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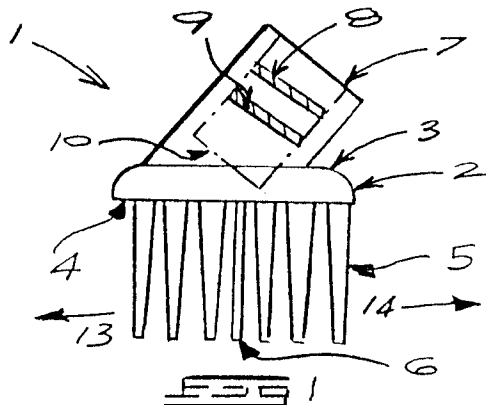
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(54) Sweeping device

(57) A sweeping device according to the invention is preferably made from an elastomeric material and comprises an elongated head having operatively upper

and lower surfaces. Integral bristles project from the lower surface as well as an elongated blade which extends along substantially the whole of the length of the head with bristles located on each side thereof.



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Description

FIELD OF THE INVENTION

This invention relates to a sweeping device for sweeping surfaces such as floors, glass, vehicles and other surfaces.

BACKGROUND TO THE INVENTION

In this specification, a sweeping surface is intended to mean a surface that is to be swept.

There exists a continuous need for the improvement of the sweeping or raking performance of sweeping devices, the objective being to achieve the maximum displacement of particles within a desired size range, at a minimum consumption of energy and at the lowest cost.

Sweeping devices in the form of squeegees for sweeping up liquids and small particulate matter are known as are devices having bristles for sweeping up larger debris and particulate matter. The latter may have bristles of varying thicknesses to permit a greater range of particles to be swept up.

Sweeping devices incorporating both bristles and a squeegee are known. Such devices are arranged such that the squeegee portion and the bristled portion have to be used separately.

Often both a bristled sweeping device as well as a squeegee are required to be used on a sweeping surface. Therefore, at least two passes over a sweeping surface are required, firstly by a bristled sweeping device and then by a squeegee. This results in double the labour requirement than if merely one pass was made over the sweeping surface.

Neither a bristled sweeping device nor a squeegee are particularly successful at sweeping up very small particulate matter.

OBJECT OF THE INVENTION

It is an object of this invention to provide a sweeping device which at least partially alleviates some of the above-mentioned disadvantages.

SUMMARY OF THE INVENTION

According to the invention a sweeping device comprises an elongated head having operatively upper and lower surfaces, bristles projecting from the lower surface, and at least one elongated blade extending at least partially along the length of the head to project from the lower surface and from a position such that there are bristles on each side thereof.

It is further provided for the depth of the blade to be substantially the same as that of the bristles and for the depth of the blade to be substantially parallel to that of the bristles.

It is further provided for the head to be generally rectangular when viewed from the plan view, alternatively for the head to be generally diamond-shaped when viewed in the plan view.

It is further provided for the bristles to be of varying thicknesses, for the bristles to be of similar length, for the bristles to cover a substantial area of the lower surface of the head, for the bristles to be of sufficient thickness and rigidity for the sweeping device to be used as a rake, alternatively for the bristles to be of sufficient thickness and rigidity for the sweeping device to be used as a broom, for the bristles to be a fibrous material, for the bristles to be of an elastomeric material, for the bristles to be of rubber.

It is further provided for the bristles to be arranged in rows extending parallel to the elongate axis of the head, for each row to contain bristles of the same order of thickness, and for there to be alternating rows of thick bristles and thin bristles, alternatively for the bristles to all be of a similar order.

It is further provided for the bristles to be substantially cylindrically, alternatively for the bristles to be frusto-conically shaped, having a circular cross-section, where the bristles are preferably tapered in a direction away from the head, and for the bristles to be chamfered at the end.

It is further provided for the blade to have a length substantially of the same order as the elongate length of the head, for the blade to be positioned generally centrally extending generally longitudinally with respect to the head, alternatively for the blade to run longitudinally;

It is further provided for the head to have a socket in the upper surface for attaching the head to a broom handle, for the socket to have a flexible retaining means on its inner surface for counteracting the removal of the broom handle from the socket, for the retaining means to contain at least one substantially frusto-conically shaped ring tapering towards the base of the socket adapted to exercise a suction grip on the end of a broom handle inserted into the socket when an attempt is made to remove the broom handle from the socket for the retaining means to comprise at least two substantially frusto-conically shaped rings tapering towards the base of the socket.

It is further provided for the head, bristles, elastomeric blade and socket to be in the form of an integral moulding of a polymeric material.

A further feature of the invention is where the head contains a stiffening member, for the stiffening member to be embedded in the head extending along the elongate length of the head, alternatively for the stiffening member to be affixed to the head, for the stiffening member to have a high strength to weight ratio, where the stiffening head to be constructed of a material selected from the group comprising spring steel, mild steel, a polymeric material, polyethylene, polypropylene, plastics materials, fibrous materials, glass fibre, asbestos, synthetic fibrous materials, and mixtures of materials of this

group.

A further feature of the invention is for the head to have a longitudinally extending transversely projecting blade which is generally transverse with respect to the bristles, for the transversely projecting blade to be configured such that it can be used as a squeegee, for the transversely projecting blade to be integrally moulded with the head, for the transversely projecting blade to have angled corners at its free corners.

BRIEF DESCRIPTION OF THE DRAWING

One embodiment of the invention is described below by way of example only, and with reference to the accompanying drawings which are:

Figure 1: a side elevation of a sweeping device;

Figure 2: a rear elevation of a sweeping device with some of the bristles removed to expose an elastomeric blade more clearly;

Figure 3: an inverted plan view of a sweeping device; and

Figure 4: a plan view of a sweeping device.

DETAILED DESCRIPTION OF THE INVENTION WITH REFERENCE TO THE DRAWING

Referring to the sketches, a sweeping device (1) has an elongate head (2) which is diamond-shaped when viewed from the plan view. The head (2) has an upper surface (3) and a lower surface (4). Bristles (5) project from the lower surface (4). An elastomeric blade (6) projects from the middle of the head (2) in the same direction as the bristles (5) to the same depth as the bristles (5).

The bristles (5) are frusto-conically shaped, tapered towards their free ends. The bristles are also chamfered at their free ends to give a generally flat end. There are a sufficient number of bristles (5) to cover most of the lower surface (4) of the head (2).

The blade (6) is situated in the middle of the head (2) extending parallel to the longitudinal axis of the head (2) such that it has a length of the same order as the longitudinal axis of the head (2). The blade (6) is surrounded by bristles (5).

The head (2) has a socket (7) in its upper surface (3). Two frusto-conically shaped rings (8,9) taper inwards towards the base (10) of the socket (7).

A stiffening member (11) composed of a mild steel plate conforms to the general shape of the head (2) when viewed in plan view and is embedded in the head (2).

A longitudinally extending transversely projecting blade (12) projects laterally from a lateral face of the head (2). An edge is formed on its free edge making it suitable for use as a squeegee. It has angled corners at its free corners.

The sweeping device (1) is manufactured as a unit

from a rubber material, thereby permitting the manufacturing of the head (2), the bristles (5), the blade (6), the socket (7) and the longitudinally extending transversely projecting blade (12) in a single manufacturing operation. The sweeping device (1) is made from a rubber which is vulcanised in an injection moulding process, the stiffening member (11) being inserted into the mould in the appropriate position before injection of the rubber and including a coating adapted to promote adhesion between the stiffening member (11) and the rubber material.

In use, the socket (7) receives the end of a broom handle (not shown). The frusto-conically shaped rings (8,9) grip the broom handle to resist withdrawal. The broom handle is used to operate the sweeping device such that the bristles (5) and blade (6) are in contact with a sweeping surface (not shown).

The sweeping device (1) is functionally operable by moving the device in forward direction (13) or a backward direction (14) against the sweeping surface. Particulate matter (not shown) on the sweeping surface is contacted by the bristles (5). If the particulate matter is too small to be effectively captured by the bristles (5) then the blade (6) captures the particulate matter. In this manner, almost all types of particulate matter can be shifted by the sweeping device (1) across the sweeping surface. Liquids will be captured by the blade and likewise shifted across the sweeping surface by the sweeping device (1). The use of the sweeping device (1) in this fashion permits it to function both a broom and as a squeegee in a single sweeping operation.

Should it be required to make use of a squeegee alone, then the sweeping device (1) is reoriented with respect to the sweeping surface such that the longitudinally extending transversely projecting blade (12) contacts the sweeping surface. In this orientation, the bristles (5) and blade (6) are not in contact with the sweeping surface and the device becomes useable as a squeegee.

Should the sweeping device (1) become damaged or worn out, it can be replaced without having to replace the broom handle. The broom handle is removed from the socket (7) and placed into the socket of a new sweeping device (1).

It will be appreciated that variations can be made to the above described embodiment of the invention without departing from the scope thereof. In particular, the sweeping device (1) and broom handle can be made as an integral unit, the sweeping device (1) can be manufactured from sub-components which are later assembled, the bristles can be configured in a pattern of rows where the bristles have varying sizes and the longitudinally extending transversely projecting blade (12) can be omitted from the sweeping device (1).

Claims

1. A sweeping device comprises an elongated head having operatively upper and lower surfaces and bristles projecting from the lower surface, the device being characterised in that it includes at least one elongated blade extending at least partially along the length of the head to project from the lower surface and from a position such that there are bristles on each side thereof. 5
2. A sweeping device as claimed in claim 1 in which the depth of the blade is substantially the same as that of the bristles. 10
3. A sweeping device as claimed in either of claims 1 or 2 in which the depth of the blade is substantially parallel to that of the bristles. 15
4. A sweeping device as claimed in any of the preceding claims in which the head is generally rectangular when viewed from the plan view. 20
5. A sweeping device as claimed in any of claims 1 to 3 in which the head is generally diamond-shaped when viewed in the plan view. 25
6. A sweeping device as claimed in any of the preceding claims in which the bristles are of varying thicknesses. 30
7. A sweeping device as claimed in any of the preceding claims in which the bristles are of similar length. 35
8. A sweeping device as claimed in any of the preceding claims in which the bristles cover a substantial area of the lower surface of the head. 40
9. A sweeping device as claimed in any of the preceding claims in which the bristles are of sufficient thickness and rigidity for the sweeping device to be used as a rake. 45
10. A sweeping device as claimed in any of claims 1 to 8 in which the bristles are of sufficient thickness and rigidity for the sweeping device to be used as a broom. 50
11. A sweeping device as claimed in any of the preceding claims in which the bristles are of a fibrous material. 55
12. A sweeping device as claimed in any of claims 1 to 10 in which the bristles are of an elastomeric material.
13. A sweeping device as claimed in claim 12 in which the bristles are of rubber.
14. A sweeping device as claimed in any of the preceding claims in which the bristles are arranged in rows extending parallel to the elongate axis of the head.
15. A sweeping device as claimed in claim 14 in which each row to contain bristles of the same order of thickness.
16. A sweeping device as claimed in claim 15 in which there are alternating rows of thick bristles and thin bristles.
17. A sweeping device as claimed in any of the preceding claims in which the bristles are substantially cylindrically shaped.
18. A sweeping device as claimed in any of claims 1 to 17 in which the bristles are frusto-conically shaped.
19. A sweeping device as claimed in any of the preceding claims in which the blade has a length substantially of the same order as the elongate length of the head.
20. A sweeping device as claimed in any of the preceding claims in which the blade is positioned generally centrally extending generally longitudinally with respect to the head.
21. A sweeping device as claimed in any of the preceding claims in which the head has a socket in the upper surface for attaching the head to a broom handle.
22. A sweeping device as claimed in claim 21 in which the socket has a flexible retaining means on its inner surface for counteracting the removal of the broom handle from the socket.
23. A sweeping device as claimed in claim 22 in which the retaining means contains at least one substantially frusto-conically shaped ring tapering towards the base of the socket adapted to exercise a suction grip on the end of a broom handle inserted into the socket when an attempt is made to remove the broom handle from the socket.
24. A sweeping device as claimed in claim 23 in which there are at least two substantially frusto-conically shaped rings tapering towards the base of the socket.
25. A sweeping device as claimed in any of the preceding claims which is an integral moulding of a polymeric material.
26. A sweeping device as claimed in any of the preceding claims in which the head contains a stiffening

member.

27. A sweeping device as claimed in claim 26 in which the stiffening member is embedded in the head extending along the elongate length of the head. 5
28. A sweeping device as claimed in claim 26 in which the stiffening member to be affixed to the head.
29. A sweeping device as claimed in any of the preceding claims in which the head has a longitudinally extending transversely projecting blade which is generally transverse with respect to the bristles. 10
30. A sweeping device as claimed in claim 29 in which the transversely projecting blade has angled corners at its free corners. 15

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