

CLAIMS

1. A continuous-flow electromagnetic-induction fluid heater (1, 1', 1'') in a vending machine for preparing beverages;

5 the continuous-flow electromagnetic-induction fluid heater (1, 1', 1'') comprises:

- at least one tubular body (7) internally defining at least one channel (7a) for a fluid and including at least one inlet opening (8) through which the fluid to be heated is fed, in use, to said channel (7a), and one outlet opening (10) through which the heated
10 fluid flows out, in use, from said channel (7a);

- a heating element (13, 13', 13'') arranged, at least partially, inside said channel (7a) so as to be lapped, in use, by the fluid; and

- an electric winding (11) wound directly in contact around an external surface (12) of said tubular body (7) and which can be electrically powered to generate an
15 electromagnetic induction field and heat, in this manner, the heating element (13, 13', 13'') due to the effect of said electromagnetic induction field;

the continuous-flow electromagnetic-induction fluid heater (1, 1', 1'') further comprises an upstream fluid baffle (25), which is housed within said channel (7a) in a position fluidically downstream of said inlet opening (8) and fluidically upstream of
20 said heating element (13, 13', 13''), with respect to the direction of the fluid from said inlet opening (8) to said outlet opening (10), and is shaped so as to reduce the hydrodynamic drag on said fluid between said inlet opening (8) and said heating element (13, 13', 13'').

25 2. The continuous-flow electromagnetic-induction fluid heater (1, 1', 1'') as claimed in Claim 1, wherein said upstream baffle (25) is coupled to, or forms integrally part of, said heating element (13, 13', 13'').

30 3. The continuous-flow electromagnetic-induction fluid heater (1, 1', 1'') as claimed in Claim 2, wherein said upstream baffle (25) is mounted at, or is defined by, a first end portion of said heating element (13, 13', 13'') arranged at said inlet opening (8).

35 4. The continuous-flow electromagnetic-induction fluid heater (1, 1', 1'') as claimed in Claim 3, wherein said tubular body (7) comprises a first shaped portion (14) internally defining a first shaped section (27) of said channel (7a) arranged fluidically

downstream of said inlet opening (8) and fluidically upstream of said heating element (13, 13', 13'') and facing said upstream baffle (25); said first shaped section (27) having a profile that follows, at least partially, an external surface (25a) of said upstream baffle (25).

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5. The continuous-flow electromagnetic-induction fluid heater (1, 1', 1'') as claimed in Claim 4, wherein said tubular body (7) further comprises feeding channels (29) arranged fluidically downstream of said upstream baffle (25) for fluidically connecting said first shaped section (27) to the remaining section of said channel (7a) downstream of said first shaped section (27) and apt to distribute said fluid around said heating element (13, 13', 13'').

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6. The continuous-flow electromagnetic-induction fluid heater (1, 1', 1'') as claimed in any one of the preceding claims, further comprising a downstream fluid baffle (26), which is housed in said channel (7a) in a position fluidically downstream of said heating element (13, 13', 13'') and fluidically upstream of said outlet opening (10), with respect to the direction of the fluid from said inlet opening (8) to said outlet opening (10), and is shaped so as to reduce the hydrodynamic drag on the fluid between said heating element (13, 13', 13'') and said outlet opening (10).

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7. The continuous-flow electromagnetic-induction fluid heater (1, 1', 1'') as claimed in Claim 6, wherein said downstream baffle (26) is coupled to, or forms integrally part of, said heating element (13, 13', 13'').

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8. The continuous-flow electromagnetic-induction fluid heater (1, 1', 1'') as claimed in Claim 7, wherein said downstream baffle (26) is mounted at, or is defined by, a second end portion of said heating element (13, 13', 13''), opposite to said first end portion, and arranged at said outlet opening (10).

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9. The continuous-flow electromagnetic-induction fluid heater (1, 1', 1'') as claimed in any one of Claims 6 to 8, wherein said tubular body (7) comprises a second shaped portion (15) internally defining a second shaped section (28) of said channel (7a) arranged fluidically downstream of said heating element (13, 13', 13'') and fluidically upstream of said outlet opening (10) and facing said downstream baffle (26); said second shaped section (28) having a profile that follows, at least partially, an external surface (26a) of said downstream baffle (26).

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10. The continuous-flow electromagnetic-induction fluid heater (1, 1', 1'') as
claimed in Claims 1 and 6, wherein said tubular body (7) has a longitudinal axis (A);
5 said inlet opening (8), said outlet opening (10) and said upstream and downstream
baffles (25, 26) are arranged coaxially to said axis (A).

11. The continuous-flow electromagnetic-induction fluid heater (1, 1', 1'') as
claimed in Claims 1 and 6, wherein said upstream and downstream baffles (25, 26) have
10 a substantially dome shape.

12. The continuous-flow electromagnetic-induction fluid heater (1, 1', 1'') as
claimed in any one of the preceding claims, wherein said heating element (13, 13', 13'')
is selected from one of the following configurations:

- 15 - a bar element, in particular having a substantially circular-shaped cross-section;
 - a plurality of bar elements, in particular having corresponding substantially
circular-shaped cross-sections; and
 - a plurality of thin wall sheets.

20 13. A vending machine for preparing beverages comprising:
 - a continuous-flow electromagnetic-induction fluid heater (1, 1', 1'') as claimed
in any one of the preceding claims;
 - a fluid supply circuit (3) fluidically connected to said continuous-flow
electromagnetic-induction fluid heater (1, 1', 1'') for supplying it with a fluid; and
25 - an electric power supply circuit (6) electrically connected to said electrical
winding (11) to electrically power it.