Commissioner’s Decision #1356

Décision du Commissaire #1356

TOPICS: O00

SUJETS: O00

Application No: 2,632,425

Demande no: 2,632,425

IN THE CANADIAN PATENT OFFICE

DECISION OF THE COMMISSIONER OF PATENTS

Patent application number 2,632,425 having been rejected under subsection 30(3) of the *Patent Rules*, has consequently been reviewed in accordance with subsection 30(6) of the *Patent Rules* by the Patent Appeal Board and the Commissioner of Patents. The findings of the Board and the decision of the Commissioner are as follows:

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INTRODUCTION

[1] This recommendation deals with a review by the Commissioner of Patents of patent application no. 2,632,425, entitled AINTEGRATED COMPRESSOR/STRIPPER CONFIGURATIONS AND METHODS.@ The Applicant is FLUOR TECHNOLOGIES CORPORATION and the inventors are Satish Reddy, John Gilmartin and Valerie Francuz.

[2] After amendments by the Applicant in response to the Examiner=s Final Action , this case was forwarded to the Patent Appeal Board (Athe Board@). A Summary of Reasons (ASOR@) from the Examiner outlined the defects which the Examiner believed made the application non-compliant with the *Patent Act* and *Patent Rules*, the only outstanding defect being that the claims would have been obvious.

[3] A further issue of lack of utility/inoperability was raised by the Board itself at the review stage. However, we are satisfied, based on the Applicant=s written and oral submissions, that this is not an issue and therefore we do not address it in this recommendation.

[4] For the reasons that follow, the Board recommends that the application be refused for being obvious and therefore non-compliant with section 28.3 of the *Patent Act*.

BACKGROUND

[5] The present application relates to a method and system of regenerating solvents used in acid gas removal systems. In a typical prior art configuration, a feed gas to be treated passes through an absorber with a lean solvent (i.e., a solvent essentially free of acid gas). The acid gas, such as carbon dioxide, is absorbed by the solvent and the purified gas exits the absorber to then be discharged. The now rich solvent containing the carbon dioxide passes to a regenerator or Astripping@ column where steam is used to strip the acid gas from the solvent, thereby making the solvent suitable for reuse in the absorber. In some cases the steam used for stripping comes from an external source and will need to be continuously generated by a source such as a reboiler. In the past, attempts have been made to improve the efficiency and/or economics of such systems through methods such as the use of auxiliary strippers with steam supplied as flashed steam from the process. Multi-pressure strippers have also been used in which vapors from each stage are compressed and fed to an upstream stage to reduce heating requirements.

[6] Other systems recover steam from flashing the lean solvent, which steam assists with stripping in the stripping column. According to the Applicant typically such steam flashed from the lean solvent is reinjected into the process through the use of additional motive steam, which additional steam brings with it disadvantages. These disadvantages include an offset water balance in the regenerator (i.e., more steam than is needed for the regeneration process), with the resulting need to remove the excess water created by the motive steam, which also results in an increased cooling demand so that the excess water can be

discharged.

[7] In the present case, the Applicant proposes to improve upon the known flue gas treatment systems (which also use absorber/regenerator units) by supplying part of the steam required by the stripper through flashing of the lean solvent. This steam is then reintroduced into the stripping column via a compressor. In this way less additional steam is required through recapture from the lean solvent, and the compressor eliminates the need for motive steam to reinject the flashed steam.

PROCEDURAL HISTORY

[8] The present application was filed on December 14, 2006 under the provisions of the Patent Cooperation Treaty and claims priority from an earlier United States patent application.

[9] In the Final Action, the Examiner rejected the application for two reasons: that the claims would have been obvious to the person skilled in the art and therefore non-compliant with section 28.3 of the Act, and that the specification was insufficient, and therefore non-compliant with subsection 27(3) of the Act. As a result of amendments made in response to the Final Action and discussions with the Applicant, the defect in relation to subsection 27(3) of the Act is no longer an issue, as noted in the SOR, which was forwarded to the Applicant on October 18, 2012.

[10] In a letter to the Applicant dated June 11, 2013 the Board

offered the Applicant an opportunity to be heard, in response to which the Applicant provided written submissions on September 16, 2013 and attended an oral hearing on October 4, 2013.

[11] The Applicant, in a letter to the Board dated October 3, 2013 and at the hearing, also clarified a point in relation to one of the documents applied under obviousness. The Applicant clarified their earlier position that one of the references applied by the Examiner under obviousness did not disclose a feature of the claims, namely flashing a lean solvent.

[12] We further note that as a result of a document submitted by the Examiner at the hearing, which document set out the points made by the Examiner at the hearing, the Applicant was given an opportunity to make further submissions in response thereto, which they declined in a letter dated October 11, 2013.

[13] The present recommendation takes into account the above noted record to date.

ISSUES

[14] The only issue remaining is that of obviousness, namely:

> Would claims 1-17 have been obvious to the person skilled in the art at the claim date in view of the prior art documents cited by the Examiner?

ISSUE: WOULD CLAIMS 1-17 HAVE BEEN OBVIOUS?

[15] Section 28.3 of the *Patent Act* sets out the conditions under which a claim may be found to be obvious:

> **28.3** 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 more than one year before the filing 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.

[16] In *Apotex Inc. v. Sanofi-Synthelabo Canada Inc.,* 2008 SCC 61 *(Sanofi)* the Supreme Court put forward a useful four-step approach to performing the obviousness assessment, which we utilize in our own analysis below:

> (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?

[17] In *Sanofi* the Supreme Court equated obvious with Avery plain@ (*Sanofi* at para. 65).

Analysis

(1)(a) The person skilled in the art

[18] In the Final Action the Examiner identified the skilled person as Athe engineer that operates and oversees the proper operation of a solvent regeneration unit.@ At the hearing and in their submissions to the Board, the Applicant did not dispute this characterization and so we proceed on this basis.

(1)(b) The relevant common general knowledge

[19] In the submissions of September 16, 2013, the Applicant agreed with the Examiner=s characterization of the common general knowledge of the skilled person, as set out in the Final Action:

> He or she would have advanced knowledge of fluid flow, transport phenomena, unit operations, material properties, process control, separation technologies, etc. He or she would also have the necessary knowledge to properly fluidly couple unit operations as needed.

[20] However, to the above the Applicant would add that the:

> notional person must know the peculiar requirements for operating a low pressure system such as a system specific to the processing of a combustion gas from a boiler or a turbine (see Applicant=s submissions of September 16, 2013 at page 12)

[21] The Applicant contends that the skilled person would understand the issues affecting the operation of such low pressure systems. As an example, the Applicant pointed to the presently claimed invention where the absorber and stripping column operate at about the same pressure (+/- 10 psi) as a result of processing

a low pressure gas. The Applicant also provided an affidavit from John Y. Mak of Fluor, USA which discusses conventional flue gas treatment and the associated operating parameters.

[22] We agree with the Applicant=s arguments above. In our view they are consistent with the background discussion in the present application where various known configurations of acid gas removal systems are described, including those which treat flue gas (e.g., the Econamine FGK and Econamine FG PlusK systems, at description page 1). We take such statements in the background discussion of the application to have been part of the knowledge of the skilled person (*Merck & Co., Inc. v. Pharmascience, Inc.*, 2010 FC 510 at para. 8).

[23] Given that such systems were known to the skilled person, the operational requirements of such systems would also have been part of the skilled person=s knowledge, as contended by the Applicant.

[24] We also note that the background discussion presents various known methods of improving the efficiency and/or economics of acid gas removal systems, such as the use of secondary regenerators, auxiliary strippers with steam flashed from the process, flashing of the rich solvent and multi-pressure strippers where the heat from vapors from each stage is used to heat upstream stages. Known problems with such systems include increased costs due to the necessary recompression of gases for injection upstream in systems where absorber pressure is significantly above regenerator pressure.

[25] The Applicant also discusses systems where steam is recovered by flashing the lean solvent, which steam is then reinjected into the stripping column to assist in the stripping process. The steam is reinjected using motive steam (which may be produced from the feed gas), which motive steam can offset the water balance in the regeneration process and increase cooling and water treatment demands as it must be removed and appropriately treated before discharge.

[26] Overall the background discussion indicates that there is an ongoing desire to improve the efficiency and/or economics of acid gas removal systems while avoiding the disadvantages of prior art systems.

[27] A last point of common general knowledge is one put forward by the Board in our letter of June 11, 2013. The Applicant, in a communication dated August 31, 2012, disclosed and discussed two documents, the Econamine FG PlusK (2003) document and a related international patent application no. WO 2004/005818, both of which originated from the present Applicant. These documents were referred to by the Examiner in the SOR as illustrating that it was already known to use absorber/stripper systems in systems that treat combustion gas from a boiler or a turbine. This was in response to a contention by the Applicant that part of the invention was the realization that such systems could be used in such a manner even though systems which treat combustion gas from a boiler or a turbine are more susceptible to backpressure issues.

[28] The knowledge taken from the WO 2004/005818 application and the

Econamine FG PlusK (2003) document by the Examiner was put forward by the Board as having been part of the common general knowledge of the skilled person, due to its extensive use, as illustrated in the Econamine FG PlusK (2003) document by 23 commercial applications around the world. In response the Applicant argued that the aforementioned document discloses a general scheme for solvent regeneration which is Amaterially distinguishable from the claimed invention@ and that it is primarily concerned with CO_2 capture. We agree with the Applicant that the system is different. However, the presently claimed invention is also intended to be used in a system for treating an acid gas such as CO_2. Therefore the skilled person would have at least known that absorber/stripper configurations were applicable to systems treating low pressure feed gases such as combustion gas from a boiler or a turbine. This point itself has not been disputed and so we take it to have been part of the common general knowledge. We also note that the Econamine FG PlusK system was described as background knowledge in the present application at page 1.

[29] With the above in mind, we turn to a consideration of the presently claimed invention.

(2) Identify the inventive concept or construe the claims

[30] In the Final Action the Examiner focussed on the independent claims in identifying the inventive concepts, which are all very similar. The Applicant, in their submissions of September 16, 2013 also focussed on the independent claims, using a common assessment for the group, but from the premise that they were

not obvious and therefore the dependent claims were not obvious as well.

[31] Below we first focus on the independent claims and thereafter proceed to consider the further features of the dependent claims.

The Elements of the Inventive Concept

[32] We set out claim 1 below as representative of the pending claims:

> 1. A method of regenerating a solvent in a process in which a feed gas comprising an acid gas is contacted with a lean solvent to thereby generate a rich solvent and a processed feed gas, comprising:
>
> absorbing in an absorber carbon dioxide from a flue gas to so form a rich solvent;
>
> wherein the feed gas is a combustion gas from a boiler or a turbine having a pressure between 15 psia and 50 psia, and wherein the absorber is operated at a pressure between 15 psia and 50 psia, and wherein the feed gas has a temperature of between 20EC and 100EC;
>
> pumping the rich solvent to increase the pressure of the rich solvent;
>
> forming a lean solvent from the rich solvent in a stripping column operating at about the same (+/- 10 psi) pressure as the absorber, using a first steam feed and a second steam feed;
>
> flashing the lean solvent to a lower pressure to thereby generate the first steam feed and a flashed solvent, wherein the first steam feed is introduced to the stripping column via a compressor; and
>
> wherein the second steam feed is produced from the stripping medium by a steam reboiler and wherein the stripping medium is recycled between the stripping column and the steam reboiler.

[33] In the Final Action, after reviewing the problems with the prior art and the proposed solution, the Examiner was of the view that the inventive concept was accurately reflected by the claimed subject matter with the exception of certain features such as the specific temperatures and pressures and the pumping step, as they did not solve a problem outlined in the description. With respect to the pumping step, the Examiner felt that the presence of such a step introduced extra equipment and costs into the process, contrary to what he felt the application was trying to avoid.

[34] The Applicant, in the submissions of September 16, 2013, submitted that it was not appropriate to identify an Ainventive concept@. The Applicant felt that the inventive concept could not be easily ascertained (*Sanofi* at para..67). Instead, their position was that the claims must be purposively construed in order to determine the essential and non-essential elements (*Whirlpool Corp. v. Camco Inc.*, [2000] 2 S.C.R. 1067, *Free World Trust v. Électro Santé Inc.*, [2000] 2 S.C.R.1024). We agree with the Applicant that claims must be purposively construed before determining issues of validity (*Whirlpool*, *supra*). However, per *Sanofi*, it is possible to assess obviousness in light of the inventive concept, if it can be readily identified.

[35] In the present case we view the inventive concept of the claims in a different manner than the Examiner. While the Examiner=s characterization of the problem was based on his view that all of the particular problems with specific prior art systems had to be individually avoided (see Final Action at page 5), as noted under our discussion of the common general knowledge, we see the problem

set out to be addressed as being to provide a more efficient and/or economical acid gas removal system. We do not, from the description, see a requirement set out that every disadvantage associated with a specific prior art system be avoided. In fact, as shown in the present description, although some operating parameters are less advantageous when using the claimed system, overall the invention represents a net energy and cost savings.

[36] In light of the above, and in view of the general focus of the claims and description on the use of the solvent regeneration system to treat a combustion gas from a boiler or a turbine, we see the particular pressures and temperatures of the independent claims, as well as the pumping step, to be an integral part of the inventive concept.

[37] Given that the stripping column operates at a low pressure, if a low pressure feed gas such as a combustion gas is treated in the absorber, the pressure in both columns would be about the same, as claimed.

[38] Similarly, the low pressures and temperatures recited for the absorber and feed gas are consistent with treatment of a combustion gas. Likewise, the presence of a pumping step is consistent with the use of a low pressure feed gas in that the pressure in the absorber is not high enough to allow for unaided flow of the rich solvent to the stripping column, therefore requiring pumping to overcome the system line losses. In contrast, in a high pressure gas treatment process such a step would be unnecessary.

[39] The Board therefore views the pressures and temperatures

specified in the claims, as well as the pumping steps, to be representative of the treatment of a low pressure combustion gas.

[40] For the purpose of this review, with respect to the inventive concept, it is sufficient to say that we would add to what the Examiner characterized as the inventive concept, the feature of treatment of a low pressure combustion gas. Other characteristics such as the associated temperatures and pressures then follow from this feature.

[41] Similarly, in any construction of the claim, the treatment of a low pressure combustion gas would be an essential feature which must be taken into account in comparison with the prior art. However, it would not be necessary to find specific recitations of temperatures and pressures or a pumping step, as again, these are representative of the treatment of such a gas. Such a view is also consistent with the discussion below of the differences between the inventive concept and the prior art.

(3) Differences between the Astate of the art@ and the inventive concept

[42] The Examiner found that claims 1-4, 6-9, 11-14 and 16-17 would have been obvious in view of British Patent application no. 2,074,035 to Batteux et al. (D2) and common general knowledge in the art. The Examiner also found that claims 5, 10 and 15 would have been obvious in view of D2 having further regard to United States Patent no. 4,160,810 to Benson et al. (D1), of course also in view of the common general knowledge although not explicitly stated as such. A detailed description of the above references is found under step (4)

of our analysis.

[43] In the Final Action the Examiner did not identify any differences between the state of the art and the inventive concept since he did not consider the particular temperatures and pressures, as well as the pumping step to have been part of the inventive concept. As shown above, the Board views these features as representative of the essential feature of treating a low pressure combustion gas such as that from a boiler or a turbine.

[44] The Applicant, in their submissions of September 16, 2013 and at the hearing contended that at least one of the following features is missing from each of the cited documents:

> (a) the feed gas is a combustion gas from a boiler or a turbine having a pressure between 15 psia and 50 psia;
> (b) the stripping column operates at about the same pressure (+/- 10 psi) as the absorber;
> (c) the rich solvent produced from the absorber is pumped before entry into the stripping column to increase the pressure of the rich solvent; and
> (d) flashing the lean solvent to a lower pressure to thereby generate the first steam feed and a flashed solvent, wherein the first steam feed is introduced to the stripping column via a compressor.

[45] In our discussion of the inventive concept above at step (2), we noted that the particular temperatures and pressures, as well as the pumping step, are consistent with the treatment of a low pressure combustion gas from a boiler or a turbine. As such, features (a) to (c) above are in essence a reflection of the fact that the feed gas is such a combustion gas. We also note that at the hearing the

Applicant conceded that the differences (a) to (c) noted above in fact are interrelated, and do reflect the idea of treating a low pressure combustion gas from a boiler or a turbine. Therefore the Applicant essentially contends that the prior art (in particular D2 with respect to the independent claims) differs from the claims in that:

> (1) it does not disclose treatment of a low pressure combustion gas; and
> (2) it does not disclose, in the treatment of such a gas, flashing of the lean solvent to a lower pressure to generate the first steam feed and a flashed lean solvent, wherein the first steam feed is reintroduced via a compressor.

[46] For the purposes of these reasons we take points (1) and (2) above as the differences over the state of the art. It is unnecessary in this case to determine if these features are in fact differences with respect to the state of the art, because for the reasons below, we find that the invention would have been obvious nonetheless.

(4) Do the differences constitute steps that would have been obvious?

[47] As discussed earlier in relation to the common general knowledge of the skilled person, various acid removal systems were known for treating various types of gases. In particular it was already well known to treat flue gases such as those from a gas turbine in an absorber/stripper system, as evidenced by the Applicant=s own Econamine FG PlusK system discussed in the background portion of the application and the associated Econamine FG PlusK (2003) document.

[48] We have also noted that in light of the common general knowledge there was a general desire to improve such systems so as to increase

the efficiency and/or economics of them. The hypothetical skilled person therefore would, in our view, be aware of any readily available documents which would address such an issue and determine if they would be applicable to the known treatment systems. Per *Eurocopter v. Bell Helicopter Textron Canada Ltée*, 2012 FC 113 at para. 80 the skilled person is presumed to be aware of any document that would be found in a reasonable and diligent search. As discussed below we view the D2 reference as one which would have been found in such a search and one which would have addressed the problems with the previously well known systems.

[49] Reference D2 cited by the Examiner relates to a process for regenerating an absorbent solution (solvent) as in the present application. The reference discloses a process in which acid gases such as CO_2 and/or H_2S are removed from a feed gas in an absorber (1) with a purified gas being produced at the upper end. In the particular example described in the D2 document, as noted by the Applicant in their submissions and at the hearing, the resulting rich solvent passes through a degassing flask, which reduces the pressure of the rich solvent. This is because the specific example is described in association with a high pressure feed gas such as natural gas, which necessitates a pressure drop before passing the rich solvent to the regeneration column, which column operates at a low pressure as in the present application and in Applicant=s Econamine FG PlusK system.

[50] However, as noted by the Examiner in the Final Action, and discussed below, the teachings of D2 are not limited to applications in which the feed gas to be treated is a high pressure gas.

[51] As a first point, the abstract of the D2 document characterizes the disclosed invention as relating to:

> a process for regenerating an absorbent solution, for example an aqueous solution of an alkanolamine, containing acid compounds such as CO_2 and/or H_2S, in which said compounds are released by heating and/or stripped away. The regenerated absorbent solution, drawn off from the regeneration zone, is subject to a plurality of successive expansions with formation of a vapour phase in the course of each expansion, and the vapour phases thus formed are gradually recompressed to form an overall compressed vapour phase, which is introduced into the regeneration zone.

[52] Therefore, like the presently claimed invention, the process of D2 teaches the use of flashing or Aexpansion@ of the lean solvent (i.e., regenerated absorbent solution) to generate a vapour phase (i.e., steam) which is then recompressed and reintroduced into the regeneration zone. The abstract continues:

> Such a process of regeneration with expansion of the regenerated solution is used in the regenerative processes for scrubbing gases containing acid compounds and renders possible an appreciable overall savings of energy.

[53] To a person looking to improve the energy efficiency of an absorber/regenerator system used to treat a feed gas such as a flue gas containing such acid compounds, such a document would be very relevant.

[54] At pages 1 and 2 of the D2 document, prior art problems similar to those discussed in the present application are presented, such as the use of motive steam to reinject flashed steam which will upset the water balance in the system.

[55] The invention of D2 proposed expanding the lean solvent (e.g., an amine based solvent) to form a vapour phase (i.e., steam) which is then, after being recompressed (e.g., via an axial compressor), reinjected into the regeneration zone, Asaid regeneration process being generally applicable and overcoming the drawbacks of the prior art process mentioned hereinabove using an expansion of the regenerated absorbent solution@ (D2 at page 2, lines 26-28, emphasis added).

[56] As stated at page 2, lines 33-35 of the D2 reference:

> the regeneration as proposed by the invention makes it possible to make an overall saving of energy which is appreciable with respect to the regeneration carried out in conventional manner.

[57] The D2 reference therefore focusses on the same goals as the present application and achieves these goals by proposing an expansion of the lean solvent, thereby generating a source of steam for the stripping process which is then recompressed and introduced into the stripper. Like the present claims, this results in two steam sources, one from the expansion step (24, 27) and one from the heating in a reboiler (14) of the stripping column solution (see Figure 1 of the D2 reference).

[58] To return to the two differences set forth by the Applicant between the D2 reference and the claims (namely the feed gas being a low pressure combustion gas as opposed to a high pressure gas, and the step of flashing the lean solvent to a lower pressure to generate a steam feed), we find from the discussion of the D2 reference above that it clearly discloses the step of flashing the lean solvent to

generate a steam feed which is recompressed and reintroduced into the stripping column. Although in D2 with respect to the particular embodiment discussed therein, expansion (i.e., flashing) and recompression occurs in two stages, the present independent claims broadly specify expansion and recompression, therefore not being limited to any particular number of stages.

[59] With respect to the treatment of low pressure combustion gas as opposed to a high pressure gas, we agree with the Applicant that the particular example discussed in D2 relates to the treatment of natural gas which is at a high pressure (e.g., 78 bars). However, as we have already pointed out, the D2 document describes the principle which is the focus of the document (i.e., the flashing of the lean solvent to form a supplemental steam feed and subsequent recompression) as being Agenerally applicable@. Further, in its general description of this invention, for example at page 2, the D2 document places no limits on its application other than that it is useful in a system comprising an absorber and regenerator which are used to remove acid gases such as CO_2 and H_2S.

[60] Likewise, the D2 reference discloses that the invention is applicable to the treating of gases at absorber pressures ranging from 1 to 120 bars and at temperatures ranging from 30 to 110EC. Low pressure combustion gases would fall within these values, as would the particularly specified ranges in the present claims, which are based on such combustion gases.

[61] The Applicant in their submissions of September 16, 2013 argued that because the particular example described in the D2 reference deals with the treatment of high pressure natural gas and therefore

includes a degassing flask, the skilled person would not take the disclosed system to be applicable to the treatment of low pressure combustion gas. Likewise, in the affidavit of John Y. Mak provided with the above noted submissions, it is contended that the system described in D2 is not suitable for treating a combustion gas with a low atmospheric pressure. In the same vein, the Applicant has argued that D2 does not suggest operation of the absorber and regenerator column at the same pressure, nor does D2 suggest the pumping of the rich solvent to increase its pressure for passage to the regenerator.

[62] We see these distinctions as being interrelated in that they arise from the choice of treating a low pressure combustion gas, which was conceded by the Applicant at the hearing. As we have found that D2 also suggests that the flashing and recompression features are applicable to a wide variety of gas pressures and temperatures in an absorber/regenerator combination, including low pressure gases, the decision to apply such a principle to treatment of such a gas cannot be inventive. Once that course of action is suggested, then, as the Applicant noted with respect to the common general knowledge of the skilled person, such a person would have been aware of the peculiar requirements for operating a low pressure system, such as the fact that the absorber and regenerator would operate at about the same pressure. Also, because the combustion gas is at a low pressure, there is no significant pressure difference between the absorber and regenerator which would drive the solvent from one to the other, thereby leading to the necessity of pumping the solvent towards the regenerator. The necessity for such a pumping step is illustrated by the Econamine FG PlusK flue gas treatment system discussed by the Applicant in the background and particularly

described in the Econamine FG PlusK (2003) document submitted by the Applicant. Similarly, in using the principle from D2 in a low pressure system, the skilled person would have known that a pressure reduction device such as the degassing flask of D2 would be unnecessary.

[63] The Applicant has also argued that there was no motivation to alter the system in D2 to arrive at the invention, in particular to take the specific steps cited as differences under step (3). However, in our view, given that the skilled person was motivated to improve the efficiency and/or economics of the commonly known systems, be they low pressure or high pressure systems, and that D2 suggests a principle generally applicable to the regenerator portions of such systems (a principle which leads to an appreciable overall energy savings), the skilled person would have immediately recognized the advantages of using the D2 regenerator modifications in a system which treats low pressure combustion gases.

[64] Once this link was made, the skilled person, in accordance with the relevant common general knowledge, would have known how to apply such modifications to a low pressure feed gas treatment system (i.e., operating pressures, whether to include a pump, etc.)

[65] We note that the Applicant has also made submissions on the invention not being Aobvious-to-try@. However we see no reason to conduct such an analysis in the present case. In any case, the points put forward in relation to this principle by the Applicant are the same as the points already put forward under obviousness generally.

[66] In the submissions of September 16, 2013 the Applicant also

contended that because of the age of D2, being published about 25 years before the filing date of the present application, this was a strong indication that the claimed invention was not obvious. Where a great deal of time has passed and upon disclosure of the invention it becomes universally adopted by those in that field, such a situation may point to inventiveness (*Pope Appliance Corp. v. Spanish River Pulp & Paper Mills, Ltd.*, [1929] 1 D.L.R. 209). However, there is no such evidence in the present case and therefore the simple age of the reference on its own is not sufficient to displace our conclusion on the obviousness of the claims.

[67] Finally, while the independent claims vary in form, namely claim 1 is to a Amethod of regenerating a solvent@, claim 7 is to a Amethod of upgrading an existing stripping column@ and claim 12 is to a Asolvent regeneration system@ we see them as sharing the same essential elements and inventive concept, whether such element is in the form of a component of the system or the function of such a component. This is in accordance with the Applicant=s submissions where it was stated that the other independent claims 7 and 12 Asimply represent other aspects of the invention and refer to the same features@ (Applicant=s submissions of September 16, 2013 at page 11).

[68] We therefore find that independent claims 1, 7 and 12 would have been obvious.

The Dependent Claims

[69] Having found that the independent claims would have been obvious, we then find that the dependent claims 2-4, 6-9, 11, 13, 14, 16, and 17 would have been obvious. These claims merely specify

details of the system operating parameters such as additional pressure ranges and the type of solvent (e.g. an amine solvent), all which are found within D2 or the common general knowledge of the skilled person when treating a low pressure combustion gas. The Applicant has not contended that the additional features of these claims lead to any further inventive step.

[70] The Examiner also alleged that dependent claims 5, 10, and 15 would have been obvious based on D2 in light of D1. D1 discloses an invention similar to that of D2 in that a high pressure gas is treated in an absorber/regenerator combination. The Applicant argues that D1 is not applicable because the lean solvent is not flashed to generate steam which is reinjected into the regenerator. While we note that D1 does show flashing of steam from the lean solvent in a flashing tank (18) (see Figure 1 of D1) and recompressing the vapour produced prior to reinjection into the regenerator, the purpose of citing D1 in the present case by the Examiner was simply to show that the use of the particular types of compressors specified in dependent claims 5, 10, and 15 would not have on its own made the combination of steps or components inventive. D1, in a similar arrangement to that of D2, discloses the use of a steam turbine compressor as opposed to the mechanical axial compressor of D2. On this basis, the particular choice of type of compressor would have been within the expected skill of the person skilled in the art.

[71] We therefore find that dependent claims 5, 10, and 15 would have been obvious as well.

RECOMMENDATION OF THE BOARD

[72] In view of the above findings, the Board recommends that the application be refused for being obvious and therefore non-compliant with section 28.3 of the *Patent Act*.

Stephen MacNeil	Paul Sabharwal	Owen Terreau
Member	Member	Member

DECISION OF THE COMMISSIONER

[73] I concur with the Patent Appeal Board=s findings and its recommendation that the application be refused for being obvious and therefore non-compliant with section 28.3 of the *Patent Act*.

[74] Accordingly, 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.

Sylvain Laporte
Commissioner of Patents

Dated at Gatineau, Quebec,
this 20th day of December, 2013