

Pressure Cooker

This invention relates to a pressure cooker.

5 Pressure cookers have, for many years, been used in domestic kitchens. They usually comprise a pot that has a lid which can be sealed to the pot in a pressure tight arrangement. The lid usually incorporates at least one safety valve. In use, the pot is placed on a cooker and
10 the contents heated to substantially increase the pressure within the pot. It has been discovered that when food is cooked at elevated pressures the cooking process take place much more quickly than would be the case at atmospheric pressure. Whilst the pot is sealed and is
15 specifically designed to operate at high pressures, there is always a need for an emergency release to ensure against explosion. Thus it is commonplace to provide a safety valve which is designed to release the internal pressure at a predetermined level. Occasionally, valves
20 of this kind become clogged by the contents of the pot which can result in a dangerous situation which, in a worst case scenario, results in explosion of the pot.

For the pot to operate satisfactorily, it is important
25 that the pressure within the pot is maintained at a certain level so that an appropriate cooking time can be calculated.

It is these issues that have brought about the present
30 invention.

According to the present invention there is provided a pressure cooker comprising a pot with a lid that can be sealed to the pot, the pot or lid including a pressure
35 release valve, wherein the pressure release valve is calibrated so that the pressure cooker operates at pressures between 300mmAQ and 400mmAQ.

Preferably, two pressure release valves are provided. In
a preferred embodiment one pressure release valve is a
poppet valve and the other valve is a ball valve. The
5 poppet valve is calibrated to commence opening at a
pressure of approximately 100mmAQ and the ball valve is
calibrated to first commence opening at a pressure of
approximately 200mmAQ. Both valves are calibrated to
maintain the pressure at between 300mmAQ and 400mmAQ.

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

15 Figure 1 is a perspective view of a pressure cooker in
accordance with an embodiment of the invention;

Figure 2 is a perspective view of the underside of the lid
of the pressure cooker;

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Figure 3 is a cross-sectional view through the lid of the
pressure cooker;

Figure 4 is an exploded partial perspective view
25 illustrating a poppet release valve;

Figure 5 is an exploded perspective view illustrating a
ball pressure release valve;

30 Figure 6 is a cross-sectional view of the ball valve;

Figure 7 is a cross-sectional view of the poppet valve;

Figure 8 is a perspective view of the pressure cooker in a
35 locked configuration;

Figure 9 is a cross-sectional view of one handle of the pressure cooker in an unlocked configuration;

Figure 10 is a cross-sectional view of the handle of the pressure cooker in the locked configuration; and

Figure 11 is a perspective exploded view of the componentry of the handle and locking means.

10 The pressure cooker 10 illustrated in the accompanying drawings essentially comprise a pot 1 which is usually made out of stainless steel or aluminium. The pot has a base, and a wall structure defining an enclosure into which foodstuffs can be placed for cooking. The pot 1 is
15 sealed by a lid 2 that has a viewing window in the form of a central domed cover 22 made of toughened, heat resistant glass which is secured to a pick up knob 23 that is central of the pot. The domed glass cover 22 is in sealed engagement and is supported within an annular aluminium
20 cover 5 which has a downwardly extending skirt 6 on its periphery which supports an annular silicon seal 25. On each side of the pot is a handle assembly 11 that includes a pressing member 12 which, as shown in Figure 8, can be slid into engagement with the top of the rim of the cover
25 5 to force the cover 5 into sealed engagement with an annular ledge 9 formed at the top of the pot 1. The annular silicon seal 25 completes the seal and ensures that, once the pot is in a sealed configuration, it can be pressurised by applying heat to the base of the pot 1.

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The annular cover 5 includes a first safety valve 4 in the form of a poppet valve 4 and a second safety valve 3 in the form of a ball valve 3. Both valves 3, 4 are located at spaced positions around the cover 5. The valves 3, 4
35 operate to control the pressure within the pot 1 and also as a safety feature to prevent excess pressure within the pot 1.

The ball valve 3 is shown in exploded view in Figure 5 and comprises a receptor 32 defining an annular shoulder 311 and an externally threaded spigot 313. An O-ring 314 sits on the annular shoulder and the spigot 313 extends through an aperture 315 in the aluminium cover 5 to screw into a cap 312 that has a central outlet 33 and diagonal cross groove 316. The aperture 315 in the wall of the cover defines a flat 317 that locates the receptor 32 in position and the cross groove 316 in the top of the cap 315 enables it to be screwed down against the receptor 32 to seal the valve 3 to the cover 5. A central aperture 34 is positioned at the base of the valve 3 and, at normal atmospheric pressure, a steel ball 35, through gravity, sits across this aperture 34 closing the valve. As the pressure increases, the internal pressure within the pot forces the ball 35 off the aperture 34 causing release of pressure through the outlet 33.

Figures 3 and 4 show the poppet valve 4 in both exploded and assembled view. The poppet valve 4 comprises a base receptor 411 which has a plurality of holes 46 around its periphery communicating with a central throughway 42 that is formed in an externally threaded spigot 416. The receptor 411 defines a shoulder 413 on which is located an O-ring 414 and the spigot 416 extends through an aperture 415 in the wall of the cover 5. A hollow cap 412 with an outlet aperture 43 and a variety of exit apertures 47 around its periphery is arranged to screw onto the threaded spigot 416 and a poppet valve member 452 sits in the throughway 42 in the receptor 411. The poppet valve member 452 has a base which supports an O-ring seal 451 and a stem 419 that extends through the outlet aperture 43, see Figure 3. At normal atmospheric pressure, the weight of the poppet valve member 452 is such that the O-ring seal 451 sits on the top of the threaded spigot 416 and prevents escape of pressure from the interior of the valve to the exit apertures 47. As the pressure

increases, the valve member 452 is pushed upwardly allowing pressure to escape past the O-ring 451 and through the exit apertures 47.

5 To close the lid and pressurise the cooker, the handles 11 which are positioned diagonally opposed on the pot 1 have pressing members 12 that can be slid from an open position shown in Figure 9 which allows the lid 2 to be removed, to a sealed position shown in Figure 10.

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As shown in Figures 9 to 11, each handle 11 comprises a moulded heat resistant plastics base 130 having a projecting lug 131 that is bolted to the outer wall of the pot body 1. The base 130 also defines a planar upper
15 surface 132 that contains a pair of parallel spaced apart dovetailed grooves 111 and a slot 112 with depressions 115, 116 at either end. The pressing member 12, which is also moulded in heat resistant plastics, has a pair of dovetailed downward projections 121 that locate to slide
20 within the grooves 111 of the handle base. A small steel ball 124 is urged by a spring 123 to seat in the depression 115 or 116 at either end of the slot 112 to hold the pressing member in position at either end of the slot. The pressing member accommodates a thumb rest
25 button 125 that can be slid forwardly and backwardly to release the ball 124 from the depression 115 or 116.

In the open position shown in Figure 9, the pressing member sits on the top of the surface of the handle 11 and
30 the ball 124 is pushed into the depression 115 in the surface of the handle base by the spring 123 thus holding the pressing member in the open position. To move the pressing member to the closed position shown in Figure 10 the thumb rest button 125 is pressed, releasing the ball
35 124 to allow the pressing member 12 to slide forwardly to the position shown in Figure 10 in which the ball 124 locates in the second depression 116 shown in Figures 9

and 11. Thus locking the handle 11 in the operative sealed position.

The valves in the pressure cooker have been specifically calibrated to ensure that the pressure cooker operates at low pressure, namely a pressure between 300mmAQ and 400mmAQ. Operating the pressure cooker at low pressures has a distinct advantage in that the pressure cooker can be opened without first releasing the pressure. In high pressure pressure cookers, it is usually not advisable to open the lid until the pressure has been released. The two valves 3, 4 have been specifically designed to operate at different pressures. The poppet valve 4 has been designed to first open when the pressure reaches 100mmAQ. This is known as the cracking pressure. Whilst some pressure is released, pressure within the pot continues to increase. When the pot reaches 200mmAQ the second valve, namely the ball valve 3, opens. The opening of both valves again has the effect of releasing pressure but does not prevent further pressure increase. Both valves continue to work until the pressure has reached 350mmAQ or, more precisely, $350\text{mmAQ} \pm 50\text{mmAQ}$. At that time, both valves open fully thereby releasing any excess pressure and ensuring that the pressure remains at $350\text{mmAQ} \pm 50\text{mmAQ}$. The operation of the valves are carefully calibrated to ensure that they first open at the cracking pressure and to maintain the operating pressure at $350\text{mmAQ} \pm 50\text{mmAQ}$. Thus both valves open progressively from a first cracking pressure to fully open pressure thereby preventing any further pressurisation of the pot. The ball valve 3 is less likely to become clogged by foodstuffs than the poppet valve 4 and the two valves operate in conjunction to provide the desired operating pressure whilst also preventing over pressurisation of the pot 1.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A pressure cooker comprising a pot with a lid that
can be sealed to the pot, the pot or lid including a
5 pressure release valve, wherein the pressure release valve
is calibrated to cause the pressure cooker to operate at
pressures between 300mmAQ and 400mmAQ.
2. The pressure cooker according to claim 1, wherein the
10 pressure cooker has two pressure release valves.
3. The pressure cooker according to claim 2, wherein one
pressure release valve is a poppet valve and the other
pressure release valve is a ball valve.
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4. The pressure cooker according to claim 3, wherein the
poppet valve is calibrated to commence opening at a
pressure of approximately 100mmAQ and the ball valve is
calibrated to commence opening at a pressure of
20 approximately 200mmAQ.
5. The pressure cooker according to either claims 3 or
4, wherein both valves are calibrated to maintain the
operating pressure between 300mmAQ and 400mmAQ.
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6. The pressure cooker according to any one of the
preceding claims, wherein the lid includes a viewing
window of heat resistant glass.
- 30 7. The pressure cooker according to claim 6, wherein the
lid comprises a central domed glass window that is
surrounded by an annular metal rim that is adapted to be
in sealed engagement with the upper surface of the pot,
the pressure release valve or valves being positioned in
35 the annular rim.

8. The pressure cooker according to any one of the preceding claims, wherein opposed sides of the pot are provided with handles, each handle including a pressing member that, in use, urges the lid into sealed engagement
5 with the pot.

9. The pressure cooker according to claim 8, wherein each handle comprises a base member moulded in heat resistant plastics and adapted to be attached to the wall
10 of the pot and the pressing member is secured to the base member to be displaceable relative to the base member from an inoperative position where the pressing member is clear of the lid and an operative position where the pressing member engages the lid and presses the lid into contact
15 with the pot.

10. The pressure cooker according to claim 9 wherein the pressing member has at least one projection that is adapted to slide in a corresponding groove in the base
20 member to facilitate the relative motion between the pressing member and the base member.

11. The pressure cooker according to claim 9, wherein the handle includes a spring loaded detent which, in use,
25 holds the pressing member in either the operative or inoperative position.

12. The pressure cooker according to claim 11, wherein the handle includes means to release the detent.
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13. A pressure cooker comprising a pot with a lid that can be sealed to the pot, handles attached to both sides of the pot wherein each handle includes a pressing member that, in use, urges the lid into sealed engagement with
35 the pot.

14. The pressure according to claim 13 wherein each
handle comprises a base supporting the pressing member so
that each pressing member is displaceable relative to the
base from an open position allowing removal of the lid to
5 a closed position in which the pressing member urges the
lid into sealed engagement with the pot.