

**A WATER CLOSET SYSTEM AND ASSOCIATED METHOD OF RECYCLING
WATER**

Field of the Invention

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The present invention relates to a water closet system and to an associated method of recycling water in the water closet system.

10 Background of the Invention

The present invention arises from Applicant's desire to conserve water and promote the recycling of water.

15 Summary of the Invention

According to one aspect there is provided a water closet system comprising:

20 a toilet having a pan and a cistern for holding a supply of water to flush the pan; and,

a wash basin formed separately of the cistern, the wash basin provided with a drain at the base of the basin and a conduit providing fluid connection between the basin and the cistern, wherein water from the wash basin drains
25 into the cistern.

The wash bowl may be positioned relative to the cistern to create a height differential between the drain and a top surface of the cistern.

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The height differential may be at least 10-15 cm.

While the basin may be fitted with a standard tap, in an alternate embodiment, the wash basin may be provided with
35 a timed or otherwise self closing tap wherein the tap automatically shuts OFF after a predetermined period from being turned ON.



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The predetermined period may be adjustable.

In one example the predetermined period is no more than
5 say 10-15 seconds.

However in one alternate example, the predetermined period
is less than 10 seconds, and in a further alternative the
period may be less than 6 seconds.
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The wash basin may be mounted at a location laterally
offset from the cistern or the pan. In this instance the
height differential may be at least 10-15 cm.

15 The conduit may be made of a flexible material.

A hole may be formed in the cistern through which the
conduit passes.

20 A second aspect provides a method of recycling water, the
method comprising:

providing a water closet having a pan and a cistern
for holding a supply of water to flush the pan;

installing a wash basin in the vicinity of, and
25 spaced from, the cistern; and,

plumbing a drain of the wash basin to the cistern;

wherein water from the wash basin drains into the
cistern to form at least a portion of the supply of water.

30 Installing the wash basin may comprise installing the wash
basin at a position relative to the cistern to create a
height differential between the drain and a top surface of
the cistern.

35 The height differential may be at least 10-15cm.

Plumbing the drain may comprise forming a hole in the

cistern and connecting a conduit between the drain and the hole.

Connecting a conduit may comprise connecting a flexible
5 conduit.

Installing the wash basin may comprise installing the wash basin at a location that is laterally offset from the cistern or pan.

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The method may further comprise providing the wash basin with a standard tap or self closing tap; in the latter, the tap automatically turns OFF within a predetermined time period from being turn ON.

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A third aspect provides a method of modifying a building having an existing water closet and a wash basin to facilitate reuse of waste water from the wash basin, wherein the water closet has a pan and a cistern for
20 holding a supply of water to flush the pan, and the wash basin has a tap and a drain, the method comprising:

determining whether the drain of the wash basin is disposed higher than a top surface of the cistern, and in the event that the drain is higher, plumbing the drain to
25 the cistern wherein waste water from the wash basin drains into the cistern, and in the event that the wash basin is not higher, repositioning the wash basin to a position where a drain of the wash basin is higher than the cistern, and plumbing the drain to the cistern.

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The method may further comprise determining whether the cistern incorporates a siphon with an integrated overflow pipe, and in the event that it does not, replacing the siphon with a siphon having an integrated overflow pipe.

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Brief Description of the Drawings

An embodiment of the present invention will now be described by way of example only with reference to the accompanying figures in which:

- 5 Figure 1 is a photographic representation of one embodiment of the water closet system in accordance with the present invention;
Figure 2 is an enlargement of a portion of Figure 1 depicting a wash basin and cistern incorporated in the
10 water closet system; and,
Figure 3 is a schematic representation from the side of the wash basin and cistern depicted in Figures 1 and 2.

Detailed Description of Preferred Embodiment

- 15 With reference to the accompanying drawings, an embodiment of the water closet system 10 in accordance with the present invention comprises a water closet or toilet 12 having a pan 14 and a cistern 16 for holding a supply of
20 water for flushing the pan; and, a wash basin 18 that is formed separately from the cistern 16. The wash basin 18 is provided with a drain 20 at its base and a conduit 22 providing fluid connection between the wash basin 18 and the cistern 16. Thus waste water from the wash basin 18
25 can drain into the cistern 16 forming part of the water supply for flushing the pan 14.

- The wash basin 18 is disposed relative to the cistern 16 to create a height differential H1 between the drain 20
30 and a top surface or lid 24 of the cistern 16.

- It is believed that a height differential H1 of at least 10-15 cm will provide a more than adequate flow rate of waste water from the wash basin 18 into the cistern 16.
35 For example in embodiments where say the basin 18 is positioned directly above the cistern 16 the height H1 may be at least 10-15 cm which will also provide more than

enough clearance for installation of the conduit 22 and a user to access an operating button on the lid 24 of the cistern. In embodiments where the wash basin 18 may be laterally offset from the cistern the height H1 need only
5 be sufficient to provide a predetermined flow rate to the cistern as access to the operating button is facilitated by the lateral offset. Again in this even a height H1 of say at least 10-15 cm may be adequate.

10 While there is no maximum preferred height H1, the height H1 will be dictated to a large extent by the requirement to place the wash basin 18 at a height at which a person of ordinary height can comfortably use the wash basin 18 for washing his hands while in a standing position.

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The wash basin 18 may be fitted with a standard tap 28 to control water flow into the basin. However in an alternate embodiment, to minimise the risk of overflowing of the cistern 16, and to assist in conserving of water, the wash
20 basin 18 may be provided with a timed or otherwise self closing tap 28. The self closing tap 28 is configured to automatically turn itself OFF within a predetermined time period from being turned ON. For example, the tap 28 may be configured to automatically turn itself off within say
25 10-15 seconds of being turned on. However this time period may be adjusted to shorter durations, for example less than 10 seconds, or less than 8 seconds or less than 4 seconds. In addition, the tap 28 may be configured to maintain itself ON for a set minimum period for example at
30 least 2 seconds or at least 3 seconds or at least 4 seconds but where the minimum period does not exceed the maximum period.

The conduit 22 may be made from a flexible material. For
35 example, the conduit 22 may be in the form of a soft PVC tube or pipe. However in an alternate embodiment, the conduit 22 may be made from different materials or

provided in different forms for example in the form of a rigid copper or stainless steel pipe, a rigid plastics material; or a flexible metallic hose.

5 In order to plumb the wash basin 18 to the cistern 16, a hole 30 is drilled, cut or otherwise formed in the lid 24 of the cistern 16. The conduit 22 passes through the hole 30 and can be fixed and sealed by various arrangements. For example, the hole 30 may be formed of a diameter
10 slightly larger than the diameter of the conduit 22, and a settable sealing compound used to seal and attach the hose 22 to the hole 30 and lid 24.

In an alternate arrangement, hose couplings or fittings
15 may be fixed to the lid 24 and/or through the hole 30 to couple the conduit 22 to the cistern 16.

While in the depicted figures, the wash basin 18 is shown as being located directly above the cistern 16, this is
20 not an essential or required feature. Indeed, it may be more convenient for the wash basin 18 to be laterally offset from the cistern 16 so that people using the wash basin 18 are not required to lean or reach over the toilet 12 to access and use the wash basin 18. This may also
25 provide more convenient access to the operating button or lever located on the lid 24 of the cistern.

A typical use sequence of the water closet system 10 is as follows. A user will operate the cistern 16 using an
30 existing button or lever or other mechanism to flush the pan 14. Once this occurs, a mains (or other) supply for the cistern 16 commences to refill the cistern 16 in the normal manner. Meanwhile, the user may operate the tap 28 of the wash basin 18 to wash his hands. The waste water
35 from the wash basin 18 flows through the drain 20 and hose 22 into the cistern 16 thereby adding to the water in the cistern 16. Thus the cistern 16 is filled by a

combination of the waste water from the wash basin 18 and the mains supply. Having regard to normal refilling rates for a cistern, and the time typically taken for a person to wash his hands, the washing process will be completed
5 well before the water level 26 in the cistern 16 reaches a preset maximum water level at which time internal valves or other mechanisms in the cistern 16 shut off the flow of water into the cistern 16 from the mains supply. Accordingly the water supply in the cistern 16 for the
10 next flush comprises a combination of waste water from the wash basin 18 and the water from the mains supply.

When the cistern 16 is being filled it will fill to a predetermined maximum water level 26 which is usually set
15 by a float forming part of the flushing mechanism and siphon of the cistern 16. Some cisterns are provided with an external overflow pipe 32 which, in the event of a failure of the float to shut off water supplied to the cistern, diverts water above the level 26 into an external
20 drain. As an alternative to reliance on the external overflow pipe, and to provide a further overflow prevention mechanism, an embodiment of the system 10 may incorporate a siphon with an integrated overflow pipe 31. The overflow pipe 31 has an upper end 33 raised above the
25 water level 26 but below the lid 24. In the event that water within the cistern 16 rises above the upper end 33 of the overflow pipe 31 the overflow water is diverted through the siphon to the pan 14.

30 Modifications and variations to the above embodiments that would be obvious to a person of ordinary skill in the art are deemed to be within the scope of the present invention the nature of which is to be determined from the above description and the appended claims.

Claims

1. A water closet system comprising:
a toilet having a pan and a cistern for holding a
supply of water to flush the pan; and,
a wash basin formed separately of the cistern, the
wash basin provided with a drain and a conduit providing
fluid connection between the wash basin and the cistern,
wherein water from the wash basin drains into the cistern.
2. The water closet system according to claim 1 wherein
the wash basin is positioned relative to the cistern to
create a height differential between the drain and a top
surface of the cistern.
3. The water closet system according to claim 2 wherein
the height differential is at least 10-15 cm.
4. The water closet system according to any one of
claims 1 - 3 wherein the wash basin is provided with a
standard tap or a timed self closing tap, and in the
latter, the tap automatically shuts OFF after a
predetermined period from being turned ON.
5. The water closet system according to claim 4 wherein
the predetermined period is adjustable.
6. The water closet system according to claim 4 or 5
wherein the predetermined period is no more than 15
seconds.
7. The water closet system according to any one of
claims 4 - 6 wherein the predetermined period is no more
than 10 seconds.
8. The water closet system according to any one of
claims 1 - 7 wherein the wash basin is mounted at a

location laterally offset from the cistern or the pan.

9. The water closet system according to any one of
claims 1 - 8 wherein the conduit is made of a flexible
5 material.

10. The water closet system according to any one of
claims 1 - 9 wherein a hole is formed in the cistern
through which the conduit passes.

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11. A method of recycling water, the method comprising:
providing a water closet having a pan and a cistern
for holding a supply of water to flush the pan;
installing a wash basin in the vicinity of, and
15 spaced from, the cistern; and,
plumbing a drain of the wash basin to the cistern;
wherein water from the wash basin drains into the
cistern to form at least a portion of the supply of water.

20 12. The method according to claim 11 wherein installing
the wash basin comprises installing the wash basin at a
position relative to the cistern to create a height
differential between the drain and a top surface of the
cistern.

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13. The method according to claim 11 wherein the wash
basin is installed at a position when the height
differential is at least 10-15 cm.

30 14. The method according to any one of claims 11 - 13
wherein plumbing the drain comprises forming a hole in the
cistern and connecting a conduit between the drain and the
hole.

35 15. The method according to claim 14 wherein connecting a
conduit comprises connecting a flexible conduit.

16. The method according to any one of claims 11 - 15 wherein installing the wash basin comprises installing the wash basin at a location that is laterally offset from the cistern or pan.

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17. The method according to any one of claims 11 - 16 further comprising providing the wash basin with a standard tap or a timed or otherwise self closing tap, and in the latter, the tap automatically turns OFF within a predetermined time period from being turn ON.

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18. A method of modifying an existing water closet and a wash basin to facilitate reuse of waste water from the wash basin, wherein the water closet has a pan and a cistern for holding a supply of water to flush the pan, and the wash basin has a tap and a drain, the method comprising:

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determining whether the drain of the wash basin is disposed higher than a top surface of the cistern, and in the event that the drain is higher, plumbing the drain to the cistern wherein waste water from the wash basin drains into the cistern, and in the event that the wash basin is not higher, repositioning the wash basin to a position where a drain of the wash basin is higher than the cistern, and plumbing the drain to the cistern.

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19. The method according to claim 18 further comprising determining whether the tap is a standard tap or a timed or otherwise self closing tap, and in the event that it is not, replacing the standard tap with a self closing tap, if preferred.

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20. The method according to claim 18 or 19 comprising determining whether the cistern incorporates a siphon with an integrated overflow pipe, and in the event that it does not, replacing the siphon with a siphon having an integrated overflow pipe.

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