

### Water Heating Jugs

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 viewed from one aspect provides an electrically heated plastics water heating jug of the type comprising an electric heater and a steam sensitive control which in use switches the heater off when water in the jug boils, the jug having a pouring spout communicating with the jug interior via a filter means adapted to remove surface scum from the water during pouring, the filter means being supported by a plurality of substantially vertical ribs.

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 in that the surface scum is filtered out as water is poured from the jug.

The filter means is preferably removable for cleaning purposes e.g. by being formed in a removable baffle. The filter means is preferably provided in an

opening communicating the spout with the jug interior and may be provided adjacent the base of 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  $\mu\text{m}$ . For ease of manufacture, the filter is preferably insert moulded into the baffle at the time of the latter's production.

In a preferred embodiment, the ribs are provided on an internal surface of the jug wall, the baffle being slidably located between the ribs. The ribs need not extend over the whole height of the jug.

In one embodiment, the filter means is arranged in an opening arranged in a lower portion of the vessel so that pouring takes place only via such opening in normal use. This arrangement forms the subject of UK patent application No. 2261362 from which this application is divided.

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 half and advantageously the lower third of the height of the jug. The "opening" as defined herein may be formed by one or a plurality of apertures in a side wall portion of the jug.

The preferred form of baffle comprises 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 directly heated by the heating element. Typically the wall may extend into the jug by around 25% of the jug radius.

Preferably, the upper part of the internal wall extends substantially across the pouring spout to define

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 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 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 jugs which have a steam sensitive control which switches the appliance 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.

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,

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

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.

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.

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  $\mu\text{m}$ . 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.

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 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 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.

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 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 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 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 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 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.

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 usable in accordance with the invention (shown omitting the filter mesh).

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 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.

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



CLAIMS

1. An electrically heated plastics water heating jug of the type comprising an electric heater and a steam sensitive control which in use switches the heater off when water in the jug boils, the jug having a pouring spout communicating with the jug interior via a filter means adapted to remove surface scum from the water during pouring, the filter means being supported by a plurality of substantially vertical ribs.
2. A water heating jug as claimed in claim 1, wherein the filter means is removable from the jug.
3. A water heating jug as claimed in claim 2, wherein the filter means forms part of a baffle which is removable from the jug.
4. A water heating jug as claimed in any preceding claim, wherein the ribs are provided on an internal wall of the jug.
5. A water heating jug as claimed in claims 3 and 4 in which the baffle is slidably located between the ribs.
6. A water heating jug as claimed in claim 5, wherein the baffle defines an internal wall extending downwardly into the jug and across a portion of the outer jug wall at a spacing therefrom.
7. A water heating jug as claimed in claim 6, wherein the wall extends into the jug by around 25% of the jug radius.
8. A water heating jug as claimed in claim 6 or 7, wherein the upper part of the internal wall extends substantially across the pouring spout to define a rear



wall of the spout.

9. A water heating jug as claimed in any of claims 6 to 8, wherein the internal wall extends substantially to the top of the jug.

10. A water heating jug as claimed in any of claims 6 to 9, wherein the upper edge of the internal wall co-operates with a lid of the jug.

11. A water heating jug as claimed in any preceding claim, wherein said filter means comprises a metal mesh.

12. An electrically heated plastics water heating jug of the type comprising an electric heater and a steam sensitive control which in use switches the heater off when water in the jug boils, the jug having a pouring spout communicating with the jug interior via a filter means adapted to remove surface scum from the water during pouring, the filter means comprising a filter mesh mounted within an internal wall member of the jug, such wall member being removably supported within the jug by vertical ribs formed on the side wall of the jug either side of the pouring spout and projecting into the jug.

13. A water heating jug as claimed in claim 12 in which the internal wall member extends vertically and is slidably received between the ribs.

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