United States Patent [19]

Downes

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[54] **DOMESTIC CLEANING APPARATUS**

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[52] **U.S. Cl.** **15/102;** 15/24

[51] **Int. Cl.²** **A46B 13/04**

[58] **Field of Search** ..... 15/102, 210 A, 22 R, 24, 15/97 R, 29, 23, 97; 401/190, 196, 199, 201, 205, 207

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Attorney, Agent, or Firm—Young & Thompson

[57] **ABSTRACT**

Venetian-blind slat-cleaning apparatus comprises a hand held housing from which a pair of cleaning elements project. The elements are contiguously mounted for cleaning opposite sides of a single slat and they are free of mechanical interconnections externally of the housing to enable blinds to be cleaned in situ by engagement of a slat as a result of movement of the apparatus laterally with respect to the slat. The drive for the cleaning elements may be rotary or reciprocal linear vibratory and the cleaning elements may be associated with releasable splash guards.

4 Claims, 4 Drawing Figures

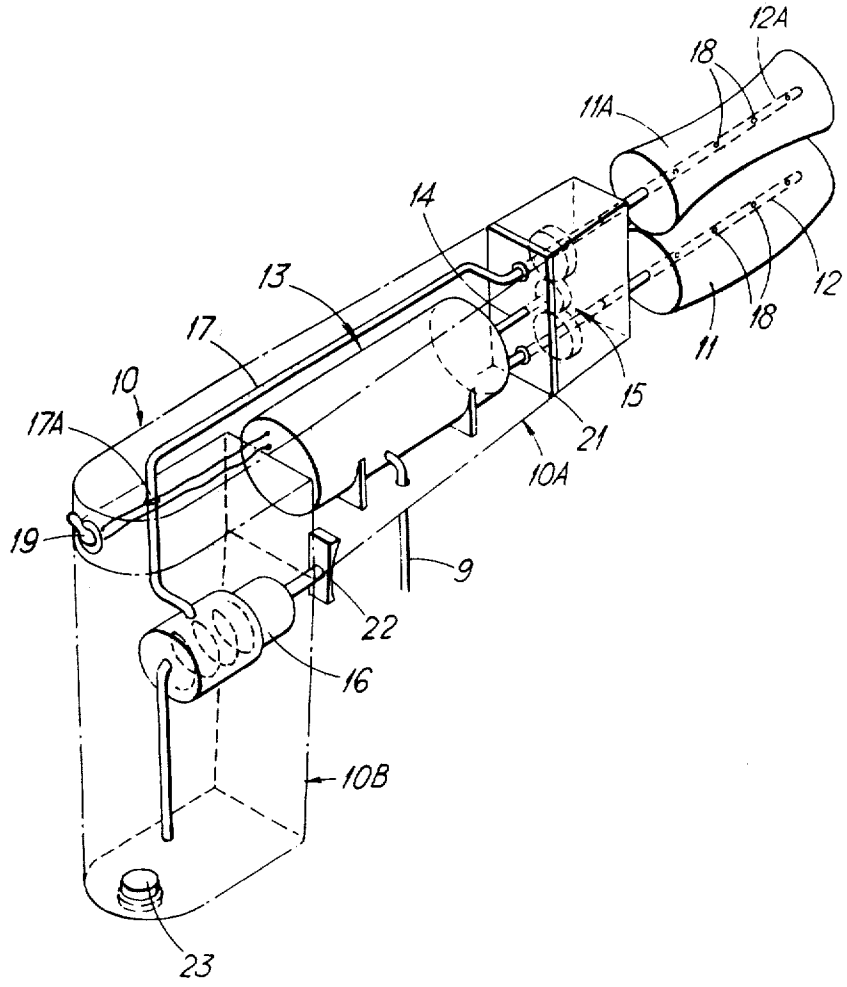


Fig. 1.

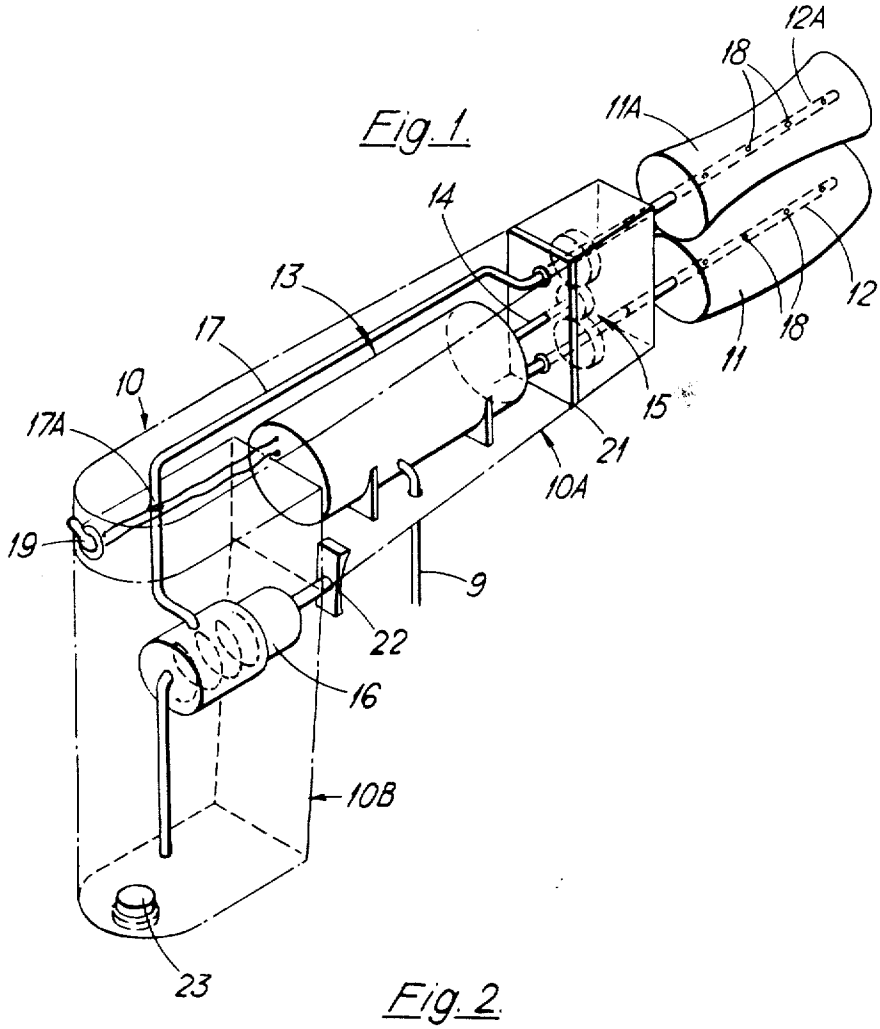
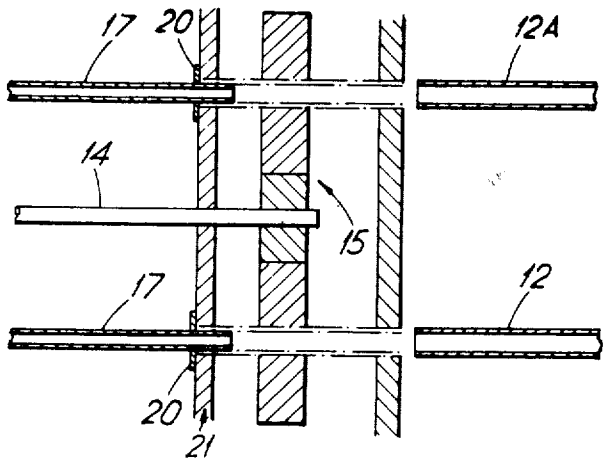

12A
18
11A
14
13
17
10
17A
19
15
21
10A
9
22
16
10B
23
12
18
11

Fig. 2.


17
20
12A
14
15
17
12
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21

Fig. 3.

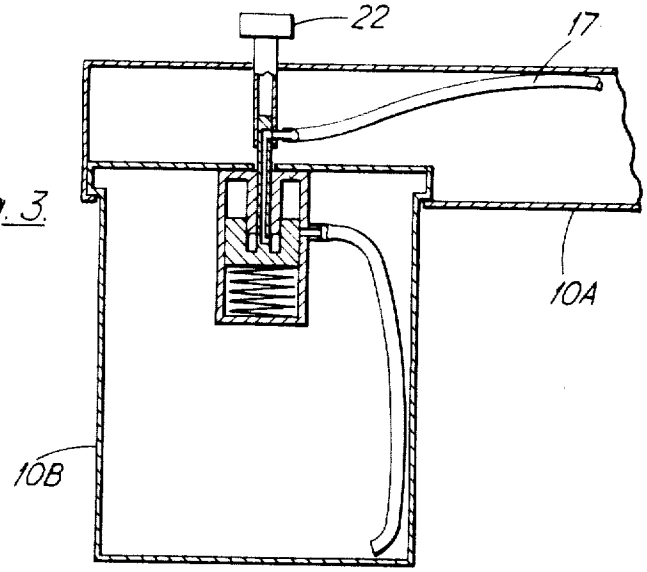
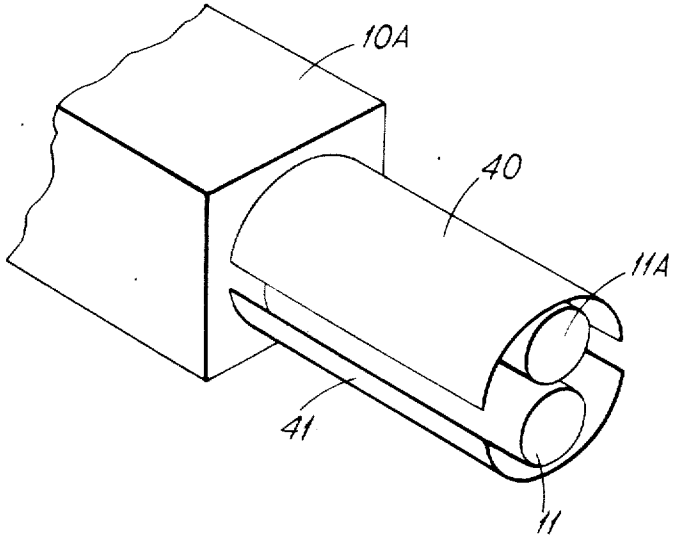


Fig. 4.



DOMESTIC CLEANING APPARATUS

This invention relates to portable apparatus for cleaning venetian blinds or other objects of a similar nature, namely having a structure primarily composed of mutually spaced elongated slats.

According to the present invention there is provided portable apparatus for cleaning venetian blinds or the like, comprising a housing adapted to be hand-held, a slat-cleaning element projecting from the housing and power-actuated means mounted within the housing and coupled to drive said element.

Also, according to the present invention there is provided portable apparatus for cleaning venetian blinds or the like, comprising a housing adapted to be hand-held, a slat-cleaning element mounted on a rotatable hollow shaft projecting from the housing, an electrically-operated motor mounted in said housing and coupled to rotate said shaft, a reservoir formed in the housing for storing cleaning liquid and having an outlet port, conduit means coupling said outlet port with the hollow interior of said shaft, and means forming perforations in the wall of said shaft in the region thereof mounting said slat-cleaning element to permit said cleaning element to receive cleaning liquid.

Still further according to the present invention there is provided portable apparatus for cleaning venetian blinds or the like, comprising a housing made of an electrically non-conductive material, a drive shaft mounted in and projecting from said housing, power-actuated means mounted within said housing and coupled to drive said drive shaft, a slat-cleaning element releasably mounted on the end of the drive shaft projecting from the housing, a cleaning-liquid-containing canister releasably mounted on the housing, the canister internally pressurised and having a valved liquid outlet port, conduit means mounted in the housing and located at one end to deliver liquid to the cleaning element and at the other end to releasably engage said outlet port, and control means mounted on the housing and operable selectively to open and close said valved liquid outlet port.

The cleaning element may be composed of such materials as are well-known in the cleaning art, of which sponge either natural or synthetic is preferred due to its having a relatively high moisture absorption rate. Alternatively, a sponge element may incorporate nylon bristles or other members capable of disloging dirt from the slats being cleaned or may simply be cloth covered.

Embodiments of the present invention will now be described by way of example with reference to the accompanying drawings, in which:

FIG. **1** is a diagrammatic schematic perspective view partly in phantom of one form of apparatus according to the present invention;

FIG. **2** illustrates a detail of the apparatus shown in FIG. **1**.

FIG. **3** illustrates a modified portion of FIG. **1**; and

FIG. **4** illustrates another part of the embodiment of FIG. **3**.

In FIG. **1** of the drawings the apparatus comprises a housing **10** made of a non-conductive plastics material, the housing having a gun-like appearance defining a barrel portion **10A** and a butt portion **10B** and is therefore adapted for hand-held operation. Mounted on and projecting from the barrel portion **10A** is a pair of slat-cleaning elements in the form of substantially cylindrical sponge elements **11, 11A** secured to hollow shafts **12, 12A** which are rotatably driven by a power-actuated means **13** which is in the form of an electric motor. A manually controlled ON/OFF switch **19** controls the motor **13** whose output shaft **14** is coupled to the shafts **12, 12A** through gearing **15** as shown in detail in FIG. **2**, and whose input is via cable **9** from either a mains supply or a reduced voltage supply. Conveniently the motor **13** to d.c. operated and a small transformer-rectifier is incorporated. Alternatively semi-conductor components may be used to control the operation of the motor **13** which in this case may be either a.c. or d.c. operated.

The butt portion **10B** of the housing **10** forms a reservoir for a cleaning liquid and this liquid is conveyed by means of a simple pump **16** and a conduit **17** connected to a reservoir outlet port **17A** to theopen ends of each of the hollow shafts **12, 12A**, the fluid reaching the cleaning elements **11, 11A** by means of perforations **18** (FIG. **1**) in the walls of the shafts **12, 12A**. It will be noted that each of the connections between the conduit **17** and the hollow shafts **12, 12A** includes a rubbing seal **20** mounted on a flange **21** of the housing **10**, whereby loss of liquid is prevented. A trigger mechanism **22** is provided as a control means to actuate the pump **16** and the reservoir is provided with a plug **23** for filling purposes.

In operation when the switch **19** is turned to the ON position the two cleaning elements **11, 11A** are caused to rotate and a slat to be cleaned is inserted between the elements so that both sides thereof are cleaned simultaneously. For ensuring maximum efficiency in this respect the elements **11, 11A** are shaped in a complementary manner to the usual contour of a venetian blind slat, but it will be appreciated that this feature is optional and may be modified or omitted at will.

With the slat in position the apparatus is simply moved along the length of the slat, cleaning liquid being applied as required as would be known to the operator. The cleaning liquid is released simply by actuation of the trigger mechanism **22.** It will be noted that by virtue of the simplicity of the apparatus thus far described the slat need not be removed from the remainder of the venetian blind; in other words the slats may be cleaned in situ by virtue of the hand-held operation of the apparatus.

In order to dry the cleaned slat the two elements **11, 11A** may be replaced by fresh elements and the process repeated without the use of cleaning liquid. To achieve the replacement of the elements of the shafts **12, 12A** may themselves be releasable or may have releasable element-carrying portions.

Numerous modifications may be made to the above-described embodiment, for example the reservoir may be a completely detachable component, being connected to the remainder of the housing by means of screw threads or by a bayonnet connection. Conveniently, as is illustrated diagrammatically in FIG. **3**, the reservoir may be a sealed canister containing cleaning fluid under pressure, the canister being for one-time use, and having a valved pressure-sealed port for receiving a conduit which is coupled to the slat-cleaning element. In this case the pump **16** of FIG. **1** is omitted but the trigger mechanism **22** is adapted to operate the valved conduit.

As is illustrated in FIG. **4**, the housing **10** may incorporate releasable splash guards **40, 41** mounted on op-

posite sides of the two cleaning elements **11, 11A** in order to minimise the quantity of cleaning liquid which is thrown outwardly from the elements **11, 11A** due to centrifugal action during use. The guards **40, 41** may, if desired, be included in the apparatus described with reference to FIG. **1.**

The motor **13** may be arranged to impart linear reciprocal vibratory motion to the elements **11, 11A**, preferably longitudinally of their length, in which case the elements **11, 11A** would not require to be symmetrical about their longitudinal axes.

Where a pair of cleaning elements **11, 11A** are provided they may be arranged to move in opposite directions, whether linearly or rotationally, or they may be moved in the same directions. Furthermore, more than one pair of cleaning elements may be provided and preferably a plurality of pairs of such elements are provided for cleaning a plurality of slats simultaneously.

By way of illustration the embodiment described with reference to FIG. **1** of the drawings may have a motor which has an output shaft rotatable at **3,000** r.p.m. and the gearing **15** may be **3:1** reduction gearing so that the two cleaning elements are rotated at about **1,000** r.p.m. in the same direction. Furthermore, the elements are conveniently about **2** inches in length and mounted on shafts, which have their axes spaced by an amount within the range **1** – 2 inches. An ammonia-based liquid cleaner has been found to be suitable.

What is claimed is:

1. Portable apparatus for cleaning venetian blinds or the like, comprising a housing adapted to be hand-held, a pair of contiguously-mounted slat-cleaning elements mounted on rotatable hollow shafts projecting from the housing, said shafts being free at their ends remote from said housing, an electrically-operated motor mounted in said housing and coupled to rotate said shafts, a reservoir formed in the housing for storing cleaning liquid and having an outlet port, conduit means coupling said outlet port with the hollow interior of said shafts, and means forming perforations in the walls of said shafts in the region thereof mounting said slat-cleaning elements, to permit said cleaning elements to receive cleaning liquid, there being a plurality of said perforations spaced apart lengthwise along each said hollow shaft, the portions of said elements which are external to the housing being free of mechanical interconnections to permit the apparatus to engage a slat to be cleaned by movement of the apparatus laterally with respect to the slat so that opposite sides of a slat are engaged simultaneously by said elements.

2. Apparatus according to claim **1,** including a pump mechanism mounted in said housing and coupled to pump liquid in said reservoir to said cleaning elements, and manually-operable control means for said pump.

3. Apparatus according to claim **1,** wherein the housing includes releasable splash guards mounted on opposite sides of said cleaning elements.

4. Apparatus according to claim **1,** wherein said reservoir comprises a cleaning liquid-containing canister releasably mounted on the housing, the canister being internally pressurized and having said valved liquid outlet port thereon, and control means mounted on the housing and operable selectively to open and close said valved liquid outlet port.

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