

STERIWAVE Plc
Microwave Hot Water Heater
Potential ~ 30% more efficient than
standard element heaters

Company Background

■ Microwave Water Heater

- Patented in UK 15-08-01 : GB 2354688
- Prototype working successfully (lower emissions than a mobile phone)
- Produces 2Ltr/min water @ 40C ~ 80C
- Low Power unit 2KW
- Flexible application potential

■ Next Target

- Seek J.V. Partner to develop mass production
- Develop unit to realise above potential.

■ Support

- Inventor will provide hands-on support
- Financial backing available to make initial developments
- Potential use of low cost production facility in Hungary

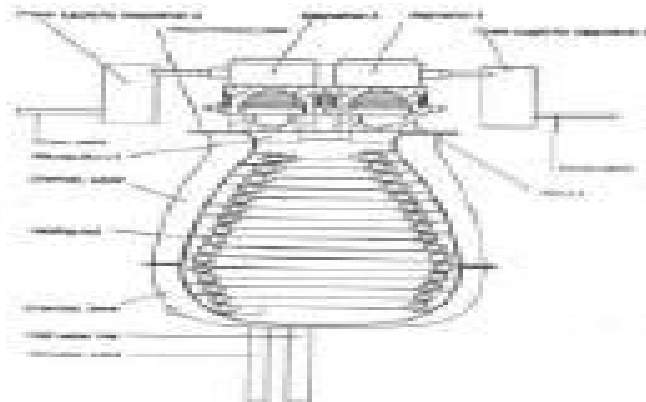
Technical Background

■ Microwave Water Heater

- Microwave generator (water cooled) directs microwaves into a chamber of water contained in coils.
- Conical Chamber of stainless steel has an angular design which prevents the generation of refraction & diffraction waves. (Major problem of early inventions)
- Base of the chamber is a reflector to direct microwaves to a silica based flexible coil which runs around the chamber wall.
- The coil which is designed to sustain both 140C temp' & pressure has both inlet and outlet valves to allow water flow.

Technical Background

UK Patent		GB 2 354 688 A	
(21) Application No. 9808992J (22) Date of Filing: 21.11.2000 (23) Priority Date: (21) 9808992J (22) 19.04.2000 (23) GB		(12) Int. Cl. ⁷ H02G 1/00 A1, H02G 1/07 A	
(24) Applicant: Pirelli Tyres 24 Jamban St., FURLEY, Surrey, CR8 3RD, United Kingdom		(72) Inventor: Franco Ruffa	
(27) Agent and/or Address for Service: Pirelli Tyres 24 Jamban St., FURLEY, Surrey, CR8 3RD, United Kingdom		(86) International Class. No. (IPC Class.) H02G 1/00 A1, H02G 1/07 A	
(54) Article Title: Micro-wave controlled flow water heater		(57) The article consists of a microwave controlled flow water heater comprising of a closed chamber into which microwaves at a frequency of 2450 mhz. are introduced via two magnetrons, the heater being characterised by a chamber of rounded conical sections having a porous base where the microwave radiation is at right angles to the downward direction of radiation and diffraction waves. The base of the microwave chamber is a reflector dish to direct energy towards the silica based flexible coil disposed against the chamber wall. The silica based coil is a helical tube inside the chamber and is terminated to inlet and outlet glands. These provide for a bidirectional flow of water to pass through the coil in any direction depending upon the application and/or the changing circumstances in which it is being used.	



10. (57) The article comprising a helical tube is intended and the prior microwaves heater has a flat base that is not intended to be used. This patent is taken in view of the applicant's documents submitted after the date of filing to enable the application to comply with the provisions of the Patents Act 1977.

GB 2 354 688 A

Technical Background



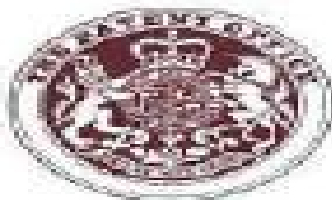
Certificate of Grant of Patent


Patent Number: GB2354688
Proprietor(s): Franco Facella
Inventor(s): Franco Facella

This is to Certify that, in accordance with the Patents Act 1977,

a Patent has been granted to the proprietor(s) for an invention entitled
"Microwave Continuous Flow Water Heater" disclosed in an
application filed 27 November 2000.

Dated 15 August 2001.




Alison Brimelow
Comptroller General of Patents,
Designs and Trade Marks
UNITED KINGDOM PATENT OFFICE

The attention of the proprietor(s) is drawn to the important notes overleaf.

Advantages & Benefits

■ Microwave Water Heater

- Apart from Microwave chamber simple design**
- Low weight (25kg)**
- Small size fit in space under sink**
- Simple installation (as washing machine)**
- Uses cold water direct from mains**
- Direct heating of the water will allow high efficiency**
- Power supply single phase 13 Amp**
- No emission concerns as gas heaters**
- Production costs would be low when built in volume**
- Flow rate increased as magnetrons added to flow chamber**
- Variety of other applications possible (Central Heating & Sterilisation)**

Advantages & Benefits

■ Potential Central Heating

- Working Electric Boiler designs exist
- Comparable flow rates by increased nos. magnetrons in flow chamber.
- No header or storage tanks needed.
- Simpler installation ~ lower cost
- Uses cold water direct from mains
- Application in electric CH countries (Scotland etc)
- Direct heating of the water will allow high efficiency
- Power supply single phase up to 50 Amp
- No emission concerns as gas boilers (EU legislation)
- Production costs would be low when built in volume
- Operating costs would be lower than current types
- Maintenance lower cost.

Current and Potential Performance Data Heater & Potential Boiler design

Hot Water Heater Current and Potential Performance data

	Input Power KW	Output Power KW	No of Magnetron	Water Supply	Flow rate Ltr/min @ 40C	No of Elements	Hot Water to Taps secs	Radiators warming mins	Estimate time (mins) to heat up 75C	Developmen t Capability	End Use Applications
Current Hot Water Prototype	2	2	1	Cold Mains	2	0			0	High	High
Conventional Electric Boiler heater	9	9	0	Cold Mains	30	3	10	4	260	Low	Single
Estimated Microwave Boiler heater	6	6	3	Cold Mains	20 (tbc)	0	10	3	300(tbc)	High	Single

N.B. Flow rate is expected to greatly improved by precise design & manufacture