

CLAIMS

1. A method to determine the recipe R_m for roasting a quantity m of a type C_y of coffee beans in a particular type of roasting apparatus, said recipe R_m providing setpoints ($T_{ym@t_i}$; t_i) of
 5 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 :

- 10 . 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 , $M \pm \Delta x$), 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 , $M \pm \Delta x$), and
- 15 . to the list of said pre-determined quantities (M , $M \pm \Delta x$), and
 . to at least one pre-determined original roasting recipe $R_{yM_{original}}$, said roasting recipe $R_{yM_{original}}$ 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 $R_{yM_{original}}$ providing setpoints ($T_{yM_{original}@t_i}$; t_i) of temperatures
 20 $T_{yM_{original}@t_1}$, $T_{yM_{original}@t_2}$, ... 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 :

- 25 . 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 , $M \pm \Delta x$), and
 . the comparison between m and the accessible pre-determined quantities of the list (M ,
 30 $M \pm \Delta x$)

determining the roasting recipe R_m 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
 35 recipe R_m corresponds to the accessible original roasting recipe $R_{yM_{original}}$,

- 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 $(M, M \pm \Delta x)$, and

5 . if m is equal to one of the other accessible pre-determined quantities $(M, M \pm \Delta x)$ of the list, then the roasting recipe R_m is calculated by applying the rule to the accessible pre-determined original roasting recipe $R_{M_{\text{original}}}$,

10 . if m is different from the accessible pre-determined quantities $(M, M \pm \Delta x)$ of the list, then the roasting recipe R_m is deduced from the accessible pre-determined original roasting recipe $R_{M_{\text{original}}}$, and/or at least one of the roasting recipes $R_M, R_{M \pm \Delta x}$ able to be calculated by applying the rule to the accessible pre-determined roasting recipe $R_{M_{\text{original}}}$.

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

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

20 . if m is different from M_{closest} but equal to one of the other accessible pre-determined quantities $(M, M \pm \Delta x)$ of the list, then the roasting recipe R_m is calculated by applying the rule to the deduced roasting recipe $R_{M_{\text{closest}}}$,

25 . if m is different from any of the accessible pre-determined quantities $(M, M \pm \Delta x)$ of the list, then the roasting recipe R_m is deduced from the accessible original roasting recipe $R_{M_{\text{original}}}$, and/or at least one of the roasting recipes $R_M, R_{M \pm \Delta x}$ able to be calculated by applying the rule to the deduced roasting recipe $R_{M_{\text{closest}}}$.

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
30 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
35 $M \pm \Delta x$ 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_M .

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_m 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_M 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_m 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_M 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_m 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 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 original pre-determined quantity M , then getting access to the pre-determined original roasting recipe RyM adapted

5 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 RyM ,

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

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$$Tm@ti = TM_{m-1}@ti + [(TM_{m+1}@ti - TM_{m-1}@ti) \cdot K \cdot (m - M_{m-1}) / (M_{m+1} - M_{m-1})]$$

with $K \leq 1$.

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

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- 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 ,

25 - 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 RyM adapted to the roasting of said pre-determined quantity M of beans,

30 . 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 RyM ,

35 - from the obtained roasting recipes RM_{m-1} and RM_{m+1} , said recipes providing the temperatures $TM_{m-1}@t_1$, $TM_{m-1}@t_2$, ... and $TM_{m+1}@t_1$, $TM_{m+1}@t_2$, ... respectively applied at discrete successive times t_1 , t_2 , ..., determining the temperature $Tm@t_1$, $Tm@t_2$, ... to be applied

to the obtained quantity m of beans at each of said discrete successive times $t_1, t_2, \dots$ as follows :

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

$$T_{m@t_i} = T_{M_{m-1}@t_i} + [(T_{M_{m+1}@t_i} - T_{M_{m-1}@t_i}) \cdot K \cdot (m - M_{m-1}) / (M_{m+1} - M_{m-1})]$$

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

$$T_{m@t_i} = T_{M_{m+1}@t_i} - [(T_{M_{m+1}@t_i} - T_{M_{m-1}@t_i}) \cdot K \cdot (M_{m+1} - m) / (M_{m+1} - M_{m-1})]$$

10 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_m to be applied on said obtained quantity m of coffee beans introduced inside the vessel is deduced by :

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- 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} ,

20 - for said two identified quantities M_{m-1} and M_{m+1} , obtaining the corresponding at least one couple of pre-determined coefficients $(a(M; M_{m-1}); b(M; M_{m-1}))$ and $(a(M; M_{m+1}); b(M; M_{m+1}))$, 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 $(1; 1)$,

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

$$a(M; m) = a(M; M_{m-1}) + [(a(M; M_{m+1}) - a(M; M_{m-1})) \cdot K \cdot (m - M_{m-1}) / (M_{m+1} - M_{m-1})]$$

with $K \leq 1$,

30 - from said determined at least one couple of coefficients $a(M; m)$ and from the pre-determined original roasting recipe R_m ($T_{yM@t_i}; t_i$), calculating the roasting recipe R_m providing the temperature $T_{m@t_1}, T_{m@t_2}, \dots$ to be applied to the obtained quantity m of beans at each of said discrete successive times $t_1, t_2, \dots$ as follows :

$$T_{yM@t_i} = a(M; m) T_{yM@t_i} + b(M; m).$$

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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 $R_{\text{flow-ym}}$ for roasting a quantity m of a type C_y coffee beans in a roasting apparatus said additional roasting recipe providing setpoints $(F_{ym@t_i}; t_i)$ of an air flow $F_{@t_1}, F_{@t_2}, \dots$ to be applied at discrete successive times $t_1, t_2, \dots$, wherein the method comprises the steps of :

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- 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 $(M, M \pm \Delta x)$, 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 $(M, M \pm \Delta x)$, and

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. to the list of the pre-determined quantities $(M, M \pm \Delta x)$, and

. to at least one pre-determined original roasting recipe $R_{\text{flow-yMoriginal}}$, said roasting recipe $R_{\text{flow-yMoriginal}}$ 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

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. 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 $(M, M \pm \Delta x)$ and

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. the comparison between M_{original} and the accessible pre-determined quantities of the list $(M, M \pm \Delta x)$

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

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

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- 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 $(M, M \pm \Delta x)$, and

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

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

12. Method according to the precedent claim, wherein the rule to calculate from one pre-determined roasting recipe $R_{\text{flow-ym}}$ ($F_{yM@t_i}$; t_i) adapted to the roasting of a pre-determined quantity M of beans at least one roasting recipe $R_{\text{flow-yM} \pm \Delta x}$ ($F_{yM \pm \Delta x @t_i}$; t_i) adapted to the roasting of a pre-determined quantity $M \pm \Delta x$ of beans is a polynomial function,
- 20 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 $R_{\text{flow-yM}}$ as follows
- 25 :

$$F_{yM \pm \Delta x @t_i} = c(M; M \pm \Delta x) F_{yM @t_i} + d(M; M \pm \Delta x)$$

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 ($c(M; M \pm \Delta x)$; $d(M; M \pm \Delta x)$)
- 30 are defined as follows :
- $c(M; M \pm \Delta x) = R \cdot a(M; M \pm \Delta x)$
 - $d(M; M \pm \Delta x) = R \cdot b(M; M \pm \Delta x)$

14. A method to determine the recipe R_{blend} for roasting a customised blend of coffee beans
- 35 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 ($T_{\text{blend}@t_i}$; t_i) 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,
- 5 - getting access to temperature adaptation factors X_y of said different types of coffee beans C_y 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 $T_{blend@t1}$, $T_{blend@t2}$, ..., to be applied to the customised blend of beans at each of discrete
- 10 successive times t_1 , t_2 , ... respectively according to following formula (I) :

$$T_{blend@t_i} = \sum_y f_y \cdot X_y \cdot T_{m_y@t_i} \quad (I)$$

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 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 ($T_{blend@t_i}$; t_i) 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 :
- 20 - 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 $R_{yMoriginal}$ ($T_{yMoriginal@t_i}$; t_i) 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,
 - 25 . to said original pre-determined quantity $M_{original}$ of beans, and
 - . to a rule to calculate from one pre-determined original roasting recipe $R_{yMoriginal}$ ($T_{yMoriginal@t_i}$; 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
 - 30 coefficients ($a(M_{original}; M_{original\pm\Delta x})$; $b(M_{original}; M_{original\pm\Delta x})$), said coefficients being specific to the difference of quantity $\pm \Delta x$, and said rule being applied to the temperatures $T_{Moriginal@t_i}$ provided by one pre-determined original roasting recipe $R_{Moriginal}$ as follows :
- $$T_{Moriginal\pm\Delta x @t_i} = a(M_{original}; M_{original\pm\Delta x}) T_{Moriginal@t_i} + b(M_{original}; M_{original\pm\Delta x}).$$

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

- 5 - 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 m_y and deducing the corresponding couple of coefficients ($a_y:b_y$) as follows :

$$a_y = a(M_{original}; M_{closest}) ;$$

$$b_y = b(M_{original}; M_{closest}),$$

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

$$a_{blend} = \sum_y f_y \cdot a_y$$

$$b_{blend} = \sum_y f_y \cdot b_y$$

- 15 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 $T_{blend@t_1}$, $T_{blend@t_2}$, ..., 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) :

$$T_{blend@t_i} = a_{blend} \left(\sum_y f_y \cdot X_y \cdot T_{yM_{original}@t_i} \right) + b_{blend} \quad (II)$$

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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.

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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,
 - 5 - 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
 - 10 to determine the recipe R_m 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
- 15 beans, said customised quantity m being equal to the accessible original pre-determined quantity M or to one of the accessible pre-determined quantity $M \pm \Delta x$.
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
- 20 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
- 25 determine an additional roasting recipe R_{flow-y_m} for roasting said quantity m of said type C_y coffee beans in the roasting apparatus said additional roasting recipe providing setpoints ($F_{y_m@t_i}$; t_i) of an air flow $F_{y_m@t_1}$, $F_{y_m@t_2}$, ... to be applied at discrete successive times t_1 , t_2 , ..., according to any one of Claims 11 to 13.
- 30 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 $R_{y_{Moriginal}}$ is pre-determined with the master roasting apparatus, and
 - 35 - 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 , $M \pm \Delta x$), 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 ($M, M \pm \Delta x$), is defined with the master roasting apparatus.

20. A computer program which, when executed by a computer, processor or control unit,
5 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
10 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.
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