

OPINION UNDER SECTION 74A

Patent	GB 2578339
Proprietor(s)	Greentec International Limited
Exclusive Licensee	
Requester	Jonathan Hewett c/o Lewis Silkin LLP
Observer(s)	Swindell & Pearson Ltd
Date Opinion issued	18 March 2024

The request

1. The comptroller has been requested to issue an opinion as to whether patent GB 2578339 B is invalid due to lack of novelty and inventive step in the light of the product '*DPD02DM44 Multifunction monitoring relay*' produced by Carlo Gravazzi Automation, its associated documentation and its control software. The evidence accompanying the request comprises a press-release and technical document of the product, two screen shots of the DPD manager app from the google play store and a document addressed to the product distributor Garo AB about the internal working of the product.
2. The patent was filed on the 25 March 2019 with no priority claim by Samuel Connor Hunt and was assigned to the current proprietor on 27 December 2019. It was published on 6 May 2020 and granted on 30 December 2020. It remains in force.

Observations

3. Observations were received that questioned the reliability of the publication dates for each of the five pieces of evidence provided and that further documents mentioned in the request have not been provided as evidence. They also questioned whether the documents actually refer to the same product or not. They also argue that the request should be rejected as it does not make a sufficiently clear and consistent argument, because it is not clear if prior use of the product or the prior disclosures of the evidence documents is meant to show lack of novelty or obviousness. There is a detailed rebuttal of the arguments about lack of novelty and inventive step.
4. Observations in reply were received that included further information, such as URLs for documents, and references to some additional documents, partly in an attempt to confirm the publication dates of the evidence originally provided in the request. They

also include further screen shots of the control app. There is a further argument presented based on an additional data sheet.

Matters to be considered by this Opinion

5. Section 74A of the Patents Act provides for the procedure where the Comptroller can issue, on request, non-binding opinions on questions of validity relating to novelty and inventive step, and on questions of infringement. Any observations should be confined to the issues raised by the request and should not broaden the scope of the opinion by raising new issues. Consequently if an observer wishes to explore validity issues not raised by the requestor then they must file a separate request.
6. I will therefore not consider any of the new documents, nor the URLs etc. that are provided in the observations in reply as they effectively raise new issues. I will try to consider the parts of the arguments that do not refer to these new documents and which are directed at the observations.
7. I am also not considering anything contained in the further communication received from the original observer following the observations in reply.
8. This opinion is thus based on the request in its original form and the three documents and two screenshots provided. I will consider the observations and observations in reply only where they relate to the initial request.
9. I will decide on publication dates of the evidence based of the request as filed.
10. If the requestor wishes to submit more evidence, then this should be made as part of a separate request. If in doing so they wish to rely on publication dates of documents, then they should try to provide evidence of when any were made public.
11. I disagree with the observer that the office should refuse to deal with the request outright under Rules 93(1) and 93(4). I note that in the observations in reply, the requestor clarified that the reference to a 'manual' meant D2, and not an additional document. Whilst the request is not that clearly presented (it jumps between references to inventive step and to novelty for example as the observer notes), I consider that there is enough in the request to allow me to form an opinion on the following attacks to validity:
 - A. That the DPD02DM44 product is prior use of the invention or
 - B. That the device of D5 is prior use of the invention;
 - C. That the invention lacks an inventive step given D2.
12. In the observations in reply, the requestor expands on their arguments, and seems to move away from using D2 as a basis for inventive step, seemingly arguing for a combination of all of D1 to D4. As this appears to me to be different to what the original request said, I will only consider the arguments I have identified above.

The Patent

13. The invention is a device for testing a 3-phase and neutral electrical power supply connection, where the neutral is also referenced to earth. This type of neutral is called a PEN. The neutral is defined at the supply source as the star connection point of the 3-phases, and this point is also connected to earth. The supply is then carried to a remote use location by four conductors. The testing device 26 makes a comparison of the voltage at the location of the star point of the three conductors (24) and the PEN conductor. If the voltage difference is large this may indicate that the PEN conductor is broken between the source and the location. This is shown in figure 2 of the patent below.

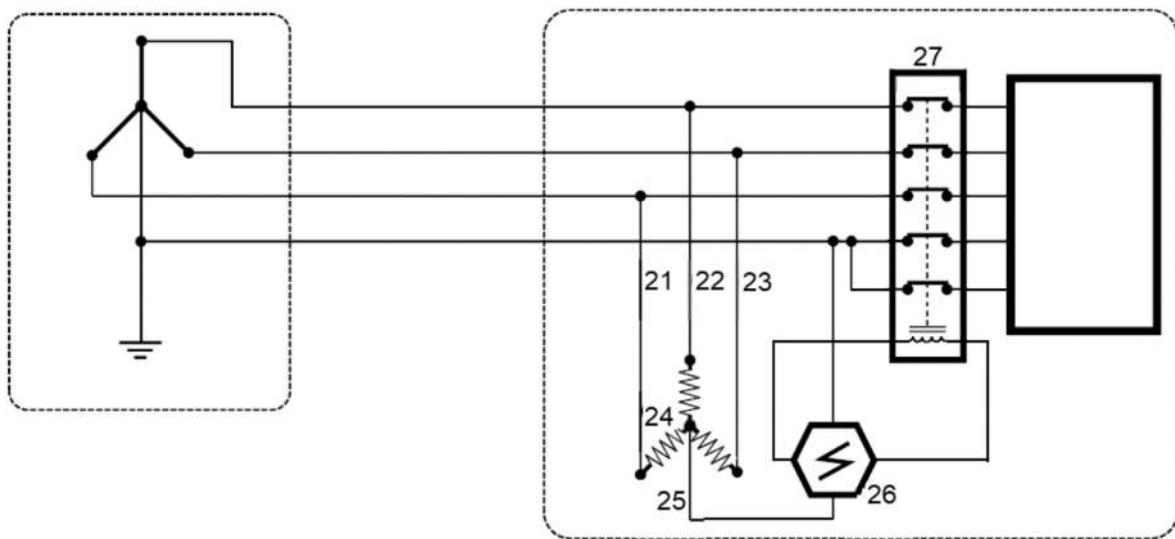


Figure 2

14. The patent describes a scenario where the location of an EV charging point is on an upper floor of a car park. Such an elevated position would make it difficult to provide a local safety earth reference for the charging point, and thus the PEN would be relied upon. A break in the PEN at such a location would be potentially dangerous and the device 26 would act to trigger an interrupter 27 for the whole supply, to isolate the charging point. The figure shows 5 connections being interrupted, with the neutral and earth having been split as separate lines from the single PEN line. The left dashed box of the figure is the main supply source and the right dashed box is the use location.

Claim construction

15. As a first step in determining the validity of the patent I must correctly construe the claims. This means interpreting them in the light of the description and drawings as instructed by Section 125(1). In doing so I must interpret the claims in context through the eyes of the person skilled in the art. Ultimately the question is what the person skilled in the art would have understood the patentee to be using the

language of the claims to mean. This approach has been confirmed in the decisions of the High Court in *Mylan v Yeda*¹ and the Court of Appeal in *Actavis v ICOS*².

16. Section 125(1) of the Act states that:

For the purposes of this Act an invention for a patent for which an application has been made or for which a patent has been granted shall, unless the context otherwise requires, be taken to be that specified in a claim of the specification of the application or patent, as the case may be, as interpreted by the description and any drawings contained in that specification, and the extent of the protection conferred by a patent or application for a patent shall be determined accordingly.

17. And the Protocol on the Interpretation of Article 69 of the EPC (which corresponds to section 125(1)) states that:

Article 69 should not be interpreted in the sense that the extent of the protection conferred by a European patent is to be understood as that defined by the strict, literal meaning of the wording used in the claims, the description and drawings being employed only for the purpose of resolving an ambiguity found in the claims. Neither should it be interpreted in the sense that the claims serve only as a guideline and that the actual protection conferred may extend to what, from a consideration of the description and drawings by a person skilled in the art, the patentee has contemplated. On the contrary, it is to be interpreted as defining a position between these extremes which combines a fair protection for the patentee with a reasonable degree of certainty for third parties.

18. The Patent has a single main claim 1, and 12 dependant claims; The main claim reads:

*1. A customer site entry device for creating a Virtual Neutral from a three-phase power source and measuring a voltage difference between the Virtual Neutral and a Protective Earth and Neutral (PEN) conductor, wherein the PEN conductor is a customer site conductor based on a Protective Multiple Earthing system,
wherein an elevated voltage difference between the virtual neutral and the PEN conductor indicates that the PEN conductor is broken, and wherein the measured voltage difference is without reference to real ground.*

19. The request comments on the scope of the term ‘*virtual neutral*’ saying that in context this should be construed as meaning a voltage derived from the centre point of a ‘three phase star configuration’. There is no comment regarding this in the observations.

20. I agree that the phrase ‘*creating a Virtual Neutral from a three-phase power source*’ needs to be construed carefully. Reading the description, there is only one method given for creating the virtual neutral, as figure 2 shows. Thus this phrase is

¹ *Generics UK Ltd (t/a Mylan) v Yeda Research and Dev. Co. Ltd & Anor* [2017] EWHC 2629 (Pat)

² *Actavis Group & Ors v ICOS Corp & Eli Lilly & Co.* [2017] EWCA Civ 1671

construed narrowly as meaning that the three phases are to be summed in a symmetrical star to form a common node for the voltage measurement.

21. The final part of the claim '*wherein the measured voltage difference is without reference to real ground*' also need to be considered. This is construed to mean that the device does not have a local earth connection such that neither the virtual neutral node or the PEN node are locally referenced to earth.

The 'DPD02DM44' product

22. The request provides three documents and two screen shots. I have numbered them below to reflect the references used in the observations.

D1. A single page press release for the 'DPD series'.

23. This is dated 'November 2016', but there is no other evidence provided in the request as to when it was made available to the public. It describes the '*DPD series*' of monitoring relays as providing '*3-phase voltage and frequency monitoring*' and being suitable for '*star and delta mains*'. There is nothing explicitly disclosed about monitoring a neutral connection, and nothing implicit or explicit about testing for a disconnected neutral input. The press release mainly focusses on the ability to re-program the device's default settings via NFC.

D2. An installation and operation manual for 'NFC Multifunction Monitoring Relay: DPD02DM44, DPD02DM44B'

24. This is not dated, nor is there anything to say what date this was made available to the public. I note that the request states:

One example of a product which implements this technique is the DPD02DM44 Multifunction Monitoring Relay, produced by Carlo Gavazzi Automation. This relay is a product within the 'DPD02' product range that was made available in 2016 (invoices confirming the sale of this product can be supplied).

25. It maybe that the requestor is implying here that they expect the D2 manual to have been provided at the same time as the product (either physically or online) and from the time of the product's introduction. There is no evidence provided for when this particular manual was made public.
26. The D2 manual is rather brief and seems to have the same information repeated in multiple languages. I note that table 1 seems to only list parameters for a 'delta line' rather than a 3-phase and earth 'star' connection; Though it does have an entry for 'neutral loss' stating '20% (not active)'. It seems that the table reflects the default settings, which are for a delta input rather than the optional star input. The drawings labelled 'priority alarms' has a diagram 'neutral loss' but it actually discloses very little beyond showing a connection to 3 phases and neutral lines and that at least a lamp can be flashing.

D3 & D4. Screen shots from google play store of 'DPD Manager app'

27. These are in Italian and English. The first D3 has details of the app in the store, stating that this is version 2.5.3 updated on 6 June 2022, and (presumably initially) released on 4 November 2016. D4 seems to be a continuation of this information (I assume from scrolling down or equivalent in the app store). Thus there is evidence that a DPD app was publicly available in November 2019. However, there is no evidence that the 'about the app' description was the same for earlier versions, and thus there is no clear evidence that the contents of D4 was publicly available prior to 6 June 2022.
28. D4 gives English information about the app and its use for control of settings using NFC. I note that neither D3 or D4 provide model numbers or a list of devices that the DPD app can control, just a reference to a 'DPD relay'. The English description in D4 refers to an alarm setting for 'Neutral loss threshold', but does not go into any more detail.
29. It seems from the request that the 2019 date in the D3 & D4 screen shots are expected to provide some credence to the assertion of the public availability of the DPD02DM44 relay in 2019, and thus the public availability of the D2 manual in 2019. I do not think that D3 and D4 provide a date for D2.

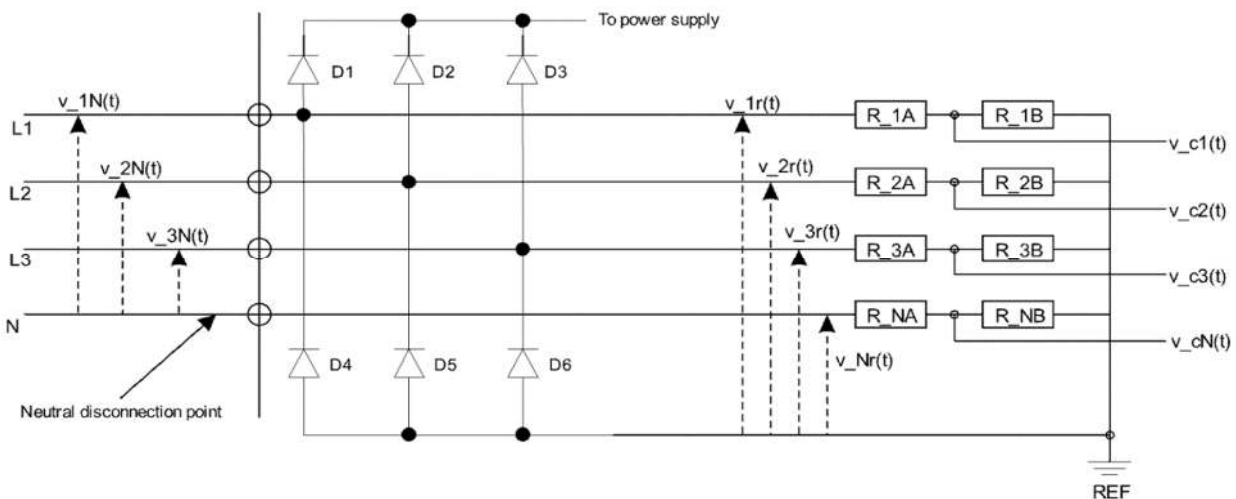
D5. Note to Distributor Garo AB from Carlo Gavazzi Controls

30. There is no date given on this document, nor does the request assert a date. The end of the note does however state this:

The above information is released to Garo AB and the respective sister companies to explain how neutral loss measurement is obtained compared to the claims of the UK patent 2578339. This type of measurement has been used in devices from Carlo Gavazzi at least since 2016.

which suggests that it was written after the priority date of the patent.

31. D5 describes the inner working of the device with reference to this figure:



The device has its power supply derived from the three phases, with diodes *D1-3* producing a 'positive rail' and diodes *D4-6* a 'reference rail'. The two sets of diodes thus forming a full wave rectifier. The remaining details of the power supply are omitted. The figure shows the voltages of each of the three phases and the neutral being separately measured relative to the derived reference rail, which is labelled as REF. The label REF is next to a earthing symbol, but it appears to me that that the device does not provide for a local earthing connection. The resistors '*R_*' are voltage dividers at the device inputs which are all tied to REF. D5 states that:

Using the measures against REF, the device builds a vector image of the voltages. This mathematical model is used to measure if neutral has been lost as well as all the other required measures (phase-phase and phase neutral voltages).

32. The observations argue that none of documents D1 to D4 have a sufficiently evidenced publication date and that D5 is not prior art.
33. The requestor in their observations in reply has provided further evidence of publication dates, but as I already note above, as this is new evidence which was not part of the original request, I will not consider those arguments here.
34. The observer points out that these documents do not explicitly specify the same device, with: D1 referring to '*DPD series*'; D2 to '*DPD02DM44*'; the app only referring to '*DPD manager*'; and D5 does not refer to either a specific model or model range of devices, instead just saying that the circuit and method were using in '*devices from carol Gavazzi at least since 2016*'.
35. It seems clear that D5 is not a prior art document. Further the request does not provide enough evidence to read D5 as a description of the specific devices of any of D1 to D4.
36. D5 does seem to be a statement that a device was made publicly available in 2016 and that it did have a loss of neutral alarm function at that time. While the observer argues that there is no specific evidence of the prior use of a product described by D5, they do not provide any evidence to the contrary. On the balance of probabilities, I accept D5 as sufficient evidence that a product with the described features was available in 2016.

The Law

37. Sections 2(2) and 2(3) of the Patents Act 1977 state:

2(2) The state of the art in the case of an invention shall be taken to comprise all matter (whether a product, a process, information about either, or anything else) which has at any time before the priority date of that invention been made available to the public (whether in the United Kingdom or elsewhere) by written or oral description, by use or in any other way.

2(3) The state of the art in the case of an invention to which an application for a patent or a patent relates shall be taken also to comprise matter

contained in an application for another patent which was published on or after the priority date of that invention, if the following conditions are satisfied, that is to say -

(a) that matter was contained in the application for that other patent both as filed and as published; and

(b) the priority date of that matter is earlier than that of the invention.

38. Section 3 of the Patents Act 1977 states:

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).

A & B : Prior use demonstrating lack of novelty

39. D1 makes no specific mention of detecting a loss of neutral, just that the device is a 3-phase monitoring relay. D2 to D4 do mention a loss of neutral alarm in such a relay, but none give any detail of how the alarm works. There is no clear evidence in the request of D2 to D4 making a disclosure of the loss of neutral alarm prior to the priority date of the invention.
40. The request argues that the neutral loss threshold, and the 20% default setting in D2 and D4 '*can be considered as a measure of the difference between the supplied neutral and test neutral*', but it seems to concede that the nature of the '*test neutral*' is not described.
41. I do not think that any of D1 to D4 would be enough to persuade me that prior use of such a 'DPD device' would result in claim 1 lacking novelty as those documents do not describe the specific functionality of claim 1. Further, documents D2 to D4 have not been shown to have been made public prior to the priority date of the patent.
42. The request then argues that document D5 should be read in conjunction with D1 to D4 to show that a 3-phase monitoring relay uses the described circuit and method. This is restated in the observations in reply.
43. The observer argues that such a combination fails because they do not clearly refer to the same product. I agree with the observer that the evidence is insufficient to read D5 as a description of how either the DPD02DM44 product or DPD02D devices work because D5 does not refer to any specific device. I do not find that the set of D1 to D5 can be taken together as descriptions of the same device.
44. As I note above, I accept, on the balance of probabilities, that D5 is evidence of a 3-phase monitoring device including a loss of neutral alarm that was publicly available in 2016.
45. The request does not have much detail regarding what the skilled person would be able to derive from inspection of such a device. The observer argues that they do not think a skilled person in possession of the device of D5 would be able to derive the method of operation of the device; They would not know what calculations are being

done with the four input voltages. The observer argues that the 'vector model' method would not be public use, stating:

Carlo Gavazzi's products ... are proprietary and have security applied to prevent reverse engineering of their microcontroller logic. Carlo Gavazzi's web site and product documentation also suggests that they ... do not offer their source code on the website.

46. Regarding the prior use of the device of D5, there seems to be implicit agreement that the circuit shown in D5 would be known from inspection of such a device. I think that it is likely that the circuit of D5 would be derivable from inspection of circuitry inside the device.
47. The request argues that the voltage node REF is the same as the 'virtual neutral' in claim 1. The observer argues that this is untrue, and notes that N is shown by D5 to also be connected to REF (this is via the resistors R_NA, R_NB). I agree with the observer and do not think REF can be taken as equivalent to the claimed 'virtual neutral'.
48. I do not think that the requestor has demonstrated that the D5 device shows the same circuit arrangement as the patent. The patent explicitly measures a voltage difference taken from the sum of the three phases and the incoming neutral while D5 in contrast shows a separate measurement of each phase and the neutral.
49. It is less clear what the skilled person might be able to derive regarding the calculations that the device would necessarily be doing with the four voltage measurements to produce the loss of neutral detection. Given the evidence here, I agree with the observer and do not think that any particular calculation using the measurements would be disclosed by the prior use.
50. In any case, I also agree with the observer that D5 does not state that producing the 'vector image' actually requires a calculation of a virtual neutral to decide 'if neutral has been lost'.
51. Thus I am not persuaded that the prior use of the D5 device would provide an enabling disclosure to show a lack of novelty of claim 1.
52. Because claim 1 is novel in the light of documents D1 to D5, I do not need to consider the dependant claims.

C Lack of inventive step given D2.

53. The request does not provide much argument regarding inventive step other than the following two passages :

The DPD02DM44 manual does not explicitly define the physical nature of the 'test neutral' and thus the basis of the comparison with the neutral loss threshold. The skilled person is therefore confronted with determining what should be compared with the PEN neutral.

and

...claim 1 would nonetheless be obvious from at least the DPD02DM44. It is known, for example, in a three-phase star-configuration, which is explicitly referenced in the installation notes for the DPD02DM44, that such a neutral could be taken from the star point.

54. As I note above, I understand that the 'manual' and 'installation notes' are both a reference to D2. I do not think there is enough evidence in the request to show that document D2 specifically was made available before the priority date. Thus the request does not persuade me of a lack of inventive step on that basis.
55. Even if D2 were shown to be prior art, the request does not persuade me that the arrangement and method of claim 1 would be obvious given that disclosure.
56. As the request does not seem to argue obviousness based upon prior use of the device of D5 as a starting point, I will not consider that here.
57. As claim 1 has an inventive step over at least D2, I do not need to consider the dependant claims.

Opinion

58. It is my opinion that claim 1 of the patent is novel in the light of documents D1 to D5.
59. It is my opinion, based on the limited argument presented, that claim 1 of the patent is inventive in the light of documents D1 to D5.
60. Accordingly, it is my opinion that the patent is valid based on the argument and evidence submitted by the requester.

Gareth Lewis
Examiner

NOTE

This opinion is not based on the outcome of fully litigated proceedings. Rather, it is based on whatever material the persons requesting the opinion and filing observations have chosen to put before the Office.