CANDIDATE'S ANSWER
B, EQE 2019

Dear Sirs,

In response to your communication, it is requested that the claims be amended by replacing the claims presently on file with the attached amended claims.

Amendments and Article 123(2) EPC
Amended claim 1 is based on original claim 1 and paragraphs [009] to [010] and [013] of the application as filed. Specifically, original claim 1 has been amended to specify that the heat storage unit comprises a salt composition which melts as the heat storage unit is heated. Basis is found at paragraph [009] which describes the cooking process of the invention generally and states that the heat storage unit contains a salt composition. The heating and melting step is also described. Original claim 1 has also been amended to specify that the heat storage unit further comprises an empty space that is dimensioned to allow the salt composition to expand upon melting. Basis is found at paragraphs [010] and [013]. Although these paragraphs provide further details of the heat storage unit, the feature of the empty space is not related or inextricably linked to the non-included features such as the heat-insulating walls. Instead, the empty space is linked to the salt composition and the process of melting the composition (i.e. features recited in amended claim 1) because the empty space is required to allow the salt composition to expand into upon melting. Thus, the overall disclosure justifies isolating the empty space in combination with the salt composition and its introduction into the claim (Guidelines H-V 3.2.1).

Amended claim 2 is based on original claim 2, and paragraphs [006], [010] and [013] and Table 1 of the application as filed. Original claim 2 has been amended to specify that the box also comprises an empty space dimensioned to allow the salt composition to expand upon melting. Basis is found at paragraphs [010] and [013]. As explained above, the empty space is linked to the salt composition already recited in claim 2. Furthermore, the empty space is required for all embodiments.
Original claim 2 has also been amended to further define the salt composition by specifying that it has a melting temperature from 130°C to 350°C. Basis is found at paragraph [006] which discloses the general melting temperature range of 110°C to 350°C in combination with Table 1 which discloses the value of 130°C. As established by the case law of the Boards of Appeal (T2/81 and T201/83, see Guidelines H-IV 2.4) amendment of a disclosed range (i.e. 110°C to 350°C) on the basis of a particular value described in a specific example (i.e. to 130°C to 350°C based on example B of Table 1) is allowable provided the person skilled in the art could have readily recognised that this value (i.e. 130°C) is not so closely associated with the other features of the example as to determine the effect of that embodiment of the invention. This provision is met in the present case, at least because paragraph [007] states that other salt compositions can be found that have melting temperatures identical or close to those in Table 1. Thus, paragraph [007] directly and unambiguously discloses that the value of 130°C in Table 1 is not only associated with the specific salt of example B because other salt compositions are available. Accordingly, the range of 130°C to 350°C is directly and unambiguously derivable from the application as filed.

Claim 3 corresponds to original claim 3. The additional features of claim 2 are originally disclosed in combination with the features of claim 3, for instance at paragraph [010] which discloses a box comprising a cooking plate fitted in a second opening of the box in combination with the box comprising the empty space. Paragraph [010] also discloses that the salt composition can be chosen from Table 1, so the box is disclosed in combination with the salt composition having the melting temperature of claim 2. Accordingly, no subject matter is added.

Claim 4 corresponds to original claim 5, except that the original claim has merely been renumbered. The additional features of claim 2 are originally disclosed in combination with the features of original claim 5, for instance at paragraph [013] which discloses the cooking surface of original claim 5 in combination with the box comprising an empty space. Paragraph [013] also discloses that the salt composition can be chosen from Table 1, so the heat storage unit of original claim 5 is disclosed in combination with the salt composition having the melting temperature of claim 2. Accordingly, no subject matter is added.
Claim 5 corresponds to original claim 4 except that original claim 4 has been renumbered and the dependencies appropriately change. The new claimed combination of claims 4 and 5 is originally disclosed at paragraphs [013] and Fig.3 which discloses a heat storage unit comprising handles (10) and wherein the cooking surface is a surface of the light-absorbing plate. Accordingly, no subject matter is added.

In view of the above, the requirements of Article 123(2) are met.

Article 84 EPC
The examiner objected to original claim 2 because of a lack of an essential feature (see the communication point 4). Amended claim 2 recites that the box comprises an empty space and recites its dimensions. As discussed above, this is supported by the description, paragraphs [010] and [013]. Therefore the objection under point 4 is addressed.

For completeness, it is noted that this feature is also required in the other independent claims.

The requirements of Article 84EPC are met.

Novelty
Claim 1 specifies that the heat storage unit comprises a salt composition that melts and also comprises an empty space dimensioned to allow the salt composition to expand upon melting.

In contrast, D1 discloses that the heat storage unit is an aluminium plate. Therefore, D1 does not disclose that the heat storage unit comprises a salt composition and the dimensioned empty space.

As appreciated by the Examiner, D1 and D2 do not disclose a cooking process according to claim 1. For instance, D2 does not disclose concentrating solar radiation onto the heat storage unit and D3 does not disclose cooking food.
Accordingly, claim 1 meets the requirements of Article 54(2) EPC.

Claim 2 is novel with respect to D1 because D1 does not disclose a heat storage unit comprising a box comprising a salt composition.

Claim 2 is novel with respect to D2 and D3 because D2 and D3 do not disclose a heat storage unit comprising a box comprising a salt composition having a melting temperature from 130°C to 350°C. In contrast, D2 discloses the salt sodium chloride having a melting temperature of around 800°C (see D2, [002]), and D3 discloses the salt MgCl₂·6H₂O having a melting temperature of 115°C (see D3, [004]).

Accordingly, claim 2 meets the requirements of Article 54(2) EPC.

Claims 3 to 6 are novel at least by virtue of their dependency on claim 2.

Article 56 EPC

Considering claim 1
D1 represents the closest prior art because it is directed to a similar purpose of the invention (Guidelines G-VII 5.1), namely cooking using solar radiation (D1, [001]). Therefore, D1 is the most promising starting point. Furthermore, D1 also mentions the steps of providing a heat storage unit, concentrating solar radiation onto the heat storage unit and cooking food placed on the heat storage unit.

D2 is not an appropriate starting point and may not be considered the closest prior art document to claim 1 because D2 is directed to a different purpose of cooking using a cooker such as a gas flame (D2, [001]). D2 is not concerned with cooking using solar radiation.

D3 is also not an appropriate starting point and may not be considered the CPA document to claim 1 because D3 is in an entirely different technical field: a radiator for holiday homes or camping (D3, [001]). D3 is not concerned with cooking, let alone cooking using solar radiation.
The differences between claim 1 and D1 are listed above, notably that the present invention requires a heat storage unit comprising a salt composition (which melts during the cooking process) and an empty space to allow the salt composition to expand upon melting.

The technical effect of this difference is that the cooking process of claim 1 can function even in the absence of solar radiation. The salt composition stores heat based on the change from solid to liquid (i.e. when it melts). Thus, even if the solar radiation is interrupted, then the salt composition solidifies and releases its heat of fusion so the food can continue to cook. Furthermore, the heat storage based on change of phase of the salt composition has the technical effect of keeping the temperature constant at melting temperature and thus the food is not exposed to large temperature variations (see paragraphs [002], [005], [009]). In contrast, the process of D1 does not function when the solar radiation is interrupted because the plate quickly cools down in the absence of solar radiation. The cooking process is interrupted.

The objective technical problem can therefore be deduced as storing heat for the cooking process whilst keeping the temperature constant.

Starting from D1, the skilled person would not arrive at the solution of claim 1. D1 provides no motivation to modify the heat storage unit. In fact, D1 teaches away from the present invention because it teaches that the plate or pot should be heated directly by the solar light and hence cook the food (D1, [003] and [004]). Thus, the skilled person would not have considered introducing a phase change material, such as salt, because this requires heating the food by means of heat transfer via the salt composition, rather than direct heat to the heat storage unit.

Considering D1 and D2

D2 relates to a different field, so the skilled person would not have combined the disclosures of D1 and D2 when considering cooking using solar radiation. In the unlikely event that the skilled person would have turned to D2 to solve the problem, he would see that D2 teaches the use of a pot comprising sodium chloride having a melting temperature of 800°C. However, it is very unlikely that solar light could heat the sodium chloride until it melts because 800°C is very high and much higher than
normal cooking temperatures (D2, [002]). Thus, the pot or pan disclosed in D2 is not compatible with the solar cooking process of D1. Even if they were combined, further modifications would be needed to arrive at claim 1 of the present invention. There is no suggestion in D1 or D2 to use a salt composition that melts when the storage unit is heated by concentrating solar radiation. Thus, claim 1 is inventive.

D1 and D3
D3 is in a remote technical field. Thus, it would not have been considered by the skilled person. In the unlikely event that the skilled person would have turned to D3 to solve the problem, he would see that D3 discourages the skilled person from using a salt composition because it is said to have the disadvantage of high melting temperatures and taking a long time to heat up under solar radiation (D3, [004]). Therefore, the skilled person is taught away from the use of a salt composition. Consequently, even by combining D1 and D3, the skilled person would not arrive at present claim 1.

Claim 2
D2 is considered to be the closes prior art because it is directed to the same purpose of a heat storage unit (D2, [001]) suitable for use in a cooking process.

D3 is not considered to be as close because although it also discloses a unit for storing heat (D3, [001]), it is not related to cooking. Thus, it does not explicitly relate to a unit comprising a cooking surface. Instead, D3 related to heat radiation which is a remote technical field to cooking.

D1 is not an appropriate starting point since it is not directed towards a heat storage unit.

D2 does not disclose a heat storage unit comprising a salt composition having a melting temperature from 130°C to 350°C. Furthermore, although D2 discloses that there are gaps between the granules of salt (D2, [002]), the gaps are not dimensioned to allow the salt composition to expand upon melting because the salt of D2 is explicitly said not to melt at cooking temperatures and thus the gaps do not have to be large enough to accommodate melting.
The technical effect of these differences is that the heat storage unit of claim 2 comprises a salt which melts at normal cooking temperatures and therefore acts as a phase-change material. The salt of D2 does not melt at cooking temperatures and thus does not store as much heat as the heat storage unit of claim 2.

The objective technical problem can therefore be deduced as providing a heat storage unit which has improved heat storage.

Starting from D2, the skilled person would not arrive at the invention of claim 2 because there is no hint towards using a salt composition with a lower melting temperature. In contrast, D2 teaches that having a high melting temperature is advantageous (D2, [002]). Thus, D2 teaches away from modifying the salt composition. Further, the gaps between the grains are said to allow air circulation. Thus, the purpose of the gaps in D2 is entirely different to the purpose of the empty space of D2. Thus, the skilled person would have no reason to modify the gap dimensions.

D2 and D3
In D3, the skilled person would not find any useful teaching for arriving at the invention because D3 discloses the use of phase change materials with melting temperatures below normal cooking temperatures. Accordingly, the skilled person would have to go against the teaching of D2, paragraph [002]. Furthermore, they relate to different types of heating (cooker vs solar heat). In spite of the above, even if the skilled person combines D2 and D3, he would not have arrived at the invention of claim 2. The skilled person is taught away from providing a salt composition with a melting temperature of 115°C because D3 teaches this has the problems of the melting process being too slow. Thus, if anything, D3 teaches the skilled person to only use materials with a melting temperature below 115°C, such as the organic materials disclosed at [003]. Consequently, even if D2 and D3 were combined, the skilled person would not arrive at the features of claim 2.
D2 and D1
The skilled person would not consider D1 because D1 is silent regarding phase change materials, salt compositions and melting points. D1 does not consider heat storage as it focuses on direct heating (D1, [004]). Accordingly, with the objective technical problem in mind, the skilled person would have no reason to consult D1. In view of the above, claims 1 and 2 meet the requirements of Article 56 EPC. Claims 3 to 6 are also inventive at least by virtue of their dependency on claim 2.

Summary
Independent claim 2 is placed in the two part for according to Rule 43(1) EPC. It is respectfully submitted that the two part form is unsuitable for independent claim 1 because of the inter-related steps and parts wherein the two part form would result in an inordinately involved claim (Guidelines F-IV 2.3).

The applicant hereby retains the right to file one or more divisional applications directed to the subject-matter excised as a result of the above detailed amendments.

All the objections raised have been overcome.

Purely as a precaution, oral proceedings are requested prior to any decision to refuse this application.

Yours faithfully,

Mr Marcellus
1. A cooking process including the steps:
   providing a heat storage unit (3) comprising a salt composition (6) and an empty space (7);
   concentrating solar radiation (12) onto the heat storage unit (3) to heat it and thereby melt the salt composition (6); and
   cooking food (8) placed on the heat storage unit (3), wherein the empty space (7) is dimensioned to allow the salt composition (6) to expand upon melting.

2. A heat storage unit (3) for use in the process of claim 1, comprising:
   a box (4) having heat-insulating walls and an opening,
   the box (4) comprising a salt composition (6) and an empty space (7),
   a light-absorbing plate (5) fitted in the opening and in thermal contact with the salt composition (6), and a cooking surface (9) in thermal contact with the salt composition (6), characterised in that: the salt composition (6) has a melting temperature from 130°C to 350°C and the empty space (7) is dimensioned to allow the salt composition (6) to expand upon melting.

3. Heat storage unit according to claim 2, wherein the cooking surface (9) is a surface of a cooking plate (2) fitted in a second opening of the box (4) and in thermal contact with the salt composition (6).

4. Heat storage unit according to claim 2, wherein the cooking surface (9) is a surface of the light-absorbing plate (5).

5. Heat storage unit according to any of claims 2 or 3 to 4, wherein the heat storage unit (3) is portable by means of handles (10).

6. A solar cooker (1) comprising:
   a heat storage unit (3) according to any one of claims 2 to 5;
   a parabolic mirror (11) for concentrating solar radiation (12) on the light-absorbing plate (5) of the heat storage unit (3).
Examination Committee I: Paper B - Marking Details - Candidate No

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Examination Committee I agrees on 90 points and recommends the grade PASS.