

Examiners' Report - Paper B 2009 (Electricity/Mechanics)

1. General Considerations

This year's paper relates to a roof tile comprising a solar collector. A solar collector may comprise a photovoltaic module in order to provide electrical energy and/or means for absorbing solar radiation to heat a fluid in order to provide thermal energy.

The application starts from the position that the invention is a roof tile comprising a transparent cover and a solar collector, see original claim 1, Par. 8 and Fig. 2.

The examiner's communication cites three documents, D1, D2 and D3.

D1 discloses two separate items of prior art. The first item is D1, Par. 1-3 and Fig. 1, it is herein referred to as D1/1. The second item is D1, Par. 4 and Fig. 2, it is herein referred to as D1/2.

D1/1 discloses a roof tile comprising a solar collector having a photovoltaic module and a metal plate. The underside of the metal plate dissipates heat.

D1/2 discloses a roof tile which differs from that shown in Fig. 1 only in that comb-shaped metal fins are attached to the underside of the metal plate. The elongate spaces between the fins are defined in D1/2 as being passageways 109.

D2 discloses a roof tile comprising a solar collector with a metal tube located above a reflecting metal plate. Solar radiation heats the tube and thus the water inside the tube. Some heat is transferred from the metal plate to the metal tube by reflection.

D3 discloses a solar panel comprising several rows of photovoltaic modules which are mounted on a metal plate and cooled by water flowing above them in passageways. The water in the passageways forms elongated lenses that concentrate solar radiation onto the photovoltaic modules.

It was expected to provide a letter to the EPO responding to all the points raised in the official communication from the EPO.

It was considered appropriate to provide an amended set of claims with the letter to the EPO. It was expected that the amended set of claims should overcome all the objections made in the official communication.

It was expected to include appropriate features of the tile shown in Fig. 5 of the application in the amended claim set, as requested in the client's letter.

Answer papers were marked on a scale of 0 to 100 points.

This year, up to 45 points could be achieved for the amended set of claims and up to 55 points could be achieved for the letter of response to the EPO. The mark awarded an answer paper was based on the total number of points achieved.

2 Claims (45 points available)

2.1 Independent device claim (up to 30 points)

A single independent device claim was expected.

Example:

The following claim is one example of a good independent claim; the claim could be worded differently and be equally good. The underlined portions are the amendments based on the description. The references in square brackets indicate an example basis for preceding features in the original application.

A roof tile (1) comprising a transparent cover (3) and a solar collector (5) [Claim 1], wherein the solar collector (5) comprises a metal plate (7) [claim 3] and a fluid-tight [Par. 11, 12, 16, 17] passageway (9) for fluid, characterised in that the metal plate (7) is arranged between the transparent cover (3) and the fluid-tight passageway (9) in such a way that heat can be transferred from the metal plate (7) to the fluid. [claim 5, Par. 12 and 17]

2.1.1 Important points to consider regarding the claim

2.1.1a Achieving novelty with respect to D1/1

In order to achieve novelty with respect to D1/1, the independent claim of the example claim set introduces the feature “passageway” as defined in original claim 5. There are no passageways disclosed in D1/1.

2.1.1b Achieving novelty with respect to D1/2

In order to achieve novelty with respect to D1/2, the independent claim of the example claim set further defines the passageway as being “fluid-tight”. The passageways of D1/2 are open channels between comb-shaped metal fins, they are therefore not fluid-tight.

2.1.1c Achieving Novelty With Respect to D2

In order to achieve novelty with respect to D2, the independent claim of the example claim set defines the relative positions of the metal plate and the fluid-tight passageway unambiguously. This is achieved by claiming that the metal plate is arranged between the fluid-tight passageway and the transparent cover.

There could be equally good alternative ways to unambiguously express the relative location of the metal plate and the passageway.

2.1.1.d Functional Feature

All the embodiments of the invention were specified with a functional limitation on the relative arrangement of the metal plate and the fluid-tight passageway; namely that of being able to transfer heat from the metal plate to the fluid (in the passageway). This feature was in original claim 5 and in both paragraphs 12 and 17.

2.1.2 Independent Claim Lacking Novelty (-20 points)

An independent claim whose subject-matter was considered to lack novelty lost **20 points**.

Example:

A claim combining the features of original claims 1, 3 and 5 “(see the communication from the EPO, points 4, 6 and 9) with the addition of the feature of the passageway being “fluid-tight” was considered not to be new with respect to D2 (-20 points). Because water flows through the metal tube 212 of D2, D2 implicitly discloses a fluid-tight passageway, see D2, Par. 3.

2.1.3 Claims lacking inventive step (-18 points)

An independent claim whose subject matter was considered to lack inventive step lost **18 points**.

2.1.4 Unnecessary limitations (Up to -20 points per limitation)

2.1.4a Major unnecessary limitations (-20 points each)

Independent claims which were according to the example independent claim but which were further limited to either the second or third preferred embodiment or one or more specific arrangements thereof were considered to have major unnecessary limitations.

Examples:

A plug and socket connector (-20 points);

A photovoltaic module (-20 points);

A fluid-tight passageway being formed by a tube having a circular cross section (-20 points);

A fluid-tight passageway being formed by a tube having a circular cross section or by the metal plate and a metal wall having a U-shaped cross section (-20 points);

A fluid-tight passageway following a meandering path (-20 points);

A frame which supports the transparent cover and holds the solar collector (-20 points);

A thermal insulation layer (-20 points).

2.1.4b Minor Unnecessary Limitations (-5 points each)

Independent claims which were the same as the example independent claim except that they had a further limitation which was considered to be unnecessary for defining the invention but which only restricted the scope of protection for the applicant in a minor way were considered in this section.

Examples:

Fluid connectors (-5 points);

Claiming physical contact or attachment of the fluid-tight passageway and the metal plate (-5 points).

2.1.5 Non Compliance with Art. 84 EPC, e.g. Clarity

Up to 18 points in total were deducted for non-compliance with Art. 84 EPC.

2.1.5a Major Art. 84 EPC Issues (up to -18 points).

Example:

An independent claim which defined a solar collector and a fluid-tight passageway for fluid but which did not clearly define that the solar collector comprised the fluid-tight passageway was considered to have a major lack of clarity; A roof tile comprising a transparent cover, a fluid-tight passageway for fluid and a solar collector... (-18 Points).

2.1.5b Minor Art. 84 EPC Issues (-5 points).

Example:

An independent claim having the same scope as the independent claim of the example claim set, except that the passageways were not defined as being "fluid-tight" and additionally having "connectors for fluid" specified in the claim, lost 5 points. It was considered that such a claim does not fulfil the requirements of Art. 84 EPC, since none of the preferred embodiments described in the description of the application support a claim to a roof tile comprising a solar collector where the solar collector has fluid connectors and a passageway for fluid which does not have to be fluid-tight. It is noted that for such a claim, no points were deducted under the section "minor unnecessary limitations" for including the "connectors for fluid".

2.1.6 Amendments not supported by the application as originally filed Art. 123(2) EPC

2.1.6a Amendments Falling Under Art. 123(2) /123(3) Trap (-20 points).

Any independent claim which included subject matter having no basis in the original disclosure of the application and which could not have been deleted in post grant proceedings without broadening the scope of the claim was considered in this section.

Example:

A Frameless roof tile comprising a transparent cover and a solar collector, whereby the solar collector supports the transparent cover. (-20 points).

2.1.6b Other Amendments Falling Under Art. 123(2) EPC (-10 points)

Any independent claim having subject matter that extended beyond that of the application as originally filed, but which could have been made compliant with Art. 123(2) EPC in post grant proceedings before the EPO without offending against Art. 123(3) EPC was considered in this section.

Examples:

An Independent claim having the same scope as the example independent claim except that the relative positions of the metal plate, the transparent cover and the passageway were defined without including the feature "in such a way that heat can be transferred from the metal plate to the fluid" (-10 Points).

An Independent claim which was the same as the example independent claim except that the "metal plate" from original claim 3 was generalised to a "plate" (-10 points).

2.1.7 Formal matters (up to -4 points in total)

This year, for the independent claim of the example claim set, it was considered appropriate to use the two-part form of claim. Independent claims having a one-part form, or a two-part form of claim which was not consistent with any of the prior art available, and claims which had missing reference signs were considered in this section.

2.2 Dependent claims (15 points available)

2.2.1 General Remarks

This year 12 points were available for the feature content of the dependent claims per se and 3 points were available for rewarding the structure of the claim set.

2.2.2 Maintaining Appropriate Original Dependent Claims (2 points)

Up to a total of 2 points were available for incorporating appropriate claims based on original dependent claims into the amended claim set.

Example:

For the independent claim of the example claim set, dependent claims based on original claims 2, 4, 6 and 7 were considered to be appropriate.

2.2.3 Claim Based on the Third Embodiment, Par. 15 (6 points)

The client requested that appropriate features of the roof tile shown in Fig. 5 be protected in the new claim set to be filed. This roof tile is the third preferred embodiment of the invention and is described in Par. 15 of the description of the application.

Example:

A roof tile (1) according to [a claim having a plug and socket, based on original claim 7] wherein the plug connector (11a) and the socket connector (11b) are so located on opposite sides of the roof tile (1) that when a plurality of such roof tiles are mounted as part of a roof, the plug connector (11a) of a roof tile (1) engages with the socket connector (11b) of a neighbouring roof tile. (6 points).

Example:

A roof tile (1) according to [a claim having a plug and socket, based on original claim 7] wherein the plug connector (11a) and the socket connector (11b) are located on opposite sides of the roof tile (2 Points).

In this example, it was considered that the requirements of Art. 123(2) EPC were not met. Furthermore it was considered that such a claim lacked some of the essential features appropriate for clearly defining a roof tile that could be used as described in Par. 15 of the application.

2.2.4 System Claim (4 points)

An objection was made by the examiner in point 10 of the communication that the original claim 8 lacked clarity, Art. 84 EPC. It was expected to include a clear system claim to replace the original claim 8.

Example:

A solar collector system formed from any combination of a plurality of roof tiles according to any of the preceding claims, based on the description par. 18 (4 points).

2.2.4a Unnecessarily Limited System Claim

A system claim which was considered to be unnecessarily limited in scope lost points.

Example:

A solar collector system formed from a plurality of roof tiles **according to claim 6** (1 point).

2.2.4b System Claim Adding Subject Matter (Art. 123(2) EPC)

There was considered only to be a basis in the application as originally filed for a system claim defining a plurality of roof tiles according to the invention as disclosed in the original application.

Example:

A solar collector system comprising **at least one** roof tile according to any of the previous claims (2 points).

2.2.5 Other Dependent Claims

2.2.5a Claims Not Considered to Offer a Useful Fall Back

For answer papers having an independent claim according to the example claim set, points were not awarded for dependent claims which were considered not to offer a useful fallback:

Examples:

Electrical wires (0 points)

Fluid defined as being water (0 Points)

2.2.5b Additional Dependent Claims offering a Useful Fall back

Some answer papers contained an independent claim that was broader than the independent claim of the example solution, for example resulting in a lack of novelty of the independent claim. In these cases, provided the total of 15 points for the dependent claims was not exceeded, up to 2 points were available for claims which provided a useful fallback. Such a claim was considered to be one that could later be combined with the independent claim to improve the applicant's position.

2.2.6 Structure (3 points)

A set of dependent claims having a claim set structure which gave the applicant an appropriate set of fall-back options, whilst at the same time being concise and having correct back-references, received 3 points.

3 Argumentation (55 points available)

3.1 General remark

This year, the official communication from the EPO raised novelty objections against the original claim set, based on the items of prior art D1/1, D1/2 and D2. The item of prior art D3 was commented on in the communication. Answer papers were expected to contain appropriate arguments in response to all the points raised in the official communication.

3.2 Source of amendment (10 points)

It was expected to indicating a basis for the amendments made in all the claims. It is noted that the following explanations and examples generally relate to the example claim set. For Answer papers having a claim set that differed from the example claim set, then the basis and explanations expected may have differed from those given below.

3.2.1 Independent Claim (7 points)

7 points were available for indicating and explaining a basis for the independent claim.

For the independent claim of the example claim set, it was expected to identify the amendments made and to indicate their basis by citing references to the application as originally filed. Additionally it was considered necessary to provide brief explanations in support of the basis indicated.

It is noted that there are different ways of indicating and explaining the basis of claim 1 of the example set of claims. The following is only one example of how this could have been done.

Example:

For claim 1 of the example set of claims:

Claim 1 as amended comprises the subject matter of originally filed claims 1, 3, and 5.

The passageway defined in original claim 5 has been specified as being a “fluid-tight” passageway. A basis for this is disclosed in the description Par. 11, 12, 16 and 17.

The metal plate defined in original claim 3 has been specified as being located “between” the transparent cover and the fluid-tight passageway. A basis for this is disclosed in the description, Par. 12 and 17. In the second and third preferred embodiments described in Par. 11, 12 and 15 a photovoltaic module is always present. As stated in Par. 17, roof tiles according to these preferred embodiments can alternatively be made without the photovoltaic modules and electrical wires. Therefore there is a basis in the application as originally filed for the feature that the passageway is “fluid-tight” in Par. 11 and for the feature that the metal plate is located “between” the transparent cover and the fluid-tight passageway in Par. 12, irrespective of whether a photovoltaic module is present or not.

3.2.2 Dependent Claims (3 points)

A total of 3 points were available for justifying a basis for the dependent claims.

Example

For the example set of claims:

Claim 2 is based on original claim 2

Claim 3 is based on original claim 4

Claim 4 is based on original claim 6

Claim 5 is based on original claim 7

Claim 6 is based on the description Par. 15

Claim 7 is based on the description Par. 18.

3.3 Clarity (3 points)

In par. 10 of the communication a clarity objection (Art. 84 EPC) was raised against the system claim (originally claim 8). Answer papers were expected to respond to this objection in the letter of reply. This year a total of 3 points were available for stating that the clarity objection had been overcome and briefly explaining why.

3.4 Novelty of the Independent Device Claim (3 points)

It was considered sufficient to mention one feature of the independent claim that is not disclosed in each item of prior art.

For the example solution, no statement was expected with respect to document D3 since this was not cited by the EPO as taking away the novelty of original claim 1. It was expected to justify the novelty of an independent claim including the features of original claim 1 with respect to each of D1/1, D1/2 and D2.

3.5 Inventive Step Argumentation for the expected claim (39 points)

It was appropriate to provide arguments which were structured to follow the problem solution approach (see Guidelines C-IV 11.7).

3.5.1 Identifying the closest prior art (7 points)

In selecting the closest prior art, the first consideration is that it should be directed to a similar purpose or effect as the invention or at least belong to the same or a closely related technical field as the claimed invention. See Guidelines C IV 11.7.1.

This year, 1 point was available for stating an item of prior art as being the closest prior art. For an answer paper having an independent claim directed to a roof tile, no point was awarded for stating that D3 was the closest prior art. For an answer paper having an independent claim according to the example claim set, 1 point was awarded for stating that D2 was the closest prior art, or for stating that D1/2 was the closest prior art.

Irrespective of which prior art was stated as being the closest prior art, a total of 6 pages were available for explanations justifying the choice of the closest prior art and for the stated item of prior art being consistent with any two-part form of the independent claim in the answer paper.

Example

For the independent claim of the example claim set, D2 is considered to be the closest prior art since it is the only prior art roof tile that comprises a solar collector for providing thermal energy. D3 does not disclose a roof tile. D1/1 and D1/2 disclose roof tiles for providing electrical energy. Therefore in terms of its purpose, D2 is considered to be closer to the invention as claimed in the example claim than D1/1 or D1/2.

3.5.2 Derivation of the problem (8 points)

- a. Identifying the distinguishing features between the claim and the closest prior art. (2 points).
- b. Stating the technical effects or the advantages of these features. (4 points).
- c. Deriving and stating a problem that is solved by these technical effects. (2 Points).

Example:

For the Independent Claim of the Example Solution where D2 is chosen as the closest prior art:

The distinguishing feature between claim 1 and D2 is that the metal plate is arranged between the cover and the passageway.

The technical effects of this difference are that:

The tubes are protected from damage from above the roof by the metal plate should the transparent cover break. Furthermore no tubes can be seen when the tile is mounted as part of a roof.

Starting from D2, an objective technical problem can be expressed as: How to improve the robustness of a roof tile comprising a transparent cover and a solar collector, wherein the solar collector comprises a metal plate and a fluid-tight passageway for fluid. A secondary objective technical problem can be expressed as: How to improve the appearance of the above roof tile.

3.5.3 Arguments in support of an inventive step (24 points)

Arguments should support the features of the independent device claim, they should be convincing and well structured. They could have been structured to answer the following questions:

- a. would the skilled person arrive at the subject matter of the claim by **considering the closest prior art on its own?**
- b. **Would the skilled person consider combining** the teaching of the closest prior art with that of other items of prior art?
- c. If the skilled person were to combine the closest prior art with other items of prior art, **would they arrive at the subject matter of the claim?**

In the following example, possible arguments are given for the independent claim of an example claim set, where D2 has been chosen as the closest prior art. For other cases, arguments could differ.

Example:

For Document D2 as the Closest Prior Art, and Claim 1 according to the Example Solution:

Considering D2 on its own (6 points)

The upper surface of the metal plate in D2 is reflective. Therefore the fluid-tight passageway of D2 needs to be located above the plate in order to receive the solar radiation reflected by the plate. Because in D2 a part of the radiation directly heats the tube, the skilled person would be biased against placing the metal plate in between the transparent cover and the tube since this portion of the thermal energy would then be lost.

There is therefore no indication in D2 itself to place the metal plate between the transparent cover and the metal plate. If the skilled person were to do so, there would be an additional step required of arranging the metal plate and the tube so that heat could be transferred from the metal plate to the fluid, without the transfer occurring by reflection.

With respect to the objective problem stated above, there is no hint in D2 as to how the tile could be made more robust. Faced with the problem, the skilled person would not have any indication in D2 to change the relative positions of the metal plate, the transparent cover and the fluid-tight passageways in order to solve the problem. With respect to the secondary objective technical problem, D2 gives no indication as to how to improve appearance of a roof tile comprising a solar collector.

Considering D2 in combination with D1 (14 points)

- D2 in combination with D1/1

- Would the person skilled in the art consider combining D2 with D1/1?

D1/1 discloses a roof tile comprising a solar collector for providing electrical energy, it does not disclose a roof tile comprising a solar collector for providing thermal energy. The general purpose of the roof tile of D1/1 is therefore different from that of the roof tile of the invention, and the skilled person would not consider looking to this prior art for a solution to the technical problems posed. Furthermore the roof tile of D1/1 does not disclose any passageway for fluid, therefore it is remote from the roof tile of the invention in terms of technical features. For this reason also the skilled person would not consider combining the technical features of D2 and D1/1 in order to solve the objective technical problems.

- If the person skilled in the art did combine the teachings of D2 with that of D1/1 they would not arrive at the invention as claimed.

If the skilled person were to combine the teaching of D2 with that of D1/1, they would not arrive at the subject matter of claim 1 of the application for the following reasons:

With respect to the objective technical problem, prior art D1/1 does offer a solution to this problem, the solution being to make the transparent cover robust enough to withstand all kinds of weather conditions. Therefore in order to solve the problem the skilled person

would make the transparent cover of the roof tile according to D2 stronger. The skilled person would therefore arrive at a roof tile being as disclosed in D2 except that the transparent cover would be made stronger. With respect to the secondary objective technical problem, the skilled person might consider that the absence of tubes in the tiles of D1/1 lead to a better appearance than the tiles of D2. However, since a fluid-tight passageway in a tube is essential for the functioning of the tiles of D2, this consideration would not prompt the skilled person to modify the tiles of D2.

- Would the person skilled in the art consider combining D2 with D1/2?

The skilled person would not consider combining D2 with D1/2 for the same reasons that they would not consider combining D2 with D1/1. Furthermore the purpose of the solar collector of D2 is to **provide** thermal energy, whereas the only mention of thermal energy in the solar collector of D1/2 is the **dissipation** of thermal energy.

The roof tile of D1/2 does disclose passageways for fluid. However the passageways are the spaces between comb shaped fins and therefore they are technically remote from the tubes of the solar collector of D2.

- If the person skilled in the art did combine the teachings of D2 with that of D1/2 they would not arrive at the invention as claimed.

Even if the skilled person did combine the teaching of D2 and D1/2, they would not arrive at the solution as claimed for the following reasons:

With respect to the objective technical problems, D1/2 offers no solutions beyond those offered by D1/1.

Combining the teaching of D2 with that of D1/2, the skilled person would realise that both solar collectors require exposure to solar radiation. If they combined the teachings in a single unit they would therefore arrive at a roof tile comprising a solar collector according to D2 and a solar collector according to D1/2 side by side. They would not arrive at the roof tile of the invention.

Considering D2 in combination with D3 (4 points)

- Would the person skilled in the art consider combining D2 with D3?

Document D3 relates to a solar panel which can be mounted on a roof, but not to a roof tile. Thus the documents are in neighbouring technical fields. The skilled person is therefore less likely to combine the teachings of D2 and D3 than if they had been in the same technical field. With respect to the objective technical problem, D3 offers no indication as to how to improve the robustness of a roof tile. Regarding the secondary objective technical problem, since solar panels disturb the appearance of buildings, the skilled person would not look to a solution to this problem in document D3

If the person skilled in the art did combine the teachings of D2 with that of D3, they would not arrive at the invention as claimed.

Document D3 discloses **fluid tight passageways** which are between a transparent cover and a metal plate. Therefore if the skilled person combined the teaching of the two documents they would not arrive at a **metal plate** which was between a transparent cover and a fluid-tight passageway. If the skilled person were to combine the teaching of D2 and D3 they would arrive at a miniaturised version of the solar panel of D3 in a roof tile but this would not have a metal plate mounted between the transparent cover and the fluid-tight passageway.

Example Claim Set

1. A roof tile (1) comprising a transparent cover (3) and a solar collector (5), wherein the solar collector (5) comprises a metal plate (7) and a fluid-tight passageway (9) for fluid, characterised in that the metal plate (7) is arranged between the transparent cover (3) and the fluid-tight passageway (9) in such a way that heat can be transferred from the metal plate (7) to the fluid.
2. A roof tile (1) according to claim 1, comprising a frame (4) which supports the transparent cover (3) and which holds the solar collector (5).
3. A roof tile (1) according to claim 1 or 2, wherein said solar collector (5) comprises a photovoltaic module (6) mounted on the metal plate (7).
4. A roof tile according to any preceding claim wherein the fluid-tight passageway (9) is formed by a metal tube (12) having a circular cross section or by the metal plate (7) and a metal wall (13) having a U-shaped cross section.
5. A roof tile (1) according to any preceding claim wherein the solar collector comprises a plug connector (11a) and a socket connector (11b) through which the fluid can enter and exit the passageway (9).
6. A roof tile (1) according to claim 5 wherein the plug connector (11a) and the socket connector (11b) are so located on opposite sides of the roof tile (1) that when a plurality of such roof tiles are mounted as part of a roof, the plug connector (11a) of a roof tile (1) engages with the socket connector (11b) of a neighbouring roof tile.
7. A solar collector system formed from any combination of a plurality of roof tiles (1) according to any of the above claims.

EXAMINATION COMMITTEE I

Candidate No. _____

Paper B (Electricity/Mechanics) 2009 - Schedule of marks

Category	Maximum possible	Marks awarded	
		Marker	Marker
Independent	30		
Dependent	15		
Claims	45		
Basis for Amendments	10		
Clarity	3		
Novelty	3		
Inventive Step	39		
Arguments	55		
Total	100		

Sub-Committee for Electricity/Mechanics agrees on marks and recommends the following grade to the Examination Board:

PASS
(50-100)

FAIL
(0-49)
COMPENSABLE FAIL
(45-49, in case the candidate sits
the examination for the first time)

3 July 2009

Chairman of Examination Committee I