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* **IN THE HIGH COURT OF DELHI AT NEW DELHI**

+ **C.A.(COMM.IPD-PAT) 3/2025**

INDIGENOUS ENERGY STORAGE TECHNOLOGIES PVT. LTD.

.....Appellant

Through: Mr. Ajay Amitabh Suman, Mr. Shravan Kumar Bansal, Mr. Abijeet Bhujbal and Mr. Saransh Saini, Advocates.

versus

DEPUTY CONTROLLER OF PATENT AND DESIGNS & ANR.

.....Respondents

Through: Mr. Gaurav Barathi, SPC with Mr. Chirantan Priyadarshan, Advocates with Mrs. Rajni Bala, Deputy Controller of Patents.

CORAM:

HON'BLE MS. JUSTICE JYOTI SINGH

ORDER

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12.03.2026

I.A. 3474/2025

1. This application is filed by the Appellant seeking to place on record additional evidence by way of Document-L containing expert opinion to reaffirm distinction between subject patent and prior references D1, D2 and D3; Document-M, data showcasing superior yield of claimed invention and Document-N, which is a letter dated 08.11.2024 intimating about the impugned order.

2. For the reasons stated in the application, the same is allowed in light of judgment in *Union of India v. Ibrahim Uddin and Another, (2012) 8 SCC 148*, since these documents have a bearing on just adjudication of this



appeal as also on the post-grant opposition. Additional documents are taken on record.

3. Application stands disposed of.

C.A.(COMM.IPD-PAT) 3/2025 & I.A. 3472/2025

4. This appeal is filed under Section 117A of the Patents Act, 1970 ('1970 Act') for quashing of order dated 18.10.2024 passed by Respondent No.1, revoking Indian Patent No. 373806 (IN'806), titled "*Cattle Manure Derived Hard Carbon as Electrode Material for Sodium Ion Batteries and Super Capacitors*".

5. To the extent necessary the facts are that the Appellant is a company specializing in sustainable energy storage solutions, particularly, sodium-ion battery technology. The focus of the company is on transforming agricultural and bio-waste such as cattle manure and sodium precursors into economically viable and environmentally friendly battery components. It is averred in the appeal that the subject invention involves a unique and scalable process to produce hard carbon from cattle manure for use in sodium-ion batteries and supercapacitors. Key benefits include cost effectiveness, environmental sustainability and superior technical performance. Patent Application was filed on 04.11.2020 and Appellant requested for examination on 17.11.2020. After publication on 27.11.2020, First Examination Report ('FER') was issued on 06.01.2021 and response was filed by the Appellant on 15.06.2021, whereafter patent was granted on 04.08.2021. Post-grant opposition was filed by Respondent No.2 on 03.08.2021, to which reply was filed by the Appellant on 30.09.2022. After hearing and filing of written submissions, Respondent No.1 passed the impugned order on 18.10.2024, revoking IN'806 under Section 25(2)(e) for



lack of inventive step and Section 25(2)(g) i.e., insufficient disclosure. To appreciate the challenge by the Appellant it would be useful to refer to the granted claims of IN'806 as follows:-

“Claim 1:

A process for preparation of Hard Carbon using Cattle Manure as biomass precursor comprising the steps of

- A. Drying the biomass precursor at a temperature in the range of 50°C to 100°C;*
- B. Grinding of product received after step A;*
- C. Mixing the obtained material in step B with an acid solution (HF), phosphoric acid (H₃PO₄) or hydrochloric acid (HCl) having molar concentration between 0.1 M to 5.0 M for 1h to 48 h, at a temperature between 25°C to 60°C;*
- D. Washing the material obtained in step C thoroughly with de-ionized (D.I.) water;*
- E. Dry the washed material obtained in step D at low pressure of 10⁻² to 10⁻³ torr: and at appropriate temperature between 60°C to 100°C;*
- F. High temperature calcination of dried material obtained in step E, involving single/multi-step controlled -environment (N₂ or Argon gas) and heating/cooling processes, in the range of 700 °C to 1600 °C for 0.5 h to 12 h.*

Claim 2:

The process for preparing high performance Hard Carbon electrode material for Sodium ion batteries using Cattle Manure as biomass precursor as claimed in claim 1, wherein the biomass precursor from cattle manure is selected from cow manure, bull manure, male or female buffalo manure, male or female goat manure, male or female sheep manure or poultry manure.

Claim 3:

The carbonaceous electrode material for rechargeable metal- ion



batteries, prepared by the method as claimed in claim 1 wherein the rechargeable metal-ion battery is selected from lithium ion battery, sodium ion battery, potassium ion battery, magnesium ion battery or calcium ion battery.

Claim 4:

The carbonaceous electrode material as claimed in claim 3, wherein the composite electrode for Sodium ion battery consists of synthesized hard carbon material, binder and carbon black in mass percentage of $(80 \pm x)$: $(10 \pm y)$: $(10 \pm z)$ respectively, where the values of x, y, and z vary between 0 to 20 in such a way that proportional percentage sum of hard carbon material, binder and carbon black remains hundred.”

6. As averred, the object of the invention is to provide a facile, cost-effective and industrially scalable method for cattle manure derived hard carbon as a potential electrode material for sodium ion batteries and supercapacitors and to provide an environmentally safe method for preparation of electrode material and prepare a low cost electrode material from biological waste and provide electrode material for sodium-ion batteries and supercapacitors. For preparation of electrode material, the cattle manure is heated in a hot air oven. Dried cattle manure is then ground into powdered form and mixed with an acid solution. The acid mixed solution is then thoroughly washed with an aqueous solution and vacuum dried. The dried sample is then calcinated involving single/multi-step controlled environment and heating/cooling processes.

7. Post-grant opposition was filed under Section 25(2)(b), (e) and (g). Opponent relied upon prior arts: D1: WO 2020/208341 published on 15.10.2020; D2: A textbook titled ‘Atkins’ in Physical Chemistry, Eighth Edition (2006) by Peter Atkins and Julio De Paula; and D3: US 2002/0192553 published on 19.12.2002. Respondent No.1 rejected the opposition under Section 25(2)(b) finding the objection to be non-sustainable. In respect of opposition under Section 25(2)(e), Respondent



No.1 upheld the objection as follows:-

“Analysis:

(i) *Although D1 does not disclose “temperature range of 50°C to 100°C” of step A of claim 1, but **step of drying is implicit from the text “animal-derived waste material is typically transported in form of dry or semi-dry pallets” (See Page 4, lines 7 – 9 of D1). Hence, this step cannot be considered as an inventive step** because it is not very much clear what technical advantage the above-mentioned step brings in the claimed process of instant patent over D1. Apart from these, it is not clear how the patentee has chosen the particular temperature range for drying the biomass precursor.*

(ii) *D1 discloses (See Page 6, lines 6 - 15 of D1) “charring” or “carbonisation” is performed to remove metal-ion and non-metal-ion impurities. The charring step results in a charred animal-derived material that has an enriched carbon content and a reduced hydrogen, nitrogen and oxygen content, compared with the levels of hydrogen, nitrogen and oxygen present in the uncharred animal-derived material. A key purpose of carbonisation is to effectively lock the carbon into an insoluble matrix. Therefore, it can be understood that “charring” or “carbonisation” will increase the quality of the hard Carbon electrode material. So, this step may be omitted for hard carbon electrode material with high purity (with ash content less than 2%) and low pyrolysis yield (less than 5% yield) (See Entry 4, Table 3 of D1 for details). Apart from these, it is not very much clear that “Does the patentee have achieved hard Carbon electrode material with higher pyrolysis yield as compared to D1, by not performing the charring step?”. **Patentee has not provided any experimental data regarding the pyrolysis yield obtained from the claimed process of the instant patent. So, the feature of “Difference in the material being subjected to pre-treatment with the Hydrofluoric acid solution” cannot be considered as an inventive step over D1.***

(iii) *D1 discloses “The acid solution is preferably dilute; 1.0M to less than 3.0M solutions work well, and a 2.0M solution, preferably a 2.0M HCl solution, is especially preferred, Acid treatment is preferably performed over a period of at least 4 hours, and a 6 hour is particularly preferred” (See Page 10, lines 10 - 13 of D1) whereas in the instant patent, the HF solution has molar concentration between 0.1 M and 5.0 M and the mixing is done for 1 hr to 48 hr (See Step (C) of instant patent). **Mere change in the range of molar concentration of HF solution and mixing time, cannot be considered as an inventive step because it is not very much clear what technical advantage the abovementioned change brings in the claimed process of instant patent over D1.** Apart from these, it is not clear how the patentee has chosen the particular molar concentration range and mixing time range for acid wash treatment.*



(iv) D1 discloses “The resulting acid treated material from step c) is optionally dried.....preferably 50 °C to 120 °C and further optionally under reduced pressure (preferably a dynamic vacuum)” whereas in the instant patent, the drying of washed material is done at low pressure of 10^{-2} to 10^{-3} torr and at temperature between 60°C to 100°C (**See Step (E) of instant patent**). So, the temperature range used in the instant patent cannot be considered to be the same as that in D1 and no specific range of pressure is disclosed in D1. On the other hand, **D2 clearly shows [Figure 4.5, Page 121] that at the low pressure range of 0.133 Pa to 1.33 Pa (which is equivalent to 10^{-3} Torr to 10^{-2} Torr as mentioned in instant Patent) and at temperature range of 333 K to 373 K (which is equivalent to 60°C to 100°C as mentioned in the instant patent) water will be converted into vapor phase. So, selection of the drying parameters, such as duration, temperature and pressure cannot be considered to be an inventive step in view of the combination of D1 and D2.**

(v) Patentee is incorrect in respect of their comments that “NEGATIVE TEACHING – The process of D1 will not work if the step of charring is not performed. A person skilled in the art reading through the disclosure of cited document D1 has no clue or motivation whatsoever to remove the most essential step (charring/carbonization) to arrive at the process claimed in the instant patent”. **D1 discloses [page 21, entry 4 in Table 3] that if the step of charring is not performed, then hard carbon with high purity and low pyrolysis yield would have been obtained. So, it is not correct to state that the process of D1 will not work if the charring step is not performed.**

(vi) Patentee argued that “The starting material in D1 undergoes various pre-treatment steps such as sink and float treatment. This changes the property of the final (end) product obtained and it may lead to loss of a large amount of the material (reactant) that ultimately lead to a poor yield of the final product. In stark contrast to the above, the instant patent does not involve any pre-treatment steps”.

But, it is not very much clear that “Does the patentee have achieved hard carbon electrode material (final product) with higher yield as compared to D1, by not performing the pre-treatment steps?”. Patentee has not provided any experimental data regarding the yield obtained from the claimed process of the instant patent. So, the feature of “Not performing pre-treatment steps” cannot be considered as an inventive step over D1.

(vii) “The use of HF solution to decrease the concentration of SiO₂ and other metallic impurities (**Step C of Claim 1**)” cannot be considered as an inventive step because D1 clearly discloses the use of HF solution to decrease the concentration of SiO₂ and other metallic impurities (**see page 4, lines 16 to 28, page 5, lines 5 to 19 and page 10, lines 1 to 13 of D1**).



(viii) D1 discloses “The preferred temperature for a chemical treatment (i.e. acid treatment) in step (c) is at least 10 °C to less than 650 °C, further preferably 50 °C to 550 °C” (See Page 9, lines 4 - 5 of D1), “Charring step is performed at a temperature between 150 °C and 700 °C (See Page 7, lines 14 - 17 of D1) and “Pyrolysis step is performed between 700 °C and 2500 °C (See Page 7, lines 23-25 of D1). From the above information, it will be very obvious for a person skilled in the art to consider “HF solution of temperature between 25 °C and 60 °C” (See Step (C) of Claim 1 of instant patent) as a “cold acid solution”.

(ix) Both D1 and D3 are related to “Process for preparing and use of hard-carbon containing materials for the electrodes used in Sodium-ion batteries”. D1 discloses (See page 11 lines 18 - 20 of D1) the use of hard carbon-containing material made using animal-derived material, as an electrode active material in secondary battery applications, especially in alkali metal-ion cells, including in sodium-ion cells. D3 discloses (See paragraphs [0170] - [0173] of D3) the ratio of carbon material, binder and carbon-black as recited in granted claim 4. Given the disclosure in Document D3 combined with the content of Document D1, a skilled person would not have to use any creative ingenuity to arrive at a composite electrode having the composition stated in claim 4. So, subject matter of claim 4 cannot be considered to be an inventive step in view of D1 and D3.

Inference:

After careful examination of the Patentee’s and Opponent’s arguments and submissions, **objection u/s 25(2)(e) of The Patents Act, 1970 (as amended in 2005), made by the Opponent is found to be sustainable.”**

8. Objection under Section 25(2)(g) was also sustained by Respondent No.1 as follows:-

“Analysis:

(i) Patentee argued that in “Tata Global Beverages Limited v. Hindustan Unilever Limited, TRA/1/2007/PT/MUM, Oct 18, 2020”, Hon’ble IPAB held that the sufficiency requirement is met if at least one way of working the invention is clearly described, enabling a skilled person to carry out the invention. There is also no need to provide examples over the entire scope claimed in the patent. **In this regard, it is to be mentioned that the patent office had never asked the patentee before, during and after the hearing to provide examples over the entire scope of the invention.**

(ii) In “ISCHEMIX LLC vs THE CONTROLLER OF PATENTS, C.A.(COMM.IPD-PAT) 33/2022 and I.A. 23186/2023, Nov 22, 2023”, Hon’ble High Court held that “In a patent application for such subject



matter, the patent specification, itself, ought to contain some data and results of lab experiments which demonstrate enhancement of efficacy of the subject invention for which patent is sought. However, if there is any additional data which becomes available, the said data ought to be submitted by the patent applicant and be placed before the Patent Office prior to the date of final oral hearing. It is often observed that patent applicants file such data in written submissions, after conclusion of oral hearings before the Patent Office, without referring to the said data during oral hearings. This may potentially lead to a situation, as in the present case, where the Patent Office may have overlooked the data and failed to consider the same. There is also the possibility of the data not being completely understandable, in mere written submissions without oral explanation. **In this regard, the patent office had asked the patentee to provide experimental results /data related to the “purity/yield of the hard carbon electrode material” obtained using the claimed process of the instant patent such that it can establish the technical advance of the instant patent over the cited documents D1, D2 and D3. But no such experimental result/data had been provided by the patentee before, during and after the hearing.**

(iii) D1 discloses (See Page 6, lines 6 - 15 of D1) “charring” or “carbonisation” is performed to remove metal-ion and non-metal-ion impurities. The charring step results in a charred animal-derived material that has an enriched carbon content and a reduced hydrogen, nitrogen and oxygen content, compared with the levels of hydrogen, nitrogen and oxygen present in the uncharred animal-derived material. A key purpose of carbonisation is to effectively lock the carbon into an insoluble matrix. Therefore, it can be understood that “charring” or “carbonisation” will increase the quality of the hard Carbon electrode material. So, this step may be omitted for hard Carbon electrode material with high purity (with ash content less than 2%) and low pyrolysis yield (less than 5% yield)(See Entry 4, Table 3 of D1). Apart from these, it is not very much clear that “does the patentee have achieved hard Carbon electrode material with higher pyrolysis yield as compared to D1, by not performing the charring step?”. **Patentee has not provided any experimental data regarding the pyrolysis yield obtained from the claimed process of the instant patent. Hence, it is not very much clear whether the claimed process of the instant patent is industrially scalable or not.**

(iv) Patentee argued that “The starting material in D1 undergoes various pretreatment steps such as sink and float treatment. This changes the property of the final (end) product obtained and it may lead to loss of a large amount of the material (reactant) that ultimately lead to a poor yield of the final product. **In severe contrast to the above, the instant patent does not involve any pre-treatment steps**”. But, it is not evident that



“Does the patentee have achieved hard Carbon electrode material (final product) with higher yield as compared to D1, by not performing the pre-treatment steps?”. Patentee has not provided any experimental data regarding the higher yield obtained from the claimed process of the instant patent. So, it is still unclear that how by “Not performing pre-treatment steps” can give higher yield as compared to D1.

(v) “The use of HF solution to decrease the concentration of SiO₂ and other metallic impurities (Step C of Claim 1)” is already disclosed in D1 (See Page 4, lines 16 to 28, Page 5, lines 5 to 19 and Page 10, lines 1 to 13 of D1).

(vi) D1 further discloses **“the preferred temperature for a chemical treatment (i.e. acid treatment) in step (c) is at least 10°C to less than 650°C, further preferably 50°C to 550°C”** (See Page 9, lines 4 - 5 of D1), “Charring step is performed at a temperature between 150°C and 700°C (See Page 7, lines 14 - 17 of D1) and “Pyrolysis step is performed between 700°C and 2500°C (See Page 7, lines 23-25 of D1). From the above facts, it will be very obvious for a person skilled in the art to consider “HF solution of temperature between 25°C and 60°C” (See Step (C) of Claim 1 of instant patent) as a “cold acid solution”.

(vii) Detailed description of the granted patent talks only about "cow manure" whereas amended claim 2 discloses "cattle manure is selected from cow manure, bull manure, male or female buffalo manure, male or female goat manure, male or female sheep manure or poultry manure". This makes the scope of the granted patent too broad. Apart from these, the meaning of “Male or Female Buffalo” is also not clear.

(viii) Detailed description talks only about “Sodium ion battery” whereas amended claim 3 discloses "rechargeable metal-ion battery is selected from lithium ion battery, sodium ion battery, potassium ion battery, magnesium ion battery or calcium ion battery. This makes the scope of the granted patent too broad.

(ix) **Claims 3 and 4 are both product by process claims. The statements of these claims are very much ambiguous in nature such that it has become very difficult to identify the boundary of the scope of the claims.**

(x) **During the hearing, the agent of the patentee said that they can delete dependent claims 3 and 4 to overcome the objections mentioned in points (ii) and (iii) above. But, the patentee had not deleted the dependent claims 3 and 4 in the written submission.**

Inference: After careful examination of the patentee’s and opponent’s arguments and their respective written submissions, **objection u/s 25(2)(g) of The Patents Act, 1970 (as amended in 2005), made by the opponent is found to be sustainable.**



9. Learned counsel for the Appellant lays a siege to the impugned order on multiple grounds. It is urged that the objection of novelty was rightly rejected under Section 25(2)(b) but despite that the objections under Section 25(2)(e) and (g) were erroneously and illegally upheld. Firstly, Respondent No.1 did not follow the five-step test required for evaluating lack of inventive step elucidated by this Court in ***F. Hoffman-La Roche Ltd. & Anr. v. Cipla Ltd., 2015 SCC OnLine Del 13619***. Respondent No.1 did not identify the person skilled in the art for judging the inventive step of the claimed invention and also failed to identify the inventive concept embodied in the patent. Respondent No.1 failed to identify whether the differences brought out by Respondent No.2 between the claimed invention and prior arts, viewed in the knowledge of alleged invention, constituted steps which would have been obvious to the ordinary person skilled in the art and rule out hindsight approach and the impugned order deserves to be set aside on this ground alone. It is also urged that the mere existence in the prior arts of each of the elements in the invention, will not *ipso facto* mean obviousness and there must be a coherent thread leading from prior arts to the invention and the tracing of the thread must be an act which follows obviously. Hindsight deduction is impermissible, as held by this Court in ***F. Hoffman (supra)***.

10. It is further urged that the opponent has not discharged the burden of proving lack of inventive step. Prior art D1 does not disclose several steps of the process of preparing high performance hard carbon electrode material for sodium-ion batteries using cattle manure as biomass precursor, as claimed in Claim 1 of the invention. The inventive process involves the following steps, which are not disclosed in D1:-



“(i) drying the biomass precursor at a temperature in the range of 50 degrees C to 100 degrees C,

(ii) mixing the obtained material in step B (i.e. dried and ground precursor material) with Hydrofluoric acid solution having molar concentration between 0.1M to 5.0 M for 1hr to 48hr at a temperature between 26-60 degrees C;

(iii) washing the material obtained in step C (i.e., dried and ground precursor material treated with the Hydrofluoric acid solution) thoroughly with de-ionized water; and

(iv) dry the washing material obtained in step D at low pressure of 10^{-2} to 10^{-3} torr and at appropriate temperature between 60-100 degrees C.”

11. D1 teaches that the starting material is transported in dried or semi-dried condition, implying thereby that precursor material of D1 is naturally dried or semi-dried animal derived material and does not lead a person skilled in the art to arrive at the step of drying a biomass precursor at a temperature in the range of 50°C to 100°C. D1 discloses acid treatment of alkaline treated charred material and further discloses that charring step results in a charred animal derived material that has an enriched carbon content and reduced hydrogen, nitrogen and oxygen content compared with levels of hydrogen, nitrogen and oxygen present in the uncharred animal derived material. However, the starting material mixed with acid solution in D1 is not the same as material treated with Hydrofluoric Acid (HF) acid solution in the instant patent. Moreover, acid treatment step in D1 is carried out in presence of HCL at 80°C to 120°C in stark contrast to the instant patent, wherein the acid treatment is performed using HF at 25°C to 60°C. HF is used to decrease SiO₂ and metallic content from the raw material, which is not possible with HCL and this is one of the significant technological advancement of the instant patent.

12. It is urged that D1 does not provide any motivation to skip the step of



charring and in fact, D1 would not have included the expensive and time consuming step of charring, if it was possible to achieve the desired result without following the said step. The key object of D1 being to reduce level of impurities and step of charring being an essential step to reduce the impurities, a skilled artisan, reading through the disclosure of D1 would have never been motivated to remove or preclude the step of charring the precursor material. It is thus clear that the analysis of Respondent No.1 is borne out of hindsight, wherein using the presently claimed invention as a blueprint, Respondent No.1 has firstly dissected the claimed invention into individual piecemeals and then cherry picked the transportation of starting material in dried or semi-dried condition and acid treatment without having any regard to the technical differences in D1 and the patent. Respondent No.1 did not appreciate that the process of D1 will not work if step of charring was not performed. The acid treatment step in D1 is carried out in presence of 'cold' HCL in stark contrast to the instant patent, where the acid treatment is performed using HF at 25°C to 60°C and this is an important difference. A person with an average skill in the art would appreciate that the term 'cold' means that the product/solution (acid herein) has a temperature below 8°C, while 'cool' means a temperature between 8°C to 15°C and 'warm' means temperature between 20°C to 40°C and neither of these terms can be confused with each other. Moreover, the starting material in D1 undergoes various pre-treatment steps such as sink and float treatment, which is not the case in the instant patent. Also, the percentage yield obtained in D1 is much lower than in the instant patent and the experimental data sought to be brought on record by separate application before this Court will substantiate this fact.



13. It is further urged that insofar as D2 is concerned, it merely discloses a phase diagram for water, illustrating the conditions under which water exists in vapour, liquid or solid phases at different temperatures and pressure points. While this information has scientific value, it is wholly irrelevant to the instant patent, which pertains to preparation of hard carbon materials and their use in composite electrodes, with no reliance on or applicability of water phase diagrams and hence, D2 is a non-analogous prior art. D3 focuses on formulations for sodium-ion batteries, specifically detailing composition of positive and negative electrodes and is a non-analogous prior art. Claim 4 of instant patent discloses a composite electrode material, specifically tailored for sodium-ion batteries and comprises synthesized high carbon binder and carbon black in mass percentages. While D3 mentions ratios superficially similar to those of Claim 4 of instant patent, its disclosed methodology alligns with standard international practices for fabricating electrodes for metal-ion batteries. Thus even the combined teachings of D1, D2 and D3 would not lead a person skilled in the art to the novel and inventive step of the instant patent.

14. It is further argued that Respondent No.1 incorrectly sustained the ground of insufficient disclosure under Section 25(2)(g). Respondent No.2's contention was that Entry 4 in Table 3 of Example 4 in document D1 describes a process equivalent to the one set out in Claim 1 of the instant patent. Opponent has merely raised a doubt about the scalability of the invention based on the yield reported in the specification from the laboratory scale experiment with no basis to raise the plea. It is settled that sufficiency requirement is met if at least one way of working the invention is clearly described, enabling a skilled person to carry out the invention and there is no



need to provide examples over the entire scope claimed in the patent. In any event, instead of revoking the patent Respondent No.1 ought to have provided an opportunity to the Appellant to submit additional data regarding the improved yields of the claimed invention, which the Appellant has now filed in this Court and which demonstrates the superior yield achieved by the claimed process.

15. It is further argued that Respondent No.1 erroneously relied on D1 and combined it with D2 and D3, whereas none of them individually or collectively teach or motivate the claimed invention. D1 concerns biomass processing; D2 is a chemistry textbook; and D3 deals with electrode formulation. Courts have held that mosaic combinations are impermissible unless the prior art itself suggests the combination with a reasonable expectation of success. Even if disclosures of D1, D2 and D3 are mosaicked, a person skilled in the art would not be motivated to combine them to arrive at the claimed invention in the present case.

16. Mr. Gaurav Barathi, learned counsel appearing for Respondent No.1 defends the impugned order and submits that the patent was opposed by post-grant opposition under Sections 25(2)(b), (e) and (g) and while examining the objections, objection under Section 25(2)(b) was found to be unsustainable while the others were held valid and by a detailed and speaking order, patent has been rightly revoked. Respondent No.1 has found on meticulous evaluation of the material on record that there is no inventive step in the subject patent since the claimed invention neither involves technical advancement as compared to existing knowledge nor has economic significance. Non-performance of pre-treatment is not an inventive step. Patentee contends that starting material in D1 undergoes various pre-



treatment steps such as sink and float treatment, which ultimately changes the property of the final product obtained, leading to loss of large amount of reactant material, thereby resulting in poor yield of the final product, whereas this is not so in the claimed invention, however, patentee has not shown how higher yield is obtained compared to D1 by not performing the pre-treatment steps. Patentee claims that Step A of Claim 1 involves drying the biomass precursor at a temperature in the range of 50°C to 100°C, however, step of drying is implicit in D1 from the text ‘animal-derived waste material is typically transported in form of dry or semi-dry pallets’. Moreover, it is unclear as to what technical advantage this step brings in the claimed process over D1.

17. It is further urged that Step C in the patent process is also not an inventive step. In regard to acid treatment, D1 discloses acid wash treatment including HF solution at 60°C with preferred molar concentration of 2.0 M for preferably six hours, whereas in the subject patent, HF solution has molar concentration between 0.1 M and 5.0 M and mixing is done for 1 to 48 hours. Therefore, mere change in range of molar concentration of HF solution and mixing time is not an inventive step. Moreover, D1 also discloses the use of HF solution to decrease concentration of SiO₂ and other metallic impurities. The skilled person would know that a beaker of acid in a lab at ambient temperature in UK will include a temperature of 25°C and therefore, the skilled person would construe the term ‘cold acid solution’ in entry 4 of Table 3 of D1 to include an acid solution at 25°C. Secondly, this interpretation is supported by page 10, lines 18 to 20 of D1. This is because an acid solution, which has been ‘heated’ includes a preferable temperature range from 50°C to 120°C. This range does not extend to 25°C, which



supports the interpretation that a ‘cold acid solution’ includes a temperature of 25°C. If entry 4 of Table 3 of D1 intended to exclude an acid solution at ambient temperature 25°C, it would refer to it as a ‘cooled acid solution’, rather than a ‘cold acid solution’.

18. It is argued that drying parameters of the subject patent is not an inventive step. In regard to drying of acid treated material, D1 discloses optional drying preferably at 50°C to 120°C and reduced pressure, whereas in the subject patent drying of washed material is done at low pressure of 10^{-2} to 10^{-3} torr and at temperature between 60°C to 100°C. D2 clearly evinces that water will be converted into vapor phase at low pressure range of 0.133 Pa to 1.33 Pa (equivalent to 10^{-3} to 10^{-2} torr in the instant patent) and at temperature range of 333 K to 373 K. Hence, in view of prior arts D1 and D2, selection of drying parameters such as duration, temperature and pressure cannot be considered as an inventive step.

19. It is argued that subject matter of claim 4 is also not an inventive step. Both D1 and D3 are related to ‘*Process for preparing and use of hard-carbon containing materials for the electrodes used in Sodium-ion batteries*’. D1 discloses the use of hard carbon-containing material made using animal-derived material, as an electrode active material in secondary battery applications, especially in alkali metal-ion cells, including in sodium-ion cells. D3 discloses the ratio of carbon material, binder and carbon-black as mentioned in Claim 4 of subject patent. Therefore, in light of disclosures in D1 and D3, it was rightly concluded that a skilled person would not have to use any creative ingenuity to arrive at a composite electrode having the composition stated in Claim 4 and it cannot be construed that Claim 4 involves an inventive step.



20. It is urged that Patent has been rightly revoked under Section 25(2)(g) of 1970 Act inasmuch as complete specification of subject patent does not sufficiently describe the invention. Further, experimental data was also not fully disclosed by the patentee despite the Patent Office asking the Appellant to do so and provide data relating to ‘purity/yield of the hard carbon electrode material’ obtained using the claimed process of the patent so as to establish technical advancement of the subject patent over cited prior arts D1, D2 and D3. D1 discloses performing of charring or carbonisation to remove metal-ion and non-metal-ion impurities and the key purpose of carbonisation is to effectively lock the carbon into an insoluble matrix and hence, it is evident that charring/carbonisation will increase quality of hard carbon electrode material and so the charring step may be omitted for hard carbon electrode material with high purity i.e., with ash content less than 2% and low pyrolysis yield i.e., less than 5% yield. In the instant patent, it cannot be inferred whether, without performing the charring step, patentee is able to achieve hard carbon electrode material with higher pyrolysis yield as compared to D1. Since no experimental data was provided by the Appellant, it could not be inferred whether the claimed process is industrially scalable or not. Further, patentee has not disclosed as to whether hard carbon electrode material with higher yield as compared to D1, is achievable without performing pre-treatment steps and thus there is no infirmity in the impugned order as the subject patent has been rightly revoked.

21. Heard learned counsels for the parties and examined their rival submissions.

22. The subject patent involves a scalable process to produce hard carbon from cattle manure for use in sodium-ion batteries and supercapacitors. Key



benefits include cost effectiveness, environmental sustainability and superior technical performance. The object to the invention is to provide a facile, cost effective and industrially scalable method for cattle manure derived hard carbon as a potential electrode material for sodium-ion batteries and supercapacitors as also to provide an environmentally safe method for preparation of electrode material and to prepare a low-cost electrode material from biological waste. IN'806 was granted on 04.08.2021, however, on post-grant opposition by Respondent No. 2, filed on 03.08.2021, patent was revoked under Section 25(2)(e) for lack of inventive step and under Section 25(2)(g) for insufficient disclosure.

23. The first contention of the Appellant is that Respondent No. 1 did not follow the five steps elucidated by the Division Bench in *F. Hoffmann (supra)* to determine whether the patent satisfied the requirement of inventive step and lack of obviousness. For the sake of reference, the five steps are as follows:-

Step No. 1 - To identify an ordinary person skilled in the art;

Step No. 2 - To identify the inventive concept embodied in the patent;

Step No. 3 - To impute to a normal skilled but unimaginative ordinary person skilled in the art what was common general knowledge in the art at the priority date;

Step No. 4 - To identify the differences, if any, between the matter cited and the alleged invention and ascertain whether the differences are ordinary application of law or involve various different steps requiring multiple, theoretical and practical applications; and

Step No. 5 - To decide whether those differences, viewed in the knowledge of alleged invention, constituted steps which would have



been obvious to the ordinary person skilled in the art and rule out hindsight approach.

24. In *Tapas Chatterjee v. Assistant Controller of Patents and Designs and Another*, 2025 SCC OnLine Del 6369, another Division Bench of this Court held that that five steps in *F. Hoffmann (supra)* have to be followed sequentially while examining the aspect of obviousness and existence of inventive step. In the present case, as rightly flagged by the Appellant, Respondent No. 1 has not followed the first step of identifying an ordinary person skilled in the art and this, to my mind vitiates the impugned order. In *Agriboard International LLC v. Deputy Controller of Patents and Designs*, 2022 SCC OnLine Del 940, this Court held that while rejecting an application for lack of inventive step, discussion on prior art, subject invention and manner in which the subject invention would be obvious to a person skilled in the art will be mandatory and merely arriving at a conclusion that subject invention lacks inventive step will be contrary to Section 2(1)(ja) of the 1970 Act.

25. The next step required to be followed while determining the inventive steps was to identify the inventive concept embodied in the patent and then to impute to a normal skilled but unimaginative ordinary person skilled in the art what was common general knowledge in the art at the priority date. Thereafter differences, if any, between the cited matter and alleged invention were to be identified to ascertain whether differences are ordinary application of law or involve various different steps requiring multiple, theoretical and practical applications and then decide whether those differences, viewed in the knowledge of alleged invention, constitute steps which would have been obvious to the ordinary person skilled in the art and



rule out a hindsight approach. In the instant case, Respondent No.1 has not identified the person skilled in the art and while differences flagged by Respondent No.2 have been noted, the fifth step also has not been followed and the patent has been revoked applying a hindsight approach.

26. In the response filed by the Appellant to the post-grant opposition, it had extensively flagged the differences between prior arts D1, D2 and D3 and the claimed invention, especially in the steps involved in the processes, however, Respondent No. 1 has negated the submissions broadly on two-fold grounds: (a) inventive step does not clearly bring out the Technical Advantage; or (b) that there is no experimental data to prove higher yield and/or significant reduction of SiO₂ and metals as impurities.

27. There is no gainsaying that every step involved in the claimed process of IN'806 was crucial. Appellant brought forth that the starting material in the subject patent was cattle manure as a biomass precursor and the steps in the process included: (a) drying the cattle manure to remove inherent moisture content; (b) grinding the dried biomass to reduce particle size and ensure uniformity; (c) treating the ground biomass with HF with a specified molar concentration at a specified temperature which facilitates removal of impurities and enhances material properties; (d) washing the material with de-ionized water to neutralise any residual acid and remove impurities; (e) drying under vacuum conditions on specified temperatures and pressure, which ensures minimal residual moisture: and (f) calcinating the dried material at specified temperatures for a specific duration to promote structural transformation of the material and enhance its functionality. Appellant urged that the process in D1 was different, where starting material undergoes various pre-treatment steps such as sink and float treatment and



mandatorily requires step of charring of pre-treated product obtained in step 1, which completely changes the property of the final product, whereas the subject patent is completely devoid of step of charring.

28. As per the Appellant, step 3 in D1 includes treatment of charred material with alkali solutions with a specified molar concentration followed by acid treatment with HCL at given molar concentration and at elevated temperature. Acid treated material is washed with hot boiling water to remove residual acid and water soluble impurities, whereafter drying is carried out under reduced pressure and finally the dried and treated charred material is subjected to pyrolysis at specified temperatures resulting in a thermally treated product with enhanced properties. The case of the Appellant is that the pre-treatment steps in D1 are fundamentally different from subject patent as the sink and float treatment separates material based on their densities but subject patent does not require any such step. Negative teaching is that process of D1 will not work in the absence of charring step. Therefore, a person skilled in the art reading through the disclosure of the cited document D1 has no clue or motivation to remove the most essential step of charring/carbonisation to arrive at the process claimed in the instant patent.

29. Appellant also brought forth that D1 discloses that charring step results in a charred animal-derived material, which has enriched carbon content and reduced hydrogen, nitrogen and oxygen content compared to the levels in uncharred animal-derived material. The key purpose of carbonisation is to effectively lock carbon into an insoluble matrix and therefore, the material being subjected to mixing with acid solution in D1 is not the same as material being mixed with HF solution as in the instant



patent. Moreover, acid treatment step in D1 is carried out in presence of HCL at 80°C to 120°C in stark contrast to instant patent where acid treatment is performed using HF at 25°C to 60°C.

30. In respect of cited prior art D2 it was urged before Respondent No.1 that D2 is only a phase diagram of water taken from a Textbook titled ‘Atkins Physical Chemistry’, Eighth Edition, which shows physical states of water under different temperature and pressure conditions i.e., vapor, liquid or solid phases. While this information has scientific value, it was wholly unrelated to the subject matter claimed in the instant patent, which pertains to preparation of hard carbon material with no reliance on or applicability of water phase diagram and hence, D2 was an entirely non-analogous prior art. In respect of D3 it was brought out that its teachings focus on formulation for sodium-ion batteries and detail composition of positive and negative electrodes. These are generic compositional ranges reflecting standard practice in the battery industry. Claim 4 of the instant patent, however, defines a specific composite electrode comprising synthesized hard carbon, binder and carbon black in precisely controlled ratios ($80 \pm x : 10 \pm y : 10 \pm z$) with $x, y, z \leq 20\%$, maintaining total = 100%. While D3 mentions ratios superficially similar to those in Claim 4, its disclosed methodology aligns with standard international practices for fabricating electrodes for metal-ion batteries and does not disclose or suggest the process sequence or material synthesis route of the instant patent. D3 is a generic insertion material and not the specific HF-treated, non-charred hard carbon derived under the instant patent and cannot anticipate or render obvious the process or resulting material disclosed in the instant patent. Appellant further asserted that even if combined teachings of D1, D2 and D3 are mosaicked, a person



skilled in the art would not be motivated to arrive at the claimed invention. For mosaicking of multiple prior arts, opponent must prove how a person skilled in the art would have led to combining documents D1-D3, which onus was not discharged by the post-grant opposer since D1 relates to manure processing, D2 to thermodynamics of water and D3 to electrode formulations, fields completely non-analogous to one another. Hence, the combined prior art also fails to yield instant patent's sequence of HF pre-treatment, omission of charring and resulting high performance hard carbon.

31. From a perusal of the impugned order, it is apparent that Respondent No.1 has not considered the aforesaid issues flagged by the Appellant in response to the opposition in the right perspective. In a nutshell, Appellant claims that comparisons with prior arts D1, D2 and D3 was misconceived as D1 has different sequence of steps and teaches away from the invention. D2 is scientifically irrelevant and D3 is a distinct process and deals with generic composition. As noted above, Appellant brought forth significant differences in the claimed process and the process disclosed in D1, more particularly, the pre-treatment steps of the starting material in D1 as also charring being an important step in D1, which are conspicuously absent in the subject patent and also pointed out that the sequence of treatment steps i.e., HF mixing and multi-step heating stage plays a pivotal role in achieving the desired hard carbon suitable for sodium-ion batteries and that any deviation from the prescribed sequence, such as following the steps outlined in D1 will result in the product characteristics being different. Experimental data placed on record, according to the Appellant, demonstrates the importance of adhering to sequence of steps. There is no determination on



these issues in the impugned order and Respondent No. 1 has simply dealt with them by posing a question as to whether the patentee could have achieved hard carbon electrode material with high pyrolysis yield as compared to D1 by not performing the charring step and thereafter observing that no experimental data has been given regarding the higher yield. Basis this, a conclusion has been reached that the difference in material being subjected to pre-treatment with HF acid solution is not an inventive step. In my view, the differences identified by the Appellant in the processes i.e., pre-treatment steps of starting material, charring process etc. were crucial and ought to have been considered after identifying the person skilled in the art. It was also pointed out by the Appellant that the difference of treatment with HF and HCL was significant since HF in the claimed invention dissolves and removes SiO₂ and metallic impurities, which HCL in D1 fails to do and while it reduces metallic content it does not eliminate silica and consequently, instant invention yields technically advanced purity and industrial superiority. This important distinction is also not considered in the impugned order.

32. With respect to objection under Section 25(2)(g) of 1970 Act, broadly speaking, contention of the Appellant is that Respondent No. 1 has misapplied the test of sufficiency requirement. Appellant submits that ground under Section 25(2)(g) can be raised only when the description of the method or instructions for working the invention are not sufficient to enable a person in India possessing average skill with average knowledge of the art to which invention relates, to work the invention. The opposer admitted that patentee has fully described the claimed invention including disclosure of best mode of practising the claimed invention and merely



raised doubt about the scalability of the invention based on the yield reported in the specification from the laboratory scale experiment but provided no basis or evidence for the assertion.

33. It is trite that sufficiency requirement is met if at least one way of working the invention is clearly described, enabling a skilled person to carry out invention and there is no need to provide examples over the entire scope claimed in the patent. Appellant has demonstrated that it has cited several examples as part of the complete specification, which would enable a skilled person to practise the claimed invention, however, as the impugned order reflects, this issue has not been considered. Moreover, Appellant rightly flags that no opportunity was granted to furnish the experimental data. In this regard, be it also noted that in the impugned order it is mentioned at more than one place that despite opportunity to the Appellant to furnish the experimental data, it failed to do so. To verify this position, records were called for, which did not substantiate this observation in the impugned order. In this backdrop, Appellant filed an application before this Court for producing additional evidence including experimental data, which has been allowed since the data is crucial for just adjudication of the post-grant opposition and moreover, additional evidence can be taken on record in the interest of justice for proper adjudication of the case. **[Ref.: Ibrahim Uddin (supra)]**.

34. For all the aforesaid reasons, I am of the view, that this is a fit case for remand. It is accordingly directed that Respondent No.1 shall consider the post-grant opposition afresh after taking into account the additional documents allowed by this Court and all the issues raised by the Appellant in reply to the opposition notice and detailed written submissions already on



record, including the issues raised in the present appeal as also all submissions raised in opposition. Decision will be taken after hearing both the parties, within a period of four months from today. It is made clear that this Court has not expressed any opinion on merits of the case.

35. Appeal stands disposed of in the aforesaid terms, along with pending application.

JYOTI SINGH, J

MARCH 12, 2026/YA/AK