

(12) NACH DEM VERTRAG ÜBER DIE INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES
PATENTWESENS (PCT) VERÖFFENTLICHTE INTERNATIONALE ANMELDUNG

(19) Weltorganisation für geistiges Eigentum
Internationales Büro

(43) Internationales Veröffentlichungsdatum
22. April 2021 (22.04.2021)



(10) Internationale Veröffentlichungsnummer
WO 2021/073810 A1

(51) Internationale Patentklassifikation:
A47J 31/42 (2006.01)

(21) Internationales Aktenzeichen: PCT/EP2020/075371

(22) Internationales Anmeldedatum:
10. September 2020 (10.09.2020)

(25) Einreichungssprache: Deutsch

(26) Veröffentlichungssprache: Deutsch

(30) Angaben zur Priorität:
01310/19 14. Oktober 2019 (14.10.2019) CH

(71) Anmelder: STEINER AG WEGGIS [—/CH]; Thermo-
plan-Platz 1, 6353 Weggis (CH).

(72) Erfinder: STEINER, Adrian; Remsistrasse 12, 6353
Weggis (CH).

(74) Anwalt: LUCHS, Willi; LUCHS & PARTNER AG, Pa-
tentanwälte, Schulhausstrasse 12, 8002 Zürich (CH).

(81) Bestimmungsstaaten (soweit nicht anders angegeben, für
jede verfügbare nationale Schutzrechtsart): AE, AG, AL,
AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY,
BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM,
DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT,

HN, HR, HU, ID, IL, IN, IR, IS, IT, JO, JP, KE, KG, KH,
KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA,
MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI,
NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU,
RW, SA, SC, SD, SE, SG, SK, SL, ST, SV, SY, TH, TJ, TM,
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, ZA, ZM,
ZW.

(84) Bestimmungsstaaten (soweit nicht anders angegeben, für
jede verfügbare regionale Schutzrechtsart): ARIPO (BW,
GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST,
SZ, TZ, UG, ZM, ZW), eurasisches (AM, AZ, BY, KG, KZ,
RU, TJ, TM), europäisches (AL, AT, BE, BG, CH, CY, CZ,
DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT,
LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI,
SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN,
GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Veröffentlicht:

— mit internationalem Recherchenbericht (Artikel 21 Absatz
3)

(54) Title: METHOD FOR PRODUCING COFFEE, AND A DEVICE FOR CARRYING OUT SAID METHOD

(54) Bezeichnung: VERFAHREN ZUM ERZEUGEN VON KAFFEE SOWIE EINE EINRICHTUNG ZUR DURCHFÜHRUNG DES
VERFAHRENS

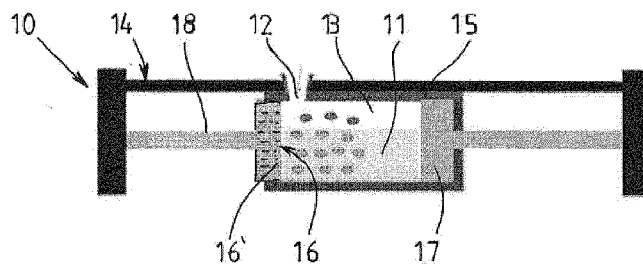


Fig. 1

(57) Abstract: In a method for producing coffee, coffee beans are ground very finely, with or without the addition of water, and a mixture of the coffee powder and water is formed, and the coffee is extracted from this mixture and preferably conveyed to an outlet. Coffee beans and the water in the grinding chamber can be supplied to at least one mill, and the coffee beans ground with the water supplied, and the mixture formed from this. To form the mixture, cold or hot water is supplied to the mill during the grinding process in the grinding chamber and/or after the grinding process. Thus, the coffee produced has an especially full-bodied flavour.

(57) Zusammenfassung: Bei einem Verfahren zum Erzeugen von Kaffee werden Kaffeebohnen mit oder ohne Wasserzugabe sehr fein gemahlen und eine Mischung aus dem Kaffeepulver und Wasser gebildet und aus dieser Mischung der Kaffee extrahiert und vorzugsweise zu einem Auslass befördert. Es können Kaffeebohnen und das Wasser in den Mahlraum wenigstens einer Mühle zugeführt und die Kaffeebohnen mit dem eingefüllten Wasser gemahlen und daraus die Mischung gebildet werden. Es wird kaltes oder erwärmtes Wasser zur Bildung der Mischung bei der Mahlung in den Mahlraum der Mühle und/ oder nach dem Mahlen zugeführt. Damit wird ein speziell gehaltvoller Geschmack des erzeugten Kaffees erzielt.



WO 2021/073810 A1

T1-P32-PCT

5

10

15

STEINER AG WEGGIS,

6353 Weggis, Schweiz

20

Method for producing coffee, and a device for carrying out said method

25

The invention relates to a method for producing coffee and a related device in accordance with the preambles to claims 1 and 12 respectively.

30

With a known method according to the printed publication US-A-6,192,785, cold coffee, with or without milk, can be dispensed from a coffee machine, in that the cold coffee is pre-prepared and filled into a container, then sucked up in a controlled manner by a pump and, via a connection element and corresponding closure valves, either heated by a flow heater or conveyed through a line, in the cold state, directly to the outlet nozzle. This coffee filled into the container is preferably produced in a conventional manner by brewing by means of hot water and then filled into the container and cooled. It is therefore possible optionally for cold or hot coffee to be dispensed, but not produced as fresh coffee.

The invention is based on the object of providing a method and device respectively by means of which, in particular, cold coffee can be produced in a relatively short time, and the prepared coffee in this case then has a specially full-bodied taste, and with this the flavour substances contained in the coffee beans are better extracted.

This object is solved according to the invention in accordance with the features of claim 1 and claim 12 respectively.

With this method according to the invention, with which the coffee beans are ground very finely with or without the addition of water, and a mixture of the coffee powder and water are formed, and from this mixture the coffee is extracted and preferably conveyed to the outlet, the coffee thereby produced has a pleasant new form of full-bodied flavour.

With one embodiment variant according to the invention, coffee beans and water are conveyed into the grinding chamber of at least one mill, and the coffee beans are ground together with the water which is filled in. As a result, a mixing of coffee and water already takes place at the grinding stage, which improves the extraction of the coffee filtered out of this.

Very advantageously, cold water at room temperature is used for the mixing and extraction of the coffee. It can advantageously be additionally cooled before the mixing and/or thereafter, since the water is heated during the grinding. It is also possible, however, for hot water to be used.

The mixing proportion of coffee beans to the water, the duration of the grinding, and/or the degree of grinding of the coffee powder are predetermined, such that the coffee extracted from this exhibits the desired taste.

According to the invention, the method is used in a coffee machine with which hot coffee can be produced by brewing and dispensed. With this additional option, coffee with the desired flavour can be produced and dispensed by the push of a button in the same time as brewed coffee produced in the conventional manner.

The invention and its further advantages are explained in greater detail hereinafter on the basis of exemplary embodiments by making reference to the drawings. The Figures show:

Fig. 1 A schematic section through a unit of a device according to the invention, during the filling of a mixture in a chamber in a cylinder;

Fig. 2 a schematic section of the unit during the pressing of a piston in the cylinder;

Fig. 3 a schematic section of the unit in the compressed state of the mixture; and

5 Fig. 4 a schematic section of the unit, in which the cylinder and the one piston are drawn away from the other piston.

A method is provided for producing coffee, with which coffee beans are ground, and from the coffee powder and water the coffee is produced and conveyed to an outlet. Used as the
10 coffee beans are, advantageously, roasted or at least lightly roasted beans, which, depending on the specific taste, can derive from different areas where such beans are cultivated.

According to the invention, the coffee beans are ground very finely, with or without the
15 addition of water, and a mixture of the coffee powder and water is formed, and from this mixture the extracted coffee is, in particular, filtered and preferably conveyed to the outlet.

With one exemplary embodiment, coffee beans and water are conveyed into a grinding chamber of a mill, and the coffee beans are ground together with the water which is filled in,
20 and the mixture is formed, and from this the extracted coffee is preferably conveyed to an outlet.

It is possible for cold water at approximately room temperature to be conveyed for the grinding into the grinding chamber of the mill. This cold water is advantageously additionally
25 cooled before the mixing into the grinding chamber and/or thereafter, since the water is heated during the grinding, such that, at the outlet as extracted coffee, it exhibits approximately room temperature, or a selectable temperature. This can be achieved by corresponding cooling means and, as appropriate, by a temperature controlling arrangement. Drinking water can be used as the water, which has a high degree of purity and does not
30 contain chlorine. It would also be possible, however, for a water mixture to be used with flavour additives or other additives.

The coffee beans and the water which can be filled into the grinding chamber are preferably precisely metered, such that a predetermined mixing ratio is produced, which is selected in
35 such a way that an optimum taste is produced with the coffee which is extracted from it. Likewise, the duration of the grinding is determined, and with this the degree of grinding of the coffee powder. The finer the grain sizes of the ground coffee, the better is the

penetration of the water in the mixture, and therefore the flavour can largely be absorbed from it. These grain sizes of the coffee powder preferably amount on average to less than 200 µm, and advantageously even less than 150 µm.

- 5 Purposefully, metering means are provided in each case both at the outlet of the coffee bean container as well as in the water feed line, each of which can be actuated by a control device, which is not represented in any greater detail. These metering means make it possible for the quantity introduced from both sources can, on the one hand, be precisely metered, and, on the other, can also be varied.

10

Depending on requirements, the water can be introduced into the grinding chamber of the mill simultaneously or after a specific grinding time of the coffee beans. This depends on factors which are to be taken into account, such as, for example, the degree of hardness of the coffee beans.

15

Before the coffee is extracted from the mixture, it can be advantageous for the mushy mixture which is formed from the coffee powder and the water to be left for a period of time, for example in a separate container, in order thereby to improve the transfer of flavour from the powder into the water. In addition, in this situation cooling of the coffee which has been
20 formed can take place, as required, by means of a temperature control arrangement.

The device for carrying out the method according to the invention explained heretofore consists of at least one container containing coffee beans, at least one mill with a grinding chamber for grinding the coffee beans, and a unit 10 for producing the coffee, and an outlet
25 into a drink's container. Assigned to this device is a program control unit with a display with a touchscreen or the like, by means of which the method in question is carried out. The device can, of course, also contain further elements.

Fig. 1 to Fig. 4 show in principle a unit 10 for the extraction of the coffee from the mixture 11, which is formed from coffee powder and water. It comprises, in a housing frame 14 indicated,
30 a cylinder 15 which can be moved to and fro, with at least one filling opening 12, and two pistons 16, 17, which form in this cylinder a sealed chamber 13 and can be moved relative to one another. The one piston 16 is provided with a sieve screen 16' and is connected to an outlet line 18. In this situation it is secured in a fixed manner to the housing frame 14, and
35 cannot be moved. The opposing piston 17 is mounted so as to be movable in the cylinder 15 by a drive, not shown, as is explained further hereinafter.

The delivery of the coffee beans and the water into the mill, which is likewise not shown, with the grinding chamber with at least one opening, is carried out by a conveying means, for example a conveying worm and a water pump. The mill comprises on the outlet side a connection line, which leads into the outlet opening 12 of the cylinder 15. The coffee bean container could, however, also be arranged in a known manner above the mill, and therefore the coffee beans are always located above the mill, and are delivered without conveying means.

Fig. 1 shows the pistons 16, 17, which are each positioned at the end side in the cylinder 15, producing a sealing effect, with which the filling opening 12 is in an open position, and the mixture 11 of water and coffee powder is filled out of the mill in portions into this chamber 13.

As soon as the chamber 13 is preferably close to being filled with the mixture 11, as can be seen in Fig. 2, in the cylinder 15, on its rear side 15', the one piston 17 is pressed against the other fixed piston 16, and in this situation the filling opening 12 in the cylinder is closed by the latter piston, and, by the pressure of the piston 17 onto the mixture 11, the coffee liquid is pressed through the filtering screen sieve 16', and, in the extracted state, is conveyed through the outlet line 18 to an outlet, and filled into a cup or similar.

The pressing of the one piston 17 against the other piston 16 inside the cylinder 15 can take place by the producing of a negative pressure in the chamber 13, in addition to the mechanical compression movement of the two pistons, which is not represented in any greater detail. It would be necessary for at least one switchable line connection to be provided between a device for producing a negative pressure (vacuum) and the chamber 13 by way of one or both pistons 16, 17, and/or by means of the cylinder 15.

It is also possible for a passage opening 19 for water to be provided in the piston 17, in order to introduce water as required, for flushing or if, for example, the mixture is too viscous, or if the flow through the screen sieve 16' were to become clogged, as is shown in Fig. 2.

Fig. 3 shows the end position of the cylinder 15, and with it the piston 17 moved with it, with which close to all the coffee is extracted, and only the coffee pack 11' as compressed cake still remains in the chamber 13.

According to Fig. 4, after the extraction is completed, the cylinder 15 and the piston 17 remaining in it, is retracted with its piston rod 17', as far as against a stop wall 14' of the housing frame 14. The lengths of the cylinder 15 and of the piston 17 are dimensioned in

such a way that, when they come in contact, the coffee pack 11' is pushed by the piston 17 out of the cylinder 15, and falls downwards into a catchment container.

As advantageous variants, it would be possible not only to provide the piston 16 with a screen sieve 16' and be connected to an outlet line 18, but the opposing piston 17 could also be assigned a screen sieve and an outlet line. Likewise, the passage opening 19 for the feeding of water could be provided in one or both pistons, in order to provide water if required, which would be arranged parallel to the respective outlet line. There would then be corresponding valves provided in these lines, in order to carry out the functions referred to.

Very advantageously, in order to produce cold coffee in particular, this device is integrated into a coffee machine, with which, as the main object, as well as milk or foamed milk, hot coffee can be produced and dispensed. This device could in principle be integrated in such a way that use would be made of the containers with coffee beans and the water connection, which are already present. The unit 10 for extracting the cold coffee and the outlet on the front side of the coffee machine would be installed separately.

The invention has been adequately explained with the exemplary embodiments described heretofore. It can, however, also be explained by further variants. The extracted coffee could also be conserved not directly at the connection, but in a container, over a specific period of time, and only after this be conveyed to the outlet. This would incur the advantage that the flavour of the extracted coffee would be still more marked and intensive.

Instead of being filled into the unit 10, the mushy consistency mixture of the coffee powder and water could also be filled into at least one coffee filter, and the coffee filtered out of this by running out. In this situation, cold or also hot water could be used. A water mixture would also be possible for the mixing stage, for example with means for promoting the extraction or the full-bodied taste.

For spatial reasons, the unit 10 with the horizontally moving cylinder 15 and piston 17 could also be arranged vertically or at with an angle between them.

Coffee machines could also be used which are provided in a known manner with removable pistons, into which either coffee powder is filled or pads are laid, which could likewise be additionally provided with a device according to the invention.

T1-P32-PCT

5

10

15

CLAIMS

20 1. Method for producing coffee, wherein coffee beans are ground and the coffee is produced from the coffee powder and water and conveyed to an outlet, characterized in that the coffee beans are very finely ground, with or without the addition of water, and a mixture of the coffee powder and water is formed, and from this mixture the coffee is extracted and preferably conveyed to the outlet.

25

2. Method according to claim 1, characterized in that the coffee beans and the water are delivered into the grinding chamber of at least one mill and the coffee beans are ground with the water which is introduced, and from this the mixture is formed.

30

3. Method according to claim 1 or 2, characterized in that for forming the mixture, cold or heated water is introduced during the grinding into the grinding chamber of the mill, and/or after the grinding.

35

4. Method according to any one of claims 1 to 3, characterized in that

the mixing proportion of the coffee beans to the water, the time duration of the grinding, and/or the degree of grinding of the coffee powder, are determined in such a way that the coffee extracted from this has the desired taste.

- 5 5. Method according to any one of claims 2 to 4, characterized in that
the water is introduced into the grinding chamber of the mill simultaneously or after a specific
grinding time of the coffee beans.
6. Method according to any one of claims 1 to 5, characterized in that
10 the mushy consistency mixture of the coffee powder and the water is left for a period of time,
and the extracted coffee is then filtered out of it.
7. Method according to any one of claims 1 to 6, characterized in that
the mushy consistency mixture of the coffee powder and the water is filled into at least one
15 coffee filter, and the extracted coffee is filtered by running out of this.
8. Method according to any one of claims 1 to 7, characterized in that
the extraction of the coffee from the mixture (11) formed from coffee powder and water by
means of a unit (10) with a movable cylinder (15) with at least one filling opening (12) and
20 two pistons (16, 17) formed in this closable chamber (13), which can be moved relative to
one another, of which at least one is formed from a screen sieve (16') and is connected to an
outlet line (18), wherein the mixture (11) of water and coffee powder is filled into this
chamber (13), and at least one piston (17) is pressed against the other inside the cylinder
(15), and thereby the coffee is extracted from the mixture (11) and conveyed through the
25 screen sieve (16') into the outlet line (18).
9. Method according to claim 8, characterized in that
the piston (17), which is opposite the piston (16) comprising the screen sieve (16'),
comprises a passage opening (19) for water, in order, if required, to convey water into the
30 chamber (13) or in order to carry out flushing.
10. Method according to claim 8 or 9, characterized in that
the cylinder (15), and the piston (17) remaining in it, can be retracted after the extraction is
completed, in order for it to be possible for the coffee pack (11') from the mixture (11) to be
35 pushed by the piston (17) out of the cylinder (15).
11. Method according to any one of claims 1 to 10, characterized in that

the average grain size of the ground coffee powder preferably amounts to less than 200 μm and advantageously even less than 150 μm .

12. Method according to any one of claims 8 to 11, characterized in that

- 5 the pressing of the one piston against the other inside the cylinder (15) takes place by the producing of a negative pressure in the chamber (13) preferably in addition to the mechanical compressing of the two pistons.

13. Method according to any one of claims 2 to 11, characterized in that

- 10 the cold water is cooled before the mixing into the grinding chamber and/or after the grinding as a mixture, such that, at the outlet, as extracted coffee, it exhibits approximately room temperature or a selectable temperature.

14. Device for carrying out the method according to any one of claims 1 to 13, with at least one container containing coffee beans, at least one mill with a grinding chamber for grinding the coffee beans, a unit (10) for extracting the coffee, and an outlet, characterized in that

- 15 the unit (10) comprises a movable cylinder (15) with at least one filling opening (12) and two pistons (16, 17), forming a chamber (13) and movable relative to one another, of which at least one is formed from a screen sieve (16') and is connected to an outlet line (18), wherein the grinding chamber of the at least one mill comprises in each case an opening for the delivery of the coffee beans and water, and a connection line, which leads into the filling opening (12) of the cylinder.

15. Device according to claim 14, characterized in that

- 25 assigned to both pistons (16, 17) in each case is a screen sieve (16'), an outlet line (18), and assigned to at least one piston is a passage opening (19) for the delivery of water.

16. Device according to claim 14 or 15, characterized in that

- 30 a program control device is provided, which is provided with a display with a touchscreen or the like, by means of which the production of the extractable coffee can be programmed and actuated.

17. Use of the method according to any one of claims 1 to 13, characterized in that

in a coffee machine, in which hot coffee can be prepared by brewing and dispensed, coffee beans are ground very finely, with or without the addition of water, and a mixture of the coffee powder and water is formed, and from this mixture the coffee is extracted and preferably conveyed to the outlet of the coffee machine.

5

18. Use according to claim 17, characterized in that coffee beans and water are introduced into the coffee machine, into at least one separate mill with a grinding chamber, and the coffee beans are ground together with the water which is introduced, and the coffee in the mixture formed in this way is extracted and preferably conveyed to the outlet of the coffee machine.

10

19. Use according to claim 17 or 18, characterized in that the mushy consistency mixture of the coffee powder and water is conveyed into at least one replaceable coffee filter in the coffee machine, and conveyed preferably from this to the outlet.

15

WO 2021/073810

1/1

PCT/EP2020/075371

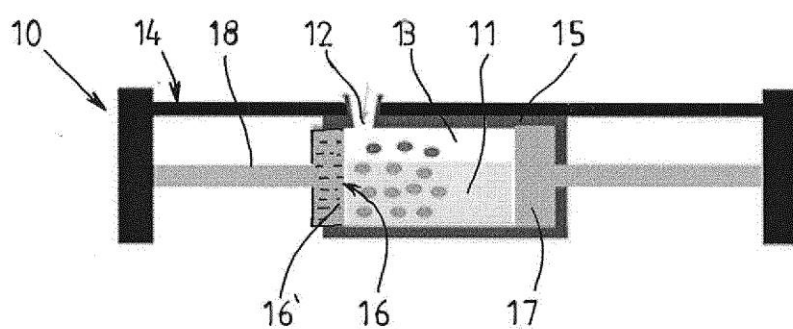


Fig. 1

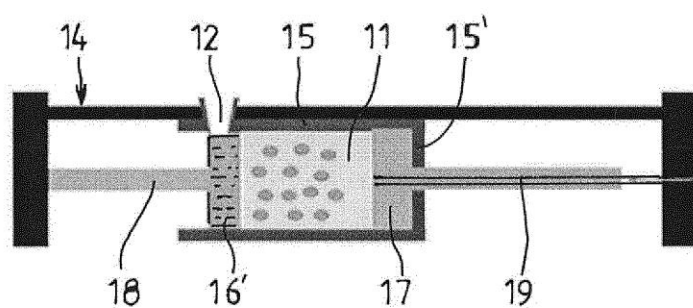


Fig. 2

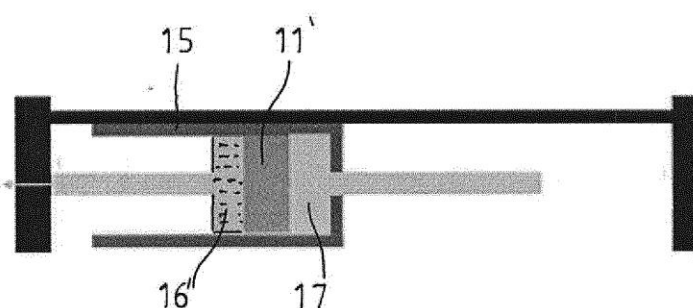


Fig. 3

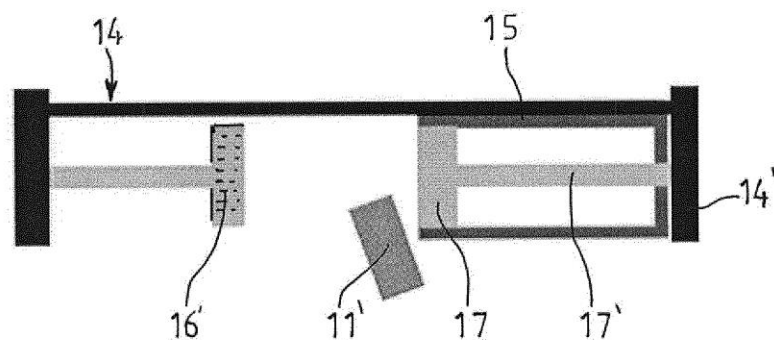


Fig. 4