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(54) **A dispensing device for a toilet cistern.**

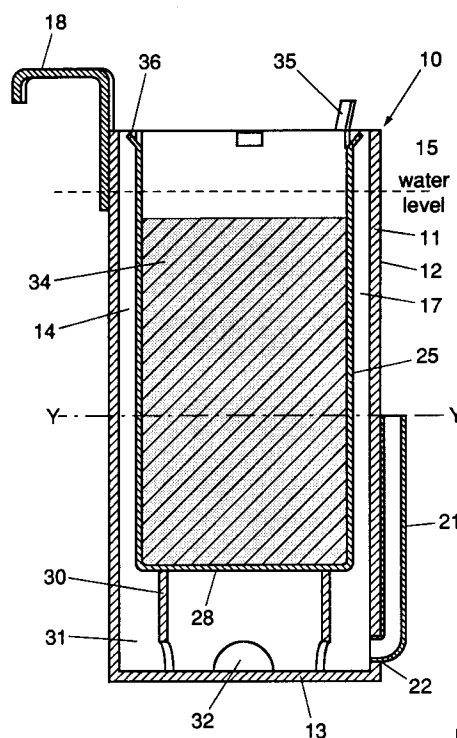
(57) A passive dispensing device (10) for use in dosing a toilet bowl (19) with water treatment material comprising:

a housing (11) forming a chamber (14) which is adapted to hold water treatment material means (34),

reservoir means (12) within the housing (11) for holding a reservoir (25) of water containing said water treatment material (34),

water flow path means (17) between the chamber (14) and said reservoir means (25),

water flow passageway means (21) extending upwardly away from said reservoir means (12), said passageway means (21) having its lower end (22) in communication with said reservoir means (12) at or adjacent its bottom wall (13), and its open upper end in flow communication with the cistern interior, said upper end being located (Y-Y) below the upper edge of the housing (11) (and below the level of the water within the cistern when full), whereby water, during the filling of the cistern (19) will flow into the reservoir means (12) upwardly along said water flow path means (17) and into the chamber (14), via said passageway means (21), whilst, when the cistern (19) is flushed, a portion only of the water within the device (10) (and containing said water treatment material) will be discharged into the cistern (19) via said passageway means (21).

**FIG. 2****EP 0 528 073 A1**

This invention relates to an improved dispensing device for use in the cistern of a toilet system, wherein the device incorporates a chemical additive, such as a disinfecting and/or deodorising compound, which is arranged to disperse in water present in the device so that water containing the compound is delivered automatically to the toilet bowl when the cistern is emptied.

Many different forms of toilet cistern dispensing devices are known in the art. In this regard, reference is made to Australian Patent Specification Nos. 564163, 261095, 288230 and U.S. Patent Specification No. 3604020. One of the problems associated with the prior art dispensing devices is that the water treatment material or additive (normally in solid form) tends to disintegrate and erode away relatively quickly. This is undesirable in that the working life of the device (normally, in "throw-away" form) is not very long, and also leads to excessive amounts of chemical material being charged with the flushing water resulting in staining of the toilet bowl which is aesthetically unattractive, particularly when the toilet is flushed after a prolonged quiescent period. The inventors have recognised that in order to effectively cleanse, disinfect and/or deodorise the flushing water, only a small amount of water treatment material or additive is needed to be mixed with the flushing water from the toilet cistern.

It is an object of the present invention to provide an improved toilet cistern dispensing device wherein the rate of dispersal of the water treatment material contained therewithin is more efficiently controlled in comparison to prior art devices, which in turn results in the working life of the water treatment material being significantly extended.

It is a further object of the present invention to provide a toilet flushing dispensing device which is of extremely simple design, of low cost and can be readily fitted to and removed from a toilet cistern system.

It is a further object of the present invention to provide an improved dispensing device wherein use is made of a removable cartridge containing the water treatment material, whereby on the material being fully consumed, one need only insert a replacement cartridge, without having to remove the device in toto.

According to this invention therefore, an improved passive dispensing device for use in dosing a toilet bowl with water treatment material comprises a housing forming a chamber which is adapted to hold water treatment material means, reservoir means within the housing for holding a reservoir of water containing said water treatment material, water flow path means between the chamber and said reservoir means, water flow passageway means extending upwardly away from said

reservoir means, said passageway means having its lower end in communication with said reservoir means at or adjacent its bottom wall, and its open upper end in flow communication with the cistern interior, said upper end being located below the upper edge of the housing (and below the level of the water within the cistern when full), whereby water, during the filling of the cistern will flow into the reservoir means upwardly along said water flow path means and into the chamber, via said passageway means, whilst, when the cistern is flushed, a portion only of the water within the device (and containing said water treatment material) will be discharged into the cistern via said passageway means.

Preferably, the water treatment material means comprises a removable cartridge having a tubular side wall having a plurality of apertures formed therein, said apertures being spaced along the length of the side wall, a closed bottom wall and an open upper end, the interior of the cartridge being filled (or nearly so) with solid water treatment material, said side wall being spaced from the inner walls of the container or housing so as to form said water flow path means.

Preferably, the lower end of the drain tube connects to the reservoir means via an opening in the side wall of the housing, said opening being spaced a small distance, e.g. 5mm above the bottom wall of the housing.

Preferably, the reservoir means is formed by a space between the cartridge bottom wall and the housing bottom wall so as to permit water to flow freely from the housing into the discharge tube or vice versa.

Preferably, the discharge tube extends upwardly by a distance which is slightly less than half the overall height of the housing or container. The tube may be provided with a flow restrictor in its outlet end for reducing the flow rate of treated water from the device, and in turn the rate of release of the water treatment material.

It will be appreciated that the height of the discharge tube is a factor which determines the volume of water discharged from the device, and that a reservoir of water containing water treatment material, will always be stored within the device, i.e. it never drains completely.

In use, the device is partially immersed in the cistern water to a depth just below the upper end of the housing, whereupon water enters the chamber from the reservoir means, via the discharge tube, and a head of water is formed in the cartridge above the upper level of the water treatment material, which then becomes dispersed or dissolved in the water. Some of the dissolved material will diffuse into the water of the reservoir means ready for discharge into the cistern. When the cistern is

flushed, treated water will be dispensed into the cistern once the level of water in the cistern falls, and such discharge will continue until the level of the water in the chamber drops to the level of the upper end of the discharge tube. A reservoir of treated water thus remains in the reservoir means ready for the next flush.

With this arrangement, the water within the dispenser is maintained in a relatively quiet state which minimises the loss of water treatment material particularly when the toilet is not in use (i.e. during quiescent periods). Preferably, the water within the device contacts substantially only the upper surface of the water treatment material, whereby the rate of release of the material is very much controlled during the flushing/refilling cistern cycles and this significantly extends the working life of the dispensing device (without having to replace the water treatment material), and avoids any problems which normally arise owing to excessive discharge of such material during flushing, e.g. unsightly stains within the toilet bowl.

In a preferred embodiment, as the water treatment material gradually dissolves away and the level of its upper surface slowly drops, further apertures in the side wall of the cartridge are progressively "exposed", whereby water which collects within the cartridge during the dispensing cycle of the device, will drain from the cartridge through the "exposed" apertures and flow downwardly through the annular space between the container side wall and the cartridge and eventually dispense through the discharge tube into the cistern.

The water treatment material may be a solid block, and compositions for same are well known in the art. The composition can contain components for controlling the rate of release of the "active" material into the water.

Preferably, the material is contained in disposable cartridges, or in a protective wrapping which dissolves in water. Refills can thus be simply inserted in the device without having to remove it from the cistern.

In order to more fully explain the applicants' invention, an embodiment is described hereunder in some further detail with reference to and illustrated in the accompanying drawings in which:

Fig. 1 is a schematic illustration of a dispenser installed in a toilet cistern;

Fig. 2 is a vertical sectional view of the dispenser assembly of this embodiment;

Fig. 3 is an "exploded" view of the assembly shown in Fig. 2; and

Fig. 4 is a perspective view of the inner cartridge shown in Fig. 3 containing the chemical additive.

In this embodiment, a toilet cistern dispensing device 10 comprises a hollow cylindrical container or housing 11 having a tubular side wall 12 defining a chamber 14, a closed bottom wall 13 and an open top, and a removable cylindrical cartridge 15 slidably located within the chamber 14, the housing 11 and cartridge 15 being dimensioned so that with the cartridge 15 housed in the chamber 14, a small annular clearance 17 exists between the side walls thereof.

The housing 11 is formed of water impervious plastics material, and has attached to its side wall a hanger strap 18, for hookingly attaching the housing 11 to a side wall of the toilet cistern 19, or to the inlet tube 20 of the cistern 19, the positioning of the housing 11 being selected so that when the cistern 19 is filled with water, the housing 11 projects slightly above the level of the water in the cistern (refer Fig. 1).

The container 11 is provided with an upwardly extending discharge tube 21 which in this embodiment, has its lower end connected to an aperture 22 in the side wall 12 of the container 11 near to its bottom wall 13, the tube 21 extending approximately parallel to the side wall 12 of the container 11 exteriorly thereof and contiguous therewith. The tube 21 terminates at its upper end at a level which is slightly below the mid-region of the container 11.

The removable cartridge 15 comprises a cup-shaped outer casing 25 of plastics material, the diameter of which is slightly less than the diameter of the cylindrical housing 11, the tubular side wall of the casing 25 having a plurality of axially spaced, horizontal rows of apertures 27 formed therein, the apertures 27 in each row being spaced circumferentially around the casing 25, the apertures 27 in each adjacent row being in staggered relationship.

The bottom wall 28 of the casing 25 is closed and sits on top of a support ring 30. The cartridge 15 is thereby supported clear of the bottom wall 13 of the container 11, and above the lower end of the tube 21. The space 31 forms a reservoir for water which enters the housing 11 through the tube 21. The ring 30 is provided with openings 32 in its side wall to permit water to flow freely through the reservoir 31 into the tube 21 and vice versa.

Water treatment material 34 containing cleansing, colouring, disinfecting and/or perfumed agents, is contained in the cartridge 15, to a level below the upper end of the casing 25, so that a space is formed above the material 34 in the casing 25 and which forms a well in which water can collect. In this initial state, only a small number of the apertures 27 in the outer casing side wall 25 are "open" or "exposed".

In this embodiment, the material is in solid or paste form and fills the interior of the cartridge 15

so that essentially only its upper surface makes effective contact with water, the apertures 27 being sufficiently small so that the contact between the water and the material 34 by virtue of the holes 27, does not have any significant effect on the dissolving or dispersion of the material 34. The material is desirably formulated so that it slowly dissolves in water, the pattern of holes 27 being effective to ensure that the material 34 is consumed evenly, so that its upper surface slowly drops substantially horizontally.

The upper end of the cartridge 15 is provided with a tab 35 which serves as a handle for manually grasping the cartridge 15 to facilitate its insertion and withdrawal from the housing 11, e.g. when a replacement cartridge 15 needs to be fitted, without having to remove the device in its entirety.

In use, the dispensing device 10 is suspended in the tank of the toilet cistern 19, for example by simply engaging its hanger strap 18 over the side wall of the cistern 19, the housing 11 being located so that it is immersed over the majority of its length. As the device 10 is immersed in the water within the cistern 19, water enters the housing 11 via the tube 21 and flows upwardly through the gap between the housing side wall 12 and the cartridge side wall 25, and into the interior of the cartridge 15 via the "exposed" apertures 27, whereupon it comes in contact with the exposed upper surface of the water treatment material 34, the water within the device 10 continuing to rise up to the level of the water in the cistern tank 19.

When the toilet cistern is flushed, a charge of water from the device (containing the water treatment material 34) is displaced through the discharge tube 21 into the cistern 19, whereupon it mixes with the water in the cistern tank and in turn is flushed into the toilet bowl. If water is emptied from the cistern tank quicker than the rate of discharge of water from the dispensing device, water from the device will also meter into the cistern during the initial stages of refilling. The level of water within the container 11 drops until it coincides with the level of the upper end of the tube 21. Upon the cistern being refilled, the water in the container 11 returns to its previous level.

As the water treatment material 34 is consumed and the level of its upper surface drops, "new" apertures 27 in the side wall of the cartridge casing 25 become "exposed" to thereby permit water collected within the casing to drain therefrom during the flushing cycle. Desirably, water within the housing 11 makes contact with the water treatment material 34 essentially only across its upper surface, this permitting the rate of dispersion of the water treatment material 34 to be effectively controlled.

In order to maintain the annular gap 17 between the housing 11 and the cartridge 15, the upper end of the casing 25 is provided with out-turned tabs 36 which engage the inner wall of the housing 11. This minimises the likelihood of blockages forming in the flow path between the housing wall 12 and the casing side wall, e.g. caused by build-up of particles from the material 34. Any other form of spacer means so as to centralise the cartridge within the housing may be employed.

In variation to the above embodiment, the tube or conduit 21 may be formed to have an horizontal leg portion which projects into the bottom region of the housing 11 and serves as a support member for the cartridge 15 (in lieu of the ring 30). The horizontal leg portion is preferably formed with holes in its wall to assist water flow into the tube.

In another variation, the chamber 14 for receiving the cartridge 15 can be separated from the walls defining the reservoir 31, whilst in yet a further variation, the tube 21 can be formed as an integral part of the wall of the housing (so as to define a passageway) rather than as a separate element.

A brief consideration of the above-described embodiment will indicate that the invention provides for an extremely simple yet very effective toilet cistern dispensing device which allows the water treatment material contained therewithin to be efficiently consumed in a way which greatly extends the working life of the dispensing device (for a given amount of material) and which allows a replacement cartridge to be fitted easily and quickly, without having to remove the container or housing for the cartridge from the cistern.

Claims

1. A passive dispensing device for use in dosing a toilet bowl with water treatment material comprising:

a housing forming a chamber which is adapted to hold water treatment material means,

reservoir means within the housing for holding a reservoir of watercontaining said water treatment material,

water flow path means between the chamber and said reservoir means,

water flow passageway means extending upwardly away from said reservoirs means, said passageway means having its lower end in communication with said reservoir means at or adjacent its bottom wall, and its open upper end in flow communication with the cistern interior, said upper end being located below the upper edge of the housing (and below the level of the water within the cistern when full),

- whereby water, during the filling of the cistern will flow into the reservoir means upwardly along said water flow path means and into the chamber, via said passageway means, whilst, when the cistern is flushed, a portion only of the water within the device (and containing said water treatment material) will be discharged into the cistern via said passageway means.
2. A dispensing device according to claim 1 comprising support means for supporting said water treatment material means above the bottom wall of the housing, the space formed between the water treatment material means and said housing bottom wall constituting said reservoir means.
 3. A dispensing device according to claim 2 wherein said water treatment material means comprises a removable cartridge having an outer wall which, when the cartridge is positioned in the chamber, is spaced from the chamber wall so as to form said water flow path means which extends uninterruptedly around the cartridge, there being apertures in the outer wall of the cartridge to permit water to flow upwardly through said water flow path into the cartridge to mix with water treatment material contained therewithin and subsequently drained therefrom during flushing of the cistern.
 4. A dispensing device according to claim 3 wherein both the housing and the cartridge comprise cylindrical tubes, said passage formed therebetween being annular in shape.
 5. A dispensing device according to claim 3 wherein said cartridge is formed of water impervious material, said apertures being arranged in vertically spaced circumferential rows along the length thereof.
 6. A dispensing device according to any one of claims 3 to 5 comprising spacer means between said cartridge and said housing for centrally locating said cartridge within the housing.
 7. A dispensing device according to any one of the preceding claim wherein said passageway means extends upwardly by a distance which is slightly less than half the overall height of the housing.
 8. A dispensing device according to any one of the preceding claims wherein said passageway means comprises a discharge tube which extends approximately parallel to the side wall of the housing exteriorly thereof and in contiguous relation therewith, the lower end of said tube connecting to said reservoir means via an opening in the side wall of the housing.
 9. A dispensing device according to any one of the preceding claims wherein said housing comprises hanger means for attaching the device to a side wall of the toilet cistern.
 10. A dispensing device according to any one of claims 3 to 9 wherein said cartridge comprises an upstanding tab projecting from its upper edge which can be manually grasped to remove the cartridge from the housing when the water treatment material is fully consumed.
 11. A dispensing device according to claim 2 wherein said support means comprises a locating ring fixed to the bottom wall of the housing, centrally thereof, the side wall of said ring being provided with openings around its lower edge to assist water flow through said reservoir means.
 12. A dispensing device according to any one of the preceding claims wherein said passageway means has a diameter which is small relative to the diameter of said housing.
 13. A dispensing device according to any one of the preceding claims wherein said passageway means is located externally of the housing.
 14. A passive dispensing device substantially as hereinbefore described with reference to and as illustrated in Figs. 1 to 4 of the drawings herein.

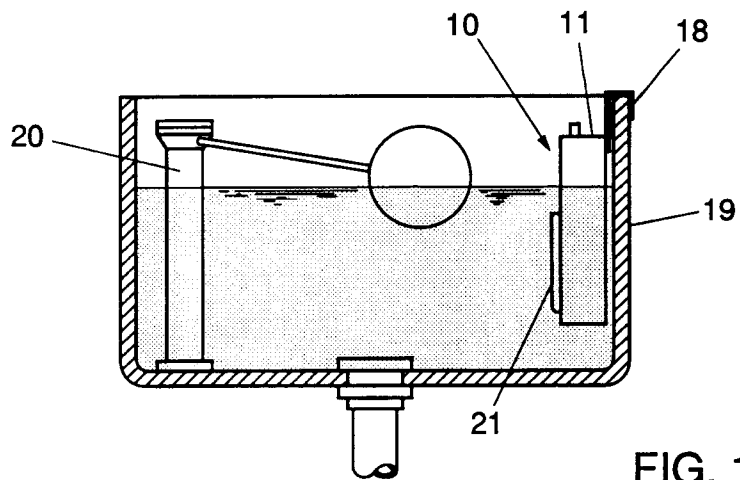


FIG. 1

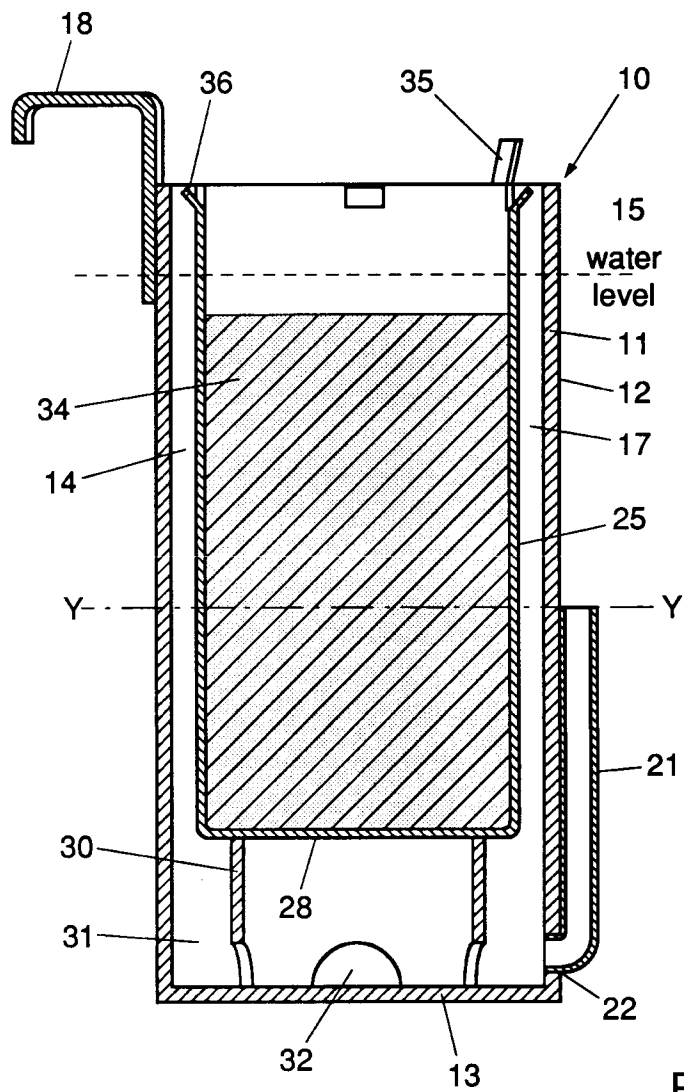
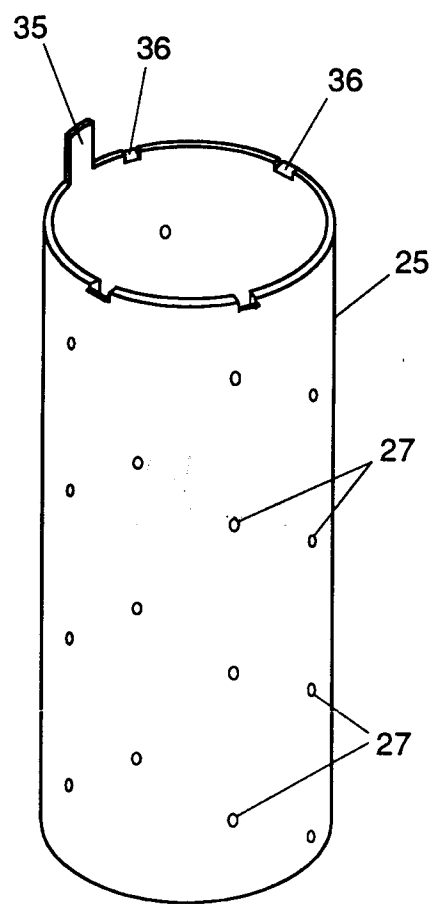
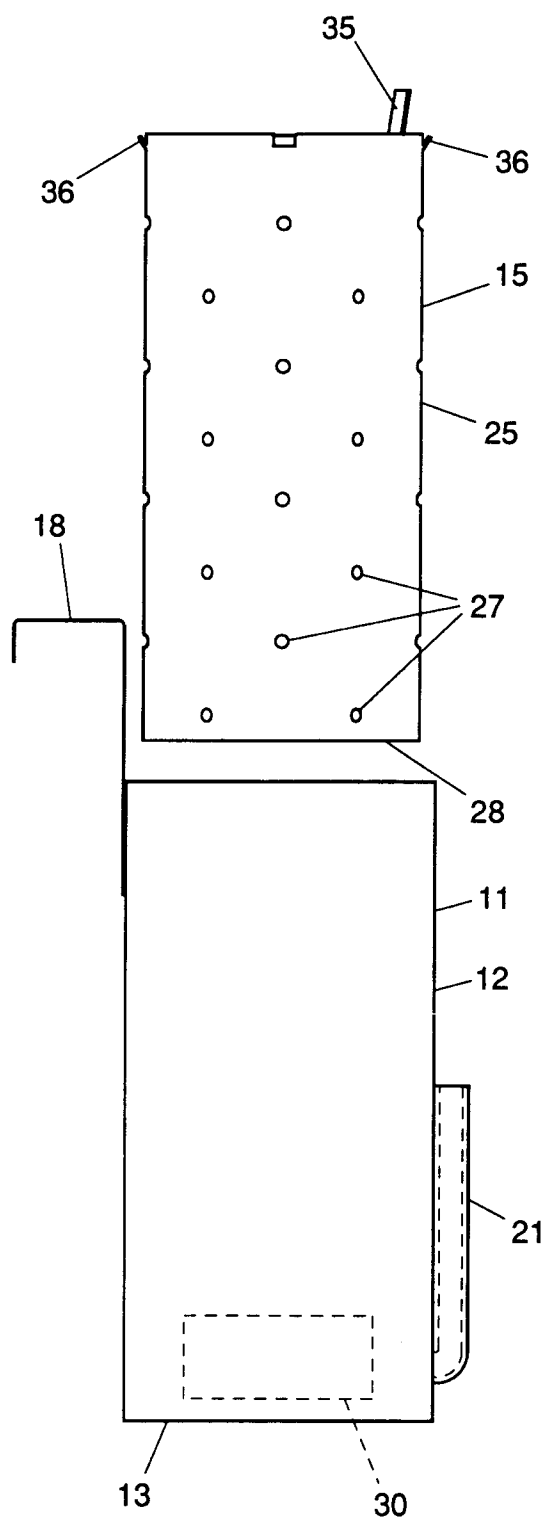


FIG. 2





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EUROPEAN SEARCH REPORT

Application Number

EP 91 20 1164

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
Y	EP-A-0 168 075 (THE PROCTER & GAMBLE CO.) * page 7, line 3 - page 9, line 13; claim 1; figures 1-8 *	1,2,8,9, 12,13,14	E03D9/02
A	---	3	
Y	GB-A-2 098 253 (L' OREAL) * page 5, line 5 - line 33; figure 9 *	1,2,9	
Y	EP-A-0 140 692 (UNILEVER) * page 7, line 34 - page 8, line 26 * * page 9, line 16 - page 10, line 17; figures 1-5 *	1,8,12, 13,14	
A	GB-A-2 067 409 (TWINOAK PRODUCTS) * page 1, line 109 - page 2, line 43; figure 3 *	3,4,5	
A	EP-A-0 180 451 (BROOKLINE DELTA) * page 6, line 24 - line 26; figure 4 *	6	
A	FR-A-2 589 498 (L' OREAL) * page 13, line 31 - page 15, line 34; figure 2 *	1,7,8,9, 12,13,14	TECHNICAL FIELDS SEARCHED (Int. Cl.5)
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The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 13 JANUARY 1992	Examiner KRIEKOUKIS S.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		F : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application I : document cited for other reasons ----- & : member of the same patent family, corresponding document	