IN THE HIGH COURT OF JUDICATURE AT MADRAS

Judgment reserved on	31.10.2023
Judgment pronounced on	31.01.2024

CORAM

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

(T) CMA (PT) No.88 of 2023
(OA/14/2017/PT/CHN)

Rhodia Operations
40, rue de la Haie Coq
F-93306 Aubervilliers
France. ...Appellant

v.

Assistant Controller of Patents and Designs,
Government of India, Patent Office,
Intellectual Property Building,
G.S.T. Road, Guindy,
Chennai – 600032. ...Respondent

PRAYER: This Civil Miscellaneous Appeal is filed under Section 117-A of the Patents Act, 1970, to set aside the order dated 11 November 2016 issued by the Respondent and direct that the Patent Application No.6334/CHENP/2009 proceed to grant.

For Appellant : Ms.Vindhya S.Mani,
Mr.Kiran Manokaran,
for M/s.Lakshmikumaran and Sridharan

For Respondent : Mr.S.Janarthanam, SPC &
Mr.Anoop K.Joy,
Assistant Controller of Patents

JUDGMENT

Background

The appellant assails an order dated 11.11.2016 by which Indian Patent Application No.6334/CHENP/2009, which is the national phase application derived from PCT Application No.PCT/EP08/55018, was rejected.

2. The appellant filed the above mentioned application dated 26.10.2009 for grant of patent in respect of an invention titled "Polyamide Material Having High Fluid Barrier Properties" by claiming its priority date from French Application No.0703069 dated 27.04.2007. The claimed invention relates to polyamide materials having high barrier properties to fluids, i.e. gases and liquids. Fifteen original claims were set out in the complete specification. Upon examining the complete specification, the First Examination Report (FER) was issued on 22.07.2014. In the FER, the respondent *inter alia* raised the following objections: that the invention is

not novel and lacks inventive step by citing prior art documents D1 and D2; and that the invention falls within the scope of Section 3(e) of the Patents Act, 1970 (the Patents Act).

3. The appellant responded thereto on 20.07.2015 and submitted amended claims 1 to 6. It contended that the claimed invention is distinguishable from D1 and D2 by stating that both D1 and D2 disclose polyolefin compositions which comprise polyamide as a minor component. In the hearing notice dated 05.07.2016, the respondent raised objections on the ground of lack of novelty and inventive step by citing prior art documents D4 to D6. Pursuant to a hearing, along with the written submissions, the appellant further amended claims 1 to 6 and asserted that the claimed invention is distinguishable and not obvious from prior arts D4 to D6. The amended claims, as of 18.10.2016, are set out below:

> ***"WE CLAIM:***
> *1. A polyamide composition having high fluid barrier properties comprising a mixture of:*
>
> *a) a polyamide matrix present in an amount from 60% to 80% by weight, relative to the total weight of the composition;*
>
> *b) from 5 to 20% by weight of a novolac resin;*

c) from 5 to 30% by weight, relative to the total weight of the composition, of a polyolefin devoid of functional groups useful for improving its compatibility with the polyamide, said polyolefin c) being a polyethylene having a density ranging from 0.94 to 0.97 g/cm³, wherein said polyolefin c) does not comprise a maleic anhydride group, a salified or unsalified carboxylic acid group, an ester group, an acrylic group, a methacrylic group, or an epoxy group; and

d) an agent for effecting compatibilization between the polyolefin and the polyamide, said compatibilizing agent d) being a compound comprising the polyolefin of c) modified by functional groups selected from the group consisting of a maleic anhydride group, a carboxylic acid group, an ester group, an acrylic group, a methacrylic group, and an epoxy group, said agent being present in an amount of at least 30% relative to the weight of polyolefin c),

wherein the polyamide composition when formed into a pipe having a thickness of 1 mm has a permeability to gasoline of no more than 0.8 g/(m²day) at 40° C, the gasoline comprising 45 volume percent toluene, 45 volume percent isooctane and 10 volume percent ethanol.

2. A method for increasing the impermeability to fluids of a polyamide matrix; said method comprising addition to said polyamide matrix present in an amount from 60% to 80% by weight, relative to the total weight of the composition the following ingredients:

b) from 5 to 20% by weight of a novolac resin;

c) from 5 to 30% by weight, relative to the total weight of the composition, of a polyolefin devoid of functionalgroups useful for improving its compatibility

with the polyamide, said polyolefin c) being a polyethylene having a density ranging from 0.94 to 0.97 g/cm³, wherein said polyolefin c) does not comprise a maleic anhydride group, a salified or unsalified carboxylic acid group, an ester group, an acrylic group, a methacrylic group, or an epoxy group; and

d) an agent for effecting compatibilization between the polyolefin and the polyamide, said compatibilizing agent d) being a compound comprising the polyolefin of c) modified by functional groups selected from the group consisting of a maleic anhydride group, a carboxylic acid group, an ester group, an acrylic group, a methacrylic group, and an epoxy group, said agent being present in an amount of at least 30% relative to the weight of polyolefin c).

wherein said increased impermeability is achieved when the polyamide composition formed into a pipe having a thickness of 1 mm has a permeability to gasoline of no more than 0.8 g/(m²day) at 40° C, the gasoline comprising 45 volume percent toluene, 45 volume percent isooctane and 10 volume percent ethanol.

3. An article obtained by forming a composition as claimed in claim 1, by at least one extrusion, molding or injection-molding conversion technique.

4. A composite article comprising at least one material made from the composition as claimed in claim 1.

5. The composite article as claimed in claim 4, wherein said article is a multilayer article in which at least one layer is composed of the composition as claimed in claim 1.

6. The multilayer composite article as claimed in claim 5, wherein at least one layer is composed of the composition

as claimed in claim 1, and that at least one layer is obtained from a composition comprising a polyolefin."

4. Eventually, by impugned order dated 11.11.2016, the application was refused on the ground that the claimed invention lacks inventive step and is obvious to a person skilled in the art in view of prior art documents D5 [US2002/0051856 A1, published on 02.05.2002] & D6 [US2005/0069662 A1, published on 31.05.2005]. The appeal was filed in the above facts and circumstances.

Contentions of the parties

5. Oral arguments were advanced by Ms.Vindhya Mani, learned counsel for the appellant; and by Mr.Janarthanam, learned SPC, assisted by Anoop K.Joy, Assistant Controller of Patents,on behalf of the respondent.

6. Learned counsel for the appellant submitted that the claimed invention relates to a composition having high barrier properties to fluids, namely, gases and liquids. She submitted that the polyamide composition comprises a polyamide matrix as the most substantial ingredient, a novolac

resin, a polyolefin, and an agent for compatibilization between the polyolefin and the polyamide. As on the priority date, she pointed out that multi-layered articles using layers of different materials, such as polyethylene and ethylene vinyl alcohol (EVOH), were part of the state of the art, and that multi-layered articles with layers of different materials not only caused delamination problems but were expensive to produce. Learned counsel contended that the claimed invention provides a solution to these problems and that such composition could be used for the manufacture of articles, such as pipes, ducts, or tanks, intended to contain or transport a fluid.

7. She referred to prior art document D5 and contended that it relates to a multi-layered fuel tank comprising the following: a first layer of high density polyethylene (HDPE), a layer of binder, a second layer of EVOH, and optionally a third layer of polyamide or a mixture of polyamide and polyolefin. She contended that D5 teaches away because it relates to multi-layered articles and the non-optional and main barrier layer therein is made of EVOH. By referring to paragraphs [0030] and [0078] of the complete

specification of D5, learned counsel contended that the polyamide composition in D5 is optional.

8. She then referred to prior art document D6, which relates to moulded articles made from polyamide resin compositions suitable for the transport or storage of fuels used in internal combustion engines, and having improved fluid permeation barrier properties. She submitted that D6 discloses that the addition of novolac resin to polyamide/nylon enhances fluid impermeability, but that functional and non-functional polyolefins are not present in D6. She further contended that D6 was classified as 'A' in the International Search Report, i.e. as a document which is not of particular relevance, since a co-polymer is used therein. Therefore, she concluded that there is no basis to combine D5 and D6 in arriving at the claimed invention and that the Controller erred in doing so by resorting to hindsight analysis.

9. Learned counsel then invited my attention to page no.123 of the appeal paper book and submitted that a set of further amended claims 1-6 were filed as auxiliary request claims, wherein independent claim 1 was

restricted to a pipe comprising the polyamide composition. Such amended claim 1 is extracted below:

> *"1. A pipe having high fluid barrier properties comprising polyamide composition, wherein the composition comprises:*
>
> *a) a polyamide matrix present in an amount from 60% to 80% by weight, relative to the total weight of the composition;*
>
> *b) from 5 to 20% by weight of a novolac resin;*
>
> *c) from 5 to 30% by weight, relative to the total weight of the composition, of a polyolefin devoid of functional groups useful for improving its compatibility with the polyamide, said polyolefin c) being a polyethylene having a density ranging from 0.94 to 0.97 g/cm³, wherein said polyolefin c) does not comprise a maleic anhydride group, a salified or unsalified carboxylic acid group, an ester group, an acrylic group, a methacrylic group, or an epoxy group; and*
>
> *d) an agent for effecting compatibilization between the polyolefin and the polyamide, said compatibilizing agent d) being a compound comprising the polyolefin of c) modified by functional groups selected from the group consisting of a maleic anhydride group, a carboxylic acid group, an ester group, an acrylic group, a methacrylic group, and an epoxy group, said agent being present in an amount of at least 30% relative to the weight of polyolefin c),*
>
> *wherein when the pipe has thickness of 1 mm, it has a permeability to gasoline of no more than 0.8 g/(m²day) at 40° C, the gasoline comprising 45 volume percent toluene, 45 volume percent isooctane and 10 volume percent ethanol."*

10. In support of these submissions, learned counsel for the appellant referred to and relied upon the following judgments:

(i) *F.Hoffmann-La Roche & Ors. v. Cipla Limited (Hoffmann-La Roche),* 2015 SCC OnLine Del 13619, particularly paragraph 151 thereof, wherein the Supreme Court formulated the steps to determine obviousness/lack of inventive step.

(ii) *Biomoneta Research (P) Ltd. v. Controller General of Patents and Designs (Biomoneta Research),* 2023 SCC OnLine Del 1482, particularly paragraphs 35, 64 and 65 thereof, wherein the Court relied on the combination v. juxtaposition or aggregation principle laid down by the EPO and held that in order to understand if the claimed invention involves an inventive step, it is necessary to understand the prior art documents.

(iii) *Agriboard International v. Controller of Patents and Designs (Agriboard International),* 2022 SCC OnLine Del 4786, particularly paragraphs 25 and 27 thereof, wherein the Court outlined three elements to be considered by the Controller while undertaking obviousness analysis.

(iv) *Rosemount INC v. Controller of Patents,* 2023 SCC OnLine Del 2487.

(v) *Gogoro Inc. v. Controller of Patents and Designs & Another,* 2022 SCC OnLine Del 2577.

(vi) *Bristol-Myers Squibb Holdings Ireland Unlimited Company & Ors. v. BDR Pharmaceuticals International Pvt. Ltd. & Anr. (Bristol-Myers),* 2020 SCC OnLine Del 1700, particularly paragraphs 32 to 36 thereof, wherein the Court emphasised the need to be cautious about teachings away from the claimed invention and mosaicing of prior art documents.

(vii) *Avery Dennison Corporation v. Controller of Patents and Designs (Avery Dennison),* 2022 SCC OnLine Del 3659, to contend that simplicity does not defeat an invention.

(viii) *Dystar Textilfarben GmbH & Co. Dutschland KG v. C.H.Patrick Co. (Dystar Textilfarben),* 464 F.3d 1356 (Fed.Cinr.2006), to contend that prior art D5 teaches away from the invention and there is no motivation for the person skilled in the art to combine prior arts D5 and D6.

(ix) *Actavis Group PTC EHF and others v. ICOS Corporation & Another (Actavis),* [2019] UKSC 15, to discuss various approaches and considerations to assess obviousness.

(x) *Environmental Designs, Ltd. and the Trentham Corporation v. Union Oil Company of California and*

Ralph M.Parsons Co. (Environmental Designs), 713 F.2d 693, wherein the Court, particularly at paragraph 33 thereof, formulated factors which may be considered in determining the level of ordinary skill in the art.

(xi) *Sankalp Rehabilitation Trust v. F.Hoffmann-LA Roche AG and Another (Sankalp Rehabilitation),* 2012 SCC OnLine IPAB 167, particularly paragraph 42 thereof, wherein the Court examined the meaning of the expression "person skilled in the art" in the Indian context.

(xii) *Rockwool International A/S v. Knauf Insulation Limited,* [2020] EWHC 1068 (Pat), particularly paragraphs 15 to 17 thereof, wherein the UK High Court discussed the person skilled in the art.

11. In response to the contentions of learned counsel for the appellant, it was submitted on behalf of the respondent that the amended claims, including those set out in the auxiliary request, lack inventive step over the teachings of D5 and D6. It was further submitted that a person skilled in the art would be motivated by the teachings of D6 to add novolac to the polyamide composition of D5 so as to improve barrier properties and thus arrive at the present invention.

12. The respondent countered the argument of the appellant that D5 is an irrelevant prior art because it is a multi-layered article. By referring to internal pages 4 and 12 of the complete specification of the claimed invention and claims 5 and 6 thereof, it was contended that the appellant's invention also envisages a multi-layered article. It was next contended that D5 teaches a barrier layer (a third layer) comprising polyamide or a combination of polyamide and polyolefin, and that although D5 refers to this layer as being optional, the said layer was also referred to as a preferred layer and discussed at length. Hence, it was contended that D5 does not teach away from using polyamide as a barrier layer.

13. As regards prior art document D6, the complete specification of D6, particularly Table 1 & 2 thereof, was referred to in order to demonstrate that the addition of novolac enhances barrier properties against fluid permeation. With reference to Table 1 of the complete specification of D6, it was pointed out that the four examples cited therein demonstrate clearly and unequivocally to a person skilled in the art that the addition of novolac

resin to polyamide enhances the barrier properties significantly.

14. In conclusion, the respondent submitted that the appellant abandoned the patent application in respect of the claimed invention in the US Patent Office, when the office raised objections on inventive step in view of prior arts D5 and D6.

15. By way of rejoinder, Ms.Vindhya Mani clarified that the claimed invention relates to a pipe made of a polyamide composition and not a multilayered article. She reiterated that the respondent resorted to hindsight analysis in combining D5 and D6 to arrive at the claimed invention.

Discussion, analysis and conclusions

16. As is evident from the preceding paragraphs, the application for the grant of patent was rejected under Section 2(1)(ja) of the Patents Act largely on the basis that the claimed invention would be obvious to the person skilled in the art based on the teachings of D5 in view of D6. Section 2(1)(ja), which defines inventive step, is set out below:

> "*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"*

From the plain language of the section, it follows that the assessment of inventive step of a claimed invention is to be made by a two-step process:

> (i) identification of feature(s), if any, that involve technical advancement over prior knowledge or having economic significance or both; and
>
> (ii) determination of whether the technical advance or economic significance or both of said feature(s) makes the invention not obvious to a person skilled in the art.

17. The appellant asserts that the claimed invention is a composition comprising polyamide, polyolefin and novolac resin, along with an agent for compatabilisation between the polyolefin and polyamide, as per specifications and proportions set out in the claims, and that such composition exhibits high levels of impermeability to liquids and gases, including fossil fuels, resolves the problem of delamination, and is less expensive to produce. As a result, it is further asserted that there is both

technical advancement and economic advantage, which would not have been obvious on the priority date to a person skilled in the art. The response of the respondent and the conclusion in the impugned order was that such technical advancement would be obvious to a person skilled in the art on the basis of the closest prior art D5 in combination with D6. The adjudication of this dispute would hinge, therefore, on identifying the person skilled in the art, deciding on the level of skill to be imputed to such person, and, thereafter, answering the question as to whether it would be obvious to such person to combine D5 and D6 without the benefit of hindsight. The manner in which obviousness analysis should be carried out was the subject of many judgments that were cited at the bar, and it is instructive to refer to some of them.

18. In *Avery Dennison,* the Delhi High Court surveyed the different approaches to obviousness analysis, such as the obvious to try approach; problem/solution approach; the could-would approach; and the teaching, suggestion and motivation (TSM) approach. Thereafter, the Court set out the tests formulated by the House of Lords in *Windsurfing International*

Inc. v. Tabur Marine Ltd, [1985] RPC 59, as modified by the Court of Appeals in *Pozzoli Spa v. BDMO SA, [2006] EWHC 1398 (Ch.),* which are referred to as the *Windsurfer Pozzoli* tests and are as under:

> "*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."*

19. In *Agriboard International,* the Delhi High Court held that the Controller, while carrying out inventive step analysis, should consider the invention disclosed in the prior art, the invention disclosed in the application under consideration, and then examine whether and, if so, in what manner the subject invention would be obvious to a person skilled in the art. The Division Bench of the Delhi High Court, in paragraph 151 of

Hoffmann-La Roche, formulated five steps to determine obviousness/lack of inventive step, and the said paragraph is set out below:

> *"151. From the decisions noted above to determine obviousness/lack of inventive steps the following inquiries are required to be conducted:*
>
> *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,*
>
> *Step No.5 To decide whether these 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 a hideside approach."*

20. In *Actavis,* the UK Supreme Court identified nine relevant considerations to be taken into account while assessing obviousness and these, in relevant part, are captured in paragraph 19 of *Avery Dennison* by

the Delhi High Court. The said paragraph is extracted below:

" The relevant considerations are:

(1) First, it is relevant to consider whether ***something was "obvious to try" at the priority date****, in other words, whether it is* ***obvious to undertake a specific piece of research which had a reasonable or fair prospect of success****....*

(2) Secondly, it ***follows the routine nature of the research*** *and whether there is an established practice of following the research through to a particular point may be a relevant consideration which is weighed against the consideration that the claimed process or product was not obvious to try at the outset of a research programme....*

(3) Thirdly, the ***burden and cost of the research programme is relevant****. But the weight to be attached to this factor will vary depending on the particular circumstances....*

(4) Fourthly, the ***necessity for and the nature of the value judgments*** *which the* ***skilled team would have in the course of a testing programme*** *are relevant considerations ...*

(5) Fifthly, the ***existence of alternative or multiple paths of research will often be an indicator that the invention contained in the claim or claims was not obvious****. If the notional skilled person is faced with only one avenue of research, a "one way street", it is more likely that the result of his or her research is obvious than if he or she were faced with a multiplicity of different avenues. But it is necessary to bear in mind the possibility that more than one avenue of research may be obvious ....*

*(6) Sixthly, the **motive of the skilled person is a relevant consideration**. The notional skilled person is not assumed to undertake technical trials for the sake of doing so but rather because he or she has some end in mind. It is not sufficient that a skilled person could undertake a particular trial; one may wish to ask whether in the circumstances he or she would be motivated to do so. The **absence of a motive to take the allegedly inventive step makes an argument of obviousness more difficult**....*

*(7) Seventhly, the fact that the **results of research which the inventor actually carried out are unexpected or surprising is a relevant consideration** as it may point to an inventive step…*

*(8) Eighthly, the courts have repeatedly emphasised that **one must not use hindsight**, which includes knowledge of the invention, in addressing the statutory question of obviousness. That is expressly stated in the fourth of the Windsurfing/Pozzoli questions….*

*(9) Ninthly, it is necessary to consider whether a feature of a claimed invention is **an added benefit in a context in which the claimed innovation is obvious for another purpose**…."*

21. The precedents on record suggest that the inventive step inquiry should be carried out in the following manner: (1) identify the person skilled in the art; (2) identify the common general knowledge to be imputed to the person skilled in the art; (3) identify the inventive concept embodied in the claimed invention; (4) identify the differences between the prior arts

and the claimed invention; and (5) decide whether those differences would be obvious to a person skilled in the art. I intend to start my analysis with identifying the inventive concept embodied in the invention because the technical advance or economic significance requirement is an essential pre-requisite in obviousness analysis under Section 2(1)(ja).

What is the inventive concept embodied in the claimed invention?

22. The claimed invention is described at internal page 3 of the complete specification as under:

> ***"INVENTION***
>
> *The Applicant has quite suprisingly demonstrated that the use, in a polyamide matrix, of a novolac resin and of a polyolefin made it possible to obtain a material suitable for the manufacture of single-layer or multilayer articles having an excellent level of impermeability to gases and to liquids, in a simple manner and without negatively altering the other properties of said materials. The solution of the invention makes it possible not only to avoid the drawbacks known from the prior art, but also to obtain hitherto unheard of fluid barrier properties, that are in any case much higher than the systems used commercially."*

From the above description, it is evident that the claimed invention identifies the problem to be solved as the need to develop single or multi-

layer articles with high fluid barrier properties or excellent levels of impermeability. As a solution to such problem, the claimed invention recites

that a composition comprising a novolac resin and a polyolefin in a polyamide matrix, when used for the manufacture of single-layer or multi-layer articles, has an excellent level of impermeability to gases and liquids. As per embodiments of the claimed invention, the composition may be used for the manufacture of articles, such as pipes, ducts, or tanks, intended to contain or transport a fluid. The industrial application of the invention is elucidated in the experimental section in internal pages 13 to 15 of the complete specification. Table 1 thereof recites that a polyamide pipe comprising novolac resin has excellent impermeability to gasoline.

23. Out of the two prior arts on which reliance was placed by the Controller in the impugned order, prior art D5 does not disclose or teach the use of novolac resin either as a composition or as a layer in a multi-layered article and prior art D6 does not disclose or teach the use of polyolefin in the composition. Therefore, undoubtedly, the claimed invention discloses

features not found in any of the prior arts cited by the Controller in the impugned order. Consequently, the technical advance requirement is satisfied. The next step is, therefore, to identify the person skilled in the art before determining whether the technical advance would be obvious to such person.

Person skilled in the art

24. The person skilled in the art is a hypothetical person created by law. The law requires that obviousness analysis be carried out by slipping into the shoes of this notional person. In spite of the significance of this notional person, the Patents Act does not define the person skilled in the art or prescribe the attributes of such person. Section 3 of the Patents Act, 1977 of the United Kingdom (the UK Patents Act), which is the provision corresponding to Section 2(1)(ja), defines inventive step as under:

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

When Section 2(1)(ja) of the Patents Act is compared and contrasted with Section 3 of the UK Patents Act, it is noticeable that the first requirement under Section 2(1)(ja), i.e. technical advancement over existing knowledge

or economic advantage or both, is not expressly prescribed in Section 3 of the UK statute. Turning to the perspective from which obviousness analysis should be carried out, both statutes use the identical expression "person skilled in the art". Against this backdrop, it is useful to examine the manner in which courts in the UK define or describe the person skilled in the art.

24. Speaking for the UK Patents Court, Justice Laddie elaborated on the general characteristics of the skilled but non-inventive person in paragraph 62 of *Lilly Icos LLC v. Pfizer Ltd. (Lilly Icos),* (2001) FSR 16, which is set out below:

> "*The question of obviousness has to be assessed through the eyes of the skilled but non-inventive man in the art. This is not a real person. He is a legal creation. He is supposed to offer an objective test of whether a particular development can be protected by a patent. He is deemed to have looked at and read publicly available documents and to know of public uses in the prior art. He understands all languages and dialects. He never misses the obvious nor*

stumbles on the inventive. He has no private idiosyncratic preferences or dislikes. He never thinks laterally. He differs from all real people in one or more of these characteristics. A real worker in the field may never look at the piece of prior art- for example he may never look at the contents of a particular public library- or he may be put off because it is in a language he does not know. But the notional addressee is taken to have done so. This is a reflection of part of the policy underlying the law of obviousness. Anything which is obvious over what is available to the public cannot subsequently be the subject of valid patent protection even if, in practice, few would have bothered looking through the prior art or would have found the particular items relied on. Patents are not granted for the discovery and wider dissemination of public material and what is obvious over it, but only for making new inventions. A worker who finds, is given or stumbles upon any piece of public prior art must realise that that art and anything obvious over it cannot be monopolised by him and he is assured that it cannot be monopolised by anyone else."

25. In the United States of America, Title 35 of the United States Code governs patents and Section 103 thereof, which deals with non-obvious subject matter, is as under:

"A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in Section 102 if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the

claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made."

Thus, under US law, obviousness is required to be determined from the perspective of "a person having ordinary skill in the art". The acronym "Mr.PHOSITA" or "PHOSITA" is often used for this notional person. In this statutory context, *in Graham v. John Deere Co. (Graham)383 U.S.1 (1966),* the US Supreme Court formulated the following four steps in obviousness analysis:

> *" Obviousness depends on (1) the scope and content of the prior art; (2) the differences between the claimed invention and the prior art; (3) the level of ordinary skill in the art; and (4) any relevant secondary considerations, including commercial success, long felt but unresolved needs; failure of others and unexpected results."*

Level of skill of person skilled in the art

26. As is evident from the above survey, the definition of inventive step in the Patents Act is closer to that in the UK Patents Act because both statutes use the expression "person skilled in the art" unlike the US Patents Act which uses the expression "person having ordinary skill in the art". That said, what is the level of skill: is it average, good, very good, excellent,

or extraordinary? The text of Section 2(1)(ja) does not place any of the above qualifiers or any analogous variant before the adjective "skilled". Is there contextual guidance regarding the level of skill? On scanning the Patents Act, I find that Section 64(1)(h), which provides for revocation of patents for failure to enable, prescribes as under:

> *(1) Subject to the provisions contained in this Act, a patent, whether granted before or after the commencement of this Act, may be revoked on a petition of any person interested or of the Central Government or on a counter-claim in a suit for infringement of the patent by the High Court on any of the following grounds, that is to say -*
>
> *(h) that the complete specification does not sufficiently and fairly describe the invention and the method by which it is to be performed, that is to say, that the description of the method or the instructions for the working of the invention as contained in the complete specification are not by themselves sufficient to enable* ***a person in India possessing average skill in, and average knowledge of, the art to which the invention relates****, to work the invention, or that it does not disclose the best method of performing it which was known to the applicant for the patent and for which he was entitled to claim protection." (emphasis added).*

The words to which emphasis was added in the above provision indicate that the statute posits a different notional person for determining whether

the invention had been sufficiently enabled. This person, in contrast to the hypothetical person in Section 2(1)(ja), is a person in India possessing average skill in and average knowledge of the art to which the invention relates. The absence of the words "in India" in Section 2(1)(ja) indicates that the person could be based anywhere in the world, including India.

27. Section 2(1)(ja) uses the word "skilled" as an adjective qualifying the noun "person". Most standard dictionaries define the adjective "skilled" as referring to a person having the ability to do a job, task or activity well. I am mindful of Judge Learned Hand's wise counsel in *Markham v. Cabell, 326 U.S. 404 (1945),* that one should not make a "fortress of the dictionary". So, I remind myself of the context: to determine whether the technical advance or economic significance or both would be obvious to a person skilled in the art. By reckoning that such skilled person could be from a range of disciplines depending on the field of invention, I ask myself what level of ability comes to mind if a person were to be described in any of the following ways: skilled medical doctor; skilled automobile engineer; skilled physicist; skilled carpenter; or skilled immunologist. In each case,

the straightforward answer is a person possessing the necessary attributes to do the job well. I bear in mind statutory context, i.e. the absence of the qualifier "average" in Section 2(1)(ja) in contrast to its use in Section 64(1)(h). I recognise that the statute neither uses words that indicate enhanced levels of skill such as "highly", "outstandingly" or "extraordinarily" nor words that indicate a low or average level of skill such as "low" or "ordinary" or "average" to further qualify the "skilled" person. By taking into account all of the above, on balance, in my view, the "person skilled in the art" as per Section 2(1)(ja) is a person whose skill level is good/greater than average. Because most disciplines/arts require a range of skills or skill set, this person should possess the skill set to do the job well. These aspects were considered in a judgment dated 12.06.2013 of the Intellectual Property Appellate Tribunal (the IPAB) in *Enercon (India) Ltd. v. Aloys Wobben (Enercon), ORA/08/2009/PT/CH.* In *Enercon*, the IPAB, speaking through Mrs.Justice Prabha Sridevan, held as under in two memorable paragraphs:

> *"35. It is true that the Roche extract is specifically with regard to the obviousness issue, but the Novartis extract is not. But it is clear from both the judgments that we should understand the concepts*

based on the sections as they are in our Act, and also contextualize it in our country. Roche v. Cipla also speaks of a person skilled in the art and not a person with ordinary skill in the art or average skill in the art. The respondent wants us to imagine a person of ordinary skill, conservative, unimaginative, will not go against established prejudice, and is in India. The law has not used the word ordinary. It had the laws of other jurisdictions before it and yet it eschewed the word "ordinary". So it is very important for us while deciding obviousness not to conjure up a dullard or a moron. Why should we proceed as if "ordinariness" is inherent in the hypothetical person? If it makes the obviousness bar a bit higher, we must bear that in mind, for This is Our Law."

"37. In this case the art is wind energy. Since this obviousness test is the most frequently debated issue in patent litigations, it may be better if in the future, the pleadings or evidence tells us who this person is. This person is skilled in the art. This person is presumed to know the state of that art at that time, and to have the knowledge that is publicly available. The Act is quite clear and free from ambiguity. The person is skilled in the art and has more than average knowledge of the state of the art and also has common sense. Indian law expects the non-obviousness to be tested against this person and not the person who is the touchstone in U.S. Law. She is Ms.P.Sita (Person Skilled in the Art) and not Mr.Phosita or Mr. Posita who are both ordinary by definition."

Attributes of a person skilled in the art

28. I turn next to the attributes of a person skilled in the art. Depending on the art, educational/ academic or vocational qualifications are likely to be required. Work experience would certainly be required because one does not ordinarily describe a person with the requisite educational qualifications but no work experience as skilled in the art. What about ability to use the tools of trade? Clearly, a person skilled in the art would be adept at using the tools of trade. With regard to knowledge, as held in *Lily Icos,* on account of the underlying public policy requirement that no monopoly right should be granted over matters previously known in the art or obvious to a person with knowledge of prior art, a level of knowledge that a real person skilled in the art is unlikely to possess is imputed to the hypothetical person. Such imputation of knowledge is not, however, unqualified and is restricted to matters previously known in the art in which such person or team of persons is skilled. The legislative intent, as gleaned from text, is certainly not that this person should be omniscient. This leads to the question: in what respects should this notional person be different from a real person skilled in the art?

29. For instance, is it necessary that this person should be forgetful of other prior art once she identifies the closest prior art? I do not think that it is necessary to impute such trait although it is necessary to be mindful of the risk of hindsight-based mosaicing. Should this person be lacking in imagination? While the extent of imaginativeness varies from person to person, imagination is an inherent human quality and the underlying public policy of fostering inventiveness does not justify banishing imagination in the notional person. What about inventiveness? Plainly, the text of the statute requires a patent applicant to establish the existence of an inventive step and, if obviousness is examined from the perspective of a skilled person with ingenuity and inventive capacity, every patent application would fail as would the public policy of fostering genuine invention. Indeed, even *de hors* the public policy justification, the expression "person skilled in the art" does not ordinarily connote a person with inventive capability. Thus, except to the extent that statutory prescription or the underlying public policy call for a departure from the characteristics of a real person skilled in the art, the notional person should, in my view, mirror a real person as closely as possible. Adopting such approach has the benefit

of enhancing the quality of obviousness analysis by ensuring that it remains rooted in the real world. In sum, other than the unreal levels of knowledge imputed to the notional person, such person should possess all the qualities that a real person proficient in the art would possess.

Identifying the person skilled in the art

30. Is it always necessary for the adjudicator to identify the person skilled in the art? If the patent applicant and the relevant patent office agree on the person skilled in the art, identification by the adjudicator is not necessary. By contrast, whenever there is disagreement, the adjudicator has to identify the person skilled in the art. Where does one begin? The obvious starting point is the field of the claimed invention. Sometimes the person skilled in the art can be readily identified from the field of invention. By way of illustration, if the claimed invention is a pure automobile patent, the person skilled in the art would be an automobile engineer. The identification process could get more complicated - and, the person skilled could even be a team of persons with requisite skills - if the claimed

invention also embraces a customised software embedded in a system/hardware. Depending on the nature of the claimed invention, the person, or team of persons, skilled in the art could be from a specific industry or industries or be proficient in technology with use cases in multiple industries. While undertaking this exercise, it is necessary to bear in mind that the object is certainly not to identify a person or team of persons with the capacity to invent in the field of the claimed invention. It is useful to refer to a couple of cases to understand how the person skilled in the art is identified.

31. In *Dystar Textilfarben,* which was a case revolving around the process of dyeing textiles with catalytically hydrogenated leuco indigo, there was a fundamental disagreement between the parties on the identification and level of skill of the person having ordinary skill in the art. In that context, the United States Court of Appeal for the Federal Circuit held as under:

> *"Designing an optimal dyeing process requires knowledge of chemistry and systems engineering, for example, and by no means can be undertaken by a person of only high school education whose skill set is*

limited to "flipping the switches". This is especially true when one considers that only in the last century have improvements in indigo reduction chemistry enabled outsourcing of the indigo reduction step from dyehouses to chemical manufacturers; prior to that simplification, there would have been no question that a dyer would also require knowledge of indigo reduction. Because, for this patent, the only finding supported by substantial evidence is that an ordinary artisan is not a dyer but a person designing an optimal dyeing process, the jury's implicit finding of a mere dyer cannot withstand scrutiny on JMOL. Accordingly, the jury's apparent decision to disregard Brochet, Winner, and Chaumat, and perhaps other prior art references, has neither in dye process art nor even in analogous arts is unsupported by substantial evidence"

32. In the Indian context, the IPAB judgment in *Sankalp Rehabilitation* is relevant and paragraph 42, in relevant part, is extracted below:

*"**42**...The Court has to see a) what is the prior art b) the differences between the prior art and the invention and c) the skill of the imaginary ordinary man. This man has skill but until KSR came along he had no inventive or creative capacity. Such a person is hard to find, but we had to conjure this man in our mind as we do the man on the Clapham omnibus. By way of diversion, it seems he is referred by the acronym Mr. PHOSITA or just PHOSITA, the preferred acronym could be POSIT it sounds better or POSITA if you please. Getting back to the track, as KSR says this man is "A person of ordinary skill is also a person of ordinary creativity not an automaton." So an automaton - like unimaginative but skilled man has now*

been allowed to have a modicum of creativity and imagination by the grace of the U.S. Supreme Court. We must remember that this ordinary man has skill in this art. He is not ignorant of its basics, nor is he ignorant of the activities in the particular field. He is also not ignorant of the demand on this art. "He is just an average man…….. Well… just an ordinary man." But he is no dullard. He has read the prior art and knows how to proceed in the normal course of research with what he knows of the state of the art. He does not need to by guided along step by step. He can work his way through. He reads the prior arts as a whole and allows himself to be taught by what is contained therein. He is neither picking out the "teaching towards passages" like the challenger, nor is he seeking out the "teaching away passages" like the defender. In this case he is a person familiar with or engaged in PEG chemistry. He knew that it was a time of intense activity in this field of chemistry. The person defending the patent will undoubtedly inform the Court that there was nothing in the prior art to encourage the person skilled in the art to work toward the invention. KSR says "The question is not whether the combination was obvious to the patentee but whether the combination was obvious to the person skilled in the art. Under the correct analysis, any need or problem known in the field of endeavour at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed." And one of the easy ways by which "a patent's subject matter can be proved obvious is by noting that there was an obvious solution encompassed by the patent's claims." KSR also says that if pursuit of known options within the technical grasp of the person skilled art leads to the anticipated success "it is likely the product not of innovation but of ordinary skill and common sense".

Identifying PSITA in this case

33. The relevant field of invention here is chemical engineering, more specifically polymer technology used predominantly in the petroleum industry to transport or store gasoline or any volatile hydrocarbon. The claimed invention, in this case, is a pipe made of a polyamide composition with high barrier properties as regards gases and liquids such as gasoline. While the appellant identifies the PSITA as a person qualified in chemistry, the Patent Office identifies the person as a "polymer technologist". From the nature of the claimed invention, it is clear that one of the primary ingredients is polyamide, which is a polymer chain linked together by amide groups. The other critical ingredient, novolac, is also a polymer. Polymers are macromolecules consisting of more than one monomer. While polymers may be naturally occurring or synthetic, here, we are concerned with synthetic polymers. Polymer technology has use cases in multiple industries, such as textiles, automobiles, petroleum and the like. In the claimed invention, polymer technology is used to make articles to store or transport

liquids such as gasoline. Therefore, the person skilled in the art should be a person with knowledge of not only polymers but the properties of gasoline and similar liquids and gases. Keeping in mind all of the above, I am inclined to conclude that the person skilled in the art is a chemical engineer with understanding of polymers. Whether the claimed invention would be obvious to such person is examined next after a brief interlude to consider what is meant by obvious.

34. There is nothing complicated about the word “obvious”, which is defined in standard dictionaries as easy to see, recognise or understand; easily discovered, seen, or understood; or easy to see or notice. Simplicity notwithstanding, most approaches to obviousness analysis flow from this word. Hence, an approach such as obvious to try. Thus, the question that looms large is, without the benefit of hindsight, would the person skilled in the art easily notice the links and weave together the prior art to arrive at the claimed invention.

Mosaicing/combining prior art

35. The undisputed position is that prior art D5, which was described by the respondent as the closest prior art, was prior to and, therefore, could not have referred to D6. Although D6 is subsequent to D5, D6 does not refer expressly to D5. Such express reference or cross reference is, however, unnecessary and it is sufficient if there is teaching, suggestion or motivation (the TSM test) in the prior art. In the context of a patent claim relating to a machine for making utensils, in *Bishwanath Prasad Radhey Shyam v. Hindustan Metal Industries, MANU/SC/0255/ 1978,* the Supreme Court held that a mere workshop improvement does not satisfy the test of inventiveness. While rejecting a formalistic conception of the TSM test, in *KSR International Co. v. Teleflex Inc. et al, 550 US 398 (2007),* the US Supreme Court held that "under the correct analysis, any need or problem known in the field and addressed by the patent can provide a reason for combining the elements in the manner claimed."

36. In *Biomoneta Research*, the Delhi High Court dealt with the combination versus juxtaposition or aggregation principle laid down by the EPO. The relevant paragraphs are extracted below:

64. *There can be no doubt that some of the features in D1, D2 and D3 are present in the subject invention, but is there something more? Can this patent be described as a lucky accident and can it be claimed that the subject patent application lacks even the scintilla of invention?*

65. *In the opinion of this Court, the subject invention is not a mere addition to a well-known combination, but it has some new features and is an improvement in the method which has brought in greater efficiency. In such inventions, the EPO guideline which deal with combination vs. juxtaposition or aggregation would be relevant, the said principle as laid down by the EPO is set out below:*

"9.5 Combination vs. juxtaposition or aggregation

The invention claimed must normally be considered as a whole. When a claim consists of a 'combination of features', it is not correct to argue that the separate features of the combination taken by themselves are known or obvious and that 'therefore' the whole subject-matter claimed is obvious. However, where the claim is merely an 'aggregation or juxtaposition of features' and not a true combination, it is enough to show that the individual features are obvious to prove that the aggregation of features does not involve an inventive step. A set of technical features is regarded as a combination of features if the functional interaction between the features achieves a combined technical effect which is different from, e.g. greater than, the sum of the technical effects of the individual features. In other words, the interactions of the individual features must produce a synergistic effect. If no such synergistic effect exists, there is no more than a mere aggregation of features…"

37. In *Dystar Textilfarben,* the Court observed that it will not read into a reference a teaching away from a process where no such language exists and cited *Ruiz v. A.B.Chance Co.,* 234 F.3d 654 (Fed. Cir. 2000), in this regard. The suggested motivation to combine is extracted below:

> *"1) in the prior art references themselves;*
>
> *2) in the knowledge of those of ordinary skill in the art that certain references, or disclosures in those references, are of special interest or importance in the field; or*
>
> *3) from the nature of the problem to be solved, leading inventors to look to references relating to possible solutions to that problem."*

The above principles should be borne in mind while deciding whether the person skilled in the art would combine the prior art.

Whether prior arts D5 and D6 are analogous

38. Though the Controller had identified prior art documents D1 and D2 at the FER stage and further identified D4 to D6 in the hearing notice, only prior arts D5 and D6 were relied on in the impugned order. Therefore, these two prior arts warrant close scrutiny. Prior art D5 is identified as an invention titled "Fuel tank having a multilayer structure" with US Patent

Application Publication No. US2002/0051856 A1 dated May 2, 2002. The fuel tank structure successively comprises a first layer of HDPE, a layer of binder, a second layer of EVOH, and optionally a third layer of polyamide or a mixture of polyamide and polyolefin. Similarly, prior art D6 is identified as an invention titled "Articles made from polyamide resin compositions and having improved fluid permeation barrier properties" having US Patent Application Publication No. US2005/0069662 A1 dated March 31, 2005. This invention concerns moulded articles suitable for the transport or storage of fuels used in internal combustion engines and having improved fluid permeation barrier properties, made from polyamide resin compositions comprising: 100 weight parts of a polyamide; 5 to 50 weight parts of a phenolic novolac resin; and optionally contain up to 40 weight percent of an ethylene-alpha-olefin copolymer impact modifier.

39. Paragraph [0020] of the complete specification of D5 discloses that the invention therein is "*useful for a fluid such as motor vehicle petrol or volatile hydrocarbon fuels such as gasoline, by avoiding losses through the structure so as not to pollute the environment*." Similarly, paragraph

[0012] of the complete specification of D6 discloses the preferred applications of the invention therein for the "*transport and storage of hydrocarbon-based fuels for use in internal combustion engines such as those found in automobiles, trucks, recreational vehicles, farm equipment, lawn maintenance equipment, and heavy machinery*." Since the two prior arts disclose articles or compositions that augment impermeability in relation to fluids, especially hydrocarbon-based fluids, they are in the same field as the claimed invention. Considering the fact that the publication dates of prior arts D5 and D6 are prior to the priority date of the claimed invention (i.e. 27.04.2007), these qualify as analogous prior art documents.

Differences between the prior arts and the claimed invention

40. Learned counsel for the appellant pointed out differences between the claimed invention and prior art documents, D5 and D6. With reference to D5, it was argued that there was no reason for the person skilled in the art to refer to D5, as the invention disclosed therein is a multi-layered fuel tank as against a single layered pipe in the claimed invention. Secondly, she pointed out that EVOH is the lead ingredient of the barrier layer therein,

whereas polyamide, which is the lead ingredient in the claimed invention, is only optional therein.

41. The contention that D5 recites a multi-layered article was refuted by the Controller by drawing my attention to internal pages 4 and 12 of the complete specification of the claimed invention. The relevant parts thereof are extracted below:

> ***Page 4***
>
> *"The compositions of the invention additionally make it possible to manufacture, in combination with polyolefin materials, multilayer structures such as, for example, extruded pipes, articles produced by the extrusion-blow molding process, injection-molded and welded articles, having an excellant adhesive strength with the polyolefin materials, and to avoid any delamination problems."*
>
> ***Page 12***
>
> *"The composition or material according to the present invention may be deposited or combined with another substrate, such as plastic materials for the manufacture of composite, in particular multilayer, articles....*
>
> *Multilayer articles are especially preferred that comprise at least one layer obtained from a polyamide composition according to the invention comprising at least novolac resin, and at least one layer obtained from a composition comprising a polyolefin. Preferably, the polyolefin is of the same nature in both layers. More preferably still, the polyolefin is a polyethylene."*

It is discernible from the two extracts above that the complete specification of the claimed invention also envisages a multi-layered article. Moreover, it becomes evident from claims 5 & 6 (set out in paragraph 3 above) that the appellant also seeks patent protection for multi-layered articles in which at least one layer is composed of the composition claimed in claim 1. In view of the above, it cannot be concluded that the multi-layered article disclosed in D5 *per se* teaches away from the claimed invention.

42. In response to the contention of the appellant that there was no reason for the person skilled in the art to refer to D5 because it deals with a barrier layer of EVOH, the respondent pointed to paragraphs [0018] and [0019] of D5, which teach a third layer (barrier layer) comprising polyamide or a mixture of polyamide and a polyolefin. The said paragraphs are extracted below:

> *[0018] optionally a third layer of polyamide (A) or a mixture of polyamide (A) and polyolefin (B).*
>
> *[0019] In the text hereinbelow, the second layer or the combination of the second and the third layer is referred to as the "barrier layer" and forms an exterior face of the wall structure.*

From the above paragraphs, it is clear that D5 teaches an optional barrier layer, i.e. a 3rd layer comprising polyamide or a mixture of polyamide and polyolefin, which comes in contact with the fluid. As regards the polyamide, paragraph [0055] suggests that the polyamide may be advantageously made of co-polyamides and paragraph [0060] provides a choice between PA 6/12 and PA 6/6-6 as their melting point is less than that of PA6. As regards the polyolefin, as per paragraph [0078], it can be functionalized or non-functionalized or can be a mixture of at least one functionalized and/or of at least one non-functionalized. In specific examples cited at paragraph [0217], the non-functionalized polyolefin is selected as HDPE with a density of 0.952 kg/1, whereas, in paragraph [0219], the functionalized polyolefin is selected from a carrier polyethylene modified with maleic anhydride. In effect, there is no teaching away from the use of polyamide in D5 and, although described as an optional layer, the complete specification of D5 contains sufficient disclosure if the optional layer is opted for based on the teachings therein.

43. The polyamide in the claimed invention, as per one preferred

embodiment, is described at internal page 5 of the complete specification as follows:

> *"According to one preferential embodiment of the invention, the thermoplastic matrix is a polyamide chosen from the group comprising polyamide PA-6, polyamide PA-6,6, polyamide PA-11, polyamide PA-12 polymeta-xylylenediamine (MXD6), and the blends and copolymers based on of these polyamides."*

As regards polyolefins, the following passages at internal pages 8 and 9 of the complete specification are relevant and extracted, in relevant parts, below:

> *"These polyolefins preferably have a density between 0.910 and 0.97 g/cm³.*
>
> *As preferred polyolefins of the present invention, mention may especially be made of polyethylene, polypropylene, polyisobutylene, polymethylpentene, polyisoprenes and blends and/or copolymers thereof.*
>
> *A high-density polyethylene is especially preferred, in particular having the following characteristics:*
>
> *- density between 0.94 and 0.97 g/cm³:*
>
> *- molecular weight between 450 000 and 4 000 000 g/mol;*
>
> *- melt flow index (MFI) measured according to the ISO 1133 standard (190° C., 2.16 kg) between 0.1 and 25 g/10 mm; and*

- degree of crystallization between 60 and 80%.

....

As the agent d) for compatibilization between the polyolefin and the polyamide, mention may be made of compounds comprising in particular polyolefin chains and functional groups intended to improve compatibility with the polyamide, such as, for example, maleic anhydride, salified or unsalified carboxylic acids, ester, acrylic, methacrylic, or epoxy groups. Grafted copolyolefins carrying such groups are preferred."

44. Claim 1, as per the auxiliary request claims, set out *supra* at paragraph 9, envisages a pipe comprising a mixture of a polyamide matrix present in an amount from 60% to 80% by weight, a novolac resin in an amount 5 to 20% by weight, a non-functionalized polyolefin being polyethylene having density ranging from 0.94 to 0.97 g/cm^3, and a compatibilization agent consisting of functionalized polyolefin selected from the group consisting of maleic anhydride, carboxylic acid, ester and the like.

45. From the above narration, it follows that many features of the claimed invention are found in D5, but the conspicuous absentee is novolac resin. Novolac resin finds place in D6. Therefore, the question that arises is

whether a person skilled in the art would be motivated to pick out the optional barrier layer in D5 and combine the same with the novolac resin as per the teachings of D6.

46. Paragraphs [0018] to [0020] of the complete specification of D6 disclose the use of polyamides 66, 11, 12, 6/10, 6/12, and 10/10 in moulding articles for uses in applications that require good barrier properties to the permeation of fluid fuels. Further, the amount of phenolic novolac resin used in the invention therein is 5 to 50 weight parts, or

preferably 10 to 30 weight parts, based on 100 weight parts of the aforesaid polyamide. The relevant paragraphs from prior art D6 are extracted below:

> ***"[0018]*** *Polyamides 66, 11, 12, 6/10, 6/12, and 10/10 are especially advantageous for use in molding articles for uses in applications that require good barrier properties to the permeation of fluid (both liquid and gaseous) fuel materials as well as good mechanical properties, moldability, and chemical resistance properties. It is preferred that the fuel materials be hydrocarbons or hydrocarbons containing other fuels Such as alcohols. The polyamides listed above can be used alone or in combination with one or more other polyamides. A preferred polyamide used in the present invention is a mixture of polyamide 66 with at least one other*

polyamide homopolymer, polyamide copolymer, or polyamide terpolymer.

[0019] *Phenolic Novolac Resin*

[0020] *The phenolic novolac resin used in the present invention is not restricted in so far as it can be used in a resin for conventional plastic moldings. The amount of phenolic novolac resin used in the present invention is 5 to 50 weight parts, or preferably 10 to 30 weight parts, based on 100 weight parts of the aforementioned polyamide. If less than 5 weight parts are present, a composition having high flowability in the molten state, and improved fluid perme ation barrier properties cannot be obtained. If more than 50 weight parts are present, the physical properties will be markedly decreased."*

47. As pointed out by the respondent, Table 1 in paragraph [0032] of the complete specification of D6 is significant as it evinces the effectiveness of the addition of novolac to polyamide on fluid permeation barrier properties. Example 1 thereof discloses that a combination of 68% in weight parts of nylon 66, 10% in weight parts of novolac and 22% in weight parts of a modified-EPDM when tested for fluid permeation barrier properties in respect of 10% ethanol in gasoline exhibited fluid permeation rate of 0.02 g/m^2 per day. Whereas the comparative example 1 thereof which contained 81% in weight parts of nylon 0% in weight parts of novolac and

10% in weight parts of the modified-EPDM was found to exhibit the fluid permeation rate of 0.63 g/m^2 per day. The inference that may be drawn from the table is that the comparative example without novolac resin exhibits 31.5 times greater fluid permeation rate than the example with novolac resin. This undoubtedly underscores the benefits of combining nylon 66, which is a polyamide, and novolac resin. A similar conclusion is drawn in the Experimental Section, Example 2, Table 1 of the complete specification of the claimed invention.

Is the technical advance of the claimed invention obvious to the person skilled in the art?

48. In the facts and circumstances of this case, the appellant contended that there is no motivation for the person skilled in the art to combine the teachings of D5 and D6. The reasoning of the Controller at internal page 9 of the impugned order to justify the conclusion that a person skilled in the art and having knowledge of D5 would look at D6 to improve the fluid impermeability properties is extracted below:

> *"Applicant argues that the barrier layer of D5 is made of an EVOH layer. Contrary to applicant's argument, D5 actually teaches a third layer comprising polyamide and polyolefin acts as a barrier layer [para 0018-0021]. Applicant argues that the HDPE layer of D5 does not*

form the barrier layer. The inventive step analysis does not rely on the HDPE first layer of the multilayer structure, rather on the HDPE comprised in the polyamide barrier layer (Third layer). Applicant argues that paragraph 0031-0033 of D6 teaches that polyamide + novolac composition do not show barrier properties. Quite contrary to applicant's assertion, the said paragraphs, including the results mentioned therein, indicates very good improvement in barrier properties exhibited by the combination of polyamide and novolac.

The composition of third layer of D5 comprising polyamide and polyolefin is taught to have good barrier properties, suitable for use a layer coming in contact with fluids-especially motor vehicle petrol or volatile hydrocarbons. D6 relates to a molded article suitable for the transport or storage of fuels used in internal combustion engines and having improved fluid permeation barrier properties, made from a polyamide resin composition comprising :(a) 100 weight parts of a polyamide, and (b) 5 to 50 weight parts of a phenolic novolac resin (Claim 1). D6 further teaches that the fluid barrier properties of polyamide can be improved by adding novolac. Evidently, in view of these teachings a PSIA would indeed have more than reasonable expectation that the combination of D5 and D6 would result in a composition exhibiting good fluid barrier property."

49. As concluded earlier, while D5 recites the use of polyamide or a mixture of polyamide and polyolefin as an optional barrier layer, there is no teaching away from the use of polyamide or a combination of polyamide and polyolefin as a barrier layer. From the teachings of only D5, a person

skilled in the art would look at using HDPE and a barrier layer of only EVOH or a barrier layer that combines EVOH and polyamide/mixture of polyamide and polyolefin. D6, however, not only teaches the use of novolac resin, but demonstrates the benefit of combining a polyamide, such as nylon 66, with a novolac resin. This tilts the balance. Indeed, even the ethylene-propylene-diene impact modifier (EPDM) disclosed in D6 is referred to at internal page 10 of the complete specification of the claimed invention. Therefore, in my view, when armed with the knowledge of both D5 and D6, while looking for a solution to the problem of permeability of fluids, it would be obvious to a non-inventive person skilled in the art and starting from D5 to combine the elements therein, particularly polyamide and polyolefin, with novolac resin to achieve higher impermeability, especially in respect of gasoline, and it would be a matter of routine experimentation to arrive at the claimed invention. I am bolstered in this conclusion by the fact that there are not many options in the realm of engineering plastics and the problem to be solved does not call for more expensive options such as the use of high performance polymers. Therefore, I am inclined to conclude that the claimed invention would be obvious to a

person skilled in the art on the basis of D5 viewed in the context of D6.

50. For reasons set out above, I affirm the order of the respondent. Consequently, (T) CMA (PT) No.88 of 2023 is dismissed without any order as to costs.

31.01.2024

Index : Yes/No
Internet : Yes/No
Neutral Citation : Yes/No
kal

To

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SENTHILKUMAR RAMAMOORTHY J.

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