were to attach, for example by stapling or sewing, an abrasive section to the normal cleaning cloth or sponge. This practice, besides being unaesthetic and labor intensive also limited the available cleaning area. This situation led to the development of various dual-usage cloths, which are described in the patent literature, however as far as applicant has been able to determine, none of these proposed cloths have come into general use, possibly because the manufacturing costs were too high.

[0006] A review of recent patents will provide an assessment of this state of the art.

[0007] A combination cleaning pad is disclosed by Sadovsky in US Patent No. 5,408,718. A central core has two large parallel surfaces, and a cover sewn to the central core. The cover includes an abrasive portion and an absorbing portion. The abrasive portion covers part of one of the major surfaces.

[0008] In US Patent No. 5,804,274 Nordin proposes a cleaning cloth wherein multiple short loops project from one face of the cloth and both long and short loops cover the opposite face which is the face to be used in removing clinging dirt.

[0009] Fenkes in US Patent No. 6,305,431 B1 proposes a mixture of loops and exposed ends to attack attached dirt substances. However as both surfaces of the cloth have the same structure, each side of the cloth has to be configured for both normal use and for the removal of said attached dirt substances.

[0010] The wet cleaning cloth disclosed by Heitz in US Patent No. 6,491,998 B1 does have two different surfaces - on one side unbundled elastic fibers project 2-12 mm from the textile carrier. The fibers are typically plastic and are claimed to enter hollows in the floor being cleaned and to remove dirt therefrom.

[0011] In International Patent No. W02006/018051 Freudenberg discloses a cleaning cloth having a planar textile structure, one side being pattern printed using liquid containing abrasive particles. This application method

greatly limits the size of the particles to be deposited and thus the abrasive surfaces made in this manner are likely to become clogged quickly in normal use.

[0012] There is therefore a need for a large area cleaning cloth, which has non-scratch abrasive means on one side and is economical to manufacture.

[0013] It is therefore one of the objects of the present invention to obviate the disadvantages of prior art cleaning cloths and to provide a cloth which is easily manufactured and not subjected to clogging.

[0014] It is a further object of the present invention to provide a simple pattern which can easily be modified to increase or decrease the proportion of the surface having non-scratch abrasive properties.

[0015] The present invention achieves the above objects by providing a cleaning cloth for cleaning dirty surfaces wherein said cloth has two major surfaces of different roughnesses, on opposite sides thereof, characterized in that said cloth is formed by a continuous knitting or weaving process utilizing at least two different filaments wherein a non-scratch abrasive monofilament is knitted into at least one of said surfaces.

[0016] In preferred embodiments of the present invention said non-scratch abrasive monofilament is knitted into only one of said surfaces, although it is possible in other embodiments to weave or knit such a filament into both surfaces but in different ratios so that the two surfaces have different degrees of roughness.

[0017] In a preferred embodiment of the present invention there is provided a cleaning cloth, wherein the filaments are polymeric filaments.

[0018] In a preferred embodiment of the present invention there is provided a cleaning cloth wherein the non-scratch abrasive monofilament is a polyamide.

In a further preferred embodiment of the present invention there is provided a cleaning cloth wherein the non-scratch abrasive monofilament is a polyethylene

[0019] In a further preferred embodiment of the present invention there is provided a cleaning cloth wherein the non-scratch abrasive monofilament is a polyester

[0020] In a further preferred embodiment of the present invention there is provided a cleaning cloth wherein the non-scratch abrasive monofilament is a polypropylene

[0021] In a further preferred embodiment of the present invention there is provided a cleaning cloth wherein the non-scratch abrasive monofilament is selected from the group consisting of polyester, polypropylene, polyethylene, and a polyamide such as nylon 6/6 ® of Dupont.

[0022] In a further preferred embodiment of the present invention there is provided a cleaning cloth comprising a first microfiber filament and a second polyamide filament.

[0023] In yet a further preferred embodiment of the present invention there is provided a cleaning cloth comprising between about 75%-95% microfiber and about 5%-25% of a non-scratch abrasive monofilament selected from the group consisting of polyester, polypropylene, polyethylene, and a polyamide such as nylon 6/6 ® of Dupont.

[0024] In another preferred embodiment of the present invention there is provided a cleaning cloth wherein the non-scratch abrasive monofilament is knitted or woven into one of the surfaces in a pattern of spaced apart rows.

[0025] In another preferred embodiment of the present invention there is provided a cleaning cloth wherein the polyamide is a nylon strip of about 100-300 micron thickness.

[0026] In a most preferred embodiment of the present invention there is provided a cleaning cloth wherein the polyamide is a plurality of nylon filaments of about 100-300 micron thickness.

[0027] In yet a further embodiment of the invention a cleaning cloth for cleaning dirty surfaces is provided in combination with a mop on which the cleaning cloth is arranged.

[0028] It will thus be realized that the novel cloth of the present invention can be manufactured in a continuous process utilizing two different types of filaments:

monofilament and multifilament. The degree of roughness can be easily defined and altered during different manufacturing processes simply by using more than one type of monofilament together with more than one type of multifilament as well as changing the spacing between the soft lines and the non-scratch abrasive lines.

[0029] The invention will now be described in connection with certain preferred embodiments with reference to the following illustrative figures so that it may be more fully understood.

[0030] With specific reference now to the figures in detail, it is stressed that the particulars shown are by way of example and for purposes of illustrative discussion of the preferred embodiments of the present invention only and are presented in the cause of providing what is believed to be the most useful and readily understood description of the principles and conceptual aspects of the invention. In this regard, no attempt is made to show structural details of the invention in more detail than is necessary for a fundamental understanding of the invention, the description taken with the drawings making apparent to those skilled in the art how the several forms of the invention may be embodied in practice.

[0031] In the drawings:

FIG. 1 is a detail elevational view of a preferred embodiment of the cleaning cloth according to the invention;

FIG. 2 is a perspective view of an embodiment wherein the non-scratch abrasive areas comprise parallel lines;

FIG. 3 is a diagrammatic view of an embodiment showing a first embodiment of a polymeric monofilament used as the non-scratch abrasive portion of the cloth;

FIG. 4 is a diagrammatic view of an embodiment

showing a second embodiment of a polymeric monofilament used as the non-scratch abrasive portion of the cloth;

FIG. 5 is an elevational view of a mop and an attached cloth according to the invention.

[0032] There is seen in FIG. 1 an enlarged detail of a cleaning cloth 10 for cleaning dirty surfaces wherein the cloth 10 is formed with two major surfaces 12, 14 (seen in FIG. 2) of different roughness, on opposite sides thereof.

[0033] The warp threads 16 are shown extending in a horizontal direction. The weft threads 18 are seen crossing and re-crossing the warp threads 16. The non-scratch abrasive filament 20 is also woven into the warp threads 16, but in a manner wherein the loops 22 extend outwards from one of the surfaces of the cloth.

[0034] The cloth 10 is formed by a continuous weaving or knitting process utilizing two different filaments 18, and 20, wherein a non-scratch abrasive monofilament 20 is knitted or woven into one of the surfaces to project therefrom.

[0035] Preferably the non-scratch abrasive areas are formed by polymeric filaments 20. The preferred non-scratch abrasive monofilament is a polyamide, particularly polyester, polypropylene, polyethylene, polyamide nylon 6/6 and others. This material combines hardness, flexibility, wear resistance and low price.

[0036] The basic cleaning cloth 10 comprises a first microfiber filament, introduced as warp and weft threads 16 and 18, providing good absorption characteristics, and a second polyester, polypropylene, polyethylene, polyamide nylon 6/6 filament 20 which serves as the non-scratch abrasive material. Typical ratios are in the range of between about 75%-95% microfiber and about 5%-25% polyester, polypropylene, polyethylene, and a polyamide such as nylon 6/6 ® of Dupont.

[0037] The preferred pattern of the cleaning cloth 10 wherein the non-scratch abrasive monofilament 20 is knitted or woven into one of the surfaces 12 in a pattern of spaced apart rows, is seen in FIG. 2. The knitting or weaving process is arranged to position the polyamide rows projecting from a first surface 12 of the cloth and being flush with the opposite surface thereof 14.

[0038] Referring now to FIG. 3, there is seen a nylon strip 24 of about 100-300 micron thickness and a width of about 1 mm. A strip of this size is suitable for use as a thread for a knitting or a weaving process used to manufacture the non-scratch abrasive component of the cloth. The strip 24 is strong, flexible and suitable for service as an non-scratch abrasive area or line. The strip 24 is supplied using a spool 26 standard for the machine used to manufacture the cloth 10.

[0039] Referring now to FIG. 4, there is depicted a detail of a cleaning cloth wherein the polyamide strip is composed of a group of 4 nylon filaments 28 of about 100-300 micron thickness.

[0040] The four filaments 28 are arranged in a single

line, as seen in the figure. Again, a standard spool 26 is used.

[0041] FIG. 5 shows a cleaning cloth 10 for cleaning dirty surfaces in combination with a mop 30 on which cleaning cloth 10 is arranged.

[0042] The corners 32 of the cloth 10 are held to the mop 30 by means of a readily-opened clamp 34. Thus the cloth 10 can be readily reversed as needed to tackle adhering dirt particles.

[0043] It will be evident to those skilled in the art that the invention is not limited to the details of the foregoing illustrative embodiments and that the present invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof. The present embodiments are therefore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced therein.

Claims

1. A cleaning cloth for cleaning dirty surfaces wherein said cloth has two major surfaces of different roughnesses, on opposite sides thereof, **characterized in that** said cloth is formed by a continuous weaving or knitting process utilizing at least two different filaments wherein an non-scratch abrasive monofilament is knitted into at least one of said surfaces.
2. A cleaning cloth according to claim 1, wherein said filaments are polymeric filaments.
3. A cleaning cloth according to claim 1 wherein said non-scratch abrasive monofilament is a polyamide.
4. A cleaning cloth according to claim 1 wherein said non-scratch abrasive monofilament is selected from the group consisting of polyester, polypropylene, polyethylene, and polyamide.
5. A cleaning cloth according to claim 1 comprising a first microfiber filament and a second polyamide filament.
6. A cleaning cloth according to claim 5 comprising between about 75%-95% microfiber and about 5%-25% of a non-scratch abrasive monofilament selected from the group consisting of polyester, polypropylene, polyethylene, and polyamide.
7. A cleaning cloth according to claim 1 wherein said non-scratch abrasive monofilament is woven or knitted into one of said surfaces in a pattern of spaced apart rows.
8. A cleaning cloth according to claim 5 wherein said polyamide is a nylon strip of about 100-300 micron thickness.
9. A cleaning cloth according to claim 5 wherein said polyamide is a plurality of nylon filaments of about 100-300 micron thickness.
10. A cleaning cloth for cleaning dirty surfaces according to claim 1 in combination with a mop on which said cleaning cloth is arranged.

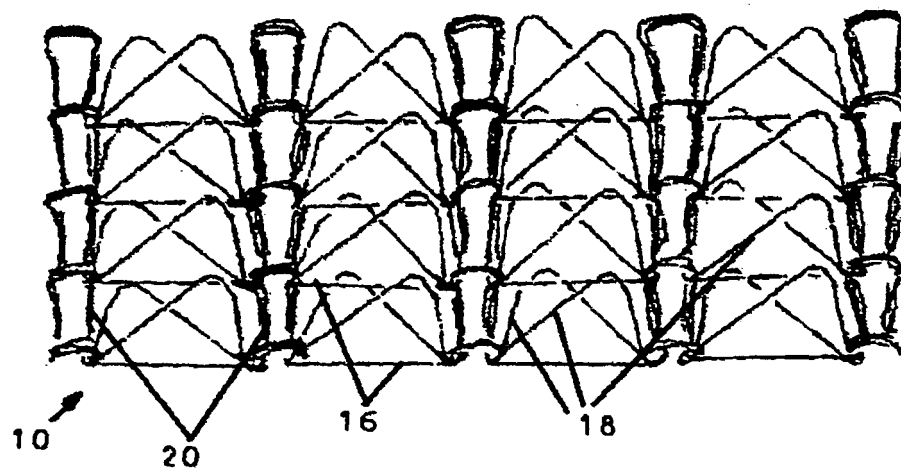


Fig. 1

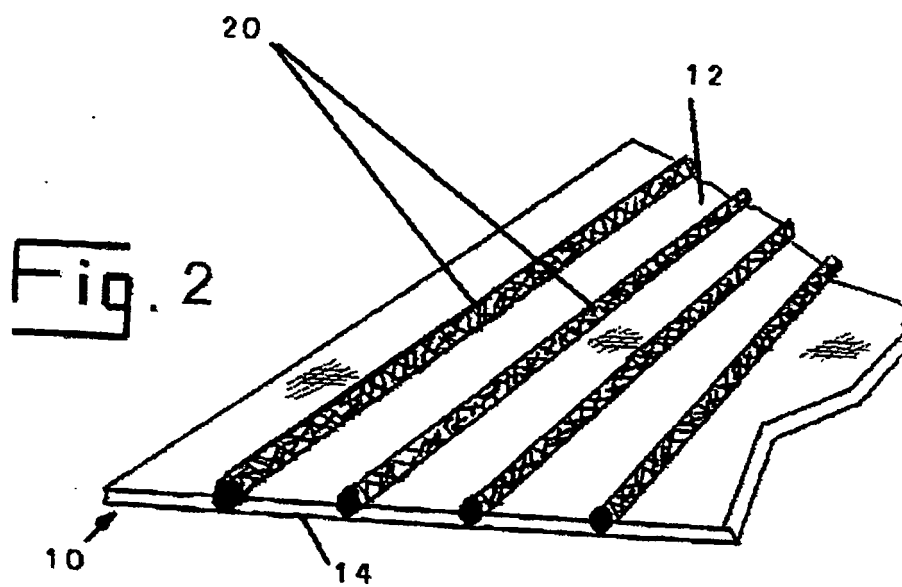


Fig. 2

Fig. 3

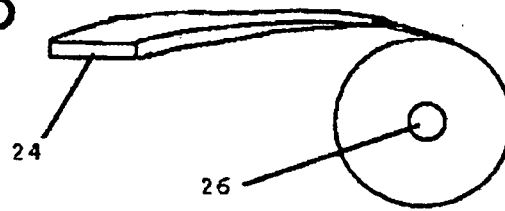


Fig. 4

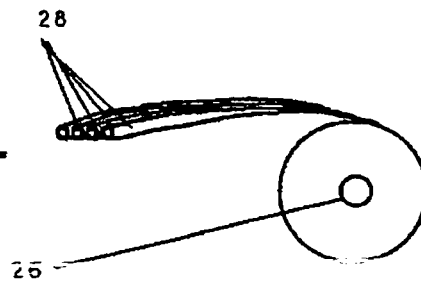
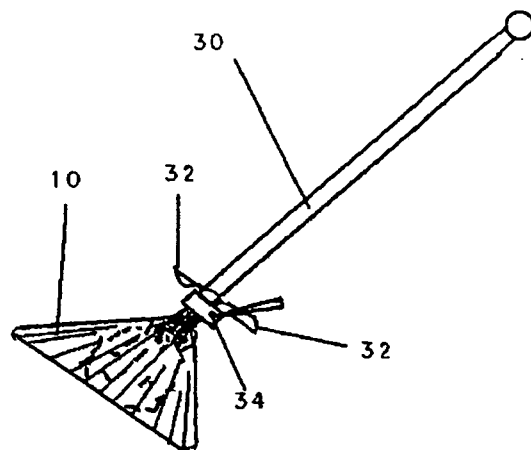


Fig. 5



REFERENCES CITED IN THE DESCRIPTION

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