

Water Heating Jugs

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The present invention relates to portable electrical water heating jugs.

It is well known that when hard water is heated in an electric kettle, for example, scale forms on the heating element and also on the walls of the heating vessel itself. We have found, however, that particularly when boiling water in plastics vessels, scale is not so likely to form on the walls of the vessel, and there is an increased tendency for scum to form which floats on the surface of the water in the vessel. When the vessel is tipped to pour its contents, this scum will very likely be poured from the vessel with the water, particularly, if as is traditional with plastics jugs, the pouring spout is arranged in an upper part of the vessel wall.

The present invention seeks to overcome this problem and provides an electric water heating jug formed of plastic and having an immersion heater arranged in the base of the interior of the jug, and a pouring spout communicating with the interior of the jug via an opening arranged in a lower portion of the jug so that pouring takes place only via such opening in normal use, said opening being defined by means of an internal wall extending downwardly from adjacent the spout into the jug and across a portion of the outer jug wall at a spacing therefrom.

Thus water poured from the jug is taken from the lower part thereof rather than from the surface of the water in the jug, so that the scum remains with the residual water in the jug. Preferably the opening is located wholly within the lower third of the height of the jug. In preferred

arrangements, the opening may be defined adjacent the base of the jug.

5 The opening is defined by means of an internal wall extending downwardly into the jug and across a portion of the outer jug wall at a spacing therefrom. Preferably the internal wall should be arranged in relation to the outer jug wall such that the volume defined therebetween is not too great. This is desirable since such volume of liquid may not be
10 directly heated by the heating element, but rather only by convection, through the opening. Typically the wall may extend into the vessel by around 25% of the jug radius.

The opening could be defined between a bottom edge
15 of the internal wall and the base of the jug. In another arrangement the opening is defined within a lower part of the internal wall.

Preferably, the upper part of the internal wall extends substantially across the pouring spout to define
20 a rear wall of the spout.

To substantially prevent liquid being reaching to the pouring spout over the top of the internal wall, and also to help prevent boiling water liquid splattering out via the pouring spout which is arranged at an upper
25 part of the jug wall, the internal wall preferably extends substantially to the top of the jug.

Further, the upper edge of the internal wall may co-operate with a lid of the jug to provide a seal in this region. This has the effect that steam produced
30 when water in the jug boils cannot easily escape out of the pouring spout. The steam pressure in the space above the water level therefore builds up more quickly. This is advantageous in automatic appliances which have a steam sensitive control which switches the appliance
35 off when water in the jug boils, in that steam will be supplied to the control more quickly and thus result in a quicker operation of the control.

The size of the opening may be chosen so as to give a satisfactory pouring rate. Typically it may extend substantially across the width of the pouring spout and have a height of from $\frac{1}{4}$ to $\frac{1}{2}$ of the jug height.

5 However, smaller openings are possible. For example, in a jug of normal size, an opening may be provided extending across the width of the spout and having a height of about 5 to 20mm, preferably about 10mm to 15. Conveniently this may, as mentioned above, be provided
10 between a bottom edge of the internal wall and the base of the jug.

Other forms of opening are possible, for example a number of for example circular apertures provided in a lower part of the internal wall.

15 Depending on the amount of water poured from the jug, it is possible that the water surface may drop to the level of the opening. To prevent scum being poured from the spout in such a case, the opening is preferably provided with filter means to filter out the scum. This
20 will also act to stop scale which may have flaked off the heating element from being poured from the jug.

The filter means may comprise a metal mesh, for example a stainless steel mesh, having a mesh size of the order of for example, 150 μ m. For ease of
25 manufacture, the filter is preferably insert moulded into the internal wall at the time of the latter's production.

Preferably the internal wall is removably located in the jug so that, if necessary, it may be removed for
30 cleaning of the filter. In a preferred embodiment, ribs are provided on an internal surface of the jug wall, the internal wall being slidably located between the ribs. The ribs need not extend over the whole height of the jug.

35 The use of a filter means associated with the pouring spout represents a new departure in the field of household water heating jugs and provides special

advantages therein. Such an arrangement forms the subject of British Patent Application 2268680 divided herefrom.

5 A preferred embodiment of the invention will now be described, by way of example only, with reference to the accompanying drawings in which:

Fig. 1 shows a schematic part section of a hot water jug embodying the invention,

10 Fig. 2 is a partial top view of the jug of Fig. 1 with the lid removed;

Fig. 3 shows a front view of the internal wall member shown in Figs. 1 and 2;

Fig. 4 shows schematically insertion of the wall member of Fig. 3 into the jug; and

15 Fig. 5 shows a front view of an alternative internal wall member which may be used in accordance with the invention.

Referring first to Figs. 1 and 2, a hot water jug 1 comprises a plastics body 2 for example of polypropylene or acetal and a lid 3. An immersion heater element (not shown) is arranged in the lower part of the interior space 4 of the jug and supplied with power via the plug connector 14. The side wall 13 of the jug body 2 is formed at its upper part with a pouring spout 5, and is also formed on either side of the spout 5 with ribs 6 projecting into the jug. The ribs 6 extend substantially to the bottom of the jug 1. A steam sensitive boiling control 15 of known type is provided at an upper part of the jug body and is in fluid communication with the interior space 4 of the jug.

30 The jug 1 is also provided with an internal wall member 7 which is slidably and removably received between the ribs 6 as shown schematically in Fig. 4. When in position, the wall member 7 extends over substantially the whole height of the jug body 2 at a spacing of approximately 25% of the jug radius from the side wall 13 of the jug. The lower edge 8 of the member

7 abuts the bottom wall 9 of the jug body 2, while its upper edge 10 cooperates with the lid 3.

5 The internal wall member 7 is provided at its lower end with an opening 11, in which is arranged a stainless steel mesh 12, having a mesh size of 150 μ m. The internal wall member 7 is of plastics material, for example acetal or polypropylene, and the mesh 12 is insert moulded into the internal wall member 7 at its time of manufacture.

10 The jug 1 may be filled either by removing the lid 3, or by leaving the lid 3 in place and filling through the pouring spout 5. The arrangement of the internal wall 7 across the inside of the spout 5 allows for smooth and efficient filling of the jug through the
15 spout 5. In conventional jugs, the lid is formed with a depending baffle which extends into the spout. This, however may make filling the jug more difficult and also results in uneven pouring.

When the jug 1 has been filled, for example to the
20 level L, it may be switched on and the water will eventually boil. Steam will be formed in the space above the water surface, and cannot easily escape through the pouring spout 5, due to the interposition of the internal wall 7 and its cooperation with the lid 3.

25 Accordingly, steam will instead be supplied under increased pressure to the steam sensitive control 15 which will, therefore operate quickly. It will also be apparent that the wall 7 will substantially prevent boiling water splashing out of the pouring spout 5 from
30 the water surface L. The water in the interior space 4 of the vessel and heated by the immersion heater is prevented from directly bubbling out of the spout, while the liquid contained between the internal wall 7 and the side wall 13 of the jug body 2 will not be subject to a
35 violent boiling since it is not directly heated by the immersion heater. Thus, compared to known jugs which must leave a certain spacing above the maximum water

level to prevent ejection of boiling water from the spout a jug as described above in accordance with the invention may be filled fuller and thus for a given nominal volume, safely hold more water. It is estimated
5 that for the same body size the capacity of a nominal 1.3 litre jug could be increased in this way to 1.5 litre.

As mentioned above, scum may form on the water surface L when the water boils. By virtue of having the
10 opening 11 at the lower part of the wall member 7, water poured from the spout 5 will be taken from the bottom of the interior space 4 of the jug rather than from its surface, so leaving the scum in the jug. Should a
15 substantial amount of water be poured from the jug, it is possible that the water level will fall to the opening 11. In such case, the scum will be filtered out, being deposited on the mesh 11, which will also prevent detached scale from reaching the pouring spout 5.

20 In the event that the mesh becomes blocked by accumulation of scale, the wall member 7 can be removed and the mesh 11 cleaned and descaled using a proprietary cleaner for example, after which it may be replaced.

Fig. 5 shows a second form of internal wall member
25 usable in accordance with the invention.

In this construction, an opening 16 is formed in the bottom edge of the wall member 7. It extends substantially across the width of the spout 5 of the jug and has a depth of about 10-15mm. The opening 16 is
30 bounded laterally by legs 17 which, in use about the base of the jug so as to define a water flow path with the base of the jug. Thus, as in the earlier embodiment, water is taken from a lower part of the jug when pouring, so leaving the scum in the jug.

35 The one large opening 16 may, if desired, be replaced by a number of smaller apertures.



CLAIMS

1. An electric water heating jug formed of plastic and having an immersion heater arranged in the base of the interior of the jug, and a pouring spout communicating with the interior of the jug via an opening arranged in a lower portion of the jug so that pouring takes place only via such opening in normal use, said opening being defined by means of an internal wall extending downwardly from adjacent the spout into the jug and across a portion of the outer jug wall at a spacing therefrom.
2. An electric water heating jug as claimed in claim 1 wherein said opening is located within the bottom third of the height of the jug.
3. An electric water heating jug as claimed in any preceding claim wherein the wall extends into the jug by around 25% of the jug radius.
4. An electric water heating jug as claimed in any preceding claim wherein said opening is defined between a bottom edge of the internal wall and the base of the jug.
5. An electric water heating jug as claimed in any of claims 1 to 4 wherein said opening is defined within a lower part of the internal wall.
6. An electric water heating jug as claimed in any preceding claim wherein the upper part of the internal wall extends substantially across the pouring spout to define a rear wall of the spout.
7. An electric water heating jug as claimed in any preceding claim wherein the internal wall extends substantially to the top of the jug.
8. An electric water heating jug as claimed in claim 7 wherein the upper edge of the internal wall co-operates with a lid of the jug.
9. An electric water heating jug as claimed in any preceding claim wherein said internal wall is removably



located in the jug.

10. An electric water heating jug as claimed in claim 9 wherein ribs ~~are~~ provided on an internal surface of the jug wall, the internal wall being slidably located between the ribs.

11. An electric water heating jug as claimed in any preceding claim wherein said opening is provided with filter means.

12. An electric water heating jug as claimed in claim 11 wherein said filter means comprises a metal mesh.

13. An electric water heating jug substantially as hereinbefore described with reference to the accompanying drawings.
