Citation: Titan Wood Limited (Re), 2025 CACP 3
Commissioner's Decision #1684
Décision du commissaire nº 1684
Date: 2025-03-11

TOPIC: O00 Obviousness

SUJET: O00 Évidence

Application No. 2849809
Demande nº 2 849 809

IN THE CANADIAN PATENT OFFICE

DECISION OF THE COMMISSIONER OF PATENTS

Patent application number 2849809, having been rejected under subsection 199(1) of the *Patent Rules* (SOR/2019-251) ("*Patent Rules*"), has consequently been reviewed in accordance with paragraph 86(7)(c) of the *Patent Rules*. The recommendation of the Patent Appeal Board and the decision of the Commissioner are to refuse the application.

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INTRODUCTION

[1] This recommendation concerns the review of rejected Canadian patent application number 2,849,809, which is entitled “PANELS OF MEDIUM DENSITY FIBREBOARD” and is owned by TITAN WOOD LIMITED. A review of the rejected application has been conducted by the Patent Appeal Board (“the Board”) pursuant to paragraph 86(7)(c) of the *Patent Rules*. As explained below, the Board’s recommendation is that the Commissioner of Patents refuse the application on the basis that the claimed subject-matter would have been obvious to the person skilled in the art.

BACKGROUND

The application

[2] The application was filed under the provisions of the Patent Cooperation Treaty and has an effective filing date in Canada of September 27, 2012. It was laid open to public inspection on April 4, 2013.

[3] The instant application relates to medium density fibreboard (“MDF”) panels and processes for forming them, in particular the use of acetylated wood fibres in forming such panels, making them more resistant to the influence of changing moisture content.

Prosecution history

[4] On November 24, 2021 a Final Action (“FA”), written pursuant to subsection 86(5) of the *Patent Rules*, stated that the application is defective on the ground that the claims on file at the time of the FA (“claims on file”, dated April 21, 2020) would have been obvious at the claim date to the skilled person in the art.

[5] In a March 17, 2022 response to the FA (“R-FA”), the Applicant provided arguments in favor of the non-obviousness of the claims on file. No amendments were proposed.

[6] As the Examiner considered the application not to comply with the *Patent Act*, RSC 1985, c P-4 [*Patent Act*] and *Patent Rules*, pursuant to subsection 86(7)(c) of the *Patent Rules*, the application was forwarded to the Board for review on May 2, 2023 along with an explanation outlined in a Summary of Reasons (“SOR”). The SOR indicated that the obviousness defect had not been overcome by the arguments presented in the R-FA.

[7] In a letter dated May 4, 2022, the Board forwarded to the Applicant a copy of the SOR and requested that the Applicant confirm their continued interest in having the application reviewed.

[8] In a response to the SOR dated August 1, 2023 ("R-SOR”), the Applicant confirmed continued interest in having the application reviewed.

[9] The undersigned Panel was assigned to review the instant application and to make a recommendation to the Commissioner of Patents as to its disposition.

[10] In a Preliminary Review letter (“PR letter”) sent November 8, 2024, the Panel was of the preliminary view that the application was defective because:

- the claims on file would have been obvious to the person skilled in the art at the relevant date.

[11] The PR letter provided the Applicant with an opportunity to make both written and oral submissions.

[12] On December 23, 2024, in a response to the PR letter (“R-PR”), the Applicant provided a proposed amended set of claims 1-16, with amendments proposed to

claims 14 and 15. Arguments in favor of the non-obviousness of the claims were also provided.

[13] A hearing was held via videoconference on January 10, 2025. The Applicant was represented by their Canadian patent agent, their European patent attorney and their internal IP manager.

[14] At the hearing, it became apparent that while no amendments were proposed in the R-PR to claim 16, it was the Applicant's intention to propose amendments to claim 16 in line with those proposed for claims 14 and 15. It was agreed at the hearing that such proposed amendments would be submitted within one week. On January 13, 2025, the Applicant submitted a further proposed amended set of claims 1-16 ("proposed claims"), which included the proposed amendments to claim 16, as well as those previously submitted with the R-PR.

[15] The Panel's final analysis of the outstanding obviousness issue is provided below.

ISSUES

[16] The issue to be addressed in this final review is whether claims 1-16 on file would have been obvious.

[17] After considering the application as it was at the time of the FA, we review the proposed claims to determine if they would be considered a necessary amendment under subsection 86(11) of the *Patent Rules*.

CLAIM CONSTRUCTION

Legal Principles and Office Practice

[18] Purposive Construction is antecedent to any consideration of validity (*Free World Trust v Électro Santé Inc*, 2000 SCC 66 [*Free World Trust*] at para 19).

[19] In accordance with *Free World Trust* and *Whirlpool Corp v Camco Inc*, 2000 SCC 67, purposive construction is performed from the point of view of the person skilled in the art in light of the relevant common general knowledge ("CGK"), considering the whole of the disclosure including the specification and drawings. In addition to interpreting the meaning of the terms of a claim, purposive construction distinguishes the essential elements of the claim from the non-essential elements. Whether an element is essential depends on the intent expressed in or inferred from the claim, and on whether it would have been obvious to the skilled person that a variant has a material effect upon the way the invention works.

[20] "Patentable Subject-Matter under the *Patent Act*" (CIPO, November 2020) [*PN2020–04*] notes that all elements in a claim are presumed essential unless such presumption is contrary to the claim language, or it is established otherwise (see also *Free World Trust* at para 57, *Distrimedic Inc v Dispill Inc*, 2013 FC 1043 at para 201).

Analysis

The person skilled in the art

[21] In the PR letter at pages 3-4, we set out our preliminary view of the person skilled in the art, supplementing that taken from the FA (which the Applicant did not dispute in the R-FA):

> In the FA at page 2, the person skilled in the art was described as:
>
> > [t]he person skilled in the art is a team comprising mechanical, manufacturing and chemical engineers and chemists.
>
> The Applicant did not dispute the above description. Given the field to which the invention relates, as discussed on page 1 of the instant application, in our preliminary view, the above identified team must be skilled in the manufacture and

> properties of engineered wood products, in particular with respect to medium density fiberboard (“MDF”). We proceed on this basis.

[22] At the hearing and in the R-PR at pages 3-4, the Applicant contended that the person skilled in the art is limited to MDF manufacturers and would not include chemical engineers or chemists. The Applicant also contended that the person skilled in the art would not be interested in panels produced at small-scale and/or in a laboratory setting, presumably a reference to prior art document D2 (WO2010/023253 A1) discussed in the PR letter and below in relation to the relevant CGK. In the Applicant’s view, the person skilled in the art would only be interested in panels produced at large or commercial scale facilities and typically using continuous processes, such criteria limiting the scope of the skilled person to manufacturers of MDF having a Machine Direction (see page 4 of the R-PR and page 4, lines 3-20 of the instant application discussing how a Machine Direction is created in MDF panels).

[23] In support of the Applicant’s identification of the person skilled in the art, reference was made in the R-PR to *Tetra Tech EBA Inc v Georgetown Rail Equipment Company*, 2019 FCA 203 at para 26 [*Tetra Tech*], which indicated that:

> the identification of the ordinary person skilled in the art should be consistent with the specification of the patent.

[24] As conveyed to the Applicant at the hearing, claims 14-16 on file are not limited to the manufacture of an MDF panel having a Machine Direction, a limitation which is present in claim 1. As such, claims 14-16 are not limited to the production of panels produced at large or commercial scale facilities and typically using continuous processes, the steps that lead to panels possessing a Machine Direction. Consequently, the characterization of the skilled person for such embodiments should not be as limited as the Applicant suggests.

[25] To use the principle set out in *Tetra Tech*, *supra*, the specification is not limited to MDF panels possessing a Machine Direction.

[26] For example, page 3, lines 13-30 discuss one problem that is to be addressed by the invention set out in the specification, namely linear swelling that occurs in large and thin panels (large and thin being characterized by panels having a length and width of at least 1 m and an aspect ratio of at least 100, the aspect ratio referring to the ratio between the length (L), and the thickness (D) of the panel, i.e. L/D, discussed later within claim construction). There is no limitation that such panels also possess a Machine Direction, a characteristic resulting from continuous processing in a large or commercial scale facility, as discussed above.

[27] Page 12, line 28 to page 13, line 6 also indicates that the invention pertains to an MDF panel formed of acetylated solid wood, later broken down to the required fiber size, the panel being large and thin, but not limited to those having a Machine Direction. Page 13, lines 7-9 points to several prior patent documents describing acetylation processes that may be referenced in order to practice the invention.

[28] We also note that in Example 2, disclosed in the instant application at pages 16-17, sample panel sizes that could not be described as large and thin (per the dimensions set out in the claims and the characterization set out at page 3, lines 4-10 of the instant application) were tested for dimensional stability in general. No discussion of warping is presented, even though these smaller panels were produced from acetylating large thin panels in a continuous manufacturing process. Clearly, there are broader concerns in the instant application rather than large thin MDF panels having a Machine Direction.

[29] At page 4 of the R-PR, the Applicant pointed to the “Field of the Invention” section of the instant application at page 1, lines 3-7 for support that the invention is limited to large, thin MDF panels having a Machine Direction. We note however

that the Field of the Invention discussion introduces the invention as being in the field of large, thin MDF panels more broadly (per the dimensions set out that are consistent with those of the claims). It is then specified that it is particularly concerned with those panels possessing a Machine Direction. Given the content of the rest of the specification as discussed above, and the lack of the Machine Direction limitation in claims 14-16 on file, we cannot interpret such passages as limiting the scope of the specification to large, thin MDF panels having a Machine Direction.

[30] Although we had previously presented the person skilled in the art in the PR letter as it was set out in the FA, since the Applicant had not objected to such a characterization, we cannot say, based on the record, whether chemists or chemical engineers would *per se* form part of a team comprising the person skilled in the art. However, the specification is directed to the production of acetylated MDF panels and refers to prior art documents for practising the acetylation process. In our view, regardless of whether chemists or chemical engineers were part of a team forming the person skilled in the art, the person skilled in the art would need to have basic knowledge of acetylation processes and how they affect the properties of the material to which they are applied.

[31] We also cannot, based on the review of the specification set out above, agree that the person skilled in the art is limited to MDF manufacturers who are solely concerned with large, thin MDF panels having a Machine Direction.

[32] Having considered all of the above, it is our view that the skilled person should be characterized as a person skilled in the art of fibreboard panel manufacturing (including manufacturing of MDF), as well as acetylation, acetylation processes and their effects on the wood products to which they are applied. This is consistent with the content of the background knowledge set out at pages 1-5 of the instant application, as well as the knowledge of acetylation that would be needed in order to practise the invention.

The relevant common general knowledge

[33] We set out at pages 4-8 of the PR letter our preliminary view as to the relevant points of CGK, which included that taken from the FA, information taken from the "Background of the invention" section of the application, information taken from documentation identified by the Board, as well as points taken from prior art document D2 (WO 2011/095824) identified as forming part of the background knowledge in the instant application at page 2:

> In the FA at page 2, the relevant CGK was described as including:
>
> > …processes for forming wood composite material, and additives that can be used for altering properties of the composite material.
>
> To the above we would add the following points taken from the Background of the invention section and considered to have been part of the skilled person's CGK:
>
> - knowledge of conventional MDF (medium density fibreboard), which refers to a composite product comprising wood fibres pressed and glued together with an adhesive, typically a phenol-formaldehyde or urea-formaldehyde resin, or a polymeric di-phenylmethane diisocyanate adhesive, which also frequently comprises a wax;
> - MDF is commonly manufactured as flat sheets or boards of various thicknesses (typically from 3 mm to 25 mm) and densities, and may be supplied with a visually attractive paper or wood veneer or plastics surface finish or surface coating;
> - MDF is a stiff, very rigid, practically inflexible material, which makes it highly suitable for use in applications where rigidity is desired, such as furniture, decorative interior wall lining, doors, separation walls, and many other typically indoor applications where it is desired to employ panels of good rigidity;
> - wood fibreboards generally are provided in thicknesses ranging from 2 mm to 60 mm;

- MDF is generally characterized as having a density in the range of from 650 kg/m^3 to 800 kg/m^3;
- wood fibreboard generally comprises wood fibres smaller than wood particle board, with MDF wood fibres typically having a length of 7 mm or below, preferably of from 1 mm to 5 mm, a width of 0.05 mm to 0.1 mm, and a thickness also of 0.05 mm to 0.1 mm;
- just as with other engineered wood products, such as particle board or oriented strand board, fibreboard (such as MDF) can also be made of modified wood (e.g. steam-treated wood or acetylated wood);
- in contrast with regular MDF or regular particle board, boards made of acetylated wood are capable of sustaining submersion in water, shown with reference to thickness swelling behaviour in WO2011/095824 (described in the instant application as providing background information on particle board, oriented strand board and fibreboard made on the basis of acetylated wood);
- conventional MDF panels are relatively thin and due to their high aspect ratio (ratio of length/thickness) of above 100, have technical problems such as linear swelling, which refers to dimensional changes in the length and width directions of the panels, as a result of temperature and relative humidity fluctuations;
- in large panels, the linear swelling is more significant and can require relatively large seams left between installed panels to accommodate the linear swelling that can occur as a result of varying degrees of humidity and temperature;
- typical large and thin fibreboard panels have a Machine Direction, where the fibrous material that makes up the fibreboard has a degree of orientation in the direction of its production as a result of continuous, commercial scale manufacture in a certain direction, which leads to differing effects of expansion and contraction due to linear swelling between the Machine Direction and cross direction;
- large, thin fibreboard panels frequently need to acclimatise at a construction location before installation due to the linear swelling issues;
- the effects of linear swelling are generally not present in small, relatively think panels, especially when their production does not lead to a Machine Direction being present;

- as a result of non-uniformity in linear dimensional change of a thin panel (including due to Machine Direction effects), panels are prone to movements out of plane, known as “warping”;
- warping can be avoided by using smaller size, thick panels (Aspect ratio 50 or lower, surface area of 0.25 m^2 or lower), but this is not suitable for all uses; and
- large MDF panels generally require that fixing means such as screws or nails be placed well away from panel edges.

The following points are also characterized within the instant application as conventional and we therefore take them to have been part of the relevant CGK of the skilled person:

- the types of wood generally known as possible starting materials for conventional MDF such as trees in the genera of pinus, picea, or eucalyptus, aspen, poplar, beech, Japanese sugi (cedar), hemlock, spruce, or radiata pine (instant application at page 10);
- the conventional adhesives used in making conventional MDF, such as phenol-formaldehyde resin, melamine urea-formaldehyde resin, or isocyanate based adhesives among which methylene diphenyl diisocyanate (MDI) and polymeric methylene diphenyl diisocyanate (PMDI) (instant application at page 10);
- the conventional additives in forming MDF panels, wherein the most widely used additive is wax, preferably paraffin, which is added either as a wax melt or in the form of an aqueous emulsion; paraffin or other waxes are mainly added to improve the swelling properties of the MDF; other additives include colorants, fungicides or insecticides (instant application at pages 10-11); and
- conventional commercial processes for producing MDF panels, such as that discussed at page 11 of the instant application at lines 22-28 and page 15 at lines 18-27.

We also note that in the FA at page 3, it was contended that MDF panels of various sizes and aspect ratios were known at the relevant date, the FA pointing to the following publication as evidence of this point:

"Standard MDF", Gunnersen, https://web.archive.org/web/20110221040541/http://www.gunnersens.com.au/products/building-products/mdf/standard.html?print_friendly=true, February 21, 2011 (February 21, 2011; date of capture)

We accept for this preliminary review that such sizes and aspect ratios were part of the skilled person's CGK.

We also bring to the Applicant's attention the following document setting out some well-known dimensions of panel and lap wood siding, which we take as having been part of the relevant CGK of the skilled person:

"Product Guide: Performance Rated Siding", APA – The Engineered Wood Association, available at https://www.apawood.org/, 2009

We also note that prior art document D2 (identified below), applied in the Final Action as part of the obviousness assessment was characterized as part of the background art associated with the invention at page 2 of the instant application. We therefore also take the information disclosed therein relating to particle boards, oriented strand board, and fibreboard made on the basis of acetylated wood to have been well-known to the person skilled in the art, forming part of the relevant CGK:

D2: WO 2011/095824 Maes et al. August 11, 2011

We further bring to the Applicant's attention two prior art documents that illustrate the relevant CGK surrounding acetylation of wood products, identified below:

D3: Rowell, "Acetylation of Wood: Journey from Analytical Technique to Commercial Reality", Forest Products Journal, Vol. 56, No. 9, available at https://www.accoya.com/app/uploads/2020/04/Wood-Acetylation-Roger-Rowell.pdf, September 2006

D4: Esler, “Treating Wood with Acetylation Process”, Woodworking Network, available at https://www.woodworkingnetwork.com/magazine/treating-wood-acetylation-process, August 15, 2011

D3 discusses the general history of the chemical modification of wood, with a particular focus on acetylation. D3 discusses the use of acetic anhydride as well as acetic acid in the acetylation process. D3 explains that the replacement of hydroxyl groups on the cell wall polymers with bonded acetyl groups reduces the hygroscopicity of the wood (D3 at page 6).

Table 3 of D3 shows the variation in Equilibrium Moisture Content with increasing levels of acetylation and increasing levels of relative humidity. The variation indicates that with increasing levels of acetylation (the weight gain parameter WPG), the Equilibrium Moisture Content decreases, reducing the influence of changing levels of relative humidity.

As D3 explains at 6-7, with acetylation, there are fewer sites in the wood to which water will bind, the fiber being more hydrophobic:

> Moisture is presumed to be sorbed either as primary or secondary water. Primary water is water sorbed to primary sites with high binding energy, such as the hydroxyl groups. Secondary water is water sorbed to sites with less binding energy; water molecules are sorbed on top of the primary layer. Since some hydroxyl sites are esterified with acetyl groups, there are fewer primary sites to which water sorbs. And since the fiber is more hydrophobic as a result of acetylation, there may also be fewer secondary binding sites.

D3 also discloses at page 7 that dimensional changes are a great problem in wood composites as compared to solid wood and how acetylation provides dimensional stability:

> Changes in dimensions are a great problem in wood composites as compared to solid wood. Composites undergo not only normal bulk

> wood swelling (reversible swelling) [b]ut also swelling caused by the release of residual compressive stresses imparted to the board during the composite pressing process (irreversible swelling). Water sorption causes both reversible and irreversible swelling; some reversible shrinkage occurs when the board dries.
> …
> The mechanism of dimensional stability resulting from acetylation is a result of bulking of the bonded acetyl groups in the cell wall polymer hydroxyl groups. Because the volume of the cell wall is swollen to near the original green volume, little swelling can occur when water enters the wood. Acetylated wood can sorb water through capillary action and, to some extent, in the cell wall. Since the water molecule is smaller than the acetyl group, some swelling can occur in "completely acetylated wood," but swelling does not exceed the elastic limit of the cell wall.

D4 discusses Accsys Technologies' Accoya Wood. As part of this discussion, the article discusses the general science behind acetylation and how it reduces the wood's ability to absorb moisture, make the wood more dimensionally stable:

> Wood contains an abundance of chemical groups called "free hydroxyls," groups that adsorb and release water according to changes in the climatic conditions to which the wood is exposed — the main reason why wood swells and shrinks. Scientists believe that the digestion of wood by enzymes initiates at the free hydroxyl sites — which is one of the principal reasons why wood is prone to decay. Acetylation changes the free hydroxyls within the wood into acetyl groups, by "reacting" the wood with acetic anhydride, which comes from acetic acid — the main ingredient in vinegar. In layman's terms, the wood is "pickled." This reduces the wood's ability to absorb moisture, rendering the wood more dimensionally stable and, because it is no longer digestible, extremely durable.

> Although D4 was only published shortly before the claim date of the instant application (September 28, 2011), we take the general discussion of acetylation as representative of the CGK that existed at the time.

[34] In the R-PR at page 4-7, as well as during the hearing, the Applicant set out reasons why they disagreed that content from prior art document D2 should be taken to have been part of the relevant CGK.

[35] The Applicant pointed to caselaw both in the R-PR and at the hearing, which indicates that information disclosed in the prior art only becomes part of the CGK when is accepted as "a good basis for further action" and that "individual patent specifications and their contents do not normally form part of the relevant common general knowledge" (see pages 4-5 of the R-PR). We agree with these points. However, the caselaw also indicates that "it is reasonable for the Commissioner to consider general or broadly worded assertions of conventional practice to be binding as CGK" (*Corning Cable Systems LLC v Canada (Attorney General)*, 2019 FC 1065 at para 56 [*Corning*]).

[36] The Applicant contended that "it is improper for all the information disclosed in D2 relating to particle boards, oriented strand board, and fibreboard made on the basis of acetylated wood forms part of the CGK" (R-PR at page 5). The Applicant contended that while the information in D2 is described as "background" information in the instant application at page 2, background information does not equate to being part of the relevant CGK. At the hearing, the Applicant also pointed to a requirement under European Patent Office practice to discuss background documentation in a patent application and that such was not an admission that the document was part of the relevant CGK.

[37] A discussion of the background art that is relevant to understanding and examining a patent application is also a requirement under the Canadian *Patent Rules* (subsection 56(1)(c)). Nevertheless, as noted in respect of the *Corning*

case, such information may be taken to have been part of the relevant CGK, depending on how it is presented.

[38] Most of the information presented in the Background of the invention section of the instant application is set out in “general or broadly worded assertions of conventional practice” (*Corning*, *supra*) or knowledge, without any reference to a prior art document. We take such information to have been part of the relevant CGK of the person skilled in the art, as we did in the PR letter.

[39] However, we acknowledge that in the case of D2, reference is made to a specific prior art document. Without acceding to the Applicant’s position that the content of D2 should not be taken to have been part of the relevant CGK, we point out that D2 was used in the obviousness analysis in the PR letter to show the “state of the art”, rather than points of CGK being taken from it to show obviousness, as is also the case in the obviousness analysis below. Regardless of whether or not it can be qualified as CGK, the document is applicable as being part of the “state of the art” in the assessment of obviousness (*Hospira Healthcare Corporation v Kennedy Trust for Rheumatology Research*, 2020 FCA 30 at para 86 [*Hospira*]).

[40] With respect to the use of the “Standard MDF” and “Product Guide: Performance Rating Siding” documents in the PR letter, the Applicant acknowledged in the R-PR at page 7 that these documents confirm previously existing MDF panel dimensions.

[41] In the R-PR at page 7, the Applicant indicated that prior art documents D3 and D4, identified in the PR letter, do not relate to MDF panels, and either focus on solid wood products (D4) or make reference to a type of fibreboard which is not MDF (D3). Therefore they would not form a technical background to the presently claimed invention, or represent relevant CGK.

[42] As the Applicant noted at page 7 of the R-PR, D3 and D4 were cited to illustrate the relevant CGK on the acetylation of wood products in general, rather than the

acetylation of a particular types of wood products. We recognize that the documents do discuss particular type of wood products at some points, but this does not mean that the general background discussion on acetylation presented therein is not generally applicable. As noted in the PR letter and reproduced above, D3 makes particular mention of the increased dimensional stability issues with wood composites (MDF being a type of wood composite) as compared to solid wood and how acetylation can address such issues.

[43] Having considered the Applicant's contentions in the R-PR and at the hearing, it is our view that the points of relevant CGK taken from D3 and D4 and set out in the PR letter would have constituted part of the relevant CGK of the person skilled in the art.

[44] We therefore proceed on the basis of the relevant CGK set out in the PR letter, qualified by the above discussion of prior art document D2.

The claims on file

[45] The instant application contains 16 claims with claims 1 and 14-16 being independent.

[46] Claim 1 is directed to a panel of medium density fiberboard ("MDF") of specific fibre and overall dimensions (indicating that the panel is large and thin) that also has a Machine Direction (the fibres having a degree of orientation in the direction of production of the panel) and wherein the fibres are acetylated wood:

> 1. A panel of medium density fibreboard (MDF), comprising wood fibres the largest dimension of which is 7 mm or below, pressed together with an adhesive, the panel having an aspect ratio of at least 100 and a surface area of at least 1 m^2 and possessing a Machine Direction, wherein the wood fibres are made of acetylated wood.

[47] Independent claims 14-16 are directed to the use of acetylated wood fibres in making MDF panels of specific dimensions, with claim 16 additionally specifying that the panels are penetrable by fixation means close to the panel corners and edges:

> 14. The use of acetylated wood fibres in making medium density fibreboard panels, the panels having an aspect ratio of at least 100 and a surface area of at least 1 m^2.
>
> 15. The use of acetylated wood fibres in making medium density fibreboard panels, the panels having a length and width of at least 1 m, and an aspect ratio of at least 100.
>
> 16. The use of acetylated wood fibres in making medium density fibreboard panels, the panels having a length and width of at least 1 m, and an aspect ratio of at least 100, wherein a fixation means is penetrable at a distance of the panels, the distance is selected from the group consisting of less than 25 mm in both directions from a corner of the panel, less than 12 mm from an edge of the panel, and combinations thereof.

[48] Claim 10 is directed to a process for manufacturing the MDF panel of claim 1.

[49] Dependent claims 2-9 provide further refinements of the panel configuration, as well as the acetylated fibre formation and origin. Dependent claims 11-13 provide further details of the process by which the panel is formed.

Meaning of terms

[50] In the PR letter at page 9, we set out our understanding of the term “aspect ratio” used in the claims on file, in view of the meaning set out in the specification:

> With respect to “aspect ratio” as used in the claims on file, we take this to refer to the aspect ratio set out in the instant description at page 3, lines 6-8:

> …wherein the aspect ratio is the ratio between the length (L), and the thickness (D) of the panel, i.e. L/D.

[51] The above was not disputed by the Applicant in the R-PR or at the hearing. We therefore proceed on the basis of the above.

The essential elements

[52] In the PR letter at page 9, we indicated that in the absence of any language to the contrary, we consider all the elements of the claims to be essential and to be considered in the obviousness analysis:

> The FA did not set out a purposive construction of the claims on file. In accordance with *PN2020-04* and the caselaw cited therein, given that the person skilled in the art would understand that there is no use of language in any of the claims indicating that the elements in each claim are optional, alternatives or a preferred embodiment, in our preliminary view, all the elements of the claims on file are considered to be essential and are taken into account in our analysis below.

[53] The above was not disputed by the Applicant in the R-PR or at the oral hearing. We therefore proceed on the basis that all of the elements of the claims on file are essential.

OBVIOUSNESS

Legal Principles

[54] Section 28.3 of the *Patent Act* sets out the legislative requirement that claimed subject-matter not be obvious:

> The subject-matter defined by a claim in an application for a patent in Canada must be subject-matter that would not have been obvious on the claim date to a person skilled in the art or science to which it pertains, having regard to

(a) information disclosed before the one-year period immediately preceding the filing date or, if the claim date is before that period, before the claim date by the applicant, or by a person who obtained knowledge, directly or indirectly, from the applicant in such a manner that the information became available to the public in Canada or elsewhere; and

(b) information disclosed before the claim date by a person not mentioned in paragraph (a) in such a manner that the information became available to the public in Canada or elsewhere.

[55] In *Apotex Inc v Sanofi–Synthelabo Canada Inc*, 2008 SCC 61 [*Sanofi*], the Supreme Court of Canada stated that it is useful in an obviousness inquiry to follow the following four-step approach, which we use below in our analysis:

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

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

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

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

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

Analysis

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

[56] The identification of the person skilled in the art has been discussed above under Purposive Construction. We apply the same characterization here.

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

[57] The relevant CGK was also discussed in relation to Purposive Construction. The same points of CGK are applied here.

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

[58] In the PR letter at pages 10-13, we explained why it was our preliminary view that the inventive concept identified in the FA, if an inventive concept beyond the essential elements of the claims should be identified at all, was too narrow. In our preliminary view, given the context of the whole specification and assuming that an inventive concept needed to be identified, the inventive concept could not be limited to the particular advantage of reduced warping in MDF panels having a Machine Direction:

> In the FA at page 2, a common inventive concept of the claims was set out:
>
> > The inventive concept of these claims pertains to making large aspect MDF panels using acetylated wood fibres to reduce swelling induced warpage in the panel when exposed to moisture.
>
> We note that in accordance with the relevant CGK of the skilled person, conventional MDF panels have high aspect ratios that are typically above 100, the ratio set out in the claims on file, hence the characterization of the panels as “large aspect” in the above inventive concept.
>
> As stated under Purposive Construction, we have taken all the elements of the claims to be essential. The inventive concepts of the claims will at least include such elements.
>
> However, as was the case in *Sanofi*, the inventive concept of a claim may comprise more than the essential elements of the claim. In *Sanofi*, a claim to a bare chemical

formula was not sufficient to determine its inventiveness (*Sanofi* at para 77). It was not possible to fully grasp the nature of the inventive concept solely from the claim language, and the Supreme Court reviewed the rest of the specification to determine if it provides any insight or clarification into the inventive concept of the claim in issue.

The specification in that case revealed that the specific compound defined by a bare chemical formula possessed special advantages over the broader genus that encompassed it, special advantages that needed to be considered in determining whether or not the claim would have been obvious.

The purpose of the inventive concept is to help determine what, if anything, makes the claim inventive. *Sanofi* did not change the substantive law of obviousness by implication, and the term “inventive concept” is not materially different than the previously used term of “solution taught by the patent”. This is a particularly relevant consideration if recourse to the specification is required (*Apotex Inc. v. Shire LLC*, 2021 FCA 52 at para 76 citing *Bristol-Myers Squibb Canada Co. v. Teva Canada Limited*, 2017 FCA 76 at paras 65-68 and 75).

We do note that the Federal Court of Appeal in *AGI Suretrack, LLC v Farmers Edge Inc*, 2024 FC 934 at para 407 has recently questioned whether the discussion of special advantages is helpful in assessing inventiveness outside the context of selection patents (pointing to *Swist v MEG Energy Corp*, 2022 FCA 118 at paras 69-77).

In the present case, the claims on file do not mention the idea of the large aspect MDF panels using acetylated wood fibres *for the purpose of reducing swelling induced warpage when exposed to moisture*. We understand that to be one of the purposes behind the use of such fibres. However, in our preliminary view, if there is an inventive concept beyond the claim language (which we assume for the purposes of our assessment), we do not consider it to be so limited, as discussed below.

The instant application at page 5, lines 4-16 sets out one well-known problem that is to be addressed by the claimed invention, namely that as a result of non-uniformity in linear dimensional change of large thin MDF panels due to changing environmental conditions (e.g., changes in relative humidity), such panels are prone to warping. This can be avoided by using smaller size thick panels, but such panels are not always desired.

However, warping is not the only issue described as being a well-known problem in using large thin MDF panels. Page 3, lines 14-30 of the instant application describes linear swelling as an issue when using large thin panels such as those claimed. Due to the thinness and size of such panels, linear swelling in the length and width directions results from fluctuation in temperature and relative humidity. As a result of such expansion and contraction, seams must be provided when installing these panels to cover a large wall to accommodate for the dimensional changes, seams which can spoil the desired aesthetic effect of such panels. It is stated that it would be desired to provide panels that do not require such seams between then when installed, something that would prevent the linear swelling.

Page 4, lines 3-20 describe another issue with large and thin panels, namely the presence of a Machine Direction in the fibres that form the panels. Such panels are generally produced in continuous commercial scale processes that result in a degree of orientation of the fibres in the finished product. The presence of a Machine Direction leads to differing expansion and contraction in the Machine Direction versus the cross-direction, which complicates the provision of seams when installing such panels.

Page 4, lines 21-28, discuss a further issue surrounding the need to “acclimatise” such panels at the location where they are to be placed, due to the linear swelling that results from varying environmental conditions.

Lastly at page 5, lines 17-23, the instant application discusses the need to place fixing means for such panels well off the edge.

With these issues in mind, the instant application at page 6 proposes, as a solution to the aforementioned issues, that such large thin MDF panels be formed of acetylated wood fibres. For example, at page 6, lines 3-7, the instant application states:

> In order to better address one or more of the foregoing desires, the invention presents, in one aspect, a panel of medium density fibreboard having a length and width of at least 1 m, and an aspect ratio of at least 100, comprising wood fibres having a length of 7 mm or below, pressed together with an adhesive, wherein the wood fibres are made of acetylated wood.

This solution is consistent across the various aspects of the invention set out on page 6, including the specific one dealing with the issue of warping, set out at page 6, lines 17-21.

The above discussion highlights that reducing warping is only one of the issues that is addressed by using acetylated wood fibres in forming large thin MDF panels, according to the instant application itself. It is therefore, in our preliminary view, not clear why this particular advantage should be part of the inventive concept of the claims on file, as opposed to any of the others. All of the effects or “advantages”, such as reduced warping, reduced linear swelling in general and reduced effects of the presence of a Machine Direction in general, result from the use of acetylated wood fibres in forming the large thin MDF panels.

In our preliminary view, it is the use of the acetylated wood fibres in forming large thin MDF panels and the resulting reduction of the effects of changing environmental conditions, one of which is linear swelling and the various issues it creates that is the inventive concept flowing through all of the claims and through the invention set out in the description. The inventive concept is not limited to the particular advantage of reduced warpage (one of the possible effects of linear swelling).

> While the above identified inventive concept is common to all claims on file, many claims includes further details that will be part of their specific inventive concept. These details are addressed in the following steps.

[59] In the R-PR at pages 9-10, the Applicant contends that the issues addressed by the invention are not related to swelling in general, instead they are directed:

> specifically to linear swell in conjunction with the effects related to the dangerous combination of “large and thin” dimensions and the presence of a machine direction in the MDF panels.
>
> …
>
> the problems incurred with the conventional commercially manufactured MDF panels are not related to environmental factors as such, not to linear swell as such, and not to machine direction as such. Rather, as noted above the large and thin dimensions go together with the non-orthogonality resulting from machine direction, present a highly synergistic combination of problem causality. This specific problem is warping.

[60] As discussed above under the identification of the person skilled in the art and at the hearing, claims 14-16 on file contain no limitation that the large and thin MDF panels claimed possess a Machine Direction (which as disclosed in the instant application leads to the moisture-induced warping). Therefore, the inventive concept of these claims cannot be the same as those claims that do not contain such a limitation. Likewise, the other portions of the specification discussed in the identification of the skilled person and in the PR letter (quoted above) point out broader issues with MDF panels in the face of changing environmental conditions.

[61] In light of the above, it is our view that, if an inventive concept is to be identified beyond the essential element of the claims, it is the use of the acetylated wood fibres in forming large thin MDF panels and the resulting reduction of the effects

of changing environmental conditions, one of which is linear swelling and the various issues it creates. As we stated in the PR letter at page 13, while this is a common inventive concept flowing through all of the claims and through the invention set out in the description, many claims include further details that will be part of their specific inventive concept (e.g., claim 1 is limited to those panels having a Machine Direction). These details are addressed in the remaining *Sanofi* steps.

(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

[62] In the PR letter at pages 13-15, we set out a detailed analysis of the differences between the state of the art as represented by prior art document D2 and the independent claims on file, reproduced below:

> The FA at page 2 identified prior art document D2 as forming part of the "state of the art".
>
> D2 discloses a composite wood product formed of acetylated wood elements. As set out in D2 at page 1, such wood products are useful as decorative sheets and/or mouldings, for indoor or outdoor applications. The products are usually formed by the wood elements (e.g., wood strands, wood particles, wood fibres and/or cellulose fibres) being acetylated, impregnated with a synthetic resin as a binder, heat hardened and pressed. D2 describes "composites" as typically including engineered wood products such as medium density fibreboard (MDF), oriented strand board and particle board.
>
> D2 also describes suitable applications for articles formed of such composites, such as external facade cladding of buildings, exterior siding applications, structural application in screening and bracing, walls, roofs and floors, cladding for a balcony,

or of a parapet panel or apron panel, or else for the internal lining of walls or furniture, or of wet-rooms or laboratory equipment.

D2 describes processes for producing acetylated wood elements as the basic raw material for producing wood composites. The wood elements may be prepared either by acetylating large geometry elements, e.g., wafers, which are then further size reduced to the desired final geometry, or by first converting green wood directly to the desired final geometry before acetylation (D2 at page 3).

In one example described at pages 4-5, wood chips were acetylated then broken down to fibres by passing through a conventional defibrator, combined with a pMDI (polymeric di-phenylmethane diisocyanate) adhesive and converted to a composite panel or board by applying high temperature and pressure. Samples were subjected to wet-dry and freeze-thaw testing. Test samples were 500 mm x 500 mm x 12 mm, as set out in Table II. The testing focussed on the effects of acetylation on thickness swelling, as discussed in the background of the instant application. Other composite samples as set out Table IV were tested as well, including MDF samples, with the same size sample boards as those of Table II. Table VI shows various further MDF panel configurations tested based on modulii of rupture and elasticity.

The acetylation of the wood products showed significant reduction in thickness swelling of the composites, with minimal effect on the modulii of rupture and elasticity in respect of MDF panels made of acetylated wood elements when using a pMDI adhesive (moisture absorption usually negatively affecting the modulii of rupture and elasticity in such composite panels). Modulus of elasticity, bending strength, surface adhesion and biological degradation were also tested, with favorable results.

With respect to claim 1 on file, D2 discloses MDF panels comprising wood fibres with a largest dimension of 7 mm or less (see Table I, last item “Fibres”, where the largest dimension, the length, is from 1 to 5 mm). D2 also discloses, as discussed above, acetylated wood fibres being combined with an adhesive and the composite panel formed using high temperature and pressure.

However, we preliminarily agree with the FA at page 3 that D2 does not disclose the particular dimensional parameters of the MDF panel set out in claim 1 on file, namely that the panel has an aspect ratio (length/thickness) of at least 100 or that the surface area is at least 1 m2. D2 discloses at Tables II and IV that the sample panels tested were 500 mm x 500 mm, making their surface area 0.25 m^2. Further, the panel thicknesses disclosed are generally 12 mm, which would make the aspect ratio approximately 42, significantly short of the claimed value of 100. We note that Table VI does set out an acetylated sample with a thickness of 5 mm, but the table does not identify the samples' other dimensions. Since there is no link in the document between the samples tested in Table VI and those of Table II or IV, we are unable to conclude that the samples set out in Table VI were also 500 mm x 500 mm (which would put the aspect ratio at 100, the minimum required in claim 1 on file).

The discussion in the FA of the differences between the claims and D2 does not take into account the inventive concept set out therein at page 2, which includes the feature that the claimed MDF panel reduces swelling induced warpage in the panel when exposed to moisture.

As noted above, we have not defined the inventive concept of claim 1 in the same manner, identifying the inventive concept as instead including a broader feature of reduction of the effects of changing environmental conditions, one of which is linear swelling and the various issues it creates. Considering such a feature, in our preliminary view, this is disclosed by prior art document D2, which sets out acetylation as a means of reducing swelling behavior of wood based composites under the effect of varying climatic conditions (D2 at page 2).

There is, in our preliminary view, a further difference between D2 and the inventive concept of claim 1 on file, namely the presence of a Machine Direction in the MDF panel. The FA does not speak to this feature in assessing the differences at Sanofi step 3. As set out within the identification of the relevant CGK, in the commercial scale manufacturing of fibre panels, a Machine Direction is the imposed orientation of the fibres in the direction of manufacture of the panels.

D2 does not discuss the concept of a panel having fibres oriented in a Machine Direction. The panels formed and tested in D2 are smaller 500 mm x 500 mm panels that, according to the description in D2 at page 5, are formed by combining an adhesive with wood fibres and then “converted to composite panel or board by applying high temperature and pressure.” Such panels are not, as discussed above, large and thin as set out by the dimensional parameters of the claims on file and it is not evident that such panels are produced in a commercial scale operation where the fibres would be given an orientation in the direction of production. They could have been produced individually according to the above noted language in D2. As such, the presence of a Machine Direction in the panels is a further difference between the inventive concept of claim 1 on file and D2.

With respect to the other independent claims 14-16, these claims do not specify that the fibres of the MDF panels possess a Machine Direction, this characteristic therefore not being a difference with respect to D2.

However, all of claims 14-16 set out the dimensional parameters that make the panels large and thin, as in claim 1, these being differences with respect to D2.

Additionally claim 16 specifies that a fixation means is penetrable at a distance of the panels, which distance is “selected from the group consisting of less than 25 mm in both directions from a corner of the panel, less than 12 mm from an edge of the panel, and combinations thereof.” In our preliminary view, given the simple specification that a fixation means can penetrate the panel at such distances, any panel that provides sufficient surface area for this to occur would fall within the claim language.

In regard to claim 10 directed to the process for forming the panel of claim 1, D2 discloses formation of the panels described therein by wood chips being acetylated then broken down to fibres by passing through a conventional defibrator, combined with a pMDI (polymeric di-phenylmethane diisocyanate) adhesive and converted to a composite panel or board by applying high temperature and pressure. D2 does not

specifically discuss cold-pre-pressing and hot pressing, or casting the fibres on a moving belt.

The other details of the dependent claims are addressed below within *Sanofi* step 4.

[63] In the R-PR at page 10 and during the hearing, the Applicant contended that the comparison of D2 with the claims on file was wrong for three reasons:

1) D2 would not be invoked by the skilled person in the first place;
2) The inventive concept must be associated with the effects of linear swell in MDF panels that are specifically “large and thin” and possess a machine direction; and
3) D2 does not address linear swell at all.

[64] In support of the first reason, the Applicant at page 11 of the R-PR points to the difference in problems that are addressed by D2 and the claims on file. The Applicant contends that D2 deals with small and thick panel issues, while the instant application addresses issues with large and thin MDF panels with a Machine Direction. At page 10 of the R-PR, the resulting warping problem is described (as in the instant application at page 4) as resulting from having a large and thin panel together with the non-orthogonality that comes from the panel having a Machine Direction. In the Applicant’s view, the skilled person would have had no reason to review D2.

[65] What problem the prior art addresses is not a reason to disqualify that prior art from consideration, at least not under *Sanofi* step 3. At the hearing, there was a discussion of how such criteria are indeed part of the considerations of inventive ingenuity before the European Patent Office (*Guidelines for Examination in the European Patent Office*, Part G Patentability, Chapter VII – Inventive Step, 5.1 Determination of the closest prior art). However, such is not the case in Canada. All prior art disclosed prior to the relevant date (in this case the claim date) is applicable at *Sanofi* step 3 (*Hospira*, *supra*). It is at *Sanofi* step 4 where other

considerations may come into play, such as whether or not a particular piece of prior art would have been found in reasonable and diligent search (*Hospira*, *supra*), with whether or not a similar problem was being addressed possibly coming into play at that point.

[66] With respect to the second reason against the use of D2, the Applicant contends at page 11 of the R-PR that the inventive concept underlying the claims, which should relate to large and thin panels and more specifically those having a Machine Direction, cannot be found in D2. As discussed above, it is not our view, having regard to the whole specification, that the inventive concept common to all the claims is limited to those panels having a Machine Direction. Further, the fact that the inventive concept of a claim is not found in a particular piece of prior art is only an indication that the claim is not anticipated, not that it is unobvious.

[67] With respect to the third reason, in our view, while D2 does not discuss the issue of linear swelling, this does not disqualify it from consideration as a prior art document. Again, that fact that a reference does not directly address the inventive concept of a claim relates more to anticipation rather than obviousness.

(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?

CLAIM 1

[68] In the PR letter at pages 16-18, we set out our preliminary view as to why the differences identified at *Sanofi* step 3 between the inventive concept of claim 1 and D2 would have been obvious:

> As set out above, the differences between D2 and the inventive concept of claim 1 are that D2, while disclosing MDF panels formed of acetylated wood fibres, does not disclose such panels with the following characteristics :

- the aspect ratio being at least 100 and the surface area of the panels being at least 1 m^2; and
- the presence of a Machine Direction in the orientation of the fibres forming the panels.

We first note that the problem that the Applicant set out to solve, whether it was to reduce the effects of changing environmental conditions in general on large, relatively thin MDF panels, to specifically reduce the effects of linear swelling, or to more specifically reduce the warping that may result from non-uniform linear dimensional changes, was already known to the skilled person as part of the relevant CGK, identified above.

We also note that large, relatively thin MDF panels such as those set out by the dimensions in the claims on file and the fact that they typically have a Machine Direction was also part of the relevant CGK of the skilled person.

The question is whether the skilled person would have come directly and without difficulty (*Beloit Canada Ltd v Valmet Oy*, (1986) 8 CPR (3d) 289 (FCA) at 294) to the idea of using acetylated wood fibres to form the large relatively thin MDF panels set out in the claims.

In our preliminary view, they would have.

The skilled person was well aware of the benefits of acetylation and how it had been used in the past to form a more stable MDF product. D3 and D4 illustrate that the skilled person knew that dimensional stability of wood composites such as MDF panels was a problem in respect of changing moisture content under changing climatic conditions and that acetylation reduced water sorption in general, increasing dimensional stability in general. This “pickling” of the wood, as described in D4, reduces the ability of the wood to absorb moisture from its surroundings and the effects of the same.

The problem that the skilled person was motivated to solve and that is addressed by the well-known acetylation of wood, is the same problem that is set out in the instant

application and that was part of the relevant CGK, namely dimensional changes resulting from changing moisture content that, depending on the configuration of a panel, leads to changes in thickness or changes in linear dimensions that can then lead to warping depending on the directional variation of the changes in linear dimensions.

In our preliminary view, the then obvious solution to the skilled person for the problem of water absorption-induced swelling or warping would have been the use of acetylation in forming the wood product, with its well-known advantages. In our preliminary view, the solution would have been immediately apparent in light of the skilled person's CGK.

The Applicant points out at page 3 of their submission dated April 21, 2020 and at pages 2-3 of the R-FA that D2 does not disclose or suggest the use of acetylated wood fibres for reducing warping or that D2 discloses MDF panels having a Machine Direction. We agree, since the panel configurations therein would not be characterized as large and relatively thin MDF panels, which are prone to the warping issue and typically possess a Machine Direction.

However, this does not mean that the subject-matter of claim 1 is non-obvious, since obviousness considers not just what is disclosed in a particular piece of prior art, but also takes into account the skilled person's CGK (and may also take into account a mosaic of prior art documents). In this case, the collective CGK of the skilled person provides the problem to be solved, the motivation to solve it, and the evident solution to it.

With the submission dated April 21, 2020, the Applicant included two declarations of Dr. Theodorus Kappen, one of the inventors listed on the instant application, which were filed in the prosecution of the corresponding US application.

In the first declaration dated January 13, 2016, Dr. Kappen discusses the warping problem with relatively large and thin MDF panels and the tendency to avoid the problem by using thick panels. Dr. Kappen indicates at para 7 that nothing is known

in the prior art about how to address the warping problem for large, relatively thin panels. However, the fact that the solution to the problem may not be known per se, only means that it does not lack novelty, not that it is non-obvious.

Dr. Kappen also presented the results of testing of boards similar to those described in a prior art document cited by the US Examiner, which testing seems to confirm what was already part of the relevant CGK, that warping is not a significant issue for relatively thick boards. Dr. Kappen later states at paras 18-19 that the use of acetylated wood in large, thin panels was not known in the art. Again, the fact that this was not known does not answer the question of whether or not it would have been obvious. We note that similar testing results were submitted in the R-FA in response to the citation of D2 (attached as an appendix to the R-FA).

The second declaration of Dr. Kappen dated April 5, 2018 also responds to the citation by the US Examiner, clarifying what is meant by the term “warp” and how this problem is not addressed by the citation.

The only point we take from both declarations is that the use of acetylated wood to address the warping issue in relatively large thin MDF panels was not previously known, a point that we have already accepted in our analysis above.

At page 2 of the R-FA, the Applicant contested the assertion in the FA at page 4 that D2 related to the root cause of the warping problem, indicating this to be moisture induced swelling. The Applicant contended that warping and swelling, or “thickness swelling”, are different issues related to different panel configurations.

Regardless of whether the reference in the FA to swelling was meant to refer to swelling in general or to thickness swelling, as we have shown by reference to D3 or D4, acetylation was well-known to address dimensional changes in general by preventing moisture absorption, which is what leads to thickness swelling or to the warping effect caused by non-uniform linear swelling, depending on the panel configuration.

> In light of the above considerations, it is our preliminary view that the subject-matter of claim 1 would have been obvious in view of D2 and the relevant CGK of the skilled person.

[69] In the R-PR at page 12, the Applicant contends that, as for step 3, D2 would not be used as a starting point for the invention, as it does not relate to large and thin MDF panels having a Machine Direction. In the Applicant's view, the skilled person would start from conventional, non-acetylated large and thin MDF, produced in a continuous process (with the fibres therefore possessing a Machine Direction).

[70] In the PR letter, quoted above, we explained why in our preliminary view the problem that the instant application set out to solve is the same problem that was addressed by the well-known acetylation of wood products, even composite wood products, namely, dimensional changes resulting from changing moisture content that, depending on the particular configuration of the panel, leads to changes in thickness or changes in linear dimensions (which in panels possessing a Machine Direction can lead to warping).

[71] The Applicant focusses on the warping issue that is particular to those large and thin MDF panels that possess a Machine Direction. However, in our view, the person skilled in the art, who has knowledge of acetylation and its effects on wood products, as well as the past dimensional stability issues associated with MDF panels, including linear swelling and warping, would have been aware that the common thread running through all the dimensional stability issues is variations in moisture content, whether it is due to immersion of the panel in water or changing environmental conditions such as changes in surrounding humidity. All of the well-known issues that were part of the relevant CGK and were discussed in the Background portion of the present application result from changing moisture content of the panels, with the particular physical effect, whether it is thickness swelling, linear swelling or warping specifically, depending

on the physical dimensions of the panel. The skilled person was well-aware that acetylation of wood products prevented moisture absorption and thereby provided dimensional stability (as set out in the discussion of the relevant CGK). Therefore, in our view, faced with such issues, it would have been evident to the skilled person that acetylation of such MDF panels having the configuration as those of claim 1, would provide dimensional stability and prevent or reduce the moisture-induced warping issue, peculiar to large and thin MDF panels possessing a Machine Direction.

[72] Contrary to the Applicant's position, our analysis above does indeed use prior art document D2 as a starting point. However, given the dimensional stability problem that is to be addressed, which results from changing moisture content, in our view, a document such as D2, which relates to moisture-induced swelling and how it can be addressed by acetylation (including in MDF panels), would have been considered very relevant to the skilled person searching for a solution to such a problem. We see no issue as to whether such a document would have been found in a reasonable and diligent search (*Hospira*, *supra*).

[73] The Applicant has contended both in the R-PR and at the hearing that D2 relates solely to smaller, thick panels and is not relevant to the large thin MDF panels having a Machine Direction as set out in claim 1 on file. We note however, that D2, while disclosing specific testing of smaller and relatively thicker test panels, also indicates at page 1 that the invention relates more generally to acetylated wood products, the products being referred to as composites that include engineered wood products such as medium density fibreboard. According to D2, such composites may be used for external façade cladding of buildings, exterior siding, structural applications in screening and bracing, walls, roofs, floors, etc. D2, in our view, therefore envisions the use of the acetylated panels in larger scale applications, rather than only in the specific sizes used for the test panels and its teachings are therefore not limited to the test panel configurations.

[74] We are therefore of the view that D2 is a valid starting point for the *Sanofi* assessment.

[75] Nevertheless, even assuming that we were to use the Applicant's position as a starting point for the obviousness analysis, which was "conventional, non-acetylated, large and thin MDF, produced in a continuous process" (R-PR at page 12), the difference between such a starting point and claim 1 would then be that claim 1 specifies that the panels are acetylated. The question would then be whether it would have been obvious, given the warping issue, which results from changing moisture content and uneven linear swelling, to use acetylation to address such an issue.

[76] In our view, given the CGK surrounding acetylation and its general effects on wood products, namely prevention of moisture absorption and increased dimensional stability, acetylation would have been an obvious choice for the person skilled in the art as a solution.

[77] At pages 12-13 of the R-PR, the Applicant questioned the use of prior art documents D3 and D4, as in the case of the identification of the relevant CGK, discussed above. We reiterate here that the purpose of D3 and D4 is to illustrate the state of the CGK surrounding acetylation of wood products in general, rather than to use information therein in relation to specific wood product configurations.

[78] For the reasons set out in the PR letter and the those presented above, in our view, claim 1 on file would have been obvious to the person skilled in the art.

CLAIMS 14-16

[79] At page 18 of the PR letter, we set out our reasons why these claims, which are not limited to panels having a Machine Direction (as was the case with claim 1), would have been obvious to the person skilled in the art:

> Independent claims 14 and 15 specify the use of acetylated wood fibres in forming relatively large, thin MDF panels (by the dimensional limitations), but do not specify that the panel has a Machine Direction. As the use of acetylated wood fibres in forming such MDF panels is considered obvious in view of our analysis of claim 1, claims 14 and 15 would have also been obvious.
>
> Claim 16 sets out a similar use of acetylated wood fibres, additionally specifying that a fixation means is penetrable at a specific distance from a corner or edge of the panel, or both. We do not view this as a distinguishing feature from those known in the prior art since the language only specifies that the fixation means is “penetrable” at a certain distance, which would be true for any prior art panel that provided enough space to accommodate such fixation distances. Commonly known panel sizes were set out in the publication cited in the FA and set out above under the discussion of the relevant CGK.

[80] No submissions specific to these claims were made in the R-PR or at the hearing.

[81] For the reasons given above for the obviousness of claim 1 and those of the PR letter quoted above for claims 14-16 specifically, in our view, claims 14-16 on file would have been obvious to the person skilled in the art.

DEPENDENT CLAIMS 2-4

[82] At pages 18-19 of the PR letter, we explained why in our preliminary view, dependent claims 2-4 would have been obvious:

> Dependent claims 2-4 specify that the aspect ratio of the panel is higher than 122, higher than 200 and that the length of the panel fibres is from 1 to 5 mm, respectively.
>
> As set out above as part of the relevant CGK, it was well-known to the skilled person that conventional MDF panels are relatively thin and have high aspect ratios (ratio of

> length/thickness) of above 100. Further, it was well-known that MDF wood fibres typically having a length of 7 mm or below, preferably of from 1 mm to 5 mm. Given that claims 2-4 set out commonly known characteristics of MDF panels, they do not add any inventive features to claim 1, which already sets out an MDF panel.

[83] The Applicant made no submissions in relation to the above in the R-PR or at the hearing.

[84] For the reasons given above from the PR letter, it is our view that dependent claims 2-4 on file would have been obvious to the person skilled in the art.

DEPENDENT CLAIMS 5 AND 9

[85] At pages 19-21 of the PR letter, we set out our preliminary view that dependent claims 5 and 9 would have been obvious, applying several prior art documents that were identified in the instant application itself:

> Claim 5 sets out an MDF panel according to any one of claims 1-4 wherein the chips that form the panel are themselves formed by first acetylating dried solid wood with acetic anhydride, then chipping the wood and further reducing the size of chips to fibres with a largest dimension of 5 mm or less.
>
> Alternatively, claim 9 specifies that the solid wood is first chipped, with the chips then being acetylated and the acetylated chips being refined so as to form acetylated wood fibres.
>
> The instant application does not define what is meant by “solid wood”, but for the purposes of this assessment we take it to refer to wood elements that are relatively large such that it can be formed into chips.
>
> D2 at page 3 specifies that:
>
> > [s]uitably acetylated wood elements may be prepared either by acetylating large geometry elements, eg wafers which are then

> further size reduced to the desired final geometry, or by first converting green wood directly to the desired final geometry before acetylation.

D2 in Table I specifies various wood elements that would be suitable for acetylation including chips, flakes, strands, splinters, particles, fibrebundles and fibres. Although D2 indicates the acetylation of “large geometry elements”, it sets out an example of these as “wafers” and in Table 1 the largest elements indicated as suitable for acetylation are “Chips”. We therefore take large geometry elements as set out in D2 to be similar in dimensions to the Chips identified in Table I and therefore not equivalent to the solid wood set out in dependent claims 5 and 9.

However, in respect of claim 9, D2 discloses at pages 4-5, a process for forming a composite panel wherein wood chips are acetylated, then broken down to fibres before being formed into a composite panel by combining the fibres with an adhesive and applying high temperature and pressure. The skilled person would readily appreciate that the chips used would have been formed from larger solid wood elements. We are therefore of the preliminary view that claim 9, which refers to claim 1, would have been obvious in view of D2 and the relevant CGK of the skilled person.

In respect of claim 5, the instant application at page 12 sets out 3 different processes by which MDF panels of acetylated wood fibres may be formed, including first acetylating solid wood as set out in claim 5, as well as chipping the wood first, then acetylating the chips as set out in claim 9. The discussion at page 5 goes on to note that the inventors have found that surprisingly, sufficient acetylation is achieved by first acetylating the solid wood, then processing it down to the fibre level, rather than forming the desired fibre size and then acetylating them, which according to the application, was the customary method that was technically complicated. Despite the allegedly surprising results, the instant application claims both alternatives, as set out in claims 5 and 9.

The instant application at page 13 lists several prior art patent documents that may be used to perform the acetylation that is part of the claimed invention, including:

D5: GB 2456915	Girotra	August 5, 2009
D6: EP 1718442	Nasheri et al.	August 25, 2005
D7: EP 0680810	Militz et al.	November 8, 1995

D5 discloses the acetylation of solid wood to improve desirable characteristics such as durability, dimensional stability, stability to ultraviolet light and thermal conductivity (D5 at page 1). The document seeks to address the prior problem of uniform penetration of wood pieces of commercial sized such that the expected advantages of acetylation are achieved (D5 at page 3). It is noted that much of the previous work in this area related to the durability and dimensional stability of small, laboratory prepared samples of wood. The acetylation process described, according to the document, results in significant improvements in dimensional stability for commercial sized wood pieces (D5 at page 15).

D6 also discloses the acetylation of solid wood pieces in order to improve their dimensional stability, as well as fiberboard, particle board, wood veneer, wood chips, oriented strand board, laminated veneer lumber and plywood (D6 at page 6). The document discloses sufficient acetylation of solid wood to achieve significantly enhanced wood resistance to decay and insect attack, as well as dimensional stability (D6 at page 11).

D7 also discloses the acetylation of solid wood, particularly to achieve a fast and sufficient acetylation in practical and commercial dimensions (D7 at page 2).

While none of D5-D7 discuss the production of MDF panels from the acetylated solid wood products, they do all disclose that solid wood products can be sufficiently acetylated so that desired qualities such as dimensional stability can be achieved. Therefore the viable acetylation of solid wood products was known before the claim date of the instant application (September 28, 2011) and would have been a known option to the skilled person in producing acetylated fibres suitable for use in

> producing MDF panels. As such, in our preliminary view, the use of such a known option with its obvious advantages (avoiding the well-known technically complicated acetylation of wood fibres as set out at page 12 of the instant application) would have been obvious to the skilled person in view of D2 and any one of D5-D7, in view of the relevant CGK.

[86] No specific arguments were made by the Applicant in relation to the above in the R-PR or at the hearing.

[87] For the reasons above from the PR letter, it is our view that dependent claims 5 and 9 on file would have been obvious to the person skilled in the art.

DEPENDENT CLAIMS 6-8

[88] At page 21 of the PR letter, we explained why in our preliminary view, dependent claims 6-8 would have been obvious, the features added by these claims having been part of the relevant CGK:

> Dependent claim 6 sets out the particular adhesives that may be used to produce the MDF panels, including phenol-formaldehyde resin, melamine urea-formaldehyde resin, methylene diphenyl diisocyanate (MDI) and polymeric methylene diphenyl diisocyanate (PMDI).
>
> Since the use of such adhesives in forming MDF panels was well-known to the skilled person, as is evident from the above identification of the relevant CGK, their use in the presently claimed invention would, in our preliminary view, have been obvious.
>
> Claim 7 additionally specifies that the source of wood for the acetylated wood fibres is pinus, eucalyptus and picea type trees. Claim 8 alternatively specifies that the source trees are spruce and radiata pine. In our preliminary view, since all of these types of wood were conventional sources of wood for MDF panels (as set out in the

relevant CGK identified earlier), their use in the presently claimed MDF panel would have been obvious to the skilled person.

[89] No submissions were made in relation to the above in the R-PR or at the hearing.

[90] For the reasons given in the PR letter, it is our view that dependent claims 6-8 on file would have been obvious to the person skilled in the art.

CLAIMS 10-13

[91] In the PR letter at page 21, we set out our preliminary view that claims 10-13 would have been obvious, the additional features of these claims, directed to a process of producing the panel of claim 1, having been part of the relevant CGK:

> Claim 10 specifies a process for obtaining an MDF panel according to claim 1, wherein acetylated wood fibres are provided, adhesive is added, the fibres are cast onto a surface so as to form a mat, the mat is cold pre-pressed and hot pressed, the surface on which the fibres are cast being a moving belt. As set out above in the identification of the relevant CGK, such process steps for forming MDF panels were well-known to the skilled person and therefore, in our preliminary view, the use of such a process in forming the claimed MDF panel would have been obvious.
>
> Claim 11 specifies the addition of wax to the fibres at the step of adding adhesive. Again, the addition of wax as an additive in forming MDF panels was well-known in accordance with the relevant CGK and would have been obvious to the skilled person.
>
> Claim 12 specifies that the pressing is conducted via moving belt. As specified in the identification of the CGK, pressing by means of a moving belt was well-known in MDF panel manufacturing.
>
> Claim 13 specifies that the pressing of claim 12 is conducted via a double belt press or calendar. Again, as set out as part of the relevant CGK, the use of a double belt

press or calendar in manufacturing MDF panels was well-known to the skilled person and would have been obvious.

[92] No submissions in respect of the above were made in the R-PR or at the hearing.

[93] For the reasons set out above from the PR letter, it is our view that claims 10-13 no file would have been obvious.

THE PASSAGE OF TIME CONSIDERATION

[94] At the hearing, the Applicant highlighted that while the CGK surrounding acetylation and its general effects had existed for decades, there was no disclosure or suggestion in the art to use acetylation to solve the specific problem of warping in MDF panels having a Machine Direction. If it would have been obvious for the skilled person to have taken such a step, then it would have been taken long ago.

[95] We first note that the fact that nothing in the prior art discloses or suggests *per se* using acetylation to address the specific warping issue for a specific panel configuration does not render the claimed subject-matter unobvious. The relevant CGK and other prior art documents may provide the necessary missing information, as they do in this case. Given the common issue among wood products, including MDF, of dimensional instability due to moisture absorption, it is our view that the general advantages of acetylation would have made the solution evident to the person skilled in the art.

[96] As for the significance of the passage of time, we note that D2 was only published on August 11, 2011, shortly before the claim date of the instant application (September 28, 2011). Very little time passed between the suggestion in D2 to use acetylation to address swelling issues in MDF panels and the filing of the instant application. We therefore do not agree with the Applicant that

anything is to be inferred in respect of obviousness from the passage of time between the relevant CGK and the prior art represented by D2.

Obviousness Summary

[97] In light of the above, we conclude that claims 1-16 in file would have been obvious to the person skilled in the art and are therefore non-compliant with paragraph 28.3(b) of the *Patent Act*.

PROPOSED AMENDMENTS IN POST-HEARING SUBMISSIONS

[98] As noted earlier, the proposed claims submitted after the hearing included the previously proposed amendments to the claims submitted with the R-PR, as well as a proposed amendment to claim 16 on file.

[99] The proposed amendments to claims 14 and 15 involved specifying that the use of acetylated wood fibres in making MDF panels of the claimed dimensions was for the purpose of addressing the warpage issue and that the panels possessed a Machine Direction [Emphasis in original R-PR submission]:

> 14. The use of acetylated wood fibres in making medium density fibreboard panels, for the purpose of reducing warpage induced by dimensional changes into the direction of the length and the width of panels having an aspect ratio of at least 100 and a surface area of at least 1 m^2, and possessing a Machine Direction.
>
> 15. The use of acetylated wood fibres in making medium density fibreboard panels, for the purpose of reducing warpage induced by dimensional changes into the direction of the length and the width of panels having a length and width of at least 1 m, and an aspect ratio of at least 100, and possessing a Machine Direction.

[100] The proposed amendment to claim 16 specified that the panels set out therein possessed a Machine Direction, consistent with the proposals for claims 14 and 15 [Emphasis in original]:

> 16. The use of acetylated wood fibres in making medium density fibreboard panels, the panels having a length and width of at least 1 m, and an aspect ratio of at least 100, and possessing a Machine Direction, wherein a fixation means is penetratable at a distance of the panels, the distance is selected from the group consisting of less than 25 mm in both directions from a corner of the panel, less than 12 mm from an edge of the panel, and combinations thereof.

[101] We have already explained in relation to claim 1 on file why large, thin MDF panels formed of acetylated wood fibres and having a Machine Direction would have been obvious to the person skilled in the art in view of the prior art and the relevant CGK. Therefore the addition of the feature that the panels possess a Machine Direction in claims 14-16 would not make those claims inventive.

[102] With regard to the specification in proposed claims 14 and 15 that the purpose of the use of acetylated wood fibres in such MDF panels is “for the purpose of reducing warpage induced by dimensional changes into the direction of the length and width of the panels…”, we recognize that the Applicant had previously claimed that this feature was part of the inventive concept of the claims on file, with which we disagreed. While now part of the inventive concept of proposed claims 14 and 15, in our view, such a feature does not represent an inventive limitation. As discussed above in relation to the claims on file and well-known from the relevant CGK, it is the presence of a Machine Direction in the fibres of an MDF panel that leads to the warping issue. Therefore, the use of acetylated fibres in large thin MDF panels having a Machine Direction would have inherently addressed the warping problem.

[103] In light of the above, proposed claims 1-16 would also have been obvious and therefore would not comply with paragraph 28.3(b) of the *Patent Act*.

[104] Since the proposed claims would not overcome the obviousness defect, they are not considered a “necessary” amendment for compliance with the *Patent Act* and Patent Rules, as required by subsection 86(11) of the *Patent Rules*.

OVERALL CONCLUSIONS

[105] We conclude that:

- Claims 1-16 on file would have been obvious to the person skilled in the art and are therefore non-complaint with paragraph 28.3(b) of the *Patent Act.*

[106] Further, since the proposed claims would not overcome the obviousness defect, they are not considered a “necessary” amendment for compliance with the *Patent Act* and *Patent Rules*, as required by subsection 86(11) of the *Patent Rules*.

RECOMMENDATION OF THE BOARD

[107] In view of the above, the undersigned recommend that the application be refused on the ground that:

- Claims 1-16 on file would have been obvious to the person skilled in the art and are therefore non-complaint with paragraph 28.3(b) of the *Patent Act.*

Stephen MacNeil Member	Marcel Brisebois Member	Javier Jorge Member

DECISION OF THE COMMISSIONER

[108] I concur with the conclusions and recommendation of the Board that the application be refused on the ground that:

- Claims 1-16 on file would have been obvious to the person skilled in the art and are therefore non-complaint with paragraph 28.3(b) of the *Patent Act*.

[109] In accordance with section 40 of the *Patent Act*, I refuse to grant a patent on this application. Under section 41 of the *Patent Act*, the Applicant has six months within which to appeal my decision to the Federal Court of Canada.

Konstantinos Georgaras

Commissioner of Patents
Dated at Gatineau, Quebec
this 11th day of March, 2025.