CLAIMS

1. Full automatic coffee machine (100) comprising a coffee extraction unit (10), said coffee extraction unit comprising :

- a brewing chamber (1) for receiving roasted and ground coffee powder, said chamber comprising an upper rim (12), a bottom wall (11) and a water inlet (13),
- an upper piston (2),
  . said upper piston being configured to be movable through the upper rim of the brewing chamber and inside the brewing chamber further to the relative movement of the brewing chamber and the upper piston, and
  . said upper piston comprising a liquid outlet duct (21),
- a lower piston (3) movable inside said brewing chamber (1) between :
  . a lowest position wherein the lower piston lies on the bottom wall (11) of the brewing chamber, and
  . a highest position wherein the lower piston is at the upper rim (12) of the brewing chamber,
- wherein the lower piston (3) comprises a piston rod (31), said piston rod extending through the bottom wall (11) of the brewing chamber, and

wherein the piston rod (31) comprises an internal channel (311) extending from a channel inlet (311a) at the lateral wall surface of the rod to a channel outlet (311b) at the bottom wall surface of the rod, and

wherein the channel inlet (311a) is designed and positioned on the lateral wall surface of the rod so that said channel inlet (311a) overlaps the bottom wall (11) of the brewing chamber only when the lower piston is in the higher position.

2. Full automatic coffee machine according to Claim 1, wherein the machine comprises a waste liquid collector (8) and the channel outlet (311b) at the bottom wall surface of the rod is connected to said waste liquid collector.

3. Full automatic coffee machine according to Claim 1 or 2, wherein the brewing chamber (1) is made movable by driving means (6)

4. Full automatic coffee machine according to the precedent claim, wherein :

- the upper piston (2) is fixed,
- the rod (31) of the lower piston comprises a free bottom end (312) located outside the brewing chamber (1) and movable with said piston and said chamber,
- the apparatus comprises a fixed bottom stop wall (5) configured to contact the bottom end of the rod of the lower piston,

- the movement of the lower piston (3) depends on the movement of the brewing chamber and/or the contact of the free bottom end (312) with the bottom stop wall (4) or the contact of the lower piston (3) with the upper piston (2).

5. Full automatic coffee machine according to any of the precedent claims, wherein the rod (31) and/or the lower pistons (3) are provided with friction means to control their movement with respect to the internal walls of the brewing chamber.

6. Full automatic coffee machine dependent on Claim 4 or 5 when dependent on Claim 4, wherein the fixed bottom stop wall (5) comprises a channel (51) configured to connect the channel outlet (311b) of the internal channel of the rod with a draining pipe.

7. Full automatic coffee machine according to Claim 1, wherein the brewing chamber (1) is fixed and the upper and lower pistons (2, 3) are movable inside and out of the brewing chamber by driving means.

8. Full automatic coffee machine according to any of the precedent claims, wherein the apparatus comprises a discharge device (4) for spent coffee

9. Full automatic coffee machine according to any of the precedent claims wherein the apparatus comprises a pressurized hot water fluid system comprising at least a water supply, a water heating device and a water pump wherein said system is connected to the water inlet (13) of the brewing chamber.

10. Method for preparing a coffee beverage with a full automatic coffee apparatus according to any one of Claims 1 to 9, wherein said method comprises the steps of :

a- in a dosing position, wherein the lower piston (3) is in the lowest position inside the brewing chamber and the upper piston (2) is at a distance from the upper rim (12) of the chamber and outside the chamber, supplying a dose of roasted and ground coffee powder into the brewing chamber, then

b- moving the chamber (1) and the upper piston (2) relatively one to the other to compress the dose of coffee powder, then

c - introducing hot water through the water inlet (13), extracting the coffee powder and dispensing extracted coffee beverage through the beverage outlet (21) of the upper piston, then

d- moving the chamber (1), the upper piston (2) and the lower piston (3) relatively one to the other in order to :

. position the upper rim (12) of the chamber away from the upper piston (2), and

. position the lower piston (3) at the upper rim (12) of the brewing chamber, and

. discharging the extracted coffee powder from the lower piston, and

. dispensing residual liquid present at the bottom of the chamber through the internal channel (311) of the rod of the lower piston.

11. Method according to the precedent claim, wherein said method comprises, after step d), at least one further step e) comprising the step of moving the chamber (1), the upper piston (3) and the lower piston (2) relatively one to the other in a closed position, wherein the lower piston is in the lowest position and the upper piston closes the chamber.

12. Method according to Claim 10 or 11, wherein said method comprise at least one further step before step a) is implemented, this step comprising :

a_0- moving the chamber (1), the upper piston (2) and the lower piston (3) relatively one to the other in order to :

. position the upper rim (12) of the chamber away from the upper piston (2), and

. position the lower piston (3) at the upper rim (12) of the brewing chamber, and

. introducing hot water through the water inlet (13) in order to purge the hot water fluid line (7) and dispensing said hot water through the internal channel (311) of the lower piston.

13. Method according to any one of Claims 10 to 12, wherein said method comprises further steps before step a) is implemented, these steps comprising :

a_1- moving the chamber (1), the upper piston (2) and the lower piston (3) relatively one to the other in order to :

. close the chamber (1) with the upper piston (2), and

. position the lower piston (3) inside the brewing chamber (1) so that the channel inlet (311a) of the internal channel is positioned below the bottom wall (11) of the chamber, and

. introducing hot water through the water inlet (13) in order to fill at least a part of the internal volume of the brewing chamber defined between the upper piston (2) and the lower piston (3),

then

a_2- moving the chamber (1), the upper piston (2) and the lower piston (3) relatively one to the other in order to position the lower piston (3) at the upper rim (12) of the brewing chamber, in order to dispense said volume of hot water through the internal channel (311) of the lower piston, then

a_3- moving the chamber (1), the upper piston (2) and the lower piston (3) relatively one to the other to the dosing position.