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(54) Title: CLEANING SHEET

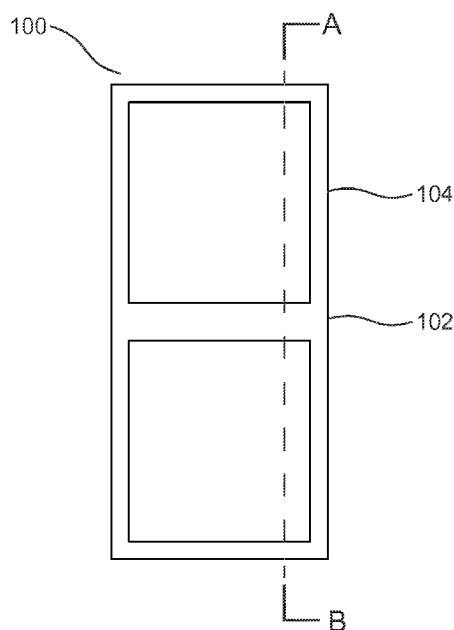


Fig. 1

(57) Abstract: The present invention provides a cleaning sheet including at least two cleaning portions and recess portions that surround each cleaning portion and function to provide separate adjacent cleaning portions, the recess portions being thinner than the thickness of the cleaning portions, thus providing recess portions that are easily bendable and cleaning portions that can better conform to objects to be cleaned. The recess portions can be formed on one side or two sides of the cleaning sheet, and are easily separated. The cleaning sheet comprises composite sponge layers and fabric layers to provide different cleaning surfaces of differing cleaning power, and which are easy to clean. The cleaning sheet provided by the present invention is adaptable to the different sizes, shapes and surfaces of a variety of objects to be cleaned.

CLEANING SHEET

Technical Field

5 The present invention relates to a cleaning tool, in particular to a cleaning sheet, which comprises at least two cleaning portions and recess portions that surround each cleaning portion to provide separate adjacent cleaning portions on the cleaning sheet.

Background

10 As common cleaning tools, sponges and scouring pads can clean common stains easily. Generally, sponges and scouring pads are made in a block shape, and are thick and possess elasticity. Due to the diversity of objects to be cleaned, cleaning tools are expected to be flexible, clingy and easily bendable so that the cleaning tools are likely to be conformable to the objects to be cleaned.

15 Efforts have been made to enable the sponge cleaning tool to be easily conformable to the objects to be cleaned, such as by making notches in the block shaped sponges. For instance, as described in Chinese Patent CN201211174, which discloses a cleaning block, a block sponge is wrapped with a piece of plastic silk screen cloth and is provided with a notch so that the sponge is capable of going deep into a cup or dish for more effective cleaning.

20 Notwithstanding the existence of sponge cleaning tools customized with respect to specific shapes, it is still expected that general cleaning tools possess softness, clinginess and bendability, so that the cleaning tools are likely to be conformable to the objects to be cleaned and are adaptable to the different sizes, shapes and surfaces of a variety of objects to be cleaned.

Summary

25 The present invention aims to overcome or improve at least one technical deficiency of existing cleaning sheets. One purpose of the present invention is to provide a soft and flexible cleaning sheet. Another purpose of the present invention is to provide a dividable cleaning sheet.

The present invention further aims to provide a cleaning sheet having sides that possess different cleaning functions.

The present invention provides a cleaning sheet, which includes at least two cleaning portions and recess portions that surround each cleaning portion and function to provide separate adjacent cleaning portions, wherein the recess portions are thinner than the cleaning portions.

5 In one embodiment of the cleaning sheet provided by the present invention, the shape of the cleaning portions can be a square, rectangle, triangle, hexagon, polygon, circle, ellipse, irregular shape or a combination thereof.

In one embodiment of the cleaning sheet provided by the present invention, the thickness of the cleaning portion is approximately 10 to 20 mm.

10 In one embodiment of the cleaning sheet provided by the present invention, the thickness of the recess portion is approximately one-tenth to one-third the thickness of the thickness of the cleaning portion.

In one embodiment of the cleaning sheet provided by the present invention, the thickness of the recess portion is approximately 1 to 3 mm.

15 In one embodiment of the cleaning sheet provided by the present invention, the recess portion can be formed on one side or two sides of the cleaning sheet.

In one embodiment of the cleaning sheet provided by the present invention, the width of the recess portion is approximately 50% to 100% of the thickness of the cleaning portion.

In one embodiment of the cleaning sheet provided by the present invention, the cleaning sheet comprises a sponge layer and a fabric layer laminated to each other.

20 In one embodiment of the cleaning sheet provided by the present invention, the sponge layer and the fabric layer are compositely bonded together at the recess portion.

25 In one embodiment of the cleaning sheet provided by the present invention, the fabric layer of the cleaning sheet comprises a woven or knitted fabric structure layer comprising flat plastic filaments and synthetic fibers. In one embodiment, the fabric layer of the cleaning sheet comprises a fabric woven with plastic filaments and synthetic fibers.

In another aspect of the cleaning sheet provided by the present invention, the synthetic fibers may be selected from one of polyester, polyamide, polypropylene.

In one embodiment of the cleaning sheet provided by the present invention, the fabric layer may be a weft-knitted fabric structure layer comprising flat plastic filaments and polyester fibers. In one embodiment, the fabric of the fabric layer may be a weft-knitted fabric woven with flat plastic filaments and polyester filaments.

5 In one embodiment of the cleaning sheet provided by the present invention, the fabric layer may be a plain woven fabric structure layer comprising flat plastic filaments and polyamide fibers. In one embodiment, the fabric of the fabric layer may be a plain-woven fabric woven with flat plastic filaments and polyamide filaments.

10 In one embodiment of the cleaning sheet provided by the present invention, the sponge layer may comprise one of a polyurethane sponge structure layer, a polyvinyl alcohol sponge structure layer or a natural cellulose sponge structure layer. In one embodiment, the sponge of the sponge layer may be selected from one of polyurethane sponge, polyvinyl alcohol sponge or natural cellulose sponge.

15 In one embodiment of the cleaning sheet provided by the present invention, the recess portion can be formed by ultrasonic bonding technology or hot-press molding technology.

In one embodiment of the cleaning sheet provided by the present invention, According to the composite sponge layer and fabric layer cleaning sheet, the sponge layer and the fabric layer can be compositely joined at the recess portion by ultrasonic bonding technology or hot-press molding technology.

20 It is thus clear that the present invention at least achieves the following technical effects:

The cleaning sheet provided by the present invention comprises at least two cleaning portions and recess portions that surround each cleaning portion and function to provide separate adjacent cleaning portions, wherein the recess portions are thinner than the cleaning portions. The recess portion can be formed on one side or two sides of the cleaning sheet, such that a flexible
25 recess portion is provided between the cleaning portions. This solves the problem of the difficulty in having sponges and scouring pads retain a bent shape, and gives better softness and flexibility of the cleaning sheets so that they may better conform to the objects to be cleaned. The cleaning tool has a hand or feeling similar to a piece of cleaning cloth, which is desirable to consumers. At the same time, a recess portion among the plurality of cleaning portions is separable, so consumers can
30 trim it according to their needs, and thus it possesses customizable functionality. Moreover, the cleaning sheet structure comprising the laminated sponge layer and fabric layer provides different

cleaning power and different cleaning sides that are easy to clean, as well as good hygroscopic effect for quick removal of water stains. Therefore, the cleaning sheet provided by the present invention is adaptable to the different sizes, shapes and surfaces of a variety of objects to be cleaned.

5 Other achievable purposes and technical effects of the present invention will be illustrated in the following specific embodiments in combination with the description and schematic diagrams of specific embodiments.

Brief Description of the Drawings

10 These and/or other characteristics and advantages of the cleaning sheet provided by the present invention can be understandable with the description of the embodiments in combination with the following drawings. The drawings are schematic rather than exactly representing a real object, thus not all details are presented in the drawings or drawn to scale. In the drawings, identical or similar marks represent the same portions or the portions with similar function or
15 structure.

FIG. 1 is a schematic diagram of a first embodiment of a cleaning sheet of the present invention.

FIG. 2 is a sectional view of the first embodiment of the cleaning sheet of the present invention.

20 FIG. 3 is a local schematic diagram of a second embodiment of a cleaning sheet of the present invention.

FIG. 4 is a local sectional view of the second embodiment of the cleaning sheet of the present invention.

25 FIG. 5 is the local schematic diagram of a third embodiment of a cleaning sheet of the present invention.

FIG. 6 is the local sectional view of the third embodiment of the cleaning sheet of the present invention.

Detailed Description

Some embodiments of the present invention are described in details with the Figures; however, the content of the present invention can be applied to various different forms and shall not be limited to the embodiments described herein. Furthermore, based on the description of the
5 embodiments, the substantive content of the present invention can be comprehended easily, so that one skilled in the art can make different modifications without deviating from the essence of the present invention.

As illustrated in FIG. 1 and FIG. 2, which demonstrate the cleaning sheet provided by one
10 embodiment of the present invention, the cleaning sheet 100 includes two cleaning portions 104 and recess portions 102 surrounding each cleaning portion 104 and formed between the two cleaning portions 104 to isolate adjacent cleaning portions 104. Each cleaning portion 104 and recess portion 102 includes a sponge layer 202 and a fabric layer 204 laminated to each other. The sponge layer 202 at the recess portion 102 is compressed to combine with the fabric layer 204. The cleaning sheet 100 can be formed by laminating the sponge layer to the fabric layer and
15 compositely joining them together. For example, the sponge layer and fabric layer can be laminated by existing ultrasonic bonding technology or other known methods, and both the sponge layer and the fabric layer can be selected from conventional appropriate materials. In one embodiment, the sponge layer may be selected from sponges including, but not limited to, polyurethane sponges, polyvinyl alcohol sponges or natural cellulose sponges. The fabric layer
20 comprises a woven or knitted fabric comprising flat plastic filaments and synthetic fibers. For example, the synthetic fibers can be selected from one of conventional polyester, polyamide and polypropylene. In one embodiment of the present invention, a weft-knitted fabric comprising flat plastic filaments and polyester fibers is used as the fabric layer 204, which is laminated to the sponge layer 202. The sponge layer and the fabric layer are laminated by ultrasonic bonding
25 technology at the recess portions 102 surrounding the cleaning portions 104 and the recess portions 102 are located between adjacent cleaning portions 104 to form the cleaning sheet 100.

The cleaning portion 104 and the recess portion 102 of the cleaning sheet 100 may be different in quantity, shape and size. A plurality of cleaning portions 104 (i.e. two or more cleaning portions 104) are available. Correspondingly, more recess portions 102 may be formed
30 around the cleaning portion 104 and between adjacent cleaning portions 104, and the recess portion 102 may be formed on one side or two sides of the cleaning sheet 100. The cleaning portions 104 may be of different shapes and sizes (i.e. – a square, rectangle, triangle, hexagon, polygon, circle, ellipse, or irregular shape, or a combination thereof), and correspondingly, the recess portion 102 formed between the cleaning portions 104 may be a straight line, a polygonal
35 line, a curve or a combination of the three. In the embodiment shown in FIG. 1 and FIG. 2, non-

restrictively, the weft-knitted fabric comprising flat plastic filaments and polyester fibers are used as the fabric layer 204 that is laminated to the sponge layer 202 to form the cleaning sheet 100. The cleaning sheet 100 forms two rectangular cleaning portions 104 having the same size. The recess portion 102 surrounds the two cleaning portions and forms a straight line between the two cleaning portions. The recess portion 102 is arranged at the thickness of the cleaning portion 104 of the cleaning sheet 100 such that the recess is formed on each side of the cleaning sheet 100. The thickness of the cleaning portion 104 may be between about 10 and about 20 mm. The size of each cleaning portion 104 is not restricted, and may be set as needed. A larger size cleaning portion 104 can be used similarly to a piece of a cleaning cloth, and a smaller size cleaning portion 104 can be used similarly to a piece of a scouring pad. In this embodiment of the present invention, one side of the rectangular cleaning portion 104 may be between about 40 and about 60 mm long, and the other side thereof may be between about 70 and about 90 mm long. The cleaning portion 104 may be larger or may be square shaped.

The recess portions 102 of the cleaning sheet 100 may have different widths and thicknesses. The recess portion 102 is thinner than the thickness of the cleaning portion. In one embodiment, the thickness of the recess portion 102 is one-tenth to one-third the thickness of the thickness of the cleaning portion 104. Typically, the specific thickness may be accurate to several millimeters, such as about 1 to about 3 mm, and the width may be less than about 10 mm, such as about 5 to about 10 mm. The width of the recess portion 102 may be about 50% to about 100% of the thickness of the cleaning portion 104 such that the cleaning sheet 100 is flexible. For instance, the appropriate width of the recess portion 102 may be about 5 to about 10 mm when the thickness of the cleaning portion 104 is about 10 to about 20 mm.

The cleaning sheet 100 as illustrated in FIG. 1 and FIG. 2 provides two identical cleaning portions 104, respectively having two different cleaning sides, one formed by the sponge layer 202 and one formed by the fabric layer 204 to result in each side having different cleaning power and hygroscopic effect. For instance, the sponge layer 202 can quickly remove water stains. The cleaning sheet 100 is flexible due to the recess portion 102 formed between the cleaning portions 104 so the cleaning sheet may easily and simultaneously clean two surfaces of an object. Moreover, the cleaning sheet 100 is also easily separated into two pieces at the recess portion 102 formed between the cleaning portions 104. Therefore, the cleaning sheet 100 provided by the present invention is adaptable to the different sizes, shapes and surfaces of a variety of objects to be cleaned.

Of course, this embodiment of the present invention may be modified. For example, the recess portions 102 may be formed on only one side of the cleaning sheet 100. In another example,

both sides of the sponge layer 202 may be laminated with a fabric layer 204 to form a cleaning sheet 100 that has fabric layers on both sides of the sponge layer.

It is certainly understood that, although that the embodiment as shown in FIG. 1 and FIG. 2 includes only two cleaning portions 104 with the recess portion 102 surrounding each cleaning portion 104, the embodiment may have some modifications, such as including more cleaning portions 104 and recess portions 102 along a longitudinal or transverse direction.

FIG. 3 and FIG. 4 present a local schematic diagram and a local sectional view of a second embodiment of the cleaning sheet of the present invention. The cleaning sheet 100 is provided with a plurality of cleaning portions 104 and recess portions 102 that surround each cleaning portion 104 and function to provide separate adjacent cleaning portions 104. Each cleaning portion 104 and recess portion 102 includes a sponge layer 202 and a fabric layer 204 laminated to each other. The sponge layer 202 at the recess portion 102 is compressed to combine with the fabric layer 204. In this embodiment of the present invention, a plain woven fabric comprising flat plastic filaments and polyamide fibers is used as the fabric layer 204. Unlike the preceding embodiment, this embodiment is characterized in that the cleaning sheet 100 is provided with a plurality of triangular cleaning portions 104 (i.e. equilaterally triangular cleaning portions 104) and a plurality of recess portions 102 that surround each cleaning portion 104, and are formed between adjacent cleaning portions 104 to isolate adjacent cleaning portions. Each recess portion 102 correspondingly forms a plurality of straight lines that intersect at a certain angle. For instance, the included angle between adjacent the straight lines is 60 degrees. It is certainly understood that, even though only parts of the cleaning portions 104 and recess portions 102 are shown in FIG. 3 and FIG. 4, more cleaning portions 104 and recess portions 102 may be tiled along each direction.

In this embodiment, each side of the cleaning portion 104 is about 20 mm long, the thickness of the cleaning portion 104 may be about 10 to about 20 mm, and the width of the recess portion 102 may be about 50% to about 100% of the thickness of the cleaning portion 104 (i.e. 5 to 10 mm). The recess portion 102 is thinner than the thickness of the cleaning portion, which means that the thickness of the recess portion 102 is about one-tenth to about one-third the thickness of the thickness of the cleaning portion 104. Typically, the thickness of the recess portion is about 1 to about 3 mm, and the recess portion 102 is formed at the thickness of the cleaning portion 104 of the cleaning sheet 100 such that the recess is formed on each side of the cleaning sheet 100.

FIG. 5 and FIG. 6 present the local schematic diagram and the local sectional view of the cleaning sheet in a third embodiment of the present utility model. The cleaning sheet 100 is provided with a plurality of cleaning portions 104 and recess portions 102 that surround each cleaning portion 104 and are formed between the cleaning portions 104 to isolate adjacent cleaning portions 104, wherein each cleaning portion 104 and recess portion 102 includes a sponge layer

202 and the fabric layer 204 that are laminated to each other. The sponge layer 202 at the recess portion 102 is compressed to combine with the fabric layer 204. In this embodiment of the present invention, a plain woven fabric comprising flat plastic filaments and polyamide fibers is used as the fabric layer 204. Unlike the preceding embodiment, this embodiment is characterized in that the cleaning portion 104 is an equilateral hexagon, and a plurality of straight-line recess portions 102 that intersect at a certain angle (i.e. - 120 degrees) are formed between the cleaning portions 104. Even though only parts of the cleaning portions 104 and recess portions 102 are shown in FIG. 5 and FIG. 6, more cleaning portions 104 and recess portions 102 may be tiled along each direction. Each side of the cleaning portion 104 is about 20 mm long, the thickness of the cleaning portion 104 may be about 10 to about 20 mm, and the width of the recess portion 102 may be about 5 to about 10 mm. The recess portion is thinner than the thickness of the cleaning portion, which means that the thickness of the recess portion 102 is about one-tenth to about one-third the thickness of the thickness of the cleaning portion 104. Typically, the thickness of the recess portion 102 is about 1 to about 3 mm. In this embodiment, the recess portion 102 is formed at the thickness of the cleaning portion of the cleaning sheet 100 such that the recess is formed on each side of the cleaning sheet 100.

One embodiment of the present invention provides a cleaning sheet, which comprises at least two cleaning portions and recess portions surrounding each cleaning portion and separating adjacent cleaning portions, wherein the recess portion is thinner than the cleaning portion.

According to one embodiment of the cleaning sheet of the present invention, the shape of each cleaning portion is a square, rectangle, triangle, hexagon, polygon, round, ellipse, or irregular shape or a combination thereof.

According to the cleaning sheet provided by the present invention, the thickness of the recess portion is approximately one-tenth to one-third that of the cleaning portion.

According to one embodiment of the cleaning sheet of the present invention, the thickness of the cleaning portion is approximately 10 to 20 mm.

According to one embodiment of the cleaning sheet of the present invention, the recess portion can form a recess on one side or two sides of the cleaning sheet.

According to one embodiment of the cleaning sheet of the present invention, the width of the recess portion is approximately 50% to 100% of the thickness of the cleaning portion.

According to one embodiment of the cleaning sheet of the present invention, the thickness of the cleaning portion is approximately 1 to 3 mm.

According to one embodiment of the cleaning sheet of the present invention, the cleaning sheet comprises a sponge layer and a fabric layer laminated to each other.

According to one embodiment of the cleaning sheet of the present invention, the sponge layer and the fabric layer are laminated with each other at the recess portion.

According to one embodiment of the cleaning sheet of the present invention, the fabric layer of the cleaning sheet comprises a woven or knitted fabric structure layer comprising flat plastic filaments and synthetic fibers.

According to one embodiment of the cleaning sheet of the present invention, the synthetic fibers can be selected from one of polyester, polyamide or polypropylene.

According to one embodiment of the cleaning sheet of the present invention, the fabric of the fabric layer may be a weft-knitted fabric comprising flat plastic filaments and polyester fibers.

According to one embodiment of the cleaning sheet of the present invention, the fabric of the fabric layer may be a plain-woven fabric comprising flat plastic filaments and polyamide fibers.

According to another aspect of the cleaning sheet provided by the present invention, the sponge of the sponge layer may be selected from one of polyurethane sponge, polyvinyl alcohol sponge or natural cellulose sponge.

According to the cleaning sheet provided by the present invention, the recess portion can be formed by ultrasonic bonding technology or hot-press molding technology.

According to the cleaning sheet provided by the present invention, the sponge layer and fabric layer can be compositely joined at the recess portion by ultrasonic bonding composite technology or hot-press molding technology.

Of course, the embodiments may be modified, such as the combination of different cleaning portions.

What is claimed is:

1. A cleaning sheet comprising:
at least two cleaning portions; and
5 recess portions that surround each cleaning portion and function to provide separate adjacent cleaning portions, wherein the recess portions are thinner than the cleaning portions.
2. The cleaning sheet according to claim 1, wherein each cleaning portion may have the shape of a square, rectangle, triangle, hexagon, polygon, circle, ellipse, or irregular
10 shape or a combination thereof.
3. The cleaning sheet according to claim 1, wherein the cleaning portion has a thickness of between about 10 and about 20 mm.
4. The cleaning sheet according to claim 1, wherein the recess portion has a thickness of between one-tenth and one-third the thickness of the thickness of the cleaning portion.
- 15 5. The cleaning sheet according to claim 1, wherein the recess portion has a thickness of between about 1 and about 3 mm.
6. The cleaning sheet according to claim 1, wherein the recess portions may be formed on one side or two sides of the cleaning sheet.
7. The cleaning sheet according to claim 1, wherein a width of the recess portion is about
20 50% to about 100% of the thickness of the cleaning portion.
8. The cleaning sheet according to claim 1, wherein the cleaning sheet comprises a sponge layer laminated to a fabric layer.
9. The cleaning sheet according to claim 8, wherein the sponge layer and the fabric layer are compositely bonded at the recess portion.
- 25 10. The cleaning sheet according to claim 8, wherein the fabric layer comprises a woven or knitted fabric comprising flat plastic filaments and synthetic fibers.
11. The cleaning sheet according to claim 10, wherein the synthetic fibers are selected from one of polyester, polyamide and polypropylene.
12. The cleaning sheet according to claim 10, wherein the fabric layer is a weft-knitted
30 fabric layer woven comprising flat plastic filaments and polyester fibers.

13. The cleaning sheet according to claim 10, wherein the fabric layer is a plain woven fabric layer comprising flat plastic filaments and polyamide fibers.
14. The cleaning sheet according to claim 8, wherein the sponge layer is selected from one of a polyurethane sponge, a polyvinyl alcohol sponge and a natural cellulose sponge.

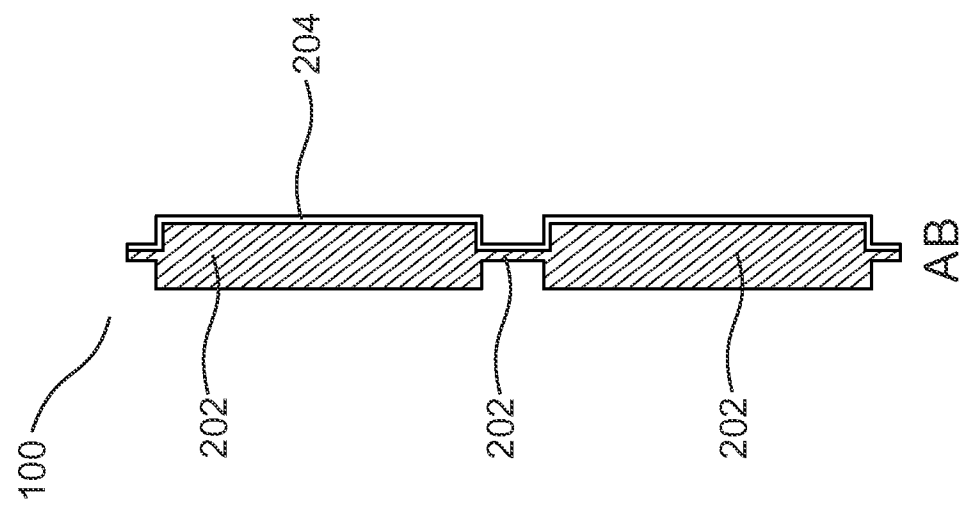


Fig. 2

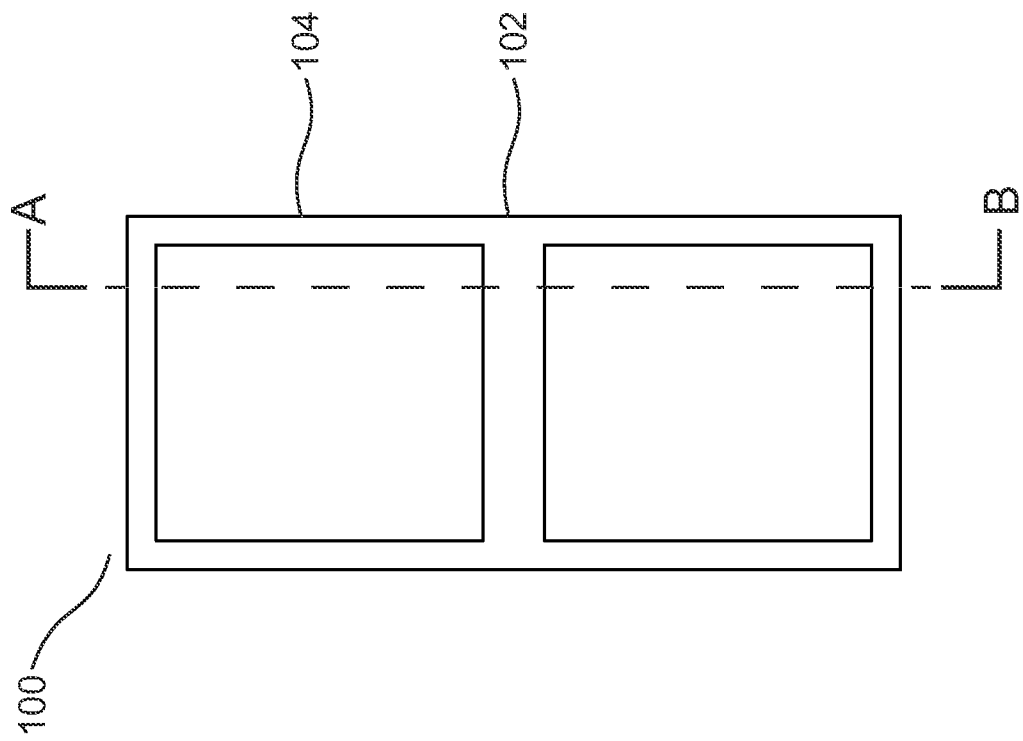


Fig. 1

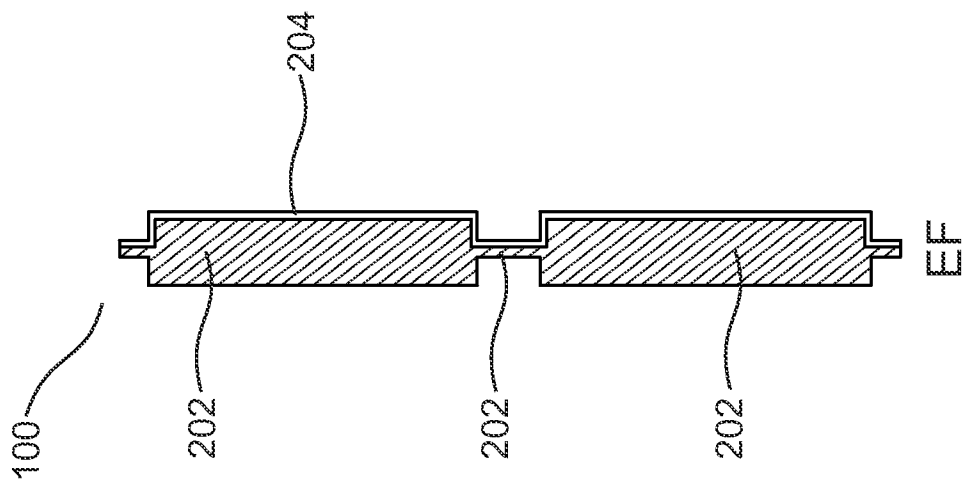


Fig. 4

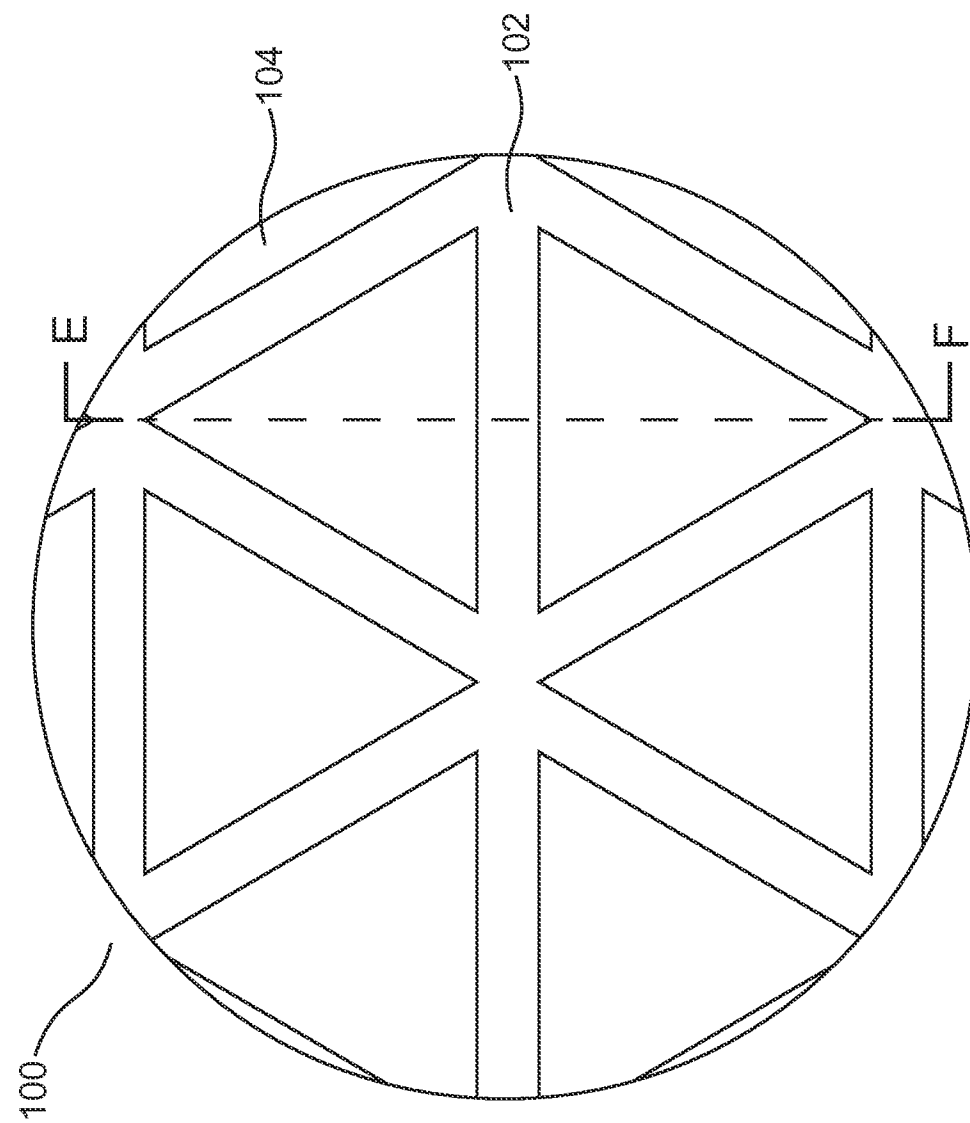


Fig. 3

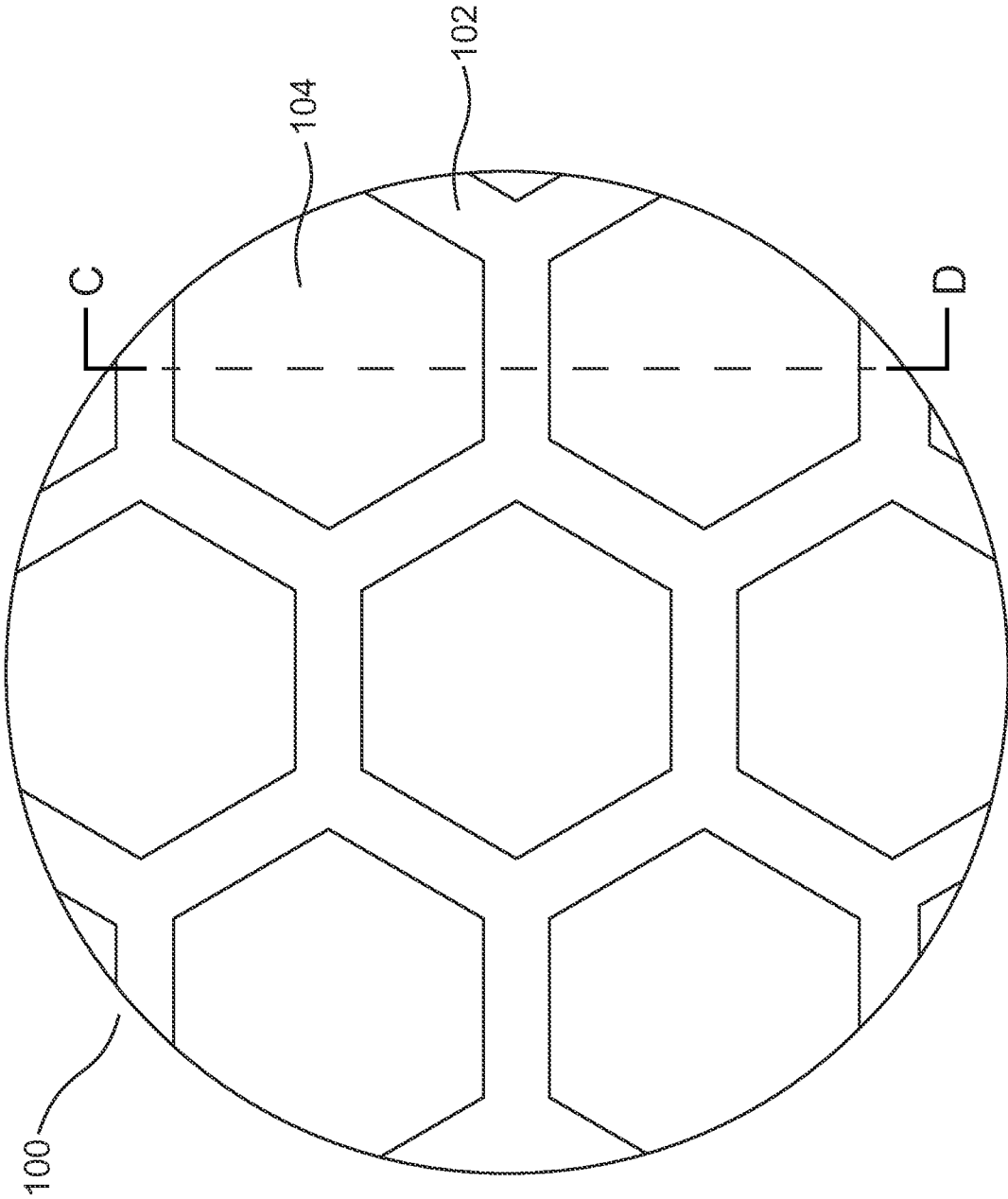


Fig. 5

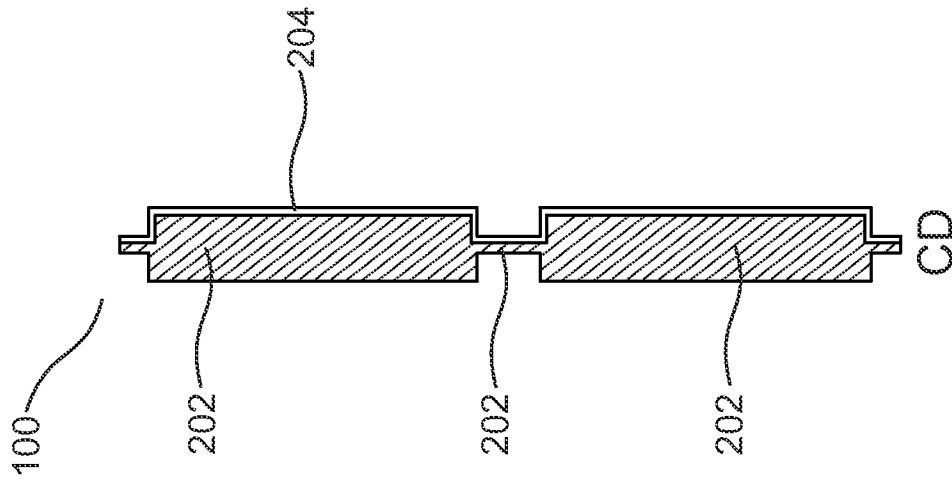


Fig. 6

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2014/057948

A. CLASSIFICATION OF SUBJECT MATTER

INV. A47L13/16 A47L17/04
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A47L B32B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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Y	the whole document	8-14
Y	----- FR 2 810 529 A1 (ELYSEES BALZAC FINANCIERE [FR]) 28 December 2001 (2001-12-28)	8-14
A	the whole document	1
X	----- DE 25 13 657 A1 (COLLO GMBH) 7 October 1976 (1976-10-07)	1,2,6
A	page 1, line 1 - line 4 page 3, line 1 - page 6, line 21 figures 1,2 ----- -/--	3-5,7-14

☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

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Date of the actual completion of the international search

26 November 2014

Date of mailing of the international search report

09/12/2014

Name and mailing address of the ISA/

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Authorized officer

Redelsperger, C

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2014/057948

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

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