A CLEANER HEAD FOR A VACUUM CLEANER

FIELD OF THE INVENTION

The present invention relates to a cleaner head for a vacuum cleaner.

BACKGROUND OF THE INVENTION

Cleaner heads for vacuum cleaners typically comprise an agitator for agitating debris located upon a surface, and a dirty air inlet through which agitated debris can pass.

During passage of agitated debris through the dirty air inlet, long strands of debris, for example hair or thread or the like, may become wrapped around the agitator or a mounting thereof. This may lead to an increased torque on the agitator, and a sufficient build-up of debris may lead to failure of the agitator, and hence a reduced pick-up performance.

SUMMARY ~~OF THE INVENTION~~

Accordingly the present ~~invention~~disclosure provides a cleaner head for a vacuum cleaner, the cleaner head comprising a single agitator rotatably mounted within a housing, the agitator being arranged transversely within the housing such that it is perpendicular to the direction of travel of the cleaner head during use, the agitator being conical in shape, such that a first end has a larger diameter than a second end.

In one aspect, the present disclosure refers to a cleaner head for a vacuum cleaner, the cleaner head comprising a single agitator rotatably mounted within a housing, the agitator being arranged transversely within the housing such that it is perpendicular to the direction of travel of the cleaner head during use, the agitator being conical in shape, such that a first end has a larger diameter than a second end

wherein the agitator has a main body with an outer conical surface, and the lowermost portion of the conical surface is parallel with a flat supporting surface when the cleaner head is in use,

wherein the agitator is cantilevered to the housing at its first end such that debris can fall from a free end of the agitator.

The conical agitator is advantageous because any debris which becomes wrapped around the agitator during use is encouraged by the conical shape to travel along the length of the agitator from the first end towards the second end where it can become lose and fall from the agitator. In use this debris which

has travelled along the agitator can then be sucked into a vacuum cleaner to which the cleaner head is attached during use. The cleaner head has a single agitator. This is advantageous as it makes the cleaner head simpler and cheaper in construction. The cleaner head does not have a plurality of agitators.

As used herein the term “debris” is considered to refer to long strands of debris which have the potential to wrap around the agitator during operation of the cleaner head, unless otherwise stated. For example, debris may be considered to comprise debris having a length which is greater than the circumference of the agitator. Particular examples of such “debris” include hair and threads.

The agitator may have a core, preferably a hollow core. The core may have an outer conical surface. The lowermost portion of the conical surface may be parallel to a flat supporting surface when the cleaner head is in use. The axis of rotation of the agitator may be inclined with respect to a flat supporting surface on which the cleaner head is supported during use. This arrangement is advantageous as the agitator is the same distance from the surface to be cleaned, along its full length.

The agitator preferably extends transversely across substantially the full width of the housing. In a particular ~~embodiment~~example the housing may have a lower opening. The lower opening may conform in outline to the taper of the agitator. Alternatively the lower opening may be rectangular in shape.

In a particular ~~embodiment~~example the agitator may be cantilevered to the housing. This is advantageous as it means that there is a free end from which debris can fall from the agitator during use of the cleaner head. In a particular ~~embodiment~~example the agitator is cantilevered at its first end. In such an ~~embodiment~~example debris will travel from the larger diameter end of the agitator towards the smaller diameter end. It can then fall off the free end of the agitator and be sucked into a vacuum cleaner to which the cleaner head is attached during use.

The agitator may further comprise bristle tufts, bristle strips or a surface conforming material, for example a fleece or felt material. The bristle tufts, bristle strips or surface conforming material may be formed from any suitable material for example nylon or carbon fibre or a combination of materials. The bristle tufts, bristle strips or surface conforming material may project the same distance from the core along the full length of the agitator.

The agitator may be driven by a belt from a motor located outside of the agitator. Alternatively it may be driven by a motor located inside the agitator. Such an arrangement is advantageous as it makes the cleaner head more compact

The cleaner head housing may also be substantially conical in shape. This is advantageous as it helps to keep the pressure inside the cleaner head correct.

The cleaner head housing may also further comprise a neck suitable for connection to a vacuum cleaner. The neck may be arranged such that it projects from the housing at a point between the first and second ends of the agitator. This is advantageous as it balances the cleaner head and provides a cleaner head which is easy to manoeuvre over a surface to be cleaned. In a particular ~~embodiment~~example the neck may project from the housing at a mid-point between the first and second ends of the agitator.

The present ~~invention~~disclosure also provides a vacuum cleaner having a cleaner head as described above.

According to a second ~~aspect~~example there is provided a cleaner head for a vacuum cleaner, the cleaner head comprising an agitator rotatably mounted within a housing, wherein the agitator comprises a main body having a wall, and bristles mounted to the main body adjacent the wall, tips of the bristles are located at a

first radial distance from a central longitudinal axis of the agitator, a tip of the wall is located at a second radial distance from the central longitudinal axis of the agitator, the bristles have a first configuration in which the first radial distance is greater than the second radial distance, and a second configuration in which the first radial distance is less than or equal to the second radial distance, and during rotation of the agitator within the housing in use the bristles flex from the first configuration to the second configuration when the bristles move into contact with a surface to be cleaned, and flex from the second configuration to the first configuration when the bristles move out of contact with the surface to be cleaned.

The cleaner head according to the second ~~aspect~~example may be advantageous principally as tips of the bristles are located at a first radial distance from a central longitudinal axis of the agitator, a tip of the wall is located at a second radial distance from the central longitudinal axis of the agitator, the bristles have a first configuration in which the first radial distance is greater than the second radial distance, and a second configuration in which the first radial distance is less than or equal to the second radial distance, and during rotation of the agitator within the housing in use the bristles flex from the first configuration to the second configuration when the bristles move into contact with a surface to be cleaned, and flex from the second configuration to the first configuration when the bristles move out of contact with the surface to be cleaned.

In particular, entanglement of debris with bristles can lead to debris wrapping around the agitator in use, and bristles are typically more densely packed, and hence more prone to entangle debris, at the base thereof. As the bristles have a second configuration in which the first radial distance is less than or equal to the second radial distance, a lower proportion of the length of the bristles may be exposed past the wall in the second configuration, and hence debris may be prevented from migrating toward the base of the bristles when bristles adopt the second configuration upon contact with a surface to be cleaned in use of the

debris toward a free end of the agitator. This may be beneficial as it may enable debris to pass-off the free end of the agitator in use and to be re-entrained within the flow of air through the housing, and hence removed from the agitator. This may allow for automatic removal of debris from the agitator without the need for user interaction.

The agitator may comprise first and second agitator portions, each of which is cantilevered within the housing, such that respective ends of the agitator portions are freely supported within the housing. This may be beneficial as it may enable debris to migrate along and off the agitator portions and to be re-entrained within the flow of air through the housing, and hence removed from the agitator. This may allow for automatic removal of debris from the agitator without the need for user interaction.

According to a third ~~aspect~~example there is provided an agitator for a cleaner head of a vacuum cleaner, the agitator comprising a main body having a wall, and bristles mounted to the main body adjacent the wall, wherein tips of the bristles are located at a first radial distance from a central longitudinal axis of the agitator, a tip of the wall is located at a second radial distance from the central longitudinal axis of the agitator, the bristles have a first configuration in which the first radial distance is greater than the second radial distance, and a second configuration in which the first radial distance is less than or equal to the second radial distance.

According to a fourth ~~aspect~~example there is provided a vacuum cleaner comprising a cleaner head according to the second ~~aspect~~example, and/or an agitator according to the third ~~aspect~~example.

In another aspect, the present disclosure refers to a vacuum cleaner comprising a cleaner head as disclosed herein.

Preferential features of ~~aspect~~examples of the present ~~invention~~disclosure may be applied equally to other ~~aspect~~examples of the present ~~invention~~disclosure, where appropriate.

CLAIMS

1. A cleaner head for a vacuum cleaner, the cleaner head comprising a single agitator rotatably mounted within a housing, the agitator being arranged transversely within the housing such that it is perpendicular to the direction of travel of the cleaner head during use, the agitator being conical in shape, such that a first end has a larger diameter than a second end~~.~~

~~2. A cleaner head according to claim 1,~~ wherein the agitator has a main body with an outer conical surface, and the lowermost portion of the conical surface is parallel with a flat supporting surface when the cleaner head is in use~~.~~

~~.~~

wherein the agitator is cantilevered to the housing at its first end such that debris can fall from a free end of the agitator.

~~3~~2. A cleaner head according to claim 1~~ or 2~~, wherein the axis of rotation of the agitator is inclined with respect to a flat supporting surface on which the cleaner head is supported during use.

~~4~~3. A cleaner head according to ~~any preceding claim~~claim 1, wherein the agitator extends transversely across substantially the full width of the housing.

~~5~~4. A cleaner head according to ~~any preceding claim~~claim 1, where the housing has a lower opening and the lower opening conforms in outline to the taper of the agitator.

~~6. A cleaner head according to any preceding claim, wherein the agitator is cantilevered to the housing.~~

~~7. A cleaner head according to claim 6, wherein the agitator is cantilevered at its first end.~~

~~8~~5. A cleaner head according to any of claims 1 to 4~~preceding claim~~, wherein the agitator further comprises bristle tufts, bristle strips or a surface conforming material.

~~9~~6. A cleaner head according to any of claims 1 to 4~~preceding claim~~, wherein the agitator is driven by a belt from a motor located outside of the agitator.

~~10~~7. A cleaner head according to any of claims 1 to ~~8~~ 4 wherein a motor for driving rotation of the agitator is located inside the agitator.

~~11~~8. A cleaner head according to any of claims 1 to 4~~preceding claim~~, wherein the housing is substantially conical in shape.

~~12~~9. A cleaner head according to any of claims 1 to 4~~preceding claim~~, wherein the housing further comprises a neck suitable for connection to a vacuum cleaner, wherein the neck is arranged such that it projects from the housing at a point between the first and second ends of the agitator.

~~13~~10. A cleaner head according to claim ~~12~~9, wherein the neck projects from the housing at a mid-point between the first and second ends of the agitator.

~~14~~11. A vacuum cleaner comprising a cleaner head as claimed in any of ~~Claims~~ claims 1 to ~~13~~4.