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(54) **HOUSEHOLD CLEANING TOOL**

HAUSHALTSREINIGUNGSWERKZEUG

Utensile de nettoyage à usage domestique

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Description

Field of the Invention

[0001] This invention relates to household cleaning tools. More particularly the invention relates to household cleaning tools which incorporate a replaceable cartridge for household cleaning fluid and which are particularly suitable for cleaning bathroom fixtures such as toilets or urinals.

Background of the Invention

[0002] When cleaning toilets, the use of a bottle of cleaning liquid in combination with a cleaning tool such as a brush results in considerable wastage through use of excess cleaning liquid. The corrosive or irritant nature of some cleaning products means that the user prefers not to dose product directly onto the cleaning tool because of the risk of spillage. This has resulted in the habit of pouring the fluid into the toilet then brushing to remove soil. If a controlled dose of cleaning fluid could be applied to the brush without risk of spillage, this could then be applied directly to the soil, minimising wastage of product and environmental harm through excessive use of detergent product.

[0003] A number of attempts have been made to tackle this problem in the prior art. WO 99/23926 discloses a toilet brush which is kept in a storage container, where the container squirts cleaning fluid onto the brush when the brush is pressed into the container, while DE 198 04 064 has a pump actuated fluid spray, again in the brush container, to apply cleaning fluid to the brush head prior to use. These systems do not overcome the risk of spillage of harmful product when removing the brush from the container for use.

[0004] WO01/03542 and DE3439912 are examples or prior art that reveal product applicator brushes attached to gas-pressurised cleaning fluid containers by a sleeve member. DE 2331694 reveals a cleaning brush with a pressurised fluid cartridge in the handle, replaced by unscrewing the handle from the cleaning head at the base of the handle.

[0005] US 5,888,002 discloses a disposable toilet brush with a cleaning fluid in a squeezable reservoir.

[0006] WO 00/42892 and EP 0 210 522 are examples of prior art showing brushes with refillable cleaning fluid reservoirs while WO99/52397 discloses a brush with an elongate reservoir which is refillable at the top end and where fluid is released over the brush by urging the brush head away from the open, lower end of the reservoir.

[0007] DE 29718117U1 has a brush with a hollow shaft for storage of solid disinfectant cartridges.

[0008] EP 0 175 505 discloses a cleaning brush with a replaceable collapsible cartridge operated by an external trigger.

[0009] This prior art household cleaning tool comprises all of the features of the preamble of claim 1.

[0010] The prior art has a number of problems. Users are not prepared to handle any part of the toilet brush other than the handle part, remote from the soiled cleaning head, because of the health hazards associated with the soil. Similarly, any operation that leads to the head of the brush being held above the handle can lead to soiled liquid or cleaning fluid running down the handle and coming into contact with the user.

[0011] In the household environment, users are not prepared to clean the toilet brush or wash any of the soiled parts because of the risk of contaminating otherwise clean washing areas. Hence the disclosed routes that involve the refilling of a reservoir all involve handling the potentially soiled area of the brush in order to refill the reservoir. Also, the refilling operation with the often corrosive or irritant cleaning fluid is considered messy and potentially hazardous.

[0012] Any use of a gas-pressurised reservoir is considered dangerous, in the context of toilet hygiene use, where children will have access to the apparatus. Also the use of propellant solvents is undesirable with respect to environmental and/or flammability issues.

Summary of the Invention

[0013] The present invention provides a household cleaning tool comprising an elongate housing having at one end an inclined handle and at the other end a cleaning head, the housing further comprising:

(a) connection means located between the handle and the cleaning head for the engagement of a removable cartridge of household cleaning fluid, and

(b) pumping means located between the connection means and the cleaning head for the transfer of household cleaning fluid from the cartridge to the cleaning head;

in which the cartridge is removable from the housing by disengaging the connection means and pulling the cartridge from the housing,
and in which the cartridge is slidably received in the housing and can be pushed down in the direction of the cleaning head in order to actuate the pumping means and thereby dispense the household cleaning fluid from the cartridge to the cleaning head via the pumping means.

[0014] The household cleaning tool according to the invention is convenient to operate and in particular can be refilled by removal an empty cartridge and installing a fresh one without the user ever having to handle the soiled cleaning head end.

Preferred Embodiments and Detailed Description of the Invention

[0015] The cartridge may be pushed down to dispense the household cleaning fluid, either by the user pushing

directly on the cartridge itself, or indirectly by means of a trigger-type actuation mechanism, whereby the handle of the tool is provided with a trigger which engages with a corresponding slot on the cartridge, to push it down when the trigger is grasped by the user. This latter form of indirect actuation may be preferable for users with small or weak hands.

[0016] Although the cartridge can be returned manually to its starting position after it has been pushed down to dispense the household cleaning fluid, it is preferred that a biasing means such as a spring is located between the pumping means and the cleaning head. This serves to return the cartridge back to its starting position without user intervention, which facilitates rapid repeated dosing of household cleaning fluid in a metered fashion to the desired site.

[0017] It is advantageous for reasons of safety and economy to prevent spillage of cleaning fluid when the cartridge is changed. This is suitably achieved by providing the cartridge with a self sealing closure which acts to prevent leakage of household cleaning fluid from the cartridge when the cartridge is removed from the housing. A preferred form of self-sealing closure is a flexible septum, which is typically made of silicone rubber. This is suitably used in conjunction with a piercing means, such as a hollow needle. The needle is provided in the housing in a location such that when the cartridge is screwed down to install it into the housing, the needle pierces the flexible septum, thereby allowing cleaning fluid to flow. The flexible septum reseals when a spent cartridge is withdrawn from the needle and removed from the housing, at least, to a sufficient degree to prevent dripping and leakage of any residual cleaning fluid which may be left in the spent cartridge.

[0018] An additional advantage of the needle and flexible septum arrangement described above is that this enables self-venting of the cartridge. This prevents the formation of a partial vacuum in the cartridge as its contents are used up, without the need to provide a separate venting mechanism such as holes drilled in the cartridge.

[0019] The cleaning head of the tool is typically provided with a means for conveying the cleaning liquid to the outer surface of the cleaning head. This can suitably be in the form of a tube or preferably a plurality of tubes connecting the pumping means to the external surface of the cleaning head, or alternatively can be as a result of the cleaning head being formed from a porous material such as sponge or a synthetic sponge material.

[0020] Preferably the cleaning head is provided with an array of bristles or synthetic bristles on its external surface. The bristles may be fastened to the cleaning head according to techniques known in the art such as fusing-on or staple-setting.

[0021] Most preferably the bristles are arranged in tufts, and fluid continuous channels lead from the interior of the cleaning head to the base of each of the arrays of bristles on the cleaning head. This arrangement provides an additional hygiene benefit since it ensures that the cleaning fluid comes into contact with the base of each of the arrays of bristles.

[0022] Furthermore, by judicious selection of the rheological properties of the cleaning fluid and the bristle profile, it is possible, through a combination of fluid viscosity and capillary action, to retain a residue of cleaning fluid in the interstices of the bristle tufts between uses of the tool. This ensures that the tool stays hygienically clean and fresh between uses. It is preferred to use transparent or translucent bristle tufts to enable visualisation of this residue of cleaning fluid.

[0023] Thixotropic household cleaning fluids are preferred for use in conjunction with the tool according to the invention, since these may be pumped without running or dripping after pumping.

[0024] Because of the potentially harmful nature of the cleaning fluid, the tool is preferably equipped with a locking device that prevents accidental pumping of liquid to the head or its use by young children. A preferred form of locking device is a twist-lockable fitting which is enabled and disabled by rotation of the cartridge about its long axis, and in which accidental movement of the cartridge between pumping and non-pumping positions is prevented by a co-operating projection and recess arrangement (e.g. of the "bayonet" type) on the cartridge and the housing respectively. Most preferred is an arrangement of this type which also prevents accidental pumping of fluid during cartridge insertion, i.e. after insertion, the cartridge must be rotated to the unlocked position in order to enable actuation of the pump.

[0025] The cartridge and housing may be marked with alignment indicators to show the locked and unlocked positions of the cartridge.

[0026] It is also preferred if the user can easily determine when the cleaning fluid in the cartridge has been used up and the cartridge needs to be replaced. In a preferred form of the invention, parts of the housing, the cartridge, the pumping means or the cleaning head are made from a transparent or translucent material such that the user can visually ascertain whether fluid remains in the cartridge.

[0027] It is also desirable that the tool is provided with a suitably shaped pot for storage when not in use. In a preferred form, the housing is provided with a closure skirt which acts to form a lid on the pot when the tool is placed in the pot. Preferably the closure skirt makes a snap fit with the corresponding upper surfaces of the pot with which it interengages. This enables easy assembly of the tool by the user from a kit of component parts. The pot is also preferably provided with a well for collecting any residual liquid which may drip from the cleaning head after use, and may be lined with a hygienic liner, e.g. of antibacterial material. It is desirable that the tool is supported in the pot by the skirt, rather than by the tool resting on the cleaning head. One option for preventing the use of the tool by children is to provide the tool and pot with a locking device such that this must be manipulated to remove the tool from the pot. A preferred form of locking

device involves co-ordinated downwards pushing and twisting of the tool relative to the pot to disengage the lock. The pot preferably has grips attached to its base to prevent it from sliding on slippery floors.

[0028] Suitable materials for the housing, handle and cartridge are any rigid easily formed materials which will be readily evident to the skilled person. Preferred materials are thermoformable polymers that are resistant to attack from the chemicals in household cleaning fluids.

[0029] A specific example of a toilet brush according to the invention is shown in the accompanying figure:

Figure 1 shows a cross section through a household cleaning tool (1).

[0030] The tool (1) is seated in a storage pot (2), and has an elongate housing (3) which is in the form of a rigid sleeve furnished with an inclined handle (4) and a cleaning head (5). A pump (6) is located in the base of the main body of the housing (3). A plurality of fluid continuous channels, shown representatively as (7), lead from the interior surface to the exterior surface of the cleaning head (5), which exterior surface is provided with an array of bristle tufts, two of which are shown schematically as (8).

[0031] A rigid elongate axisymmetric cartridge (9) containing household cleaning fluid (10) is located in the sleeve of the housing (3) and is connected with the housing (3) by means of a twist-lockable bayonet coupling (11) between housing (3) and cartridge (9). The connection is prevented from leaking by a flexible washer (12). A hollow needle (13) is provided between the pump (6) and the cartridge (9), so that when the cartridge (9) is screwed into place, the needle (13) penetrates a flexible silicone sealing septum (14) which seals the neck of the cartridge (9). This allows (14) allowing cleaning fluid (10) to enter the pump (6) through the hollow needle (13).

[0032] In order to operate the tool, the cartridge (9) is pushed down in the direction of the cleaning head (5) which causes the pump (6) to be actuated, thereby transferring cleaning fluid (10) from the cartridge (9) through the channels (7) to the array of bristle tufts (8). This action also compresses a spring (15) located between the pump (6) and the interior surface of the cleaning head (5), so that after the pumping action, the spring can return the cartridge (9) to its starting position.

[0033] The elongate housing (3) is provided with a closure skirt (16) that snap fits onto the pot (2) to form a lid on the pot (2) when the tool (1) is in the pot (2). The pot (2) is also provided with a well (17) for collection of any residual cleaning fluid (10) that drains from the cleaning head (5).

Claims

1. A household cleaning tool (1) comprising a elongate housing (3) having at one end an inclined handle (4) and at the other end a cleaning head (5), the housing further comprising:

(a) connection means (11) located between the handle (4) and the cleaning head (5) for the engagement of a removable cartridge (9) of household cleaning fluid (10), and
(b) pumping means (6) located between the connection means (11) and the cleaning head (5) for the transfer of household cleaning fluid (10) from the cartridge (9) to the cleaning head (5);

in which the cartridge (9) is removable from the housing (3) by disengaging the connection means (11) and pulling the cartridge (9) from the housing (3), **characterised in that**
the cartridge (9) is slidably received in the housing (3) and can be pushed down in the direction of the cleaning head (5) in order to actuate the pumping means (6) and thereby dispense the household cleaning fluid (10) from the cartridge (9) to the cleaning head (5) via the pumping means (6).

2. A tool (1) according to claim 1 in which a biasing means (15) located between the pumping means (6) and the cleaning head (5) returns the cartridge (9) to its starting position after it has been pushed down to dispense the household cleaning fluid (10).

3. A tool (1) according to claim 1 or claim 2, in which the cartridge (9) is provided with a self-sealing closure (14) to prevent leakage of fluid (10) from the cartridge (9) when the cartridge (9) is removed from the housing (3).

4. A tool (1) according to any one of claims 1 to 3, in which the self-sealing closure (14) is in the form of a flexible silicone septum.

5. A tool (1) according to any one of claims 1 to 4, in which the cleaning head (5) is provided with a plurality of channels (7) for conveying fluid (10) from the interior to the exterior surfaces of the cleaning head (5).

6. A tool (1) according to any one of claims 1 to 5, in which the connection means (11) is twist-lockable, and unlocking is necessary before the pumping means (6)can be actuated.

7. A tool (1) according to claim 6, in which locking or unlocking takes place by rotating the cartridge (9) about its long axis.

8. A tool (1) according to any one of claims 1 to 7, which further comprises a pot (2) for retention thereof when not in use.

Patentansprüche

1. Haushaltsreinigungsgerät (1), umfassend ein gestrecktes Gehäuse (3), das an einem Ende einen geneigten Griff (4) und an dem anderen Ende einen Reinigungskopf (5) aufweist, wobei das Gehäuse weiterhin umfasst:

   (a) Verbindungsmittel (11), angeordnet zwischen dem Griff (4) und dem Reinigungskopf (5), für den Eingriff einer entfernbaren Patrone (9) mit Haushaltsreinigungsfluid (10) und
   (b) Pumpmittel (6), angeordnet zwischen dem Verbindungsmittel (11) und dem Reinigungskopf (5), zur Übertragung von Haushaltsreinigungsfluid (10) aus der Patrone (9) zu dem Reinigungskopf (5),

   wobei die Patrone (9) aus dem Gehäuse (3) durch Entkuppeln des Verbindungsmittels (11) und Herausziehen der Patrone (9) aus dem Gehäuse (3) entnehmbar ist,
   dadurch gekennzeichnet,
   dass die Patrone (9) gleitfähig in dem Gehäuse (3) aufgenommen wird und in die Richtung des Reinigungskopfes (5) herunter geschoben werden kann, um das Pumpmittel (6) zu betätigen und dadurch das Haushaltsreinigungsfluid (10) aus der Patrone (9) zu dem Reinigungskopf (5) über das Pumpmittel (6) abzugeben.

2. Gerät (1) nach Anspruch 1, wobei ein vorgespanntes Mittel (15), das zwischen dem Pumpmittel (6) und dem Reinigungskopf (5) angeordnet ist, die Patrone (9) zu ihrer Ausgangsposition zurückführt, nachdem sie zum Abgeben des Haushaltsreinigungsfluids (10) herunter gedrückt wurde.

3. Gerät (1) nach Anspruch 1 oder Anspruch 2, wobei die Patrone (9) mit einem selbst abdichtenden Verschluss (14) ausgestattet ist, um das Auslaufen von Fluid (10) aus der Patrone (9) zu verhindern, wenn die Patrone (9) aus dem Gehäuse (3) entnommen wird.

4. Gerät (1) nach einem der Ansprüche 1 bis 3, wobei der selbst abdichtende Verschluss (14) in Form eines biegsamen Silikonseptums vorliegt.

5. Gerät (1) nach einem der Ansprüche 1 bis 4, wobei der Reinigungskopf (5) mit einer Vielzahl von Kanälen (7) zum Transportieren von Fluid (10) von dem Inneren zu den äußeren Oberflächen des Reinigungskopfes (5) ausgestattet ist.

6. Gerät (1) nach einem der Ansprüche 1 bis 5, wobei das Verbindungsmittel (11) drehverriegelbar ist und Entriegeln notwendig ist, bevor das Pumpmittel (6) betätigt werden kann.

7. Gerät (1) nach Anspruch 6, wobei Verriegeln oder Entriegeln durch Drehen der Patrone (9) um ihre eigene Längsachse erfolgt.

8. Gerät (1) nach einem der Ansprüche 1 bis 7, das weiterhin einen Topf (2) zur arretierten Aufbewahrung desselben, falls es nicht in Gebrauch ist, umfasst.

Revendications

1. Ustensile de nettoyage à usage domestique (1) comprenant un boîtier allongé (3) présentant, à une extrémité, une poignée inclinée (4) et à l'autre extrémité une tête de nettoyage (5), le boîtier comprenant en outre :

   (a) un moyen de raccordement (11) situé entre la poignée (4) et la tête de nettoyage (5) dans lequel s'engage une cartouche amovible (9) de liquide de nettoyage à usage domestique (10), et
   (b) un moyen de pompage (6) situé entre le moyen de raccordement (11) et la tête de nettoyage (5) servant au transfert du liquide de nettoyage à usage domestique (10) de la cartouche (9) à la tête de nettoyage (5) ;

   dans lequel la cartouche (9) peut être retirée du boîtier (3) par dégagement du moyen de raccordement (11) et par retrait de la cartouche (9) du boîtier (3),
   caractérisé en ce que
   la cartouche (9) vient se loger par coulissement dans le boîtier (3) et peut être poussée vers le bas dans la direction de la tête de nettoyage (5) afin de permettre l'actionnement du moyen de pompage (6) et ainsi d'administrer le liquide de nettoyage à usage domestique (10) provenant de la cartouche (9) à la tête de nettoyage (5) par l'intermédiaire du moyen de pompage (6).

2. Ustensile (1) selon la revendication 1, dans lequel un moyen de sollicitation (15) situé entre le moyen de pompage (6) et la tête de nettoyage (5) renvoie la cartouche (9) à son emplacement initial après que celle-ci a été poussée vers le bas pour permettre l'administration du liquide de nettoyage à usage domestique (10).

3. Ustensile (1) selon la revendication 1 ou 2, dans lequel la cartouche (9) est munie d'une obturation à fermeture automatique (14) empêchant la fuite du liquide (10) de la cartouche (9) lorsque la cartouche (9) est retirée du boîtier (3).

4. Ustensile (1) selon l'une quelconque des revendications 1 à 3, dans lequel l'obturation à fermeture automatique (14) a la configuration d'une cloison souple en silicone.

5. Ustensile (1) selon l'une quelconque des revendications 1 à 4, dans lequel la tête de nettoyage (5) est munie d'une pluralité de canaux (7) servant au transport du liquide (10) entre les surfaces intérieures et extérieures de la tête de nettoyage (5).

6. Ustensile (1) selon l'une quelconque des revendications 1 à 5, dans lequel le moyen de raccordement (11) est verrouillable par rotation et un déverrouillage est nécessaire avant que le moyen de pompage (6) puisse être actionné.

7. Ustensile (1) selon la revendication 6, dans lequel le verrouillage ou le déverrouillage se produit par rotation de la cartouche (9) sur son axe longitudinal.

8. Ustensile (1) selon l'une quelconque des revendications 1 à 7, comprenant en outre un pot (2) dans lequel celui-ci repose lorsqu'il n'est pas utilisé.

Fig.1.

