ABSTRACT

A device for cleaning surfaces consists of a cleaning body and a rinsing tube mounted on one end of an arm which is secured at its other end to an operating rod. The end of the arm connected to the cleaning body is formed of a torsion rod while its other end is fixed to the operating rod in a friction-fit joint. The cleaning body and rinsing tube extend transversely of the longitudinal axis of the arm and are angularly revoluble about the longitudinal axis of the arm due to its torsion rod.

6 Claims, 4 Drawing Figures
DEVICE FOR CLEANING VERTICAL OR SLOPING SURFACES

This invention relates to a device for use in cleaning vertical or sloping surfaces, in particular high windows and building facades, having a supply of a rinsing agent and a cleaning body arranged on the adjustable arm of an operating rod.

It has already been proposed to fix a sponge shaped as a longish, rectangular slab in a recess of a holding plate, and to have this plate mounted to swivel about the free end of the arm of the operating rod. The rinsing or washing agent, such as water, is supplied through a central nozzle on the operating rod.

The device according to the invention differs from the prior art in that the arm is connected at one end to the operating rod with a joint forming a friction fit, whilst the other end carries the cleaning body on a preferably rectangular extension together with at least one rinsing agent pipe coextensive over its full width and having a number of small holes opening to the front along the entire length thereof, rinsing agent pipe and extension being angularly revoluble about the longitudinal axis of the arm, in opposition to spring action.

With the said known devices the dirt can indeed be dislodged from the surface to be cleaned, but not entirely removed from it. At the edges and in the corners, for instance of windows, the dirt can be loosened only if the edges of the cleaning slabs are not worn and the operating rod is guided laterally exactly vertical. In contrast to this, with the device according to the invention, window surfaces whose frame members are not square for instance can also be thoroughly cleaned even with heavily worn cleaning slabs and operating rod held a little slantwise. In contradistinction to the prior art the device according to the invention has its joint subject to a certain frictional engagement and located at the inner instead of the outer end of the arm, which has the advantage that with changed slant of the operating rod, for instance due to the presence of shafts, flower beds, etc., the arm can be brought perpendicularly to the surface to be cleaned without having to turn the operating rod round and adjust the arm by hand. The torsion bar enables the cleaning body to be swivelled in relation to the operating rod so that the cleaning body, even with the operating rod slanted laterally somewhat, can be applied over the full width of the horizontal window frame members by slightly increased upward or downward pressure. This adjustability enables areas difficult of access to be cleaned properly in particular, while the rotatability of the cleaning body about the longitudinal axis of the arm enables the cleaning body to be swivelled into the necessary position for thorough cleaning, even when the operating rod is held slantwise, so that the cleaning body may be pushed and pulled against limits such as the top and bottom window frame members.

The extension of the arm may conveniently consist of a preferably rectangular plate, its plane lying in the longitudinal axis of the arm or substantially parallel thereto, while the longitudinal centerline of the plate is at right angles to the axis of the arm. On both sides of the plate at least a slab-shaped cleaning body of porous plastics is fixed between the plate and a clamping strip disconnectably secured to the latter, so that the cleaning body projects beyond the plate and clamping strip both at the front and sides.

With this design and arrangement the cleaning body works not with one of its broadsides but with one of its narrow sides and hence with a higher specific area pressure, ensuring a particularly good cleaning action.

Preferably, the friction fit on the joint between the arm and the operating rod is such that the arm shall not be displaced by the friction generated during actual cleaning, but can be swivelled upwards or downwards (over and above the contact pressure required for actual cleaning) for instance against a window frame member. In contrast to the existing devices, according to the invention the operating rod need not be turned round to adjust the arm: Especially in the case of very long operating rods, this advantage may involve a considerable saving in time. With a marked downward adjustment of the arm, even window sills can be washed with the device.

A typical form of embodiment is described more in detail hereinafter with reference to the accompanying drawing, wherein:

FIG. 1 is a side view of the device showing the arm and the top of the operating rod, partly in axial cross section;

FIG. 2 is a top view to FIG. 1;

FIG. 3 shows a detail of FIG. 1 on an enlarged scale, partly in section;

FIG. 4 shows a sectional view taken on the line IV—IV of FIG. 1, on an enlarged scale.

The designations “top” and “right” refer to FIG. 1. “Front” refers to the side facing the surface to be cleaned.

The extreme end of the operating rod 1, which may be, say, circular in cross section, has a plug 2 inserted therein. Said plug terminates in a forked holder carrying between disk-shaped forks 8 the disk-shaped end 10 of an arm 14 swivably mounted on a screw 9. Besides providing a pivot for arm 14, the screw 9 produces a certain friction fit between the forks 8 and the disk-shaped end 10 of arm 14. As may be seen from FIG. 4, the disk 10 has recesses 13 on both sides extending nearly to the edge thereof, ensuring an increased frictional resistance between disk 10 and forks 8 under a given clamping pressure of screw 9. To prevent the screw 9 from turning, its head 9' may be, say, hexagonal and let into a corresponding profiled recess 8' in the fork 8. To guide the hose 6 in the range of the joint between the operating rod 1 and the arm 14, two lugs 8'' are arranged between the forks, and between which lugs the hose 6 is taken.

Arm 14 consists of a length of tube 14a having inserted therein a tube of smaller section 14b. A torsion rod 15 has its inner end 15' rigid with the inner end of tube 14b. At the other end of the torsion rod 15 is a holder 16 having fixed thereto with a screw 18 a square tube or support 17 so that the longitudinal axis of same is at right angles to arm 14. 16' designates a bracket terminating at top in an eye 16'' into which a nipple 28 is inserted. The part of the nipple 28 projecting to the left of bracket 16' has connected thereto a hose for the rinsing agent, say, a water hose 6, whilst the part of the nipple projecting to the right of bracket 16' carries a rinsing agent tube 26 extending parallel with the square support 17 and having a series of small holes 27 facing forward along the entire length thereof. The rinsing agent tube 26 is additively linked with support 17 by means of holders 25 extending slantwise from support 17 up to the two ends of the tube.
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The square support 17 has a plate-shaped extension 19 projecting to the front. This extension may for example consist of a flat plate of sheet metal in the shape of a long, narrow rectangle, the plane of said plate coinciding with the axis of arm 14, whilst its longitudinal axis extends at right angles to the axis of arm 14 and parallel to the minding tube 26. The plate-shaped extension 19 serves to take a cleaning body 20 on each of its sides, which bodies are likewise in the form of a long, narrow rectangle and project both at the sides and beyond the extension 19, as may be seen from FIG. 3 in particular. A porous plastics material that does not absorb water may be conveniently employed for the cleaning slabs 20. To fix the cleaning slabs 20 to the extension 19 use is made of two clamping strips 23 which by means of the screws 22 are tightened against the threaded sockets 21 mounted on extension 19. The clamping strips 23 have ribs 24 on the side facing the cleaning slabs 20. As visible from FIG. 2, said ribs are interrupted to accommodate the screws 22 and the threaded sockets 21. It also appears from FIG. 2 that the front corners of the clamping strips 23 are rounded, as are also the front corners of extension 19, although not shown in the drawing. By this, the cleaning slabs last out longer in use, without said corners coming in contact with the window frame.

The rough, commercially available plastics envisaged for the cleaning slabs do not absorb water and can be compressed and bent like an ordinary sponge. Consequently a special method of fixing is needed to ensure that the foremost part touching the surface to be cleaned remains fully effective. Said part must not be pressed by the fixing device. Because the clamping strips 23 are narrower than the plastics slabs 20 and have ribs 24 in the middle as well, the plastics slabs have strong pressure exerted upon them only in the proximity of said ribs and are effectively guided up to the foremost edge.

If, for instance, the cleaning body 20 is pushed up against a window pane, the bottom half exerts hardly any pressure against the pane, because the front edge of the strip 23 is further back and gives the plastics only little rigidity. The described method of fixing makes it easy to change the plastics slabs, which only have to be cut to shape and not cemented. Moreover by turning them round 180 degrees they may be used twice. By providing several parallel rows of threaded sockets 21 side by side on the plate 19 the plastics slabs may be exploited still better. The plastics slabs may also be fixed on a circular or oval tube, though this means more expensive manufacture and awkward fixing. Due to the resiliency of the torsion rod 15 the corners are treated in a gentle way.

If the dirt is very difficult to dislodge, a detergent may be added to the water.

To enable windows to be cleaned right into the frames even if the sills are wide, the length of the arm 14 should be dimensioned according to the greatest depth of the sill. The dimensions of the various parts of the operating rod 1 and the arm 14, etc. depend on the particular requirements, are however as small as possible and suitably manufactured in lightweight material, such as Anticorodal or plastics.

What I claim is:

1. A device for use in cleaning vertical or sloping surfaces, in particular high windows and building facades, comprising an operating rod, an elongated adjustable arm extending in its longitudinal direction between a first end and a second end and secured at its first end with a friction fit joint to said operating rod, a rectangular extension secured to the second end of said arm, a cleaning body secured to said rectangular extension, a rinsing agent pipe mounted on the second end of said arm and extending coextensively with said extension over its length, said rinsing agent pipe having a number of small holes therethrough along its entire length and said holes facing in the direction of the surface to be cleaned, said arm being formed at least for a portion of its extent in the longitudinal direction by a torsion rod and due to said torsion rod said rinsing agent pipe is angularly revoluble about the longitudinal axis of said arm in opposition to the spring action of said torsion rod.

2. A device as defined in claim 1, wherein said extension of said arm consists of a rectangular plate whose plane lies in the longitudinal axis of the arm or substantially parallel thereto, while the longitudinal center line of said plate is at right angles to the longitudinal axis of said arm, a clamping strip disconnectably attached to said plate, said cleaning body comprises a slab-shaped body of porous plastics positioned on both sides of said plate, said slab-shaped body fixed between said plate and said clamping strip in such way that said cleaning body projects beyond the plate and clamping strip both at the front facing in the direction of the surface to be cleaned and the sides.

3. A device as defined in claim 1, wherein said arm comprises a fixed part secured to said operating rod, said tension rod is fitted at one end into said fixed part, and a holder for said rinsing tube and cleaning body is secured to the other end of said torsion rod and extends transversely of its longitudinal axis.

4. A device as defined in claim 2, wherein a pair of said clamping strips are arranged one on each side of said plate, and said clamping strips are fitted with ribs extending in the longitudinal direction of said plate and said ribs are centered relative to the sides of said strip with said ribs facing toward said cleaning body.

5. A device as defined in claim 1, wherein the joint between said operating rod and the first end of said arm comprises a forked holder mounted in the end of said operating rod, said forked holder having forked parts and the second end of said arm being held friction-tight between the forked parts of said holder.

6. A device as defined in claim 5, wherein the first end of said arm connected into said forked holder is disc-shaped and has an annular surface on each face at its outer edge in contact with said forked holder and the disc-shaped end is recessed closely inwardly from the annular surfaces so that the recessed faces are spaced from the surface of the said forked holder whereby the friction fit at the joint between said arm and operating rod is so dimensioned as to generate on the arm a moment of resistance which exceeds the moment of rotation acting on the arm with normal cleaning, the arm being however swingable against a stop at much increased pressure.

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