

Mop-Head for Cleaning Surfaces

TECHNICAL FIELD

5 The present invention relates to a mop for cleaning all types of surfaces (including floor surfaces), which may be effectively used as a dry mop as well as a wet mop.

BACKGROUND OF THE INVENTION

10 The traditional cleaning mop comprises a bundle of strips or strings (made from natural or synthetic fibers) readily connected on one end to a long wooden rod, which rod is used to propel the said bundle of strips or strings along the floor surface thereby mopping and cleaning the floor. The traditional mop is used as a wet
15 mop.

 However, these mops do not effectively remove all solid particles from the floor surface. Solid particles commonly found on floors surfaces that are desirable to be removed during the cleaning process, include dust particles, lint, hair, crumbs
20 and other debris. Therefore, if someone attempts to mop an un-swept floor, some of these particles would end up being moved around the floor surface rather than being removed by the mop.

 As a result, in order to clean the floor properly, a user has to do two-step
25 cleaning process each time i.e. first sweep the floor and then wet mop the floor. This process is time-consuming and laborious. Further, the user is obliged to purchase separate cleaning devices for such cleaning purposes i.e. a broom for sweeping the floor and then a mop for wet mopping the floor.

30 To avoid the need of separate cleaning devices, mops have been improved to allow wet and dry mopping using the same device. Currently, the most common

mop of this nature comprises a flat-based mop-head, to which cleaning materials (such as cleaning sheets and wipes) may be attached such that the flat base is covered by such material. Such cleaning material may comprise both dry as well as wet cleaning sheets and wipes, permitting the user to both dry as well as wet mop the floor surface. The flat base of the mop-head (once it is covered by the desired material) is placed in contact with and propelled along the floor surface by the user.

The efficiency of such cleaning mops depends on the size of the flat base in contact with the floor surface to be cleaned.

Flat based mop-heads are generally effective in removing finer particles such as dust, lint and hair, but larger particles such as crumbs tend to be pushed along the edge of the mop-head rather than be picked up by the material covering the flat base.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide an improved mop-head.

In a broad form, the present invention provides a mop-head with a convex lower surface, so that when a cleaning pad is attached, it adopts a curved surface for engagement with a surface to be cleaned.

In one form, the convex surface is provided by a two part construction, wherein an upper cover engages and warps a flexible lower cover to present a convex shape. The cleaning pad, once affixed, thereby takes the convex shape.

In one implementation, the upper cover has a mounting hole for attachment in use a mop handle being connected within the mounting hole.

In one implementation of the present invention, first prop pillars are provided in the middle of the bottom of the upper cover and second prop pillars are provided

flanking the first prop pillars on both sides. The height of the first prop pillars is greater than the height of the second prop pillars.

The difference in height between the first prop pillars and the second prop pillars may range from 10% to 50%.

In one implementation of the present invention, the lower surface of the lower cover is generally flat.

In another implementation of the present invention, the lower surface of the lower cover comprises a flat middle portion edged by a border area on at least 1 side. The border area comprises an inner edge and an outer edge such that a gradient extending upwards and ranging from 25% to 40% is created between the inner edge and the outer edge. The outer edge is provided with a raised wall such that the lower surface of the lower cover is adapted to receive and retain a resilient layer to be applied over it.

In this implementation of the invention, the difference in the height between the first prop pillars and the second prop pillars and the gradient of the border area are such that the lower surface of the lower cover is warped to present a convex camber surface when the upper cover is engaged with and connected to the lower cover. The convex shape of the lower surface of the lower cover creates a contact area with the floor surface when the mop-head is in use and a gap is formed between at least one of the sides of the lower cover and the floor surface.

Suitable implementations of the present invention provide a mop-head, and when a handle and cleaning pad are attached, a mop, which provides improved performance in use, and has an improved construction. In suitable implementations, when the upper cover is connected to the lower cover, the middle portion of the lower cover is arched downward, such that the contact area for the cleaning pad with the surface to be cleaned is formed in the middle of the lower surface of the

lower cover and a gap of a certain height is formed between at least one of the sides of the lower cover and the floor surface. When the mop is in use, the gap permits the entry of larger particles such as crumbs into that gap, such that they may be collected at the lower surface of the lower cover, without such particles being pushed along the edges of the mop-head.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a plan view of a mop-head with a mop handle attached;

Fig. 2 is a plan view of a top of an upper cover of the mop-head;

Fig. 3 is a plan view of a base of an upper cover of the mop-head;

Fig 4 is a perspective view of the base of the upper cover of the mop-head;

Fig. 5 is a plan view of a top of a lower cover of the mop-head;

Fig. 6 is a plan view of a lower surface of a lower cover of the mop-head;

Fig 7 is a cross sectional side view of the lower surface of the lower cover showing the gradient of the border area and the resilient layer when it is attached to the lower surface;

Fig 8 is a cross sectional side view of the lower surface of the lower cover when the mop-head is assembled, showing the gradient of the border area and the resilient layer when it is attached to the lower surface and when a cleaning pad is attached to the lower cover so as to cover the lower surface of the lower cover;

Fig. 9 is a side view of the mop-head showing a convex shaped lower surface of the lower cover, when the upper cover is engaged with and connected to the

lower cover;

Fig. 10 is an enlarged view of removable hook-and-loop tapes showing its position on a lower cover of the mop-head in the present invention;

Fig. 11 is a cross-sectional side view showing the assembly of the mop-head;

DETAILED DESCRIPTION OF DRAWINGS

The present invention will be further described hereinafter with reference to the accompanying drawings. It is to be understood that specific embodiments described herein are only intended to explain the present invention, and are not taken to limit the present invention. Further, it will be appreciated that the examples provided represent only one of many possible implementations of the present invention.

Fig. 1 illustrates one implementation of the present invention wherein a mop-head (1) with a mop handle (2) is provided. The mop-head (1) of the implementation is in the shape of a flat plate when viewed from the above. The mop handle (2) may be provided, preferably with an extendable telescopic structure. Such extendable telescopic structure allows a user to clean large areas, hence saves cleaning time. The mop-head (1) comprises an upper cover (3) and a lower cover (4).

As shown in Fig. 2, the mop-head (1) has a mounting hole (5) on the top of the upper cover (3), the bottom of the mop handle (2) is connected within the mounting hole (5), and the bottom of the upper cover (3) is connected to the top of the lower cover (4).

Fig. 3 illustrates an implementation of the present invention wherein first prop pillars (6) are provided in the middle of the base of the upper cover (3) and second

prop pillars (7) are flanking the first prop pillars (6).

As illustrated in Fig. 4, the height of the first prop pillars (6) is greater than the height of the second prop pillars (7). The difference in height between the first prop pillars (6) and the second prop pillars (7) may range from 10% to 50%.

Fig. 5 illustrates an implementation of the present invention wherein a recess (8) is provided on the top of the lower cover (4) which shape and size of the recess (8) is complementary to the shape and size of the corresponding part of the bottom of the upper cover (3) such that the base of the upper cover (3) may be mounted inside the recess (8). The lower cover (4) is also provided with holes (9) which holes correspond to the position of the prop pillars (6,7). Both the upper cover (3) and the lower cover (4) are made of a plastic material such as Acrylonitrile Butadiene Styrene (ABS) or Polyphenylene Ether (PPE). The lower cover (3) allows a certain amount of deformation when the upper cover (4) is connected to the lower cover (3).

The edges of the lower cover (4) are extended to form bevel edges (10). The upper cover (3) is engaged with and connected to the lower cover (4), by mounting the upper cover (3) into the recess (8) of the lower cover (4) and connecting the upper cover (3) to the lower cover (4) by use of fastening means applied through the holes (9), such holes being aligned with the prop pillars (6,7).

Fig. 6 illustrates an implementation of the present invention, wherein a lower surface of the lower cover (4) of the mop-head is provided with a flat middle portion (11) edged by a border area (12). The border area (12) comprises an inner edge (13) and an outer edge (14) such that a gradient extending upwards and ranging from 25% to 40% is created between the inner edge (13) and the outer edge (14). The outer edge (14) is provided with a raised wall (15) such that the lower surface of the lower cover (4) is adapted to receive and retain a resilient layer (16) to be attached to it. The resilient layer (16) takes on the shape of the lower surface

of the lower cover (4). The width and the length of the lower surface of the lower cover (4) may range between 15cm to 18cm and 24cm to 28cm respectively.

Fig. 7 illustrates an implementation of the present invention where the border area (12) is provided on 2 sides of the lower surface of the lower cover (4) and the resilient layer (16) is attached to the lower surface of the lower cover (4) wherein the resilient layer (16) takes on the shape of the lower surface of the lower cover (4).

In another implementation, the border area (12) and raised wall (15) is provided on at least one side of the lower surface of the lower cover (4) of the mop-head.

In another implementation, the border area (12) and raised wall (15) is provided along the length of the lower surface of the lower cover (4) of the mop-head.

In another implementation, the border area (12) is provided on the length of the lower surface of the lower cover (4) of the mop-head and the raised wall (15) is provided on all sides of the lower surface of the lower cover (4) of the mop-head.

Fig. 8 illustrates an implementation of the present invention where the border area (12) is provided on 2 sides of the lower surface of the lower cover (4) and the resilient layer (16) is attached to the lower surface of the lower cover (4) wherein the resilient layer (16) takes on the shape of the lower surface of the lower cover (4). A cleaning pad (22) is attached to the lower cover (4) so as to cover the lower surface of the lower cover (4);

Fig. 9 illustrates an implementation of the present invention, wherein the lower surface of the lower cover (4) is warped to present a convex camber surface when the upper cover (3) is engaged with and connected to the lower cover (4). The

convex shape of the lower surface of the lower cover creates a contact area (17) with the floor surface (18) when in use and a gap (19) is formed between at least one of the sides of the lower cover (4) and the floor surface (18). In a preferred embodiment of the invention, the gap (19) is formed between the front and rear sides of the lower cover (4) and the floor surface (18).

The height range of the gap (19) is about 1-5 mm, and the horizontal depth of the gap (19) is about 2 -3 cm.

Fig. 10_illustrates an implementation of the present invention, in which attachment means (21) are provided to which a cleaning pad (22) may be attached so as to cover the lower surface of the lower cover (4). In this implementation, the attachment means (21) are adhesively attached to each of the bevel edges of the mop-head.

In another preferred embodiment of the present invention, the attachment means (21) are removable hook-and-loop tapes to which the cleaning pad may be attached. These hook-and-loop tapes are replaceable and may be replaced by first removing the old hook-and-loop tape and thereafter attaching a new hook-and-loop tape 2 by applying the adhesive on the back thereof and attaching it at the original bevel edge (10).

Fig. 11 illustrates an implementation of the present invention wherein the fastening means provided for connecting upper cover (3) to lower cover (4) are screws (20) which are inserted through the holes (9) and fastened into the prop pillars (6,7) which are adapted to receive the screws. A resilient layer (16) is provided to be attached to the lower surface of the lower cover (4) by adhesive wherein the resilient layer (16) takes on the shape of the lower surface of the lower cover (4).

As shown in Figs 6, 7 and 11, due to the height difference between the first prop pillars (6) and the second prop pillars (7) and the gradient of border area (12), the middle portion of the lower cover (4) is forced to arch downward to form the convex shape with the floor surface (18), after the upper cover (3) is connected to the lower cover (4), Such convex shape of the lower cover (4) creates a contact area (17) in the middle of the lower surface of the lower cover (4) and a gap (19) is formed between the front and rear sides of the lower cover (4) and the floor surface (18).

When the mop is in use, the gap (19) permits the entry of larger particles such as crumbs into that gap (19) such that they may be collected at the lower surface of the lower cover (4), without such particles being pushed along the edges of the mop-head (1).

Whilst a specific implementation using four first prop pillars (6) and six second prop pillars (7) have been described, it will be understood that other numbers of prop pillars could be provided, depending upon the dimensions and other requirements for the mop. Further, alternative projections or shaped structures could be provided in the upper cover to effect the desired shape changes in the lower cover, and thereby achieve the desired convex cleaning surface.

In a preferred embodiment, the top of the upper cover (3) is provided with the mounting hole (5) in the centre to which a mop handle may be connected when in use.

Whilst a specific implementation wherein the shape of the upper and lower covers (3,4) are rectangular and the middle portion of the lower cover (4) is provided in a grid design, it will be understood that other shapes and designs may be used.

In another preferred embodiment, the resilient layer (16) is of an Ethylene-vinyl acetate (EVA) or rubber material. The EVA or rubber material is attached by adhesive, to the lower surface of the lower cover (4) and takes on the convex shape of the lower surface of the lower cover (4).

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In a preferred embodiment, the lower surface of the lower cover (4) is of about 16 cm in width and 26 cm in length and is larger in size than that of other mop-heads while still using the same size of cleaning material. The present invention optimizes the cleaning surface available from the same size of cleaning material, thereby optimizing resources and saving time.

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In a preferred embodiment, the difference in height between the first prop pillars (6) and the second prop pillars (7) is 30%; and the height of the gap (19) is 5mm and the horizontal depth of the gap (19) is 2 cm.

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The measurements and details described in the present invention are merely for the illustration of the specific embodiments. It is not intended to limit the scope of the present invention. Any equivalent variation or modification without departing from the spirit and principles of the invention shall fall within the scope of the present invention.

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CLAIMS

1. A mop-head adapted to receive a removable cleaning pad, the mop-head having a convex lower surface, such that operatively the cleaning pad will adopt a convex shape.

2. The mop-head of claim 1, wherein the mop-head comprises an upper cover and a lower cover, the upper cover being adapted to warp the lower cover to provide the convex lower surface.

3. The mop-head of claim 2, wherein first prop pillars are provided in the middle of the upper cover, second prop pillars are provided flanking the first prop pillars, the height of the first prop pillars being greater than the height of the second prop pillars, such that when the upper cover and lower cover are assembled, the lower surface of the lower cover forms the convex surface.

4. The mop of claim 3, wherein the first prop pillars are in the range of about 10 to 50 % higher than the second prop pillars.

5. The mop-head of claim 2, wherein the lower surface is provided with a border area, such border area comprising an inner edge and an outer edge wherein a gradient is provided extending upwards between the inner edge and the outer edge.

6. The mop-head of claim 5 wherein the gradient ranges from 25% to 40%.

7. The mop-head of any of the above claims, wherein the cross section of the lower cover is of an approximately rectangular structure, and said approximately rectangular structure is provided with a transitional bevel edge from a side edge to the top of the lower cover in the lengthwise direction, and the attachment for the cleaning pad is provided at the bevel edge.

8. The mop-head of any of the above claims, wherein the width and the length of the lower surface of the lower cover range between 15 to 18 cm and 24 to 28 cm, respectively.

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9. The mop-head of any of the above claims wherein the upper and lower covers are connected in such manner that a gap is formed between at least one of the sides of the lower surface of the lower cover and the floor surface.