CLAIMS

1. A method to determine the recipe R_{ym} for roasting a quantity m of a type C_y of coffee beans in a particular type of apparatusfor roasting coffee beans, said roasting apparatus comprising :

- a vessel (1) to contain coffee beans,
- a heating device (12) to heat coffee beans contained in the vessel,
- a control system (180) operable to control the heating device and configured to apply a roasting recipe (R) providing setpoints (T@ti ; ti) of temperatures T@t1, T@t2, … to be applied at discrete successive times t_1, t_2, …, respectively,

wherein, for a customised quantity m of coffee beans of type Cy introduced inside the vessel,

- the control system is configured to obtain at least :
  . the quantity m of coffee beans introduced inside the vessel, and
  . the type Cy of coffee beans introduced inside the vessel, and
- based on the obtained type Cy and the obtained quantity m, the control system is configured to determine said recipe R_{ym} for roasting the quantity m of coffee beans of type Cy in the roasting apparatus, said recipe R_{ym} providing setpoints ($T_{ym@ti}$; ti) of temperatures $T_{ym@t_1}$, $T_{ym@t_2}$, … to be applied at discrete successive times t_1, t_2, …, respectively,

wherein the method comprises the steps of :

- getting access :
  . to a rule to calculate the roasting recipe adapted to the roasting of a quantity of beans, said quantity being comprised in a list of pre-determined quantities (M, M±Δx), from any pre-existing roasting recipe adapted to the roasting of another quantity of beans in said particular type of roasting apparatus, said another quantity being comprised in the list of pre-determined quantities (M, M±Δx), and
  . to the list of said pre-determined quantities (M , M±Δx), and
  . to at least one pre-determined original roasting recipe $R_{yMoriginal}$, said roasting recipe $R_{yMoriginal}$ being adapted to the roasting of one original pre-determined quantity $M_{original}$ of beans of type C_y in said particular type of roasting apparatus, said pre-determined original roasting recipe $R_{yMoriginal}$ providing setpoints ($T_{yMoriginal@ti}$; ti) of temperatures $T_{yMoriginal@t_1}$, $T_{yMoriginal@t_2}$, … to be applied at discrete successive times t_1, t_2, …, respectively, and
  . to said original pre-determined quantity $M_{original}$ of beans, and

- based on :

. the comparison between m and the accessible original pre-determined quantity $M_{original}$, and

. the comparison between $M_{original}$ and the accessible pre-determined quantities of the list (M, M±Δx), and

. the comparison between m and the accessible pre-determined quantities of the list (M, M±Δx)

determining the roasting recipe R_{ym} to be applied on said quantity m of coffee beans as follows :

- if m is equal to the accessible original pre-determined quantity $M_{original}$, then the roasting recipe R_{ym} corresponds to the accessible original roasting recipe $R_{yMoriginal}$,

- if m is different from the accessible original pre-determined quantity $M_{original}$, and

- if the accessible original pre-determined quantity $M_{original}$ is equal to one of the accessible pre-determined quantities of the list (M, M±Δx), and

. if m is equal to one of the other accessible pre-determined quantities (M, M±Δx) of the list, then the roasting recipe R_{ym} is calculated by applying the rule to the accessible pre-determined original roasting recipe $R_{yMoriginal}$,

. if m is different from the accessible pre-determined quantities (M, M±Δx) of the list, then the roasting recipe R_{ym} is deduced from the accessible pre-determined original roasting recipe $R_{yMoriginal}$, and/or at least one of the roasting recipes R_{yM}, $R_{yM±Δx}$ able to be calculated by applying the rule to the accessible pre-determined roasting recipe $R_{yMoriginal}$.

- if $M_{original}$ is different from any of the accessible pre-determined quantities of the list (M, M±Δx), then identifying, in said list, the quantity $M_{closest}$ presenting the smallest difference with $M_{original}$ and deducing the corresponding roasting recipe $R_{yMclosest}$ from the accessible pre-determined roasting recipe $R_{yMoriginal}$, and then :

. if m is equal to said quantity $M_{closest}$ presenting the smallest difference with $M_{original}$, then the roasting recipe R_{ym} corresponds to said deduced roasting recipe $R_{yMclosest}$,

. if m is different from $M_{closest}$ but equal to one of the other accessible pre-determined quantities (M, M±Δx) of the list, then the roasting recipe R_{ym} is calculated by applying the rule to the deduced roasting recipe $R_{yMclosest}$,

. if m is different from any of the accessible pre-determined quantities (M , M±Δx) of the list, then the roasting recipe R_{ym} is deduced from the accessible original roasting recipe

$R_{yMoriginal}$, and/or at least one of the roasting recipes R_{yM}, $R_{yM\pm\Delta x}$ able to be calculated by applying the rule to the deduced roasting recipe $R_{yMclosest}$.

2. A method according to Claim 1, wherein the rule is a mathematical function, such as a polynomial, logarithmic or exponential function, applied to the temperatures $T@t_i$ of the setpoints of the pre-existing roasting recipe adapted to the roasting of another quantity of beans comprised in the list of pre-determined quantities (M, $M\pm\Delta x$).

3. A method according to Claim 2, wherein the rule to calculate from one pre-existing roasting recipe R_M ($T_{M@t_i}$; t_i) adapted to the roasting of a pre-determined quantity M of beans at least one roasting recipe $R_{M\pm\Delta x}$ ($T_{M\pm\Delta x}$ @t_i ; t_i) adapted to the roasting of a pre-determined quantity $M\pm\Delta x$ of beans is a linear function,
said rule being defined by at least one couple of pre-determined coefficients ($a_{(M;M\pm\Delta x)}$; $b_{(M;M\pm\Delta x)}$), said coefficients being specific to the difference of quantity $\pm\ \Delta x$, and said rule being applied to the temperatures $T_{yM@t_i}$ provided by the pre-determined original roasting recipe R_M as follows :

$$T_{yM\pm\Delta x}@t_i = a_{(M;M\pm\Delta x)}\ T_{yM@t_i} + b_{(M;M\pm\Delta x)}.$$

4. A method according to the precedent claim, wherein said polynomial rule is defined by at least two couples of pre-determined coefficients ($a_{(M;M\pm\Delta x)}$; $b_{(M;M\pm\Delta x)}$), each of said couple being applied during a specific range of time Δt_i of the pre-determined roasting recipe R_{yM}.

5. A method according to any one of the precedent claims, wherein the accessible original pre-determined quantity $M_{original}$ is equal to one of the accessible pre-determined quantities of the list (M, $M\pm\Delta x$) of the rule.

6. A method according to the precedent claim, wherein, if m is different from the accessible original pre-determined quantity M and from any of the accessible pre-determined quantities $M\pm\Delta x$**,** then the roasting recipe R_{ym} to be applied on said obtained quantity m of coffee beans introduced inside the vessel is deduced from one or two of the accessible roasting recipe R_{yM} and/or the calculable roasting recipes $R_{yM\pm\Delta x}$, each of said one or two recipes being adapted to the roasting of one pre-determined quantity of beans respectively and said pre-determined quantity or quantities of beans presenting the smallest difference(s) of quantity with the obtained quantity m.

7. A method according to the precedent claim, wherein the roasting recipe R_{ym} to be applied on said obtained quantity m of coffee beans introduced inside the vessel is deduced by selecting in the list of the accessible original roasting recipe R_{yM} and/or the calculable roasting recipes $R_{yM\pm\Delta x}$, the roasting recipe adapted to the roasting of one pre-determined quantity of beans presenting the smallest difference of quantity with the obtained quantity m.

8. A method according to Claim 6, wherein the roasting recipe R_{ym} to be applied on said obtained quantity m of coffee beans introduced inside the vessel is deduced by :

- identifying in the list of the accessible pre-determined quantities M and $M\pm\Delta x$, the two successive pre-determined quantities M_{m-1} and M_{m+1} presenting the smallest differences with m, wherein M_{m-1} is inferior to M_{m+1},

- for said two identified quantities M_{m-1} and M_{m+1}, obtaining the corresponding roasting recipe R_{Mm-1} and R_{Mm+1} respectively, said recipes being determined as follows :
  . if one of the identified quantities M_{m-1} or M_{m+1} is equal to the original pre-determined quantity M, then getting access to the pre-determined original roasting recipe R_{yM} adapted to the roasting of said pre-determined quantity M of beans,
  . if one or two of said identified quantities M_{m-1} and/or M_{m+1} differ(s) from the original pre-determined quantity M, then calculating the corresponding roasting recipes R_{Mm-1} and/or R_{Mm+1} by applying the rule to the accessible original roasting recipe R_{yM},

- from the obtained roasting recipes R_{Mm-1} and R_{Mm+1}, said recipes providing the temperatures $T_{Mm-1@t1}$, $T_{Mm-1@t2,}$, … and $T_{Mm+1@t1}$, $T_{Mm+1@t2}$, … respectively applied at discrete successive times t_1, t_2, …, determining the temperature $T_{m@t1}$, $T_{m@t2,}$, … to be applied to the obtained quantity m of beans at each of said discrete successive times t_1, t_2, … as follows :

$$T_{m@ti} = T_{Mm-1@ti} + [(T_{Mm+1@ti} - T_{Mm-1@ti}) \,.\, K \,.\, (m - M_{m-1})/(M_{m+1} - M_{m-1})]$$

with $K \leq 1$.

9. A method according to Claim 6, wherein the roasting recipe R_{ym} to be applied on said obtained quantity m of coffee beans introduced inside the vessel is deduced by :

- identifying in the list of the accessible pre-determined quantities M and $M\pm\Delta x$, the two successive pre-determined quantities M_{m-1} and M_{m+1} presenting the smallest differences with m,

- for said two identified quantities M_{m-1} and M_{m+1} obtaining the corresponding roasting recipe RM_{m-1} and RM_{m+1} respectively, said recipes being determined as follows :

  . if one of the identified quantities M_{m-1} or M_{m+1} is equal to the pre-determined quantity M, then getting access to the pre-determined original roasting recipe R_{yM} adapted to the roasting of said pre-determined quantity M of beans,

  . if one or two of said identified quantities M_{m-1} and/or M_{m+1} differ(s) from the original pre-determined quantity M, then calculating the corresponding roasting recipes RM_{m-1} and/or RM_{m+1} by applying the rule to the accessible original roasting recipe R_{yM},

- from the obtained roasting recipes RM_{m-1} and RM_{m+1}, said recipes providing the temperatures $T_{Mm-1@t1}$, $T_{Mm-1@t2,}$, … and $T_{Mm+1@t1}$, $T_{Mm+1@t2}$, … respectively applied at discrete successive times t_1, t_2, …, determining the temperature $T_{m@t1}$, $T_{m@t2,}$, … to be applied to the obtained quantity m of beans at each of said discrete successive times t_1, t_2, … as follows :

. if m is closer to M_{m-1}, then :

$$T_{m@ti} = T_{Mm-1@ti} + [(T_{Mm+1@ti} - T_{Mm-1@ti}) \,.\, K \,.\, (m - M_{m-1})/(M_{m+1} - M_{m-1})]$$

. if m is closer to M_{m+1}, then :

$$T_{m@ti} = T_{Mm+1@ti} - [(T_{Mm+1@ti} - T_{Mm-1@ti}) \,.\, K \,.\, (M_{m+1} - m)/(M_{m+1} - M_{m-1})]$$

with $K \leq 1$.

10. A method according to Claim 6 and wherein the rule is a linear function according to Claims 3 or 4, wherein the roasting recipe R_{ym} to be applied on said obtained quantity m of coffee beans introduced inside the vessel is deduced by :

- identifying in the list of the accessible original pre-determined quantities M and $M \pm \Delta x$, the two successive pre-determined quantities M_{m-1} and M_{m+1} presenting the smallest differences with m, wherein M_{m-1} is inferior to M_{m+1},

- for said two identified quantities M_{m-1} and M_{m+1}, obtaining the corresponding at least one couple of pre-determined coefficients $(a_{(M;Mm-1)};b_{(M;Mm-1)})$ and $(a_{(M;Mm+1)};b_{(M;Mm+1)})$, wherein if one said two identified quantities M_{m-1} and M_{m+1} is equal to M, then the corresponding couple of pre-determined coefficients is (1;1),

- from said obtained couples of pre-determined coefficients ($a_{(M;Mm-1)};b_{(M;Mm-1)}$) and ($a_{(M;Mm+1)};b_{(M;Mm+1)}$), determining at least one couple of coefficients $a_{(M;m)}$ as follows :

$$a_{(M;m)} = a_{(M;Mm-1)} + [(a_{(M;Mm+1)} - a_{(M;Mm-1)}) \,.\, K \,.\, (m - M_{m-1})(M_{m+1} - M_{m-1})]$$

with $K \leq 1$,

- from said determined at least one couple of coefficients $a_{(M;m)}$ and from the pre-determined original roasting recipe R_{yM} ($T_{yM@ti}$; t_i), calculating the roasting recipe R_{ym} providing the temperature $T_{m@t1}$, $T_{m@t2}$, , … to be applied to the obtained quantity m of beans at each of said discrete successive times t_1, t_2, … as follows :

$$T_{ym@ti} = a_{(M;m)}\, T_{yM@ti} + b(M;m).$$

11. A method according to any one of the precedent claims wherein said method is applied in a specific roasting apparatus comprising an air flow driver (121), wherein said method enables the determination of an additional roasting recipe $R_{flow\text{-}ym}$ for roasting a quantity m of a type C_y coffee beans in a roasting apparatus said additional roasting recipe providing setpoints ($F_{ym@ti}$; t_i) of an air flow $F_{@t1}$, $F_{@t2}$, … to be applied at discrete successive times t_1, t_2, …, wherein the method comprises the steps of :

- getting access :
  - . to a rule to calculate the roasting recipe adapted to the roasting of a quantity of beans, said quantity being comprised in a list of pre-determined quantities (M , M±Δx), from any pre-existing roasting recipe adapted to the roasting of another quantity of beans in said particular type of roasting apparatus, said another quantity being comprised in the list of pre-determined quantities (M, M±Δx), and
  - . to the list of the pre-determined quantities (M , M±Δx), and
  - . to at least one pre-determined original roasting recipe $R_{flow\text{-}yMoriginal}$, said roasting recipe $R_{flow\text{-}yMoriginal}$ being adapted to the roasting of one original pre-determined quantity $M_{original}$ of beans of type C_y in said particular type of roasting apparatus, and
  - . to said original pre-determined quantity $M_{original}$ of beans, and

- based on :
  - . the comparison between m and the accessible original pre-determined quantity $M_{original}$ and on the comparison between m and the accessible pre-determined quantities of the list (M, M±Δx) and
  - . the comparison between $M_{original}$ and the accessible pre-determined quantities of the list (M, M±Δx)

determining the roasting recipe $R_{flow\text{-}ym}$ to be applied on said quantity m of coffee beans as follows :

- if m is equal to the accessible original pre-determined quantity $M_{original}$, then the roasting recipe $R_{flow\ ym}$ corresponds to the accessible original roasting recipe $R_{flow\text{-}yMoriginal}$,

- if m is different from the accessible original pre-determined quantity $M_{original}$, and

- if the accessible original pre-determined quantity $M_{original}$ is equal to one of the accessible pre-determined quantities of the list (M, M±Δx), and
  . if m is equal to one of the other accessible pre-determined quantities (M, M±Δx) of the list, then the roasting recipe $R_{flow\ ym}$ is calculated by applying the rule to the accessible pre-determined original roasting recipe $R_{flow\text{-}yMoriginal}$,
  . if m is different from the accessible pre-determined quantities (M, M±Δx) of the list, then the roasting recipe $R_{flow\text{-}ym}$ is deduced from the accessible original roasting recipe $R_{flow\text{-}yMoriginal}$, and/or at least one of the roasting recipes $R_{flow\text{-}yM}$, $R_{flow\ yM\pm\Delta x}$ able to be calculated by applying the rule to the accessible roasting recipe $R_{flow\text{-}yMoriginal}$.
- if $M_{original}$ is different from any of the accessible pre-determined quantities of the list (M, M±Δx), then identifying, in said list, the quantity $M_{closest}$ presenting the smallest difference with $M_{original}$ and deducing the corresponding roasting recipe $R_{flow\text{-}yMclosest}$ from the accessible roasting recipe $R_{flow\text{-}yMoriginal}$, and then :
  . if m is equal to said quantity $M_{closest}$ presenting the smallest difference with $M_{original}$, then the roasting recipe $R_{flow\text{-}ym}$ corresponds to deduced roasting recipe $R_{flow\text{-}yMclosest}$,
  . if m is different from $M_{closest}$ but equal to one of the other accessible pre-determined quantities (M, M±Δx) of the list, then the roasting recipe $R_{flow\text{-}ym}$ is calculated by applying the rule to the deduced roasting recipe $R_{flow\text{-}yMclosest}$,
  . if m is different from any of the accessible pre-determined quantities (M , M±Δx) of the list, then the roasting recipe $R_{flow\text{-}ym}$ is deduced from the accessible original roasting recipe $R_{flow\text{-}yMoriginal}$, and/or at least one of the roasting recipes $R_{flow\text{-}yM}$, $R_{flow\text{-}yM\pm\Delta x}$ able to be calculated by applying the rule to the deduced roasting recipe $R_{flow\text{-}yMclosest}$.

12. Method according to the precedent claim, wherein the rule to calculate from one pre-determined roasting recipe $R_{flow\text{-}yM}$ ($F_{yM@ti}$; t_i) adapted to the roasting of a pre-determined quantity M of beans at least one roasting recipe $R_{flow\text{-}yM\pm\Delta x}$ ($F_{yM\pm\Delta x\ @ti}$; t_i) adapted to the roasting of a pre-determined quantity M±Δx of beans is a polynomial function,

said rule being defined by a couple of pre-determined coefficients ($c_{(M;M\pm\Delta x)}$; $d_{(M;M\pm\Delta x)}$) and being applied to the air flow provided by the pre-determined roasting recipe $R_{fnlow\text{-}M}$ as follows :

$$F_{yM\pm\Delta x\,@ti} = c_{(M;M\pm\Delta x)}\, F_{yM_{@ti}} + d_{(M;M\pm\Delta x)}$$

13. Method according to the precedent claim and Claim 3, wherein, the method comprises getting access to a ratio R and the couple of pre-determined coefficients ($c_{(M;M\pm\Delta x)}$; $d_{(M;M\pm\Delta x)}$) are defined as follows :

- $c_{(M;M\pm\Delta x)} = R\, a_{(M;M\pm\Delta x)}$
- $d_{(M;M\pm\Delta x)} = R\, b_{(M;M\pm\Delta x)}$

14. A method to determine the recipe R_{blend} for roasting a customised blend of coffee beans C_A, C_B, … with respective quantities m_A, m_B, … of said coffee beans in a particular type of roasting apparatus, said recipe R_{blend} providing setpoints ($T_{blend@ti}$; ti) of temperatures $T_{blend@t1}$, $T_{blend@t2}$, … to be applied at discrete successive times t_1, t_2, …, respectively, wherein the method comprises the steps of :

- for each type of coffee beans C_y part of the blend, determining the roasting recipe R_{ym} to be applied on said quantity m_y of coffee beans according to any one of Claims 1 to 13,
- getting access to temperature adaptation factors Xy of said different types of coffee beans Cy respectively of the customised blend,
- from said determined roasting recipes R_{ym} and from said accessible temperature adaptation factors X_y, and based on the quantities m_y of beans of type C_y, determining the temperature $T_{blend@t1}$, $T_{blend@t2,\,\ldots,}$ to be applied to the customised blend of beans at each of discrete successive times t_1, t_2, …respectively according to following formula (I) :

$$T_{blend@t_i} = \sum_{y} f_y \,.\, X_y \,.\, T_{m_y@t_i} \qquad \text{(I)}$$

wherein y corresponds to all the types of coffee beans present in the blend and f_y represents the fraction in weight of coffee beans of type C_y in the blend of coffee beans.

15. A method to determine the recipe R_{blend} for roasting a customised blend of coffee beans of different types C_y with respective quantities m_y of said coffee beans in a particular type of roasting apparatus, said recipe R_{blend} providing setpoints ($T_{blend@ti}$; ti) of temperatures $T_{blend@t1}$, $T_{blend@t2}$, … to be applied at discrete successive times t_1, t_2, …, respectively, wherein the method comprises the steps of :

- getting access :

. for each types of coffee beans C_y comprised in the blend, to at least one pre-determined original roasting recipes $R_{yMoriginal}$ respectively, each recipe $R_{yMoriginal}$ ($T_{yMoriginal@ti}$; t_i) being adapted to the roasting of one original pre-determined quantity $M_{original}$ of beans of type Cy in said particular type of roasting apparatus,

. to said original pre-determined quantity $M_{original}$ of beans, and

. to a rule to calculate from one pre-determined original roasting recipe $R_{yMoriginal}$ ($T_{yMoriginal@ti}$; t_i) at least one roasting recipe $R_{Moriginal\pm\Delta x}$ adapted to the roasting of a pre-determined quantity $M_{original\pm\Delta x}$ of beans in said particular type of roasting apparatus, said rule being a linear function, and said being defined by at least one couple of pre-determined coefficients ($a_{(Moriginal;Moriginal\pm\Delta x)}$; $b_{(Moriginal;\ Moriginal\ \pm\Delta x)}$), said coefficients being specific to the difference of quantity ± Δx, and said rule being applied to the temperatures $T_{Moriginal@ti}$ provided by one pre-determined original roasting recipe $R_{Moriginal}$ as follows :

$$T_{Moriginal\pm\Delta x}\ @ti = a_{(Moriginal;Moriginal\pm\Delta x)}\ T_{Moriginal@ti} + b_{(Moriginal;Moriginal\pm\Delta x)}.$$

and

. to said at least one pre-determined quantity $M_{original\pm\Delta x}$, and

. to temperature adaptation factors X_y of said different types of coffee beans C_y respectively, and

- for each type of coffee beans C_y part of the blend, identifying in the list of pre-determined quantities $M_{original}$ and $M_{original\pm\Delta x}$ the quantity $M_{closest}$ presenting the smallest difference with my and deducing the corresponding couple of coefficients (a_y:b_y) as follows :

$$a_y = a_{(Moriginal;Mclosest)}\ ;$$

$$b_y = b_{(Moriginal;Mclosest)},$$

- calculating the corresponding couple of coefficients of the blend as follows :

$$a_{blend} = \sum_{y} f_y\ .\ a_y$$

$$b_{blend} = \sum_{y} f_y\ .b_y$$

wherein y corresponds to all the types of coffee beans present in the blend and f_y represents the fraction in weight of coffee beans of type C_y in the blend of coffee beans,

- determining the temperature $T_{blend@t1}$, $T_{blend@t2,,\ ...,}$ to be applied to the customised blend of beans at each of discrete successive times t_1, t_2, …respectively according to following formula (II) :

$$T_{blend@t_i} = a_{blend} \left(\sum_{y} f_y \,.\, X_y \,.\, T_{yMoriginal@ti}\right) + b_{blend} \quad \text{(II)}$$

wherein y corresponds to all the types of coffee beans present in the blend and f_y represents the fraction in weight of coffee beans of type C_y in the blend of coffee beans.

16. An apparatus for roasting coffee beans comprising :
- a vessel (1) to contain coffee beans,
- a heating device (12) to heat coffee beans contained in the vessel,
- a control system (180) operable to control the heating device and configured to apply a roasting recipe (R) providing setpoints (T@t_i ; t_i) of temperatures T@t_1, T@t_2, … to be applied at discrete successive times t_1, t_2, …, respectively,

wherein, for a customised quantity m of coffee beans of type C_y introduced inside the vessel,
- the control system is configured to obtain at least :
  . the quantity m of coffee beans introduced inside the vessel, and
  . the type C_y of coffee beans introduced inside the vessel,

and
- based on the obtained type C_y and the obtained quantity m, the control system is configured to determine the recipe R_{ym} for roasting the quantity m of coffee beans of type C_y in the roasting apparatus according to the method of any one of Claims 1 to 15.

17. An apparatus for roasting coffee beans according to the precedent claim wherein said apparatus is configured to receive and roast a customised quantity m of coffee beans coffee beans, said customised quantity m being equal to the accessible original pre-determined quantity M or to one of the accessible pre-determined quantity M±Δx.

18. An apparatus for roasting coffee beans according to the precedent claim wherein the heating device (12) comprises an air flow driver (121) and the control system (180) is operable to control said air flow driver (121) and is configured to apply a roasting recipe (R_{flow}) providing setpoints (F@t_i ; t_i) of an air flow F@t_1, F@t_2, … to be applied at discrete successive times t_1, t_2, …, respectively,

and

based on the obtained type C_y and the quantity m, the control system is configured to determine an additional roasting recipe $R_{flow\text{-}ym}$ for roasting said quantity m of said type C_y coffee beans in the roasting apparatus said additional roasting recipe providing setpoints

($F_{ym@ti}$; t_i) of an air flow $F_{ym@t1}$, $F_{ym@t2}$, … to be applied at discrete successive times t_1, t_2, …, according to any one of Claims 11 to 13.

19. A system of roasting apparatuses comprising one master roasting apparatus and a set of roasting apparatuses according to any one of Claims 16 to 18, said master apparatus and the roasting apparatuses of said set being of the same type, wherein :

- the original roasting recipe one pre-determined original roasting recipe $R_{yMoriginal}$ is pre-determined with the master roasting apparatus, and
- the rule to calculate the roasting recipe adapted to the roasting of a quantity of beans, said quantity being comprised in a list of pre-determined quantities (M, M±Δx), from any pre-existing roasting recipe adapted to the roasting of another quantity of beans in said particular type of roasting apparatus, said another quantity being comprised in the list of pre-determined quantities (M, M±Δx), is defined with the master roasting apparatus.

20. A computer program which, when executed by a computer, processor or control unit, causes the computer, processor or control unit to perform the method of any one of Claims 1 to 15.

21. A computer program according to the precedent claim, wherein said computer program is executed at least in part by the processing unit of a device external to the apparatus for roasting coffee beans.

22. A computer readable storage medium comprising instructions which, when executed by a computer, processor or control unit causes the computer, processor or control unit to carry out the method of any one of Claims 1 to 15.