Intellectual Property Office

BL O/603/19

08 October 2019

PATENTS ACT 1977

APPLICANT	Benjamin Blackwood
ISSUE	Whether Patent application GB1419065.6 complies with Sections 1(1)(b) & 3
HEARING OFFICER	Mrs S E Chalmers

DECISION

1 Patent application number GB 1419065.6 was filed on 27 April 2014 and was published as GB 2531722 on 4 May 2016.

2 The combined search and examination report, dated 13 March 2015, reported that the claimed invention lacked novelty and inventive step together with several other minor issues. Several rounds of amendment, argument and re-examination followed with the examiner maintaining that the invention lacked inventive step. A hearing was offered in the examination report of 16 April 2019, but the turn of phrase used mistakenly suggested that if the agent did not respond then the case would be passed to a hearing officer for a decision. The agent subsequently phoned the examiner to query the progress of the case and was informed that a request for a hearing was required which they duly made in their response of 12 July 2019.

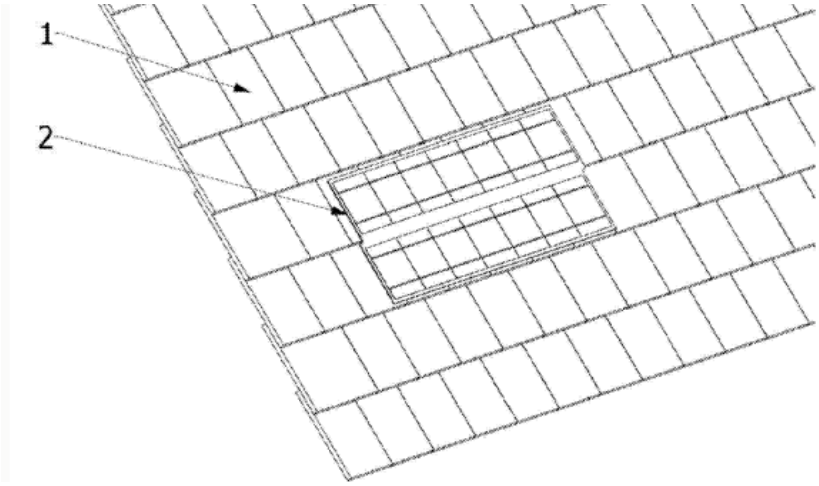
3 The period allowed for complying with the requirements in the act ended on 27 April 2019. That period could have been extended by two months to 27 June 2019 but the request to do so was not received until 12 July 2019, after the period allowed for extending the compliance period. In their letter of 26 July 2019, the examiner invited the applicant to challenge their decision not to exercise discretion and allow the late filing of the request for extension, but the applicant has not done so. As a result, if I find in that the invention claimed lacks inventive step then there is no possibility of amending and the case will be refused.

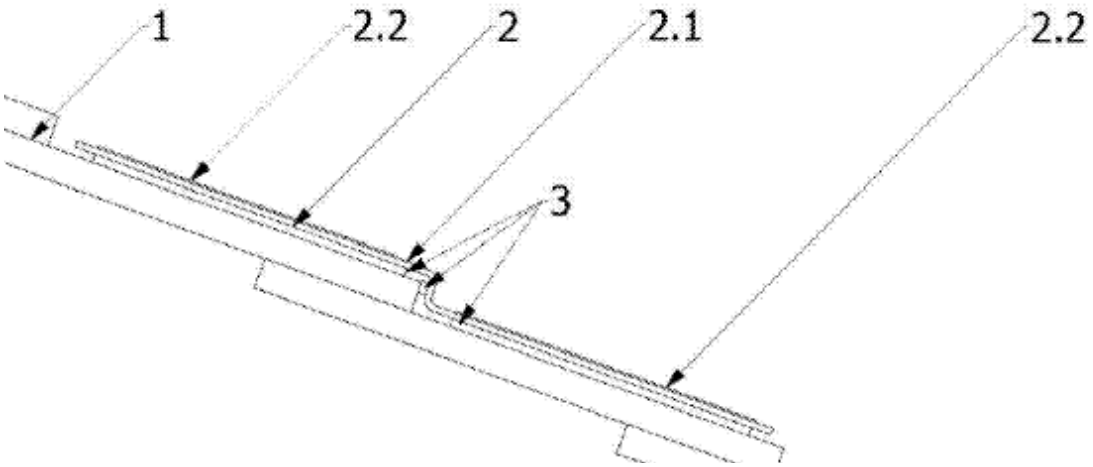
4 I confirm in reaching my decision that I have considered all the correspondence on file.

The Invention

5 The application is entitled “Solar Tile System” and relates to improvements in solar tile systems for mounting to roofs which seeks to provide a solar tile system that is much more widely suitable for use than the current solar tile systems and solar panels. Embodiments provide a solar tile system comprising at least one tile module

(2) that covers overlapping tiles of the roof wherein each tile module comprises a tile module base (2.1) with a photovoltaic material (2.2) fixed to its upper surface and which tile module base has at its under surface an adhesive (3) for fixing it directly onto the top of the roof tiles. The base is substantially planar but has a step to enable it to snugly overlie upper and lower adjacent rows of overlapping roof tiles as shown below.





6 The claims include two independent claims numbered 1 and 10 which read:

1. A solar tile system installed to a roof or other external surface of a structure, the system comprising at least one tile module that cover roofing tiles or other cladding sheets of the roof or other external surface wherein the at least one tile module comprises a tile module base with a photovoltaic material fixed to its upper, in use, surface, and which tile module base has at its under surface an adhesive fixing it directly onto the top of the roofing tile or other cladding sheet of the roof or other external surface, the tile module base underside having at least two planar portions that conforms to the upper surface of the tiles of the roof, separated by a stepped portion that allows the tile module base to seat over two rows of lapped tiles or other cladding sheets.

10. A method of fitting a solar tile system to a roof or other external surface of a structure, the method comprising providing a solar tile system comprising at least one tile module that is configured to cover tiles or other cladding sheet of

a roof or other external surface wherein each tile module comprises a tile module base with a photovoltaic material fixed to its upper, in use, surface and which tile module base has an under surface having a first generally planar portion that conforms to the upper surface of the tiles of the roof, and a second stepped portion that allows the tile module base to seat over two rows of lapped tiles or other cladding sheets, to receive an adhesive for fixing it directly onto the top of the roof tiles or other cladding sheet of the roof or other external surface; applying adhesive to the tile module base under surface; and placing the tile module onto a tile or other cladding sheet of a roof or other external surface that is already in place in the roof, whereby the tile module underside adheres to the tile or other cladding sheet and is thereby fixed in place.

The law

7 Section 1 of the Patents Act 1977 requires that:

> *"1(1) A patent may be granted only for an invention in respect of which the following conditions are satisfied, that is to say –*
> *(a) ….*
> *(b) it involves an inventive step..."*

8 Section 3 of the Act requires that:

> *An invention shall be taken to involve an inventive step if it is not obvious to a person skilled in the art, having regard to any matter which forms part of the state of the art by virtue only of section 2(2) above (and disregarding section 2(3) above).*

9 Whether or not an invention defined by the claims involves an inventive step is assessed using the four-step test first formulated by the Court of Appeal in *Windsurfing*[1] and restated by the court in *Pozzoli*[2] as:

(1) (a) Identify the notional "person skilled in the art"

(b) Identify the relevant common general knowledge of that person;

(2) Identify the inventive concept of the claim in question or if that cannot readily be done, construe it;

(3) Identify what, if any, differences exist between the matter cited as forming part of the "state of the art" and the inventive concept of the claim or the claim as construed;

(4) Viewed without any knowledge of the alleged invention as claimed, do those differences constitute steps which would be obvious to the person skilled in the art or do they require any degree of invention?

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[1] *Windsurfing International Inc. v Tabur Marine (Great Britain) Ltd, [1985] RPC 59*
[2] *Pozzoli SPA v BDMO SA [2007] EWCA Civ 588*

Arguments and analysis

Step 1: Identify the person skilled in the art and the common general knowledge of that person.

10 The examiner identifies the person skilled in the art as a designer and manufacturer of photovoltaic structures for roofs. The examiner states that such a person would be well aware of the use of adhesive to secure various types of photovoltaic modules to a roof surface, for example as shown in nine of the documents they cite which are said to be selected examples of a large number showing adhesive attachment. They also state that that person would be aware of the problems associated with mechanical fastenings which penetrate the roof surface, and the advantages provided by adhesive attachment.

11 In their letter of 29 October 2018, the agent comments that while the skilled person would be aware of the use of adhesives in fixing some types of solar panel to roofs and the advantages of this, they are equally aware that there are practical problems in using adhesive on relatively large solar panels for stepped tiles. With their letter of 1 April 2019, they submit that they believe there is a technical prejudice in the art that has caused the skilled person to dismiss the use of adhesives for large solar panels. To support this assertion, they provide evidence in the form of emails from solar panel installers responding to a query as to whether they offered a solar panel solution that is adhesively fixed instead of using mechanical brackets noting that there they don't want to disturb to roof structure and have limited space for scaffolding. In each case the installer responds that the do not offer an adhesive solution and that scaffolding is required for installation with one noting that they thought that there is no adhesive system which is MCS (Microgeneration Certification Scheme) approved.

12 In my opinion, the notional person skilled in the art is someone who wishes to install solar panels or design solar panels (as this would necessarily entail some consideration of how they are to be installed). Such a person might be employed by a solar panel manufacturer or an installation company. The notional person would have a general knowledge of solar energy harnessing devices for buildings and other structures and would be aware of adhesive as an attachment means at least for certain types of solar panels and the advantages/disadvantages of doing so.

Step 2: Identify or construe the inventive concept

13 Many of the comments in the agent's letters about the skilled person's knowledge and documents cited refer to or suggest that the agent/applicant believes that the inventive concept includes (i) the rigidity of their invention and flexibility of solutions in the documents, (ii) the relative size of the panels, (iii) that adhesive is the only attachment means and (iv) that the adhesive covers the entire under surface of the module. There are also suggestions that the inventive concept requires that (iv) the solar panel is attached to roof tiles and (v) specifies the number of underlying roof tiles covered.

14 The examiner comments that the claims do not define that the adhesive covers the entire under surface of the module and only defines a module having two rows, and so itself may also be "comparatively small" but still span at least two rows.

15 The claims do not refer to the (i) rigidity or otherwise of the panels nor (ii) the size of the planar portion(s) and therefore the inventive concept, as claimed, encompasses a range of sizes of both rigid and flexible panels. Dependent claims 5 to 8 specify the material and thickness of the base which would likely be relatively rigid, but the independent claims are not restricted to this.

16 Neither claim precludes the presence of other attachment means and therefore cover attachment using mechanical fastenings in addition to adhesive.

17 Claims 1 and 10 respectively define a solar tile system installed to and method of fitting a solar tile system to "*a roof or other external surface*". Both also specifically refer to "…*fixing [the solar tile system] directly onto the top of the roofing tile or other cladding sheet of the roof or other external surface*…". The inventive concept covers fixing the solar tile system having a stepped profile to an external surface.

18 Claims 1 and 10 refer to the tile module base having an under surface "*that allows*" (i.e. is suitable for) "*seating over two rows of lapped tiles*". Claim 10 refers to "*a first generally planar portion and a second stepped portion*" whereas claim 1 refers to "*at least two planar portions separated by a stepped portion*". Exemplary embodiments show a tile system which spans over fourteen underlying roofing tiles including the upper and lower adjacent rows each of seven roofing tiles. The inventive concept covers smaller panels suitable for, at least partially, covering two tiles in adjacent rows.

19 The inventive concept of claim 1 concerns a solar tile system installed to an external surface comprising a tile module having a profile that matches the underlying external surface that comprises a tile module base with a photovoltaic material fixed to its upper surface, and an adhesive on its underside for fixing it directly onto the external surface, the tile module base underside having at least two planar portions separated by a stepped portion suitable for seating over two rows of lapped tiles.

20 The inventive concept of claim 10 is a method of fitting a solar tile system to an external surface comprising providing a solar tile system having a profile that matches the underlying roof comprising a tile module that comprises a tile module base with a photovoltaic material fixed to its upper surface and which has an under surface having a first generally planar portion and a second stepped portion suitable for seating over two rows of lapped tiles; applying adhesive to the tile module base under surface; and placing the tile module onto the external surface, whereby the tile module underside adheres to the external surface and is thereby fixed in place.

Step 3: Identify the differences between the inventive concept and the matter cited as state of the art.

21 The examiner cited ten prior art patent documents as showing similar devices. I will focus my discussion on WO 2006/010261, US 2009/0320898 and JP 2002-332733.

22 WO 2006/010261 shows a modular solar panel overlay 110 for mounting on an underlying roof deck comprises a substrate 180 and one or more rows 120 of photovoltaic cells 122. Reverse bends 130 are formed between each row of photovoltaic cells to define risers 132 that provide the modular solar panel overlay with vertical relief that mimics the overlapping characteristic of composite shingles

and conform to the roof deck. The use of adhesive to attach large area PV modules directly to a building substrate is discussed as part of the background to the invention, specifically referring to US6553729 which shows this to be known. The embodiments use mounting clips to attach the modular solar panel overlay to the roof.

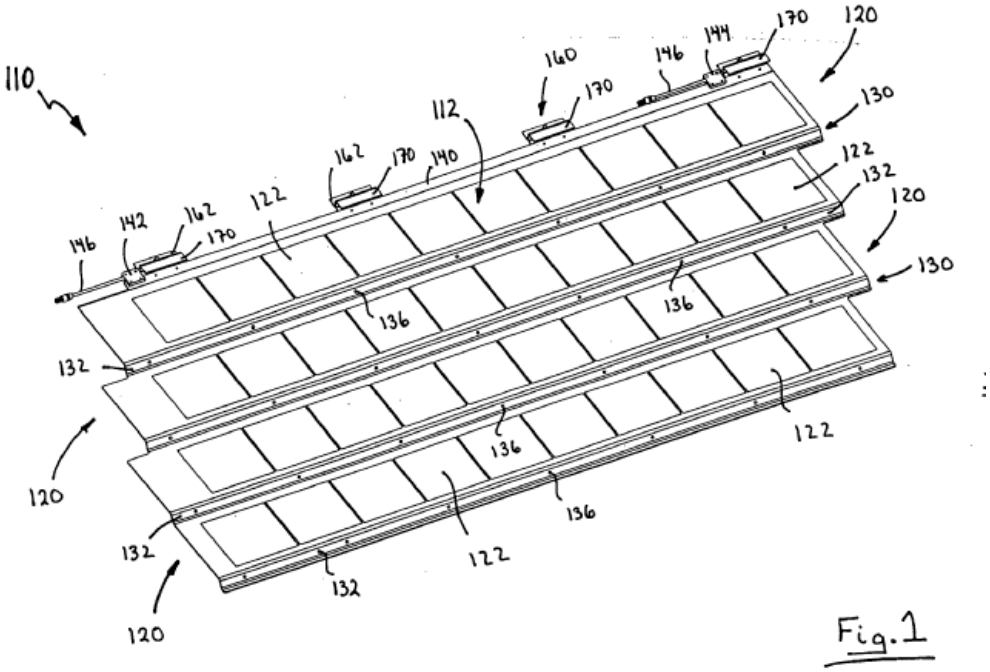
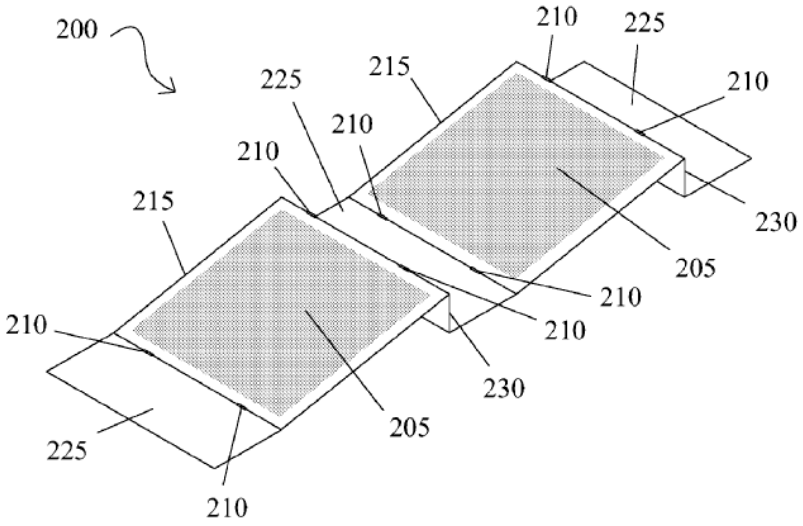


Fig.1

23 The applicant comments on WO`261 in the letter of 29 October 2018 that "*the design described in '261 being unsuitable for the use of adhesives, perhaps because the design necessarily constitutes individual rows, which would be difficult to link together in the manner described if adhesives were used*". Similar comments are made in the letter of 1 April 2019. The cross-sectional view of the modular solar panel overlay shown in figure 5 and description of WO`261 make it clear that this is not the case; the overlay shown in figure 1 has a single substrate which is bent.

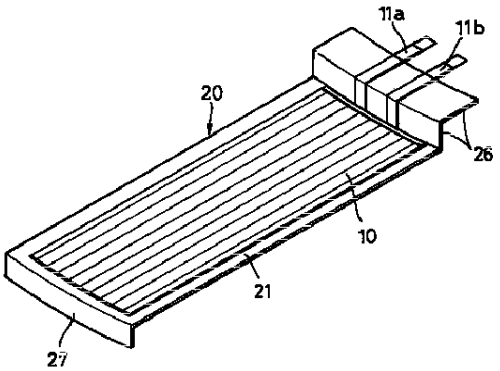
24 WO`261 differs from the inventive concept in not specifying an embodiment in which adhesive is used to attach the modular solar panel overlay to the roof.

25 US 2009/0320898 describes a configurable articulated photovoltaic assembly which has a plurality of photovoltaic modules connected to each other by hinges to allow the assembly to fold for transportation. The assembly is secured in place using a variety of adhesives, a variety of mechanical fasteners or both. In some embodiments the assembly includes a plurality of base attachment plates 225 and a plurality of risers 230 attached between modules 205 and to an end of base attachment plates 225. This is said to allow the assembly to fold generally flat when not in use and to be positioned at a selected angle to optimize their efficiency and from channels between modules.



26 US `898 is provided by the examiner as an example of using adhesive to attach a photovoltaic assembly to a roof who notes that it discloses a multiple row covering which is adhered to a roof at separate points across the rows. The agent's letter of 29 October 2018 comments on this document that the "…*use of adhesives…is not applied to the back to photovoltaic module itself but instead to*…" base attachment plates 225. Whilst that may be, it is not part of the inventive concept. This document differs from the inventive concept in that none of the embodiments are said to have a profile that matches the underlying roof. In other examples, the document discloses that the base attachment plates may be attached by mechanical means or a combination of mechanical means and adhesive.

27 JP 2002-332733 relates to a solar cell module 20 including solar cell 10 whose size corresponds to a flat part of roofing tiles and is shaped to provide shoulder parts 26 and a step part 27 corresponding to the unevenness of the tile-like roofing. The figure shows the module as including two planar portions (one receiving the solar cell, the other being part of shoulder 26) having a profile that matches the underlying roof, separated by a stepped portion (part of shoulder 26). The solar cell module 20 is stuck along the surface of the roofing with adhesive.



28 JP `733 is also provided by the examiner as an example of using adhesive to attach a solar cell module to a roof. The described embodiments have a profile that matches the underlying roof tile and appear to be suitable for seating over two rows lapped tiles albeit that one of those rows is only partially covered by shoulder 26

29 In their letter dated 29 October 2018 the agent states that JP `733 describes a resin film, which is flexible and hence conforms to the shape of the roof but is unsuitable for thick tiles or corrugated profiles and precludes the preferred installation method. In the letter of 8 May 2018, they propose that JP `733 is concerned with single tiles. None of these features are clearly required/precluded by the inventive concept and it is not clear to me that there is a substantial difference between the disclosure in JP`733 and the inventive concept of either independent claim. As this point has not previously been put to the applicant I will not consider it further.

30 The other prior art documents cited all disclose solar panels/tiles attached to a roof using adhesive and are said to be examples of many. The applicant asserts that although adhesive has been proposed by these examples its use has not been specifically related to stepped roof tiles because that presents difficulties and drawbacks and that many concern single PV tiles. Of the examples which show panels conforming to the underlying roof the applicant asserts that these are small, flexible panels whereas their invention is a large, rigid panel. However, the size of the panel, number of tiles covered, and its rigidity are not features of the claims.

Step 4: Determine whether when viewed without knowledge of the invention as claimed whether the differences constitute steps which would have been obvious to the person skilled in the art.

31 The question before me can be summarized as follows: would it be obvious to the skilled reader of WO 2006/010261 to use adhesive (instead of, or in addition to, the mechanical fastening described in embodiments) to attach the described solar panel to a roof?

32 *Windsurfing* teaches, at page 77, that "*it would be wrong to prevent a man from doing something which is merely an obvious extension of what he has been doing or of what is known in the art before the priority date*". Furthermore, *Pozzoli* teaches, at paragraph 28, that "*where, however, the patentee merely patents an old idea thought not to work or to be practical and does not explain how or why, contrary to the prejudice, that it does work or is practical, things are different. Then his patent contributes nothing to human knowledge. The lion remains at least apparent (it may even be real) and the patent cannot be justified*" (underlining added).

33 The examiner concludes that the person skilled in the art would not require an inventive step to attach the module disclosed in WO'261 to a roof using adhesive as the advantages of adhesives are well known, not least as discussed in WO`261 with reference to US6553729, and the mounting clips are only a preferred embodiment.

34 The applicant has argued extensively that solar system installers would not be inclined to try using adhesive alone to fix conventional flat solar panels to a tiled roof as a matter of course because of a prejudice in the art against doing so with large rigid panels. However, that is not the correct question. The solar panel of WO `261 is not a conventional solar panel and the claims do not require that the solar panel is either rigid, large or attached to a tiled roof using only adhesive.

35 The examiner contends that the application does not disclose anything special about the adhesive or the method of attachment. They go on to propose that if there is indeed a prejudice against using well known roofing adhesive, then something must

make it possible in the present application where it wasn't possible before. They then say that the application does not sufficiently provide details of any special method of attachment; it just refers to "an adhesive", which may be "a polyurethane adhesive (PU)" or "a foaming PU adhesive".

36 The application describes problems associated with high winds that give rise to the preference of mechanical fastenings in the art and states that the stepped profile makes attaching with adhesive "*relatively invulnerable to dislodgement by high winds*". However, the applicant has not invented a new adhesive which overcomes the disadvantages which have deterred others; instead their application concerns the provision of a solar panel module which is stepped to have a profile that matches the underlying roof to mitigate those deterrents. This is known from WO `261. If, as the applicant proposes in the letter of 29 October 2018, conventional adhesive is not suitable for affixing the solar panel of WO `261 to a roof then the same would be true of the solar panels of this application.

37 In the agent's letter of 29 October 2018, it is proposed that:

> *Extensive research and development work has shown that there are key unique steps introduced by the introduction of this method which present challenges not simple to overcome even by those skilled in the art, such as:*
> *a. Roof needs to be surveyed to ensure that the correct stepped profile is designed and fabricated.*
> *b. Bespoke fabrication process needed to account for varying roof designs.*
> *c. Wind uplift calculations are required.*
> *d. Fixing to the roof covering presents a new load condition (most fixing systems attach to the underlying roof structure which is already commonplace, and usually structurally accepted without testing). This new load condition must be tested in-situ, usually via pull-up testing on the roof covering itself.*
> *e. Roof substrate adhesive bonding performance needs to be tested via pull-out testing in line with the factored loads borne by the wind uplift calculations. This will enable fit-tuning of the most suitable type of polyurethane adhesive and suitable primer and cleaning regime.*
> *f. Accelerated weathering testing is required for chosen adhesive to roof covering bond to ensure the bond does not unacceptably degrade over time (usually a factor of at least 1.2 should remain after 25 years).*
> *g. The outputs of steps d), e) and f) usually need to be issued to the local building control authority for acceptance before proceeding, and sometimes the building insurer.*
> *All of the above steps a) to g) are required for the adhesive fixing method and are not normally required for mechanical fixing methods.*

38 The application does not explain how any of the above steps have been addressed (or indeed even mention them). Taking the applicant/agent at their word that all of these steps are required; doing each of these steps must either be (i) straightforward in which case the disclosure in the application is sufficient but it would be equally straightforward for the reader of WO`261 to take the same steps or (ii) not straightforward in which case the application is likely insufficient. I will proceed on the basis that it would be straightforward.

39 The skilled person is entitled to install the solar panel of WO `261 to an external surface using any suitable, conventional, attachment means (either alone or in combination). Adhesive is one such conventional attachment means. Even if the skilled person reading WO`261 would not necessarily be led directly to try adhesive fixing, doing so is obvious in the sense that it is lying in the road (ob via) and it would be wrong that they should be stopped by a monopoly from doing so. I therefore find that the invention defined in claims 1 and 10 is obvious from the disclosure in WO 2006/010261 and common general knowledge. I have also considered dependent claims and find that all the features therein are either disclosed in WO 2006/010261 or also obvious therefrom.

40 Having concluded that the invention is obvious following the approach in *Windsurfing/Pozzoli,* I also considered whether the invention is a collocation as set out in SABAF[3]. The adhesive and solar panel with a stepped profile each perform their own proper function independently of the other and the claims are an aggregation or juxtaposition of these features. For the purposes of Section 3 the adhesive and solar panel are therefore separate inventions, and each is known (the adhesive is conventional, and the solar panel is known from WO`261). The combination of a series of known features, each playing its usual part in the final entity is a matter of design or mere collocation, not of invention and this reinforces my findings above that the invention of claims 1 to 10 is obvious.

Conclusion

41 I have found that the invention defined in claims 1 to 10 does not involve and inventive step. I therefore refuse the application under Section 18(3).

Appeal

42 Any appeal must be lodged within 28 days after the date of this decision.

Mrs S E Chalmers

Deputy Director, acting for the Comptroller

[3] SABAF SpA v MFI Furniture Centres Ltd [2005] RPC 10