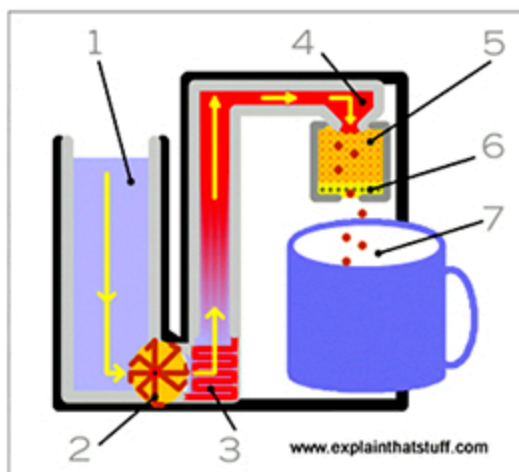


How coffee pod machines work

Greatly simplified, this is what happens inside a typical pod machine:

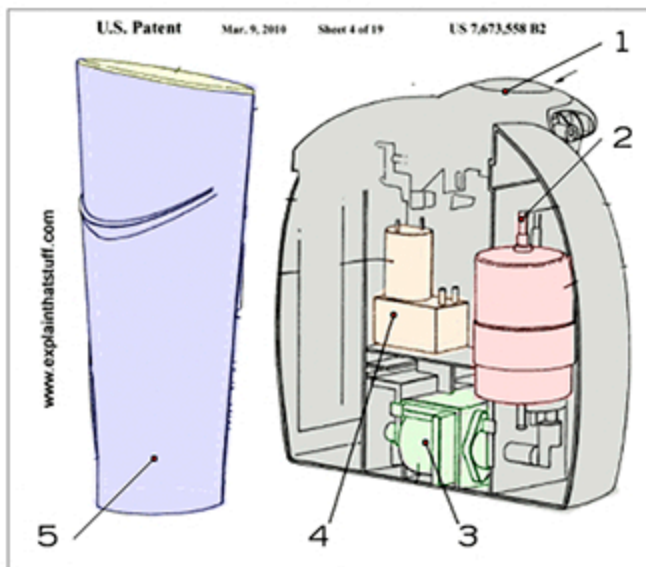
1. You load **water** into the tank at the back.
2. A **pump** at the bottom sucks the water in and pumps it through the machine.
3. The water heats up to the perfect temperature as it flows up past the **heating element**.
4. The water is pumped through a narrow needle to increase its pressure.
5. The hot, high-pressure water pumps through the ground coffee in the pod, releasing the flavor. In the Tassimo, the water pumps up and into the pod through a narrow hole at the edge, then drips back down again through a bigger hole in the center.
6. A piece of filter paper at the bottom of the pod stops the coffee grounds from falling through into the coffee.
7. Coffee drips through into your cup.



What do they look like inside?

Unfortunately, I don't have any photos showing the internals of a real pod coffee maker—but I do have the next best thing: one of the original design drawings filed for the Tassimo coffee maker, from the original US patent application filed by Kraft Foods in 2005:

1. **Outer case:** This is made from tough ABS plastic and designed as a two-part clam-shell so the inside parts can be fitted together easily.
2. **Water heater:** In the original design, this is a 1550-watt heater (compared to the 2000–3000 watt **heating elements** in typical electric kettles). It can heat enough water to make a coffee from about 20°C to about 85°C (70°F to 185°F) in under a minute.
3. **Water pump:** This powerful pump can move almost a liter of water in a minute; in practice, it doesn't need to move anything like so much to make a single cup of coffee. Its job is to move the water from the (blue) tank at the back into the (red) water heater and then through the coffee pod. It works at a pressure of 1–2 bars (roughly 1–2 times normal atmospheric pressure). That might sound a lot, but it's *considerably* lower pressure than in a typical espresso machine, which works at more like **8–15 times atmospheric pressure**.
4. **Air compressor:** After the coffee is dispensed, this blows pressurized air through the machine to ensure that all the pipes are clear, ready for brewing the next cup.
5. **Water tank:** This holds roughly 1.5 liters of water. It sits on the back of the machine and has a spring-loaded valve at the bottom, where it clips onto the water pump.



For much more detail, take a look at [US patent #7,673,558: Insert, a machine and a system for the preparation of beverages](#) by Satwinder Singh Panesar and Steve Carter of Kraft Foods, Inc., which also goes into great detail about the design and construction of the coffee pods themselves. Artwork courtesy of US Patent and Trademark Office.