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IN THE HIGH COURT OF JUDICATURE AT MADRAS

Judgment reserved on	12.12.2023
Judgment pronounced on	11.06.2024

CORAM

The Hon'ble Mr. Justice **SENTHILKUMAR RAMAMOORTHY**

(T) CMA (PT) No.52 of 2023
(OA/56/2020/PT/CHN)

Indian Institute of Technology (IIT Madras)
IIT PO, Chennai 600 036

Represented by:

T.K.Ramkumar & Sumitha Vibhu,
Advocates, Patent & Trade Mark Attorneys
Ram and Rajan Associates
No. 12/42, Vedantha Desikar Swamy Street,
(Pelathope)
Mylaopore, Chennai 600 004

... Appellant

-vs-

1. The Controller of Patents & Designs,
Boudhik Sampada Bhawan,
Chennai- Theni Hwy, Guindy,
Chennai, Tamil Nadu- 600032.
2. The Assistant Controller of Patents & Designs,
Boudhik Sampada Bhawan,
Chennai- Theni Hwy, Guindy,
Chennai, Tamil Nadu- 600032.



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3. The Examiner of Patents & Designs,
Boudhik Sampada Bhawan,
Chennai- Theni Hwy, Guindy,
Chennai, Tamil Nadu- 600032.

...Respondents

PRAYER: Civil Miscellaneous Appeal is filed under Section 117-A of the Patents Act, 1970, praying to pass an order granting a patent in Application No. 4032/CHE/2013; to set aside the impugned order of Respondent 1 refusing registration; and a direction that the Respondent 1 shall allow the application to proceed to grant on an expedited basis.

For Petitioner : Mr. T.K. Ramkumar
for M/S. Ram and Rajan & Associates

For Respondents: Mr. Rajesh Vivekananthan,
Deputy Solicitor General

JUDGMENT

Background

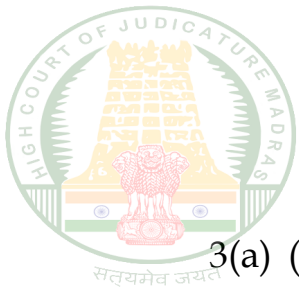
The appellant assails an order dated 20.04.2020 by which Patent Application No.4032/CHE/2013 was rejected by the Indian Patent



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Office. Indian Institute of Technology Madras (the appellant) filed the above-mentioned application entitled 'METHOD OF DOPING POTASSIUM INTO AMMONIUM PERCHLORATE' on 10.09.2013. The application was published on 25.12.2015 and the First Examination Report (FER) was issued on 01.10.2018. The FER cited prior art document D1 (US3269879) dated 30.08.1996 and raised objections on the grounds that the claimed invention lacks novelty, inventive step, and is patent-ineligible as per Section 3(d) of the Patents Act, 1970 (the Patents Act). The appellant filed a response to the FER on 01.04.2019 amending the complete specification. The hearing letter was issued on 26.11.2019 maintaining objections under Sections 2(1)(ja) and 3(d) of the Patents Act. The appellant made oral submissions during the physical hearing on 19.12.2019 and filed written submissions with amended claims on 01.01.2020.

2. The impugned order was passed on 20.04.2020 whereby the Controller refused the application under Sections 2(1)(ja), 3(d) and



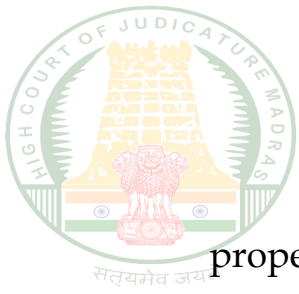
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3(a) (i.e. invention is frivolous) of the Patents Act, the last being a new ground not raised either in the FER or even in the hearing notice. Against this backdrop, the present appeal arises.

Counsel and their contentions:

3. Oral arguments on behalf of the appellant were advanced by Mr. T.K. Ramkumar, learned counsel, assisted by Ms. Sumitha Vibhu, learned counsel; and on behalf of the respondents by Mr. Rajesh Vivekananthan, learned Deputy Solicitor General.

4. Learned counsel for the appellant opened his arguments by submitting that the claimed invention relates to a method of doping potassium into ammonium perchlorate (AP) for increased burn rates in solid propellants used in defence and space applications. When potassium is doped with ammonium perchlorate through a recrystallization process, he submitted that it changes the latter's thermal properties and has an incremental effect on the solid



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propellant's burning rates.

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5. He summarized the process as follows: AP is completely dissolved in distilled water following which floating impurities are removed by filtering the solution; water removal is achieved by heating the filtrate; and moisture removal by reheating it in a hot air oven at 333k for two days. Recrystallization of AP happens during the filtering process wherein the potassium gets doped into AP. The filtering material used and the time of exposure of the solution to the filtering material determine the amount of potassium that gets doped into AP. The recrystallized AP doped with potassium (RAP) increases the burn rate as compared to the AP manufactured through a process that uses a reagent.

6. Learned counsel next contended that rejection of the patent application is untenable on all the four reasons mentioned therein. First, he submitted that the conclusion that the claimed invention was excluded under Section 3(a) of the Patents Act because it was



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frivolous was raised for the first time in the impugned order.

Consequently, he contended that the appellant was denied an opportunity to respond to such objection; hence, such conclusion is liable to be interfered with.

7. Secondly, as regards the conclusion that the invention is a mere new use of a known process, he contended that Section 3(d) of the Patents Act does not apply if the usage of a known process results in a new product. According to him, during the filtering process, AP acquires potassium from the filtering material. He further submitted that this is not accidental and that the product acquired as a result of the known process is new, i.e., potassium doped AP, possessing different thermal properties than those of pre-doped AP. Additionally, he contended that the invention uses the filtrate material as a new reactant and the resultant potassium doped AP exhibits increased thermal properties, and thereby enhances the burn rate of AP and that of the composite solid propellant.



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8. Thirdly, he contended that the usage of the filtrate material - stainless steel sieve, cotton cloth, or filter paper - as a reactant for doping, sans any external reagent, by itself makes the invention novel, and that all chemical reactions take place in-situ once the filtrate is used. Therefore, he submitted that it cannot be a ground for refusal of the patent.

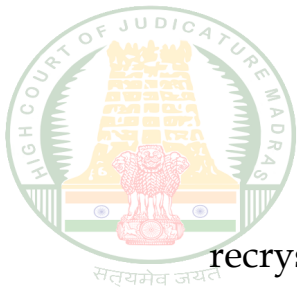
9. Fourthly, he contended that the use of filtering material, without any external reagents, which results in a new product, i.e. potassium doped in AP with enhanced burn rates, constitutes an inventive step under Section 2(1) (ja) of the Patents Act. He pointed out that the cited prior art teaches co-crystallization of AP with alkali metal or alkaline earth metal having formula $MaXb$, wherein M is an alkali or alkaline earth metal cation, or the ammonium (NH_4) group. Example III of D1 employs steps such as dissolving ammonium perchlorate in water; adding solution of potassium iodide to the



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ammonium perchlorate solution; vigorously stirring the mixture at 50°C under pressure; obtaining a thick slurry; filtering the precipitate; and drying and screening to obtain an isomorphous co-crystallized ammonium perchlorate with potassium iodide.

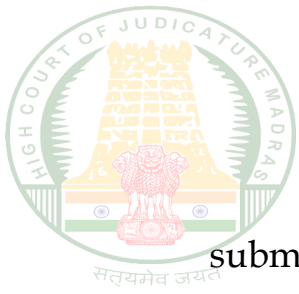
10. By contrast, he submitted that the claimed invention, which does away with the use of external reagents, uses steps such as dissolving AP in water; exposing the AP to potassium present in the stainless steel sieve, cotton cloth, or filter paper by recrystallization or double recrystallization; filtering the impurities by using the filtrate material and enabling the AP to be doped with potassium; removal of water by heating; removal of moisture by reheating; and drying the filtrate in a hot air oven at 333k for two days. He further contended that D1 does not disclose or render the invention obvious because the claimed invention teaches a method to dope potassium in AP with no external reagents by using the filtrate material. Besides, he pointed out that repeating the dissolution and



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recrystallization to achieve the required level of potassium in the final product constitutes a technical advance under Section 2(1)(ja) of the Patents Act. According to learned counsel, eliminating the use of external reagents and using the filtrate material as a source for potassium, which methods were previously unknown, has economic significance because it results in significant cost reduction. He further submitted that changing of filtering material after the filtrate gets clogged or torn is a standard procedure and does not render the claimed invention devoid of economic significance. As for industrial capability, learned counsel submitted that the claimed invention is capable of being industrially upscaled and the use of oven drying satisfies the criteria.

11. Learned Deputy Solicitor General appeared for the Respondents. In his submissions, he justified the conclusions in the impugned order. Though the objection with reference to Section 3(a) of the Patents Act was not communicated in the hearing notice, he



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submitted that the appellant was put on notice that the claimed invention is frivolous and provided an opportunity to respond at the hearing. By way of elaboration, he pointed out that the use of filtering material cannot be considered as the use of a reactant because such filtering material does not act as a catalyst for a chemical reaction.

12. His next contention was that the processes involved are conventional processes, viz., dissolving, filtering to remove impurities, heating, reheating, and drying; and that a monopoly cannot be claimed for steps in the chemical reaction process that are a part of common general knowledge. By also pointing out that doping of potassium with ammonium perchlorate occurs naturally during the filtering process in-situ without intervention from the inventor, he submitted that it is, therefore, no more than mere discovery. Additionally, he reiterated that the filtering material cannot be considered as a reactant. Therefore, he contended that the invention is excluded from patent protection under Section 3(d) of the Patents



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13. According to learned counsel, the processes of dissolving, filtering, heating, reheating and drying are not only part of common general knowledge but that D1 discloses these steps. He further submitted that the doping of potassium without using a reagent happens in-situ, without the inventor's input, and cannot be said to constitute a technical or economic advancement under Section 2(1)(ja) of the Patents Act. Moreover, he pointed out that the claim that by using stainless steel sieve, filter paper and cotton cloth as filtrate material, 0.45, 0.71 and 0.85, respectively, weight percentage of potassium is released is untenable because 100% release of potassium ion cannot be expected given that reaction takes place on the adsorbed or absorbed potassium on the filtering material. Further, he submitted that use of filter paper on an industrial scale is more expensive than adding potassium ion as a reactant because the filtering material needs to be changed frequently to achieve the disclosed potassium ion content as the filtering material loses all the



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potassium ion at one stage. He also submitted that established procedures are not known for monitoring potassium content in the product to achieve the desired quantity of potassium. Additionally, he submitted that hot air oven drying is impracticable in large scale industries. Because of these reasons, he concluded his submissions by contending that the claimed invention does not satisfy the requirements of an 'invention' under Section 2(1)(j) of the Patents Act.

Discussion, Analysis and Conclusion:

14. As the first step in determining whether the invention can be granted a patent, I set out the amended claims:

- "1. A method of doping potassium in ammonium perchlorate by recrystallization process, without using any reagents, the said method comprising,*
- a. Completely dissolving the ammonium perchlorate in distilled water*
 - b. Filtering the solution from step (a) to remove floating impurities*



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c. Heating the filtrate from step (b) to remove the water and

d. Placing the ammonium perchlorate thus obtained from step (c) in a hot air oven at 333 K for two days to completely remove moisture

wherein, the ammonium perchlorate acquires potassium from the filtering material during filtering process and the amount of potassium being doped in ammonium perchlorate depends on the type of filtering material and time of exposure of the solution to the filtering material.

2. The method as claimed in claim 1, wherein the filtering done during recrystallization process determines the amount of potassium that will get doped into ammonium perchlorate.

3. The method as claimed in claim 1, wherein the filtering material includes stainless steel sieve, cotton cloth and filter paper.

4. The method as claimed in claim 1, wherein the potassium required to be doped into the ammonium perchlorate is very small and the amount of potassium doped into the ammonium perchlorate by



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using stainless steel sieve, filter paper and cotton cloth as filtering material are 0.1 %, 0.15% and 0.24 % respectively.

5. The method as claimed in claim 3, wherein the observed weight percentage of potassium present in stainless steel sieve, filter paper and cotton cloth as determined by Energy Dispersive analysis using X-rays (EDAX) is 0.45%, 0.71% and 0.85% respectively.

6. The method as claimed in claim 1, wherein filtering the dissolved solution multiple times without letting ammonium perchlorate crystallize will enhance the doping percentage of potassium in ammonium perchlorate.

7. The method as claimed in claim 1, wherein successive recrystallization will enhance the doping percentage of potassium in ammonium perchlorate.

8. The method as claimed in claim 1, wherein as long as the filter being used is consistent, the amount of potassium getting into ammonium perchlorate remains constant.

9. The method as claimed in claim 1, wherein doping potassium in ammonium perchlorate changes the



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thermal properties of ammonium perchlorate.

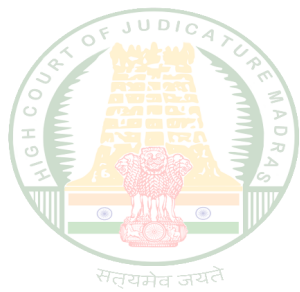
10. *The method as claimed in claim 1, wherein the potassium doped ammonium perchlorate enhances the burn rates of ammonium perchlorate and that of composite solid propellant."*

I next discuss the grounds on which the patent application was refused by the Controller.

Frivolous Invention:

15. The relevant part of the order finding that the application is frivolous under Section 3(a) of the Patents Act is reproduced below:

"11. During hearing the applicant stressed that the crux of the instant invention lies in the fact that the ammonium perchlorate acquires potassium from the filtering material. Therefore, it was informed the applicant that the present invention is frivolous and cannot be considered as an invention. Because the applicant has clarified, the source of potassium in the process steps of principal claim in the hearing. Though the objection under section 3(a) of the Patents Act for



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frivolous intention was not communicated in the hearing notice it was explained to the applicant that the instant invention is frivolous invention under section 3(a) of the Patents Act and cannot allowed in view of the following; As for as chemical reactions are concerned, the reactions are taking place in a scientific way i.e., what reactant will react with what? To yield a product. $A+B\text{-----}>C+D$. In some cases there may be a catalyst in addition to the other process conditions or parameters. In some cases, the chemical reactions are taking place in a stoichiometric ratio. In the history of chemical reactions the filtering material never considered as a reactant. The findings of the inventors may be a novel finding in which the reaction is taking place in-situ without any additional input from the inventors. The process of finding the fact that the ammonium perchlorate acquires potassium from filtering material without any reagents is a discovery because the reaction is taking place in-situ without any additional input from the inventors. Because the inventors are just disclosing the fact



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how and from where the potassium was acquired.

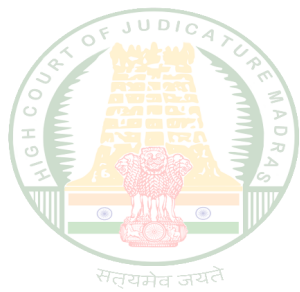
Therefore the claims fall within the scope of section 3(a) of the Patent Act, hence cannot be allowed."

16. I note that this line of objection on the ground of frivolousness is conspicuous by its absence in the FER and the hearing notice, and has been raised by the Controller for the first time in the impugned order. Since the appellant was deprived of an opportunity of being heard on the objection under Section 3(a), both Section 14 read with Section 80 of the Patents Act and principles of natural justice were contravened. Therefore, the impugned order cannot be sustained in this respect.

Section 3(d):

17. Next, I discuss the rejection under Section 3(d) of the Patents Act. In relevant part, it was held as under:

" 10. the process of the present invention relates to a



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conventional process. The process of the present invention involves four steps i.e., Dissolving, Filtering to remove floating impurities, Heating and further heating. These four steps are very common in the chemical reaction process and do not require any citation. The cited document D1 for instance in example III discloses the general steps of **dissolving, heating, filtering and drying**. Any person skilled in the art apply the above process steps, in order to dissolve the reactant, filtering the impurities, concentrating by heating and further heating. But the difference is that the ammonium perchlorate acquires potassium from the filtering material during filtering process in the present invention. It may be accidental or unexpected whatever it may be, the instant invention is only a novel finding that the ammonium perchlorate acquires potassium from the filtering material during filtering process. The reaction is taking place in-situ without any additional input from the inventors. The **process of finding the fact that the ammonium perchlorate acquires potassium from filtering material without any reagents is a discovery because the reaction is taking place in-situ without any additional input from the inventors. Here the filtering material cannot be considered as a reactant. Therefore, the claims fall within the scope of section 3(d)**



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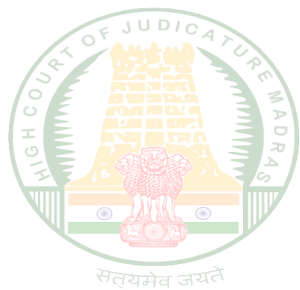
of the Patents Act since they relate to mere use of known process which does not result in new product and without employing any new reactant. Therefore, the invention cannot be allowed under section 3(d) of the Patents Act.” [emphasis supplied]

18. On perusal of the above paragraph, it can be gleaned that the Controller, while recognizing that the invention may be novel, ruled that it is is patent ineligible under Section 3(d) of the Patents Act. Section 3(d) is set out below:

“3. What are not inventions- The following are not inventions within the meaning of this Act, –

(d) the mere discovery of a new form of a known substance which does not result in the enhancement of the known efficacy of that substance or the mere discovery of any new property or new use for a known substance or of the mere use of a known process, machine or apparatus unless such known process results in a new product or employs at least one new reactant.”

[emphasis supplied]



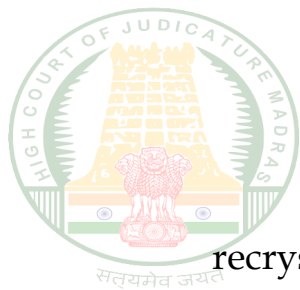
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19. Thus, Section 3(d) prescribes three exclusions: (a) the mere discovery of a new form of a known substance unless there is enhancement in the known efficacy of the substance; (b) mere discovery of any new property/new use for a known substance; or (c) mere use of a known process, machine or apparatus unless it results in a new product or employs a new reactant. Since this a process and not substance claim, only exclusion (c) is relevant.

20. Public policy mandates prohibition of the grant of monopoly rights to an already known process that adds no scientific or economic value in the relevant field. Accordingly, an invention which makes mere use of a known process that does not result in a new product or does not employ a new reactant is excluded from patentability as per Section 3(d) of the Patents Act.

21. In the claimed invention, AP is dissolved in water and filtered using a stainless steel sieve or cotton or filter paper, wherein



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recrystallization of AP (RAP) causes potassium to be doped in ammonium perchlorate during the filtering process. The impugned order cites Example III of prior art D1 as involving similar processes. The relevant part of D1 recites as follows:

“EXAMPLE III

*Co-crystallized ammonium perchlorate and
potassium iodide*

A 490-gram sample of ammonium perchlorate was dissolved in about 3 litres of water. The solution was poured into a 3-neck flask provided with a stirrer, thermometer and a dropping funnel. A solution of 10 grams of potassium iodate in 500 ml. of water was then slowly added to the aqueous ammonium perchlorate solution. The vigorously stirred mixture was then concentrated at 50° C under reduced pressure. When a thick slurry was obtained, the precipitate was filtered, dried and screened to obtain an isomorphous cocrystallized product. The product obtained by the above-described method was analyzed and found to contain about two percent potassium iodate.”



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22. Cited prior art D1 US 3,269,879 entitled 'Ammonium salt

lattice with isomorphously substituted inorganic salts' relates to the production of novel ammonium perchlorate and ammonium nitrate compositions by co-crystallization. Such preparation, including the one in cited example III, by co-crystallizing ammonium perchlorate with potassium iodate has greater sensitivity to impact and lower decomposition temperature and is useful in explosive compositions. Although the problem identified and the end product in example III of D1 are different from those of the claimed invention, both employ similar processes, albeit not in the same order. Example III cited above involves the processes of dissolution of AP in water, stirring potassium iodide, concentrating the stirred mixture at 50° C under reduced pressure which produces a slurry which is then filtered, dried and screened to obtain the isomorphous co-crystallized product.

23. The claimed invention employs dissolution, filtration,



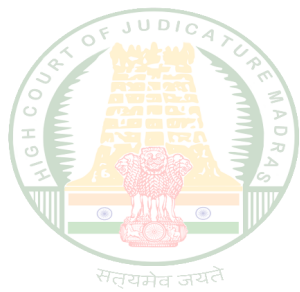
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heating, drying and reheating. The resultant product in the claimed invention is also not new but merely a variant of the one in D1.

Moreover, scientific non-patent literature [see '*Modified Ammonium Perchlorate Incorporating Potassium, Permanganate, and Dichromate Dopants [u]*' by Arnold Adicoff, William M. Ayres, Marian E. Hills, & William R. McBride, Research Department, NWC, US Department of Defence, 1971 (declassified via USNWC dated Jan 4, 1984)] indicates that doping of ammonium perchlorate with compounds like potassium, permanganate, etc., results in the corresponding doped variant of AP, i.e. potassium doped AP or permanganate doped AP with varying impacts on the propellant burnrate based on experimental conditions.

24. One of the grounds of rejection was that a new reactant was not used. In order to understand what constitutes a 'reactant', I refer to the Oxford Dictionary of Chemistry (8th ed., 2020):

“chemical reaction: A change in which one or more or compounds (the reactants) form new



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compounds (the products)."

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Thus, for a compound to be considered as a reactant, it must trigger or cause a chemical reaction to form a new compound. In the claimed invention, the filtrate material is merely used for the purpose of filtering. In the complete specification, there is nothing to indicate that the use of stainless steel sieve or cotton or filter paper as filtering material causes a chemical reaction. The filtrate material in the claimed invention acts as a mere *medium* that facilitates the doping of potassium with AP and recrystallization during the filtering process. It cannot be characterized as a reactant in and of itself. Therefore, I conclude that the filtrate material cannot be considered as a reactant. The claimed invention employs dissolution, filtration, heating, drying and reheating. All these processes are known. Since a new reactant was not used while adopting these known processes and these processes do not result in a new product, I further conclude that the claimed invention is excluded from patentability under



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Section 3(d) of the Patents Act. As a consequence of the above conclusion, even if the appellant establishes the existence of an inventive step, it becomes moot. Nonetheless, in view of extensive arguments having been advanced on the issue, I discuss the inventive step issue as the last aspect after considering other objections.

Industrial capability:

25. Next, I deal with the finding that the claimed invention is not “capable of industrial application”. Relevant portions of paragraphs 12, 13 and 14 of the impugned order are as below:

“12. ... Because the applicant disclosed that “EDAX analysis is performed on the stainless-steel sieve, cotton cloth and the filter paper, employed for the filtering process, to examine if these contained any potassium. It is noticed that, stainless steel sieve, filter paper and cotton cloth has 0.45, 0.71 and 0.85 percentages by weight of



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potassium, respectively". From the above while preparing the potassium doped ammonium perchlorate in large scale in industries we can get the maximum potassium content on product 0.45, 0.71 and 0.85 if a stainless steel sieve, cotton cloth and filter paper are used as filtering material respectively assuming that 100% release of potassium ion. But we cannot expect 100% release because that the reaction is taking place on the adsorbed or absorbed potassium on the filtering material. In the industrial scale process filter paper is not advisable in general. While preparing large scale, at one stage the filtering material loses all the potassium ion therefore there is a need to change the filtering material with the new one in order to achieve the potassium content on the product as disclosed in the present invention. And that may make the invention more expensive than adding a potassium ion as a source reactant.

13. Also there is a need to monitor the potassium content on the product and allowing more contact time without any established procedures to get the



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expected result, this has to be done by trial. The instant invention discloses as a potassium ion in the filtering material and potassium doped ammonium perchlorate product and failed disclose what type of potassium compound. Moreover, while using the cotton cloth or filter paper as a filtering material it has to be placed on some material as support for the filtration to take place. If the support material has any potassium ion, that will also be acquired by ammonium perchlorate at the first instance. Replacing the stainless-steel sieve filter is more expensive than the cotton cloth filter on large scale production.

14. *In the step (d) of the claim 1 present invention uses hot air oven for drying the ammonium perchlorate for two days. Hot air oven drying for two days may be suitable for laboratory scale trial with less quantity. The same is not feasible while manufacturing the product in large scale industries. Therefore, there is a need for alternate drying process, may be of any conventionally available technology. In view of the*



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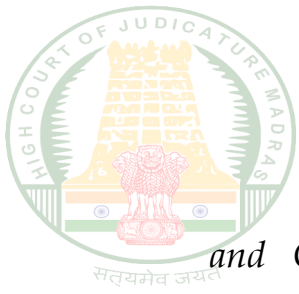
foregoing discussions, the instant invention does not involve inventive step under section 2(1) (ja) of the Patents Act. Therefore cannot be considered as an invention under section 2(1) (ja) of the Patents Act."

26. Section 2(1)(ac) of the Patents Act defines 'capable of industrial application' as follows:

2. Definitions and interpretation. – (1) In this Act, unless the context otherwise requires, –

(ac) "capable of industrial application", in relation to an invention, means that the invention is capable of being made or used in an industry;"

While amending the Patents Act in 2002 to ensure compliance with the TRIPS Agreement, the term 'useful' in Section 2(1)(j) was replaced with 'capable of industrial application'. An equivalent phrase 'susceptible of industrial application' is used in the European Patent Convention and the UK Patents Act, 1977. Therefore, I refer to the UK Supreme Court judgment in *Human Genome Sciences Inc v Eli Lilly*



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and Company [2012] RPC 6 ('Human Genome'). In deciding the industrial applicability of a novel human protein and its antibodies as regards therapeutic activities, the UK Supreme Court formulated a set of general principles to ascertain whether a claimed invention is 'susceptible of industrial application. The following are the general principles:

“107. The general principles are:

- (i) The patent must disclose “a practical application” and “some profitable use” for the claimed substance, so that the ensuing monopoly “can be expected [to lead to] some ... commercial benefit” (T 0870/04, para 4, T 0898/05, paras 2 and 4);*
- (ii) A “concrete benefit”, namely the invention’s “use ... in industrial practice” must be “derivable directly from the description”, coupled with common general knowledge (T 0898/05, para 6, T 0604/04, para 15);*
- (iii) A merely “speculative” use will not suffice, so “a vague and speculative indication of*



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possible objectives that might or might not be achievable” will not do (T 0870/04, para 21 and T 0898/05, paras 6 and 21);

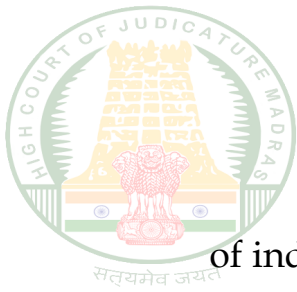
(iv)The patent and common general knowledge must enable the skilled person “to reproduce” or “exploit” the claimed invention without “undue burden”, or having to carry out “a research programme” (T 0604/04, para 22, T 0898/05, para 6); “

27. It is clear from the definition provided in Section 2(ac) of the Patents Act and the standards formulated in *Human Genome* that the claimed invention must disclose a practical application and should be capable of being exploited for commercial benefit without significant difficulty. The possibility of doing so must be discernible from its specification and common general knowledge. Claim 1 discloses and asserts that the claimed invention results in potassium doped AP with a higher burn rate. The complete specification supports the claim, including by indicating use cases in industry.



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While rejecting the application, the respondents do not contend that an increased burn rate does not have industrial application. Instead, it was stated that the use of cotton cloth or filter paper as filtration materials, in contrast with the use of a reagent, is expensive on account of the need for frequent replacement. Given that the 'capable of industrial applicability' filter only requires that the claimed invention must be capable of being put to practical use and not that it should be capable of industrial use at a lower cost than prior art, the respondents' contention that changing the filtrate material during the filtration process is expensive, is not a relevant consideration for ascertaining the claimed invention's industrial applicability. It may, however, be relied on to counter the contention that the claimed invention has economic significance. Similarly, from the recitals in the complete specification, it appears that the hot air ovens employed to remove moisture content can be upscaled to industrial scale drying ovens for large scale manufacturing. Based on these reasons, I conclude that the claimed invention passes the test of being capable



of industrial applicability.

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Inventive Step:

28. The last aspect I examine is whether the claimed invention possesses an inventive step. In the impugned order, the findings with regard to lack of 'inventive step' are as below:

“12. Section 2(1)(ja) of the Patents Act refers to 'inventive step' means a feature of an invention that involves technical advance as compared to the existing knowledge or having economic significance or both and that makes the invention not obvious to a person skilled in the art. In view of the section 2(1)(ja) of the Patents Act the minimum requirement for invention is to have non-obvious technical advancement or economic significance. The applicant claim over the fact that the doping of potassium was achieved without using reagent cannot be considered as technical advancement or economic significance....”

29. Section 2(1)(ja) defines 'inventive step' as under:



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“(ja) “inventive step” means a feature of an invention that involves technical advance as compared to the existing knowledge or having economic significance or both and that makes the invention not obvious to a person skilled in the art;”

Thus, in order to surmount the inventive step test test, the claimed invention must possess both the following characteristics:

- (i) it must exhibit technical advancement as compared to the existing knowledge or have economic significance in the industry or both of the above; and
- (ii) the purported technical advance must not be obvious to a person skilled in the art.

30. The tests formulated in *Windsurfing International Inc. v Tabur Marine (GB) Ltd* [1985] RPC 59 for identifying whether an invention involves an inventive step, as further refined in *Pozzoli Spa v. BDMO SA*, [2006] EWHC 1398 (Ch.), referred to as the 'Windsurfer-Pozzoli' tests are as below :



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“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 be readily 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 have been obvious to the person skilled in the art or do they require any degree of invention.”

The above steps would apply in the Indian context with the caveat that PSITA is of above average skill with normal imagination but lacking in ingenuity or inventiveness (*Rhodia Operations v Assistant*



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Controller of Patents and Designs, 2024-2-L.W.642).

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31. The appellant claims that the inventive step of the claimed invention lies in eliminating the use of external reagents through the usage of the filtrate material, viz., stainless steel sieve or cotton cloth or filter paper wherein varying percentage weights of potassium gets doped into AP resulting in RAP with incremental thermal properties. Even assuming that such usage constitutes a 'technical advance', it must not be obvious to PSITA for it to qualify as 'inventive step'.

PSITA:

32. The crucial second step in conducting the obviousness analysis is to identify the notional person skilled in the art (PSITA). The claimed invention relates to the preparation of potassium doped AP for enhancing the burn rates in composite solid propellants. This requires knowledge and expertise in the use and impact of chemical compounds in propellant systems. Therefore, a chemical engineer



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working in the field of composite solid propellants would qualify as the PSITA for conducting the obviousness analysis.

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33. Upon perusing the complete specification, it is evident that recrystallization of AP enables the doping of potassium in it. After dissolving the AP in distilled water, it is exposed to the potassium present in the filtrate material. Table 2 and lines 16-25 in page 11 of the complete specification reveal that the type of filtrate material used and the time of exposure of the AP solution to the filter determine the amount of potassium that gets doped into the AP after recrystallization.

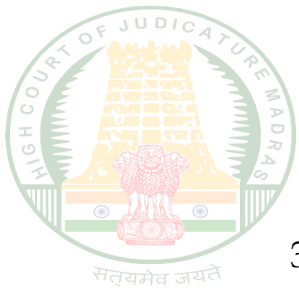
34. Turning to the appellant's contention that the usage of the filtrate material in lieu of external reagents constitutes an inventive step, D1 discloses and common general knowledge dictates that floating impurities are removed through the filtration process which inevitably requires the usage of filtrate material. In the claimed



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invention, the doping of potassium into AP after recrystallization that has accretionary effects on AP's burning rates happens *in-situ* during the filtration process. The claimed technical advance of choosing the type of filtrate material used therein from and out of known filtering materials would be obvious to PSITA from D1 and common general knowledge.

35. Additionally, a close reading of Table 2 along with figure 2 reveals that the burn rates of AP increase only till the weight percentage of potassium in AP is around 0.19, and that there is only a marginal impact on the burn rate at higher weight percentages. Thus, the appellant's intervention in the process is confined to the extent of limiting the time of exposure of AP to the filter to reach the ideal weight percentage of 0.19 and choosing the type of appropriate filtrate material. This only entails routine experimentation and does not require any ingenuity on part of the appellant.



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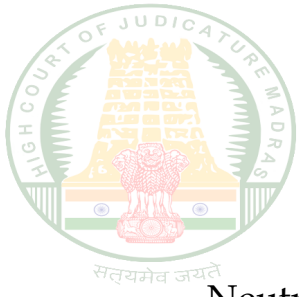
36. Furthermore, I conclude that without any experimental data to compare the costs of using filtrate material, which requires frequent changing, *vis-a-vis* using an external reagent, the economic significance of the claimed invention cannot be established. Because of these reasons, I conclude that the claimed invention lacks an inventive step under Section 2(1)(ja) of the Patents Act.

37. For the reasons set out above, the rejection of the claimed invention by the Controller in the impugned order on the basis of Section 3(a) and on industrial applicability under Section 2(1)(j) is held to be untenable, whereas the rejection on the basis of Sections 3(d) and 2(1)(ja) is sustained. Consequently, the rejection of the patent application is affirmed by dismissing (T) CMA (PT) No.52 of 2023 without any order as to costs.

11.06.2024

Index : Yes / No

Internet : Yes / No



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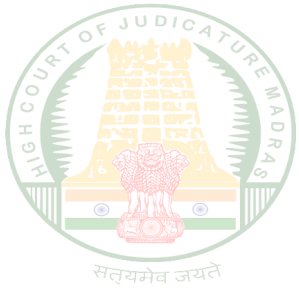
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Neutral Citation : Yes/ No

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To

The Controller of Patents,
Patent Office,
Intellectual Property Building,
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SENTHILKUMAR RAMAMOORTHY J.

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Pre-delivery judgment made in
(T) CMA (PT) No.52 of 2023
(OA/56/2020/PT/CHN)