

Candidate's answer

To: EPO

In response to the outstanding examination report, we herewith file amended claims replacing the claims on file and our arguments in support of the claims.

1. Basis for the amendments (A 123(2) EPC)

Amended claim 1 is based on a combination of claims 1, 4, and 5 as filed. The combination is disclosed in the application as filed, since original claim 5 depended on claim 4 which in turn directly referred to claim 1.

Amended claim 1 has the additional feature that “the zeolite (31) is arranged to be only at the side of the barrel (30)”. This feature is disclosed in par 13 of the application as filed, in connection with the “U-shaped cross-section” feature of original claim 5. Par 12 refers to the subj. matter of claim 1 as filed, on which par 13 builds. The combination of the “zeolite at a side”, the “U-shaped cross-section”, and claim 1 is thus disclosed in par 12-13. Please note that the “adsorption chamber insulates the evaporation chamber” is an effect of the U-shaped cross-section feature, and thus not a further feature that must be included in amended claim 1. The effect is implied by the U-shaped adsorption chamber surrounding the evaporation chamber.

Amended claim 2 is based on claim 6 as filed, wherein the negatively formulated “zeolite not at bottom” feature has been removed. This feature is already included in amended claim 1 in a positive formulation. It is noted that in claim 6 as filed the “zeolite not at bottom” feature and the “substantially full height” feature were combined, and they are separated in amended claims 1 and 2 respectively. However, from par 13 it is clear both are not essentially related. The first feature is described in l. 4 of par 13, the second only in line 11 preceded by “if furthermore...”. It is therefore allowed to separate these features.

Amended claim 3 corresponds to claim 7 as filed. Basis is also found in par 13 ll. 11-12 in connection with the subj. matter of amended claim 2 on which amended claim 3 depends.

Amended claim 4 is based on claim 8 as filed.

Amended claims 5-6 are based on claims 2-3 as filed, respectively.

2. Clarity (A. 84 EPC)

It is submitted that the clarity objection related to the negative formulation in claim 6 as filed is overcome by the positive formulation of the corresponding feature in amended claim 1.

3. Novelty (A. 54 EPC)

The invention as claimed in amended claim 1 is novel over the currently known prior art for at least the following reasons:

- KB does not disclose that the adsorption chamber has a U-shaped cross-section, nor that the zeolite is arranged to be only at the side of the barrel.
- D1 does not disclose a self-cooling barrel; it relates to a barrel cooler. Furthermore, it does not disclose the zeolite arranged to be only at the side.
- D2 also does not disclose a self-cooling barrel; it relates to a single-use cooling and heating box not comprising a barrel. Furthermore, it does not disclose the adsorption chamber surrounding the evaporation chamber.

Thus, amended claim 1 is considered novel over KB, D1, D2.

5. Inventive step (A. 56)

The problem-solution approach will be used cf. GL C-IV 11.5.

5.1 Closest prior art

We take KB to be the closest prior art.

KB is a self-cooling barrel and is thus in the same field (self-cooling containers) as the subj. matter of amended claim 1, and is directed at a similar purpose (cooling of liquids through adsorption). KB has the features of the first part of amended two-part claim 1 in common.

D1 is considered more remote, since it discloses a barrel cooler, not a self-cooling barrel. Arguably, D1 belongs to a different field (coolers for external containers) which takes precedence over the common purpose (cooling through adsorption).

D2 is also considered more remote than KB since, while it relates to a self-cooling container, it is designed as a single-use product, to be thrown away after use. Moreover the adsorption process is used to heat a second container comprised in the product. As such, D2 has a different purpose (heating and cooling) than the invention.

5.2 Objective technical problem

KB differs from the self-cooling barrel of amended claim 1, in that

- 1) the adsorption chamber has a U-shaped cross-section and surrounds the evaporation chamber (distinguishing feature 1, f.d 1)
- 2) the zeolite is arranged to be only at the side of the barrel (distinguishing feature 2, f.d. 2)

The effects of these features are, respectively,

- 1) the adsorption chamber insulates the evaporation chamber (par 13 l. 5) so that the efficiency is improved.
- 2) heat can be efficiently dissipated into the ambient air from the side of the barrel, so the efficiency of the adsorption cooling process is independent of the support of the barrel. In contrast, for KB it is recommended to stand the barrel on specific supports (par 8) to facilitate heat dissipation. Moreover, stacking of barrels being cooled is problematic due to heat dissipation problems.

As the distinguishing features solve two partial problems independently, two partial objective technical problems will be formulated (cf. C-IV 11.5.2 last par and T 389/86).

- 1) How to improve the efficiency of the adsorption process.
- 2) How to efficiently dissipate heat into the ambient air.

5.3 Arguments in favour of inventive step

KB

First the teachings of the closest prior art will be considered.

With respect to objective technical problem 1 (otp 1) KB has no pointers for improvements. The skilled person would thus rely on routine efficiency improvements e.g. increase volume of the chambers, look for better zeolites, etc. The skilled person would thus not arrive at a U-shaped arrangement as claimed (distinguishing feature 1).

With respect to otp 2, KB teaches the use of dedicated supports designed to dissipate heat (par 8 last sent.) Furthermore, it is common to provide holes in top edges of KB barrels to overcome the dissipation problem when barrels are stacked on top of each other, see the attached sketch by the applicant. The skilled person would apply either or both of these, and thus not arrive at distinguishing feature 2.

Amended claim 1 is thus inventive over KB and common general knowledge.

KB combined with D1

As both otp's relate to cooling, the skilled person might consider D1. However, the first par [001] teaches against a combination of the cooler with a barrel, as it states it is advantageous to be able to transport a barrel independently of the cooler. The skilled person would thus not combine KB with D1.

If he were to consider D1 further, in par 3 he would find an adsorption chamber with a U-shaped cross-section, which surrounds the evaporation chamber.

In par 6 it is disclosed that this particular configuration makes the process highly efficient, because

- a) heat is given off to the environment by the zeolite
- b) the adsorption chamber insulates the evaporation chamber.

Thus, the skilled person would apply this configuration to deal with both otp's, since a) addresses otp 2) and b) addresses otp 1). D1 contains no pointers for further improvements.

The skilled person might thus apply distinguishing feature 1 (the U-shaped cross section) to KB. However, he would not apply distinguishing feature 2 (d.f. 2) since D1 does not disclose d.f. 2, and instead teaches that the arrangement of D1's drawing, where the zeolite fills the entire U-shape including the bottom space, is ideal for heat dissipation to the environment.

KB combined with D2

The skilled person might consider D2, since it relates to self-cooling containers. However, D2 does not disclose dissipating adsorption heat to ambient air, but rather to use said heat to heat a further container. KB and D2 are thus incompatible as they relate to different purposes.

If the skilled person were to still combine KB with D2, he would end up with

- 1) a thermally insulating jacket and/or a thermally insulating cover as an answer to otp 1 (see D2 par 4)
- 2) a further container surrounded with zeolites to dissipate the heat from said zeolites in answer to otp 2 (cylindrical heating space 217 of D1).

As such, even a combination of KB and D2 would not result in either distinguishing feature.

It is noted that D2 discloses a zeolite that is arranged at a side of a heating space. This is different from d.f. 2, since the zeolite in D2 is not arranged surrounding the evaporation chamber, which in turn surrounds the container to be cooled.

Amended claim 1 is considered inventive over KB combined with D2.

KB combined with D1 and D2

The combination would not be made by the skilled person because of the incompatibility issues described above.

Even if the combination were made, the skilled person would not find d.f. 2, since it is not disclosed or hinted at in any of the prior art documents.

Therefore, amended claim 1 is inventive over KB combined with D1 and D2.

6. Conclusion

It is submitted that the amended claims meet the requirements of the EPC. Once agreement on the claims has been reached, amended description pages will be submitted if needed. Purely as a precaution, in case refusal is envisaged, Oral Proceedings are requested.

Carl Berg
Professional Representative

(signature)

Attachment

- amended claims
- sketch by applicant conc. KB

Amended claims

1. A self-cooling barrel (30) comprising
 - a container (40) for liquid to be cooled,
 - an adsorption chamber (32) containing a zeolite (31),
 - an evaporation chamber (34) containing water,
 - a first wall (35) separating the adsorption chamber (32) from the evaporation chamber (34),
 - a valve (36) arranged to open and close a passage in the first wall (35), and
 - a second wall (38) for separating the evaporation chamber (34) from the liquid to be cooled,

the second wall (38) comprising at least part of a side wall of the container (40) and a bottom wall of the container (40)

characterized in that

the adsorption chamber (32) has a U-shaped cross section and surrounds the evaporation chamber (34), and the zeolite (31) is arranged to be only at the side of the barrel (30).

2. A self-cooling barrel (30) according to claim 1, wherein the evaporation chamber (34) extends along substantially the full height of the container (40).
3. A self-cooling barrel (30) according to claim 2, wherein the valve (36) is arranged in the top portion of the barrel (30).
4. A self-cooling barrel (30) according to any of the preceding claims, wherein the top portion and bottom of the barrel (30) have corresponding structures configured so that a plurality of such barrels can be stably stacked on top of each other.
5. A self-cooling barrel (30) according to any of the previous claims, comprising a layer (33) of hygroscopic material for storing the water, the layer (33) being arranged in the evaporation chamber (34) on the second wall (38).
6. A self-cooling barrel (30) according to any of the previous claims, comprising a wire mesh (39) for holding the zeolite (31) at a distance from the first wall (35), the wire mesh (39) being arranged in the adsorption chamber (32).

EXAMINATION COMMITTEE I

Candidate No.

Paper B (Electricity/Mechanics) 2012 - Marking Sheet

Category		Maximum possible	Marks awarded	
			Marker	Marker
Claims	Independent	30	30	30
	Dependent	5	5	5
Arguments	Basis for Amendments	14	8	10
	Clarity	2	2	2
	Novelty	2	2	2
	Inventive Step	47	42	38
Total		100	89	87

Examination Committee I agrees on 88 marks and recommends the following grade to the Examination Board:

PASS
(50-100)

COMPENSABLE FAIL
(45-49)

FAIL
(0-44)

28 June 2012

Chairman of Examination Committee I