Paper No. 15

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte ANTERO LAINE AND
OLAVI PIKKA

Appeal No. 2001-0065
Application 09/048,289

ON BRIEF

Before WILLIAM F. SMITH, Administrative Patent Judge, McKELVEY, Senior Administrative Patent Judge, and MOORE, Administrative Patent Judge.

MOORE, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 from a final rejection of claims 1 – 24, all the claims pending in this application.

REPRESENTATIVE CLAIM

Claim 1,18, and 21, which are illustrative of the subject matter on appeal, read as follow:

1. A method of producing chemical pulp, comprising the steps of:

(a) cooking comminuted cellulosic fibrous material to produce brown stock having shives;

(b) washing the brown stock to produce chemical pulp at a consistency of between about 6-18%;

(c) oxygen delignifying the chemical pulp at a consistency of between about 6-18%;

(d) screening the pulp from step (c) to produce at least an accept fraction and a shive-containing reject fraction;

steps (a) – (d) being practiced in a main fiber line; and then after step (d):

(e) further treating the accept fraction, and (f) directly transporting the shive-containing reject fraction back to the main fiber line before step (c).

18. A chemical pulp producing fiber line system, comprising:

a fiber line comprising in sequence: a digester for cooking cellulosic fibrous material to produce brown stock; a first washer for washing the brown stock from said digester; at least one oxygen delignification stage, and a screening stage for screening chemical pulp from said oxygen delignification stage to produce an accepts fraction and a shive-containing rejects fraction; and

means for directly transporting the shive-containing rejects fraction to said fiber line before a said oxygen delignification stage.

21. A method of producing chemical pulp comprising the steps of:

(a) cooking comminuted cellulosic fibrous material to produce brown stock;

(b) washing the brown stock to produce chemical pulp; and

(c) oxygen delignifying the chemical pulp at a consistency of between about 6 – 18%, and to allow the shives to become impregnated by alkaline liquid to enhance separation of fibers; and wherein oxygen delignification is practiced utilizing at least first and second distinct oxygen delignification stages each comprising an upflow vessel, and at least one of the vessels including a multiple feeding device; and

(d) during the practice of step (c), subjecting the pulp to mechanical action without refining so as to produce an oxygen delignified chemical pulp substantially devoid of shives so that downstream screening of the oxygen delignified pulp is unnecessary.

THE REFERENCES

In rejecting the appealed claims under 35 U.S.C. § 103, the Examiner relies on the following references:

United States Patents

Ahs et al. (Ahs)	4,895,619	Jan. 23, 1990 (filed Jan. 30, 1989)
Mannbro (Mannbro)	4,595,455	Jun. 17, 1986 (filed Sep. 4, 1981)
Prough (Prough)	4,220,498	Sep. 2, 1980 (filed Dec. 14, 1978)

Foreign Patent Documents

Nummenaho et al. (Nummenaho)	CA 2,132,056	Mar. 16, 1995

Other Prior Art

Specification, page 14, lines 2-5, referencing Finnish Patent FI 924,805 (Admitted Prior Art)[1].

THE REJECTIONS

For clarity, the rejections of record are summarized below:

(A) Claims 1, 3, 4, 13, 14, 16, 18 and 20 are rejected under 35 U.S.C. §103(a) as being unpatentable over Ahs, with or without Mannbro

[1] It is noted that the Examiner relied upon the discussion of a "conventional" multiple feeding device contained in the specification by reference to a Finnish Application without obtaining a copy of the cited Finnish Application. The Appellants did not provide a copy of the Finnish Application, nor any other references cited in the application. This is inconsequential as the "admission" based on the substance of the Finnish Application is not in dispute and it is cumulative to other references. However, we note that references in general, especially if their disclosures are referenced or relied upon in formulating rejections, should be provided by Applicants or obtained by the Examiner and if necessary translated. We have obtained a copy of the reference and placed it in the record for future consideration if it should be necessary.

(B) Claim 2 is rejected under 35 U.S.C. §103(a) as being unpatentable over Ahs in view of Mannbro, further in view of Prough.

(C) Claims 5-8, 11-12, 17 and 19 are rejected under 35 U.S.C. §103(a) as being unpatentable over Ahs with or without Mannbro, and further in view of Canadian Patent 2,132,056 or Admitted Prior Art (Finnish Patent 924,805)

(D) Claims 9, 10 and 15 are rejected under 35 U.S.C. §103(a) as being unpatentable over Mannbro with or without Ahs, further in view of Prough.

(E) Claims 21-24 are rejected under 35 U.S.C. §103(a) as being unpatentable over Ahs with or without Mannbro, with or without Prough, further in view of Canadian Patent 2,132,056 or Admitted Prior Art (Finnish Patent 924,805).

SUMMARY OF DECISION

After review of the entire record on appeal, we affirm rejections A, B, and C of record, except that we vacate rejection A as it applies to claim 14, reverse rejection A over Ahs alone, and reverse rejection C as it applies to claims 6, 7, 8, 11, 12, and 19. We reverse rejections D and E, and impose a new ground of rejection upon claim 14 under 35 U.S.C. §112, second paragraph.

DISCUSSION

The Invention

The Appellants' invention relates generally to a method of producing chemical pulp by (in a main fiber line) cooking the cellulosic fiber material to produce brown stock, washing the brown stock to produce chemical pulp at a consistency of between about 6 – 18%, oxygen delignifying the chemical pulp at a consistency of between about 6 – 18%, screening the pulp to produce an accept fraction and a reject fraction containing shives. The accept fraction is then further treated, while the reject fraction is directly transported back to the main fiber line before the delignification stage. The claims of

the instant application relate to methods of producing the chemical pulp and a chemical pulp producing fiber line system.

The Rejections

(A) Claims 18, 1, 3, 4, 13, 14, 16, and 20 are rejected under 35 U.S.C. §103(a) as being unpatentable over AHS ET AL with or without MANNBRO.

In sum, the rejection over Ahs alone (the complete text of which may be found in the Examiner's Answer, page 3, line 4 to page 4, line 9) relies upon Ahs to teach cooking to produce brown stock, washing, oxygen delignifying, screening, and returning the shive containing reject fraction to the main fiber line before the oxygen reactor. The rejection concludes it would have been obvious to remove the secondary reactor and continuously recycle the rejects.

We find that the Examiner has not provided sufficient motivation within Ahs alone to establish a prima facie case of obviousness. The Examiner has stated, without elaboration, that:

> It would have been obvious to the artisan that the oxygen delignification stage (6) could be eliminated and the reject recycled directly to the fiber line before the oxygen reactor (3) and recycled through the reactor (3) several times until the reject passes through the screen. (Examiner's Answer, page 3, lines 14-17).

Our review of Ahs fails to show any motivation for removing the reactor (6) from the process of Ahs. Ahs seems to us to teach towards the inclusion of additional reactors, up to as many as are necessary. See, e.g. column 2, line 1 ("at least one"), column 3, lines 36-41 ("If desired, any branch line may be provided with one or more additional secondary reactors in order to increase the degree of delignification and relieve the screening apparatus since the number of times a particular bundle of fibers has to be recirculated can be correspondingly reduced.")

Accordingly, we reverse the rejection over Ahs alone.

Turning now to the combination of Ahs with Mannbro, Ahs is as discussed above and Mannbro is relied upon "if necessary" to teach recycling without refiner or oxygen treatment. We note that Mannbro clearly illustrates recycling in the fiber line without further treatment (See, e.g. the Figure, reference numerals10 and feed line to 8) and as such the Examiner has established a prima facie case of obviousness.

The Appellants first argue that the wrong standard of patentability has been applied by the Examiner, stating that it is "not the burden of applicant to show unexpected results" (Appeal Brief, page 5, lines 12 – 13). We believe that the Appellants have misinterpreted a sentence contained in the rejection, where the Examiner perhaps inartfully and gratuitously noted that "No unexpected results have been shown for passing through a single oxygen reactor 2 times compared to 2 separate oxygen reactors" (Examiner's Answer, page 3, lines 17-18). First, to the extent this applies to the rejection over Ahs alone the issue is moot as we have reversed that rejection. Second, to the extent this statement may be said to be applicable to the rejection over Ahs in view of Mannbro, the discussion contained in the Examiner's Answer, page 7, line 15 to page 8, line 17 clearly indicates that the Examiner's position on obviousness is founded on the cited art and not predicated upon a failure of the Appellants to make a showing of unexpected results.

Addressing the substance of the rejection, we note that the Appellants have argued that the modification of Ahs by removing the reactor "would specifically go against the teachings of Ahs et al which require the additional oxygen reactor" (Appeal

Brief, page 6, lines 8-9). The Appellants further state, with regard to the combination with Mannbro, that:

> [T]here clearly is no *prima facie* case of obviousness is apparent from an evaluation of Mannbro. The Mannbro reference does not provide any assistance to Ahs et al as far as teaching the claimed invention is concerned, and in fact also provides a teaching specifically contrary to the invention since Mannbro requires high consistency (that is about 30%) oxygen delignification of pulp. Thus it would be specifically against the teachings of Mannbro to modify Ahs et al to provide the invention, which uses medium consistency oxygen delignification. This can never be considered obvious. (Appeal Brief, page 8, line 17 – page 9, line 1).

The Appellants additionally argue in their Reply Brief that elimination of the reactor of Ahs is based on hindsight and reconstruction of the prior art with the invention in mind as the "essence" of Ahs is to utilize a second oxygen reactor and it can "never" be considered obvious to go against the essence of an invention (Reply Brief, page 1, lines 7 – 12).

The Appellants also contend that the Examiner selectively viewed the prior art with the invention in mind, arguing that in the "pulp and paper art, medium and high consistency treatments are universally recognized as being significantly different" (Reply Brief, page 2, lines 17-21), and that the Examiner erred in reciting 18% as a consistency of Ahs.

We believe that the Appellants have over focused on the differences of the Ahs and Mannbro references. Both are highly relevant to the present invention, relating to the same field of endeavor and describing very similar processes. While we agree that the Examiner mistakenly stated that Ahs disclosed 18% (we, like the Appellants, can find references only to 15% and "medium consistency" in Ahs (see, e.g. column 2, lines

13-14 and claim 16)), we do not find this difference sufficient to render the combination improper.

Both Ahs and Manbro are concerned with the treatment and disposition of shives in a chemical pulp process, and utilize a recirculating loop arrangement to accomplish this disposition. The fact that Mannbro may relate to a high consistency delignification process does not lead one of skill in the art away from the combination, as it is not the particular delignification process that is the central issue to one of skill in the art. While high consistency and medium consistency delignification may be different, the remainder of the disclosed structure and processes are nearly identical. Furthermore, in Mannbro the pulp is pressed in only stage 8, and rediluted before being screened in stage 10.

Thus, the pulp is only of high consistency for a very small portion of its journey through the Ahs apparatus (the reactor) and at one of skill in the art would be familiar with presses and redilution to adjust as necessary to engineer a plant.

The Appellants also further criticize the Mannbro reference, stating "Also the Mannbro reference does not teach circulating a reject fraction upstream of an oxygen reactor, as is recited in claim 1" (Appeal Brief, page 9, lines 10 – 11). In support of this statement, the Appellants assert a lack of clarity and state that:

> Mannbro teaches in figure 1 and in column 1, lines 42 through 55, that chemical pulp passes through a press 8 and an oxygen reactor and then is diluted and passes to a screen 10. A line is shown in figure 1 of Mannbro leading from the screen 10 back through a valve to the press 8. No description is provided of what that line is, why a valve is there, etc. However, it appears from column 5, lines 51 through 54, that knot cores, bark, etc. are rejected from the system. That is that the course rejects, which would include shives, are completely discharged from the system and not used in any other way. The fine impurities, such as stickies, appear to be returned to the main line of the process. It is believed that in line 50 of column 5 of Mannbro that several screening steps are

> discussed, and the accepts of the second intertiary screening stages are returned upstream of the oxygen reactor, whereas the rejects are totally discharged. Thus, it is believed that Mannbro's teachings are specifically distinct from the claimed invention in which the coarse fraction of the rejects, including shives, are returned prior to the oxygen reactor. Thus, Mannbro does not teach the invention of claim 1, nor any reason why this would be provided, nor any reason why Ahs et al would be modified in view of Mannbro. (Appeal Brief, page 9, line 16 to page 10, line 6)(Emphasis in Original).

We disagree with this interpretation of Mannbro, and point the Appellants to the entire disclosure of Column 9, line 39, to Column 10, line 2, which discusses Figure 1. There the function of the line in Figure 1 leading back to the press is clearly described at lines 63-69 of Column 9, which we reproduce as follows:

> If it is desirable to bleach away such material in the oxy-stock which material normally would be rejected from the process in the form of screening rejects, this material can instead, preferably after disintegration, be returned to the brown stock to be subjected to repeated oxygen delignification.

While disintegration is preferred, it clearly is not required. Thus, Mannbro discloses the feeding of the rejected shives back into the brown stock, with or without further processing.

The Appellants also assert that there is an "unexpected" advantageous result in the present invention – in the elimination of the expense of an additional oxygen reactor without the elimination of its function (Appeal Brief, page 5, lines 25-26). The Examiner notes in reply that:

> The instant process would require several passes to obtain the same shive reduction taught by AHS. The oxygen delignification reactor of the instant case would have to be larger than the oxygen delignification reactor of AHS to handle the additional passes of pulp. Such may not result in economic savings (Examiner's Answer, page 8, lines 8-11).

While the decreased operating expense (if any) might be advantageous, we do not see the purported process economies of the screenroom rejects feeding into the

oxygen reactor as sufficient to overcome the prima facie case of obviousness. To quote the cited article, which includes as an author co-inventor Pikka himself:

> "The screenroom location, among others, is a question of the process economy and layout of the mill". S. Martikainen, R. Lopponen, O. Pikka, and J. Vehmaa "Mill Scale Experiences of a New Screenroom and Oxygen Stage Application", page 248, column 1, lines 32-35, 1998 International Pulp Bleaching Conference, June 1-5, 1998 Helsinki, Finland.

Furthermore, and importantly, there is simply no quantitative evidence of these economic savings in the form of a declaration containing factual data.

The Appellants have argued that there is no basis upon which one would go against the teachings of Ahs which require the additional reactor, citing Uarco v. Moore Business Forms, 440 F.2d 580, 585, 169 USPQ 263, 267 (7th Cir. 1971); In re Fleissner, 264 F.2d 897, 121 USPQ 270 (CCPA 1966); In re Edge, 359 F.2d 896, 149 USPQ 556 (CCPA 1966), and Ex Parte Thomson, 184 USPQ 558, 559 (Bd. App 1974). All of those cases are easily distinguishable on their facts.

In Uarco, the references were not readily combinable, and both references had portions which had to be discarded. In Fleissner, the CCPA noted that the manner of operation of the invention was "altogether foreign to the teachings of the reference patent". Fleissner, 264 F.2d at 900, 121 USPQ at 271-2. In the present instance, the Ahs and Mannbro references are clearly related, easily combined, and the omission of a separate oxygen delignification unit on the branch line does not compare to a "manner of operation altogether foreign" to the teachings of the art as a whole.

In Edge, the CCPA did note that it may be unobvious to remove an element while retaining its function, but also that there was no suggestion to bond a thin layer of metal directly to a card and obscuring a printed indicia thereon. In the present instance, there

is an unambiguous teaching in Mannbro to recycle the shives without further treatment to the fiber line. Finally, Thomson is distinguishable as the combination of Ahs and Mannbro in no way acts to "destroy" the Ahs apparatus for its intended purpose. Rather, Ahs is modified, but still accomplishes its goal of refining pulp while keeping a relatively stable kappa number (Ahs, column 2, lines 7-12).

We note that the test for obviousness involves consideration of what the combined teachings, as opposed to the individual teachings (and, by extension, components thereof), of the references would have suggested to those of ordinary skill in the art. In re Young, 927 F.2d 588, 591, 18 USPQ2d 1089, 1091 (Fed. Cir. 1991); In re Keller, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981). The art as a whole would instruct one of skill in the art to recycle shives prior to delignification, as many times as necessary with appropriate screening and washing, which differs significantly from the Appellants' interpretation of the Ahs reference alone. While Ahs may not teach the elimination of the reactor, we do not agree that their removal acts to destroy Ahs, as the overall function of Ahs remains intact.

Having determined that a proper prima facie case of obviousness has been made out by the Examiner by the combination of the Ahs and Mannbro references, we now turn to consider the rebuttal evidence in the record and reweigh the entire matter, as required by In re Hedges, 783 F.2d 1038, 1039, 228 USPQ 685, 688 (Fed. Cir. 1986).

The Appellants note in the Appeal Brief, at page 6, line 25 to page 8, line 16 that they have placed evidence in the record that the invention has been commercialized and recognized in the art. A review of that evidence shows that, in sum:

1) A commercial mill in Norrsundet, Sweden may practice the invention.

2) A commercial mill in Imatra, Finland may practice the invention.

3) In 1996 Mr. Pikka co-authored a paper on the process that was selected for publication based (in part) upon whether it relates to new information of interest to the pulp and paper trade. Mr. Pikka in his declaration states that the process reported in the article is according to the invention, and results in higher yield, savings in chemicals, improved cleanliness, heat economy, reduced foaming and anti-foaming agent.

4) In 1998 Mr. Pikka co-authored a paper on the process that was selected for publication based (in part) upon whether it relates to new information of interest to the pulp and paper trade. Mr. Pikka in his declaration states that the process reported in the article is according to the invention, and results in higher quality pulp, improved yield, cleaner, and improved economy by reduction of heat expenses.

The Examiner was unconvinced by the declaration of Pikka, noting, inter alia, that:

> The evidence suggested shows that some processes, it is not clear if it is the claimed process, has been used commercially. There is no evidence that the technology has been sold or otherwise been commercially successful. There is no evidence that this technology has been sold to other companies? Nor has evidence been presented to show that sales increased due to the new technology. The evidence presented is “not” commensurate in scope with the claims. The claims call for separating the accepts and rejects and “directly” transporting the rejects to the fiber line. The Commercial mills pass the reject to other screening and pressing stages after the accept and reject separation. It is “not” directly transported to the fiber line. There is no evidence that any commercial success was due to the “direct” recycle of the rejects. For example, Exhibit A shows the reject passing from the screens (M800,M400) to some other structures. It is not “directly transported” to the main line. The additional structures appear to include a screw press. Such a press would mechanically work the pulp. The screw press would break up any remaining shives.

The Appellants state that the "highly relevant evidence has been ignored" (Appeal Brief, page 7, line 10). In the contrary, it appears from the above that the Examiner has considered the evidence, but found it to be unpersuasive.

We note that the mere existence of commercial use is not sufficient. In Ruiz v. A.B. Chance, Inc., 234 F.3d 654, 57 USPQ2d 1161 (Fed Cir. 2000) the court illustrated the methodology and analysis that should occur in regard to secondary considerations when making an obviousness determination:

> Accordingly, we urge the district court to make findings as to: 1) whether secondary considerations rebut a prima facie case of obviousness; and 2) if the evidence of secondary considerations is probative, whether there is a nexus between the claimed invention and commercial success. See Simmons, 739 F.2d at 1575, 222 USPQ at 746 (" A nexus between the merits of the claimed invention and evidence of secondary considerations is required in order for the evidence to be given substantial weight in an obviousness decision.").

In the present instance, the Examiner has followed the Ruiz suggested methodology. First, he questioned the nexus between the merits of the claimed invention and the evidence of secondary considerations. Exhibits A and B or the Pikka declaration are ambiguous at best as to whether they embody the claimed invention. Both exhibits illustrate either additional undefined processing in the return line, or no return line at all, as noted in the Examiner's answer, page 10, lines 14 et seq. No statement rebutting this is seen in the Reply Brief, and our independent review of the declaration confirms the Examiner's position.

The Appellants have stated that the claim language "substantially only conveyed" places no limitations on other types of treatment which can occur in the branch line other than refining or accessory oxygen delignification (Appeal Brief, page 7, lines 18-22).

We disagree with this interpretation of the claims. Both claims 1 and 18 clearly recite "directly transporting" and the specification, page 6, lines 19-24 notes:

> The term "directly transporting" as used in the present specification and claims with respect to conveyance of pulp from after an in-line screening stage to before an in-line oxygen delignification stage means that the pulp is substantially only conveyed from one place to the other, e.g. by pumping or pressure differential, without refining or accessory oxygen delignification.

This language is clear. Substantially only conveyed from one place to the other is the meaning to be given to the term "directly transported", and as an example, is illustrated pumping or pressure differential transport without refining or accessory delignification. As a consequence, other major processing steps beyond conveying are excluded, although conceivably minor carryover, e.g. a continuation of delignification, could occur. Had the Appellants desired more leeway in processing during the transport process, they should have chosen language other than "directly transporting."

In Exhibit A, the Appellants have not made clear the function of elements M800, M400, or the structure between M400 and M800. Given that they are said to be additional screening (Pikka declaration, paragraph 2, line 4) and there is evidently another processing stage between the screening steps, the Examiner correctly determined that the process diagram does not correspond to the claimed subject matter. In Exhibit B, the function of the devices between lines 22 and 23 is unclear, and the diagram is incomplete. We are additionally unable to see a return line from the rejects to the digester, despite the declaration saying this is so.

In any event, it seems clear that neither Exhibit A nor Exhibit B comport with the claim restrictions "substantially only conveyed" and as such this evidence lacks a nexus to the claimed invention.

Even were we to accept arguendo the Appellants' interpretation of the claims, and that there was a nexus, we would still arrive at the conclusion that the probative value of Exhibits A and B is negligible. The fact that a commercial process is in place in two locations does not provide evidence of commercial success. The relevant types of evidence include inter alia, copying, long felt but unsolved need, failure of others, commercial success, unexpected results created by the claimed invention, unexpected properties of the claimed invention, licenses showing industry respect for the invention, and skepticism of skilled artisans before the invention. See, e.g., In re Rouffet, 149 F. 3d 1350, 1355, 47 USPQ2d 1453, 1456 (Fed. Cir. 1998).

In In re Huang, 100 F.3d 135, 139-40, 40 USPQ2d 1685, 1689-90 (Fed. Cir. 1996), the Federal Circuit noted that even though several hundred thousand units had been sold, the evidence had no context which enabled an assessment of its probative value.

> In the present case, Huang has simply not provided sufficient information upon which the PTO could determine whether the grips were commercially successful. Although Huang's affidavit certainly indicates that many units have been sold, it provides no indication of whether this represents a substantial quantity in this market.

The same applies here. The evidence of record does not establish how many pulp mills exist worldwide, what percentage changeover this represents, how much money in materials was saved, how the effluent from the plant was measurably reduced, or any other quantified benefit. Further, there is no declaratory evidence as to licenses, royalties, or acclaim within the industry. Of particular note - there are no cost savings enumerated over the closest prior art despite the heavy emphasis placed upon this in the Appellants' arguments.

The two published papers do not provide "recognition" in the art of the invention. The statement that they are in part "of interest to the pulp and paper trade" (Pikka declaration, page 2, paragraph 4, lines 3-4) does not indicate (1) if any peer review or other screening for merit occurred, as is usually the case for, e.g. academic publications or (2) what other considerations went into the decision to publish the articles (presumably the other part).

Turning now to the substance of the papers from the bleaching conference, we initially note that they are not declaratory evidence, per se. The data presented in the publications would have best been provided in declaration form, comparing the closest prior art directly, and illustrating the benefits of the invention.

We look to the declaration, pages 2-3, paragraphs 4 and 5 for the Appellants' interpretation of the articles. According to declarant Pikka, the processes are according to or relate to the practice of the invention and:

> This procedure results in a higher yield, savings in bleaching chemicals, and improved cleanliness, improved heat economy, reduced foaming tendency, and a lower consumption of anti-foaming agent, compared to if screening is before the oxygen delignification, and by recirculating the rejects directly back to the fiber line – rather than treating them with an additional reactor – the costs associated with the additional reactor are eliminated, yet the results are just as advantageous. (Pikka declaration, page 3, lines 3-9, relating to Exhibit C)

and

> As reported in this paper [Exhibit D], actual tests and observations show that by practicing the method of claim 1 of the above-identified application utilizing the apparatus of claim 18 it is possible to have a significant positive impact on the quality of the pulp in the operation and economy of the entire delignification process. The quality of the pulp produced is good with the pulp going to bleaching so clean that it does not cause problems in bleaching. Because oxygen delignification is a mild fiberizer of shives, the quality of the fibers produced is good and there is improved yield. Also there is improved heat economy (typically a savings of 50 – 100 Adt of steam per ton of pulp) compared to if screening takes place before oxygen delignification, and there is a large

> savings in equipment compared to if an additional oxygen reactor is utilized in the rejects recirculation.

We are unpersuaded by the conclusory statements contained in the declaration, and the data in the articles.

Specific to Exhibit C, we find that some of the purported benefits are attributed to other features. Specifically, at page 106, column 2, lines 7, it is stated that:

> Because there are [sic] fractionated three-stage washing, the washing loss to bleaching is extremely low, less than 5 kg/COD/ADMT. The consumption of bleaching chemicals has dropped considerably and the quality of the pulp has improved.

Even if the improved results are somehow to be attributed to the claimed invention, they are not unexpected from a recirculating system in general. Ahs maintains a kappa number (Ahs, column 2, lines 7-12) and results in a reduction in chlorine consumption, purer pulp with improved strength, and reduced energy (Ahs, column 1, lines 45-62).

Turning now to Exhibit D, the results are equivocal vis-à-vis the claimed subject matter. Initially, it should be noted, that of all the experimental or mill set ups described, only Figure 7 appears to recirculate rejects to the brown stock before delignification. Furthermore, there seem to be several screening and separating steps for the reject portion between the delignification step and the return to the brown stock. The process steps referenced by F3/0, 3xRB300HD, F2/0, and KW4R are undefined, although the figure caption appears to refer to them as light reject removal, sand separation, and reject washing.

Secondly, throughout the article various tests are run, but none are correlated directly to the setup of Figure 7. The conclusion states merely that “[t]he screenroom

connection after oxygen delignification has a positive effect on the quality of the pulp and on the operation and economy of the process" (Exhibit D, page 250, column 1, lines 17-19). That, simply, does not equate to the claimed subject matter and the screenroom location has been said, by the inventors, to be a choice of process economy of the mill.

Thirdly, no data are presented in declaration form and the heat savings enumerated in the declaration are said to be "typically" from 50 – 100 Adt of steam per ton of pulp. This provides no context for assessing the weight of the savings. Such information might be useful if this represented a significant savings, but the total heat expenditures are not provided in declaration form, and we have no way of assessing their value.

Thus, we agree with the conclusion of the Examiner that the Pikka declaration does not overcome the prima facie case of obviousness for claim 1. Claims 4 and 13 therefore fall with claim 1.

Turning now to claim 18, the Appellants state that the means for directly transporting a shive containing rejects fraction from a screening stage downstream of a digester to the fiber line before an oxygen delignification stage is not taught by Ahs and Mannbro, and is contrary to their combined teachings.

The Appellants are simply incorrect. We direct the Appellants to the disclosure of Ahs and Mannbro as discussed above, specifically where Ahs provides a secondary delignification (branch) line where the screen rejects are fed to a secondary reactor to be further delignified using oxygen in an alkaline environment (column 2, lines 35-40). After further delignification, the branch line feeds back into the main line at a point

located upstream of the main reactor to remix with the main stream (column 2, lines 44 – 49). In Mannbro (column 5, lines 47-55 and column 9, lines 58 – 68) the recycling of shives prior to the delignification step is disclosed.

Turning now to claims 3 and 14, the Appellants state that the features of those claims are not suggested by either Ahs or Mannbro.

Claim 3 interposes the step of washing between delignification and screening. The Examiner states that "It would have been obvious to wash the pulp prior to the screening stage as such is taught by AHS ET AL (Figures 2-4)." (Examiner's Answer, page 4, lines 2-3).

A close examination of figures 2-4 of Ahs reveals the step of washing is added before a screening step, both upstream (block 2) and downstream (block 11) of the delignification unit. We therefore agree that the addition of another screening step would have been obvious as described by Ahs.

Claim 14 also interposes the step of washing between step (b) washing and step (c) delignification, and also includes the step of returning the washed coarse rejects prior to step (b) washing. It is our opinion that this claim includes a typographical error or is otherwise unclear, as it seems to us to make little sense to wash after a wash and recycle rejects into the wash with no processing (creating in essence an endless cycle, absent some form of degradation or processing not apparent to us).

Both the Examiner and the Appellants appear to have misread the claim as screening the pulp between steps (c) and (d) (Appeal brief, page 10, lines 15-17 and Examiner's Answer, page 4, lines 4-6). Our examination of the specification indicates there is no support for the apparently endless wash cycle of the literal claim; thus, the

claim is indefinite under 35 U.S.C. § 112, second paragraph. Inasmuch as it is not proper to reach the §103 issues on an indefinite claim (see, e.g. In re Steele, 305 F.2d 859, 134 USPQ 292 (CCPA 1962)), we vacate the rejection under §103 specific to claim 14 and impose a new ground of rejection as discussed at the end of this opinion.

We turn now to claim 20, which recites that the digester is a single digester or a plurality of batch digesters, that there is a coarse screen between the digester and the brown stock washer, and an oxygen delignified pulp washer between the oxygen delignification stage and a screening stage or after the screening stage.

The Examiner has pointed to Ahs, figures 2-4 as illustrating coarse screening after digestion and prior to washing (Examiner's Answer, page 4, lines 3-4) and further states it would have been "obvious to wash before each of the screening stages of [Ahs]" (Id, lines 4-5).

The Appellants state that "No attempt is made in the Final Rejection to point out where in the references that feature is found, or any reason … why it would be provided in the references, and the undersigned can find none" (Appeal Brief, page 11, lines 9-12).

We point the Appellants to the Final Rejection, page 3, lines 4 et seq. for a discussion on the coarse screening feature and washing before screening; Ahs, figures 2-4; and Mannbro, column 5, lines 33-39. While we agree that it would have been preferable if the Examiner had more specifically identified the claims or their elements in the discussion in the final rejection, we disagree with the Appellants' characterization that no attempt has been made and in this particular rejection it is readily apparent why the claim is rejected.

Our independent review of Ahs indicates a clear teaching of screening and double screening (see, e.g. Ahs, column 3, lines 9-35 for a description of screening upstream and downstream of the main reactor; Mannbro, column 5, lines 33-39 for a discussion of coarse screening); and washing upstream and downstream (see, e.g. Ahs, figures 2-4, reference numerals 2, 16, 11 and 5). We therefore find no error in the determination that the subject matter of claim 20 would have been obvious.

Turning now to claim 16, the Appellants state that the claim calls for coarse screening of the pulp with a coarse screen and washing the coarse rejects from the screen, and practicing step (c) by mixing oxygen with the pulp in a mixer and practicing step (f) by transporting the pulp to one of several locations. (Appeal Brief, page 11, lines 14 et seq.).

The Appellants further state that they are unable to find a disclosure of coarse screening in Ahs, Ahs does not teach the features of claim 16 including the direct transport. (Appeal Brief, page 11, lines 20 et seq.), and Mannbro requires a second reactor (Appeal Brief, page 12, line 1).

We will not repeat the discussion of each of the elements of claim 16, but again direct the Appellants' attention to Mannbro, column 5, lines 34-37 where coarse screening is discussed. As Ahs teaches washing before screening (figures 2-4), and the Appellants themselves have admitted placement of the screenroom is a matter of process economy of the mill, we find no error in the Examiner's rejection of this claim as obvious.

B. Claim 2 is rejected under 35 U.S.C. §103(a) as being unpatentable over Ahs in view of Mannbro, further in view of Prough.

In the Examiner's Answer, page 4, lines 12-14, the Examiner states that:

> AHS ET AL teaches (col. 2, lines 38-40) adding alkali to the reject. It would have been especially obvious to impregnate (soak) the reject material in alkali prior to adding it back to the pulp line as such is taught by PROUGH '498 (column 4, lines 26-35).

The Appellants state in response that:

> Prough '498 teaches that the pulp has to be either refined and delignified or merely refined before introducing it back to the main fiber line. The invention, on the other hand, provides that the rejects can be brought back to the main line upstream of the oxygen delignification reactor without any treatment. This is significant, and means that in fact Prough '498 actually teaches contrary to the invention and therefore cannot provide a *prima facie* case of obviousness with the other references.

This argument misses the point of the combination of references. Prough is not relied upon to establish the location of the rejects return or whether refining is necessary in the branch line. Prough is relied upon to show the obviousness of using a soak tank 40 and its accompanying function allowing a caustic soak before returning the pulp (Prough, column 3, lines 53-62).

The Appellants note that "the mere fact that alkaline impregnation *per se* is known does not make it obvious in the context of the invention, or in the specific method steps recited in claim 2" (Appeal Brief, Page 13, lines 10-12).

A close examination of Prough (with particular attention to Figure 3a and the description at column 3, line 47 to column 4, line 35) Ahs, and Mannbro indicates that Prough, Ahs, and Mannbro are all in the same field of endeavor, all relate to known methods of improving yield, and all illustrate close variations on the pulping process. Figure 3a is particularly illustrative; it, in combination with Ahs and Mannbro clearly rendered the invention as claimed in claim 2 obvious to one of skill in the art at the time the invention was made by teaching and suggesting alkaline impregnation to ensure a

sufficient amount of chemical is present in the rejects to prevent the formation of "dirt" (Prough, column 1, lines 19-32) when returning the shives to the main fiber line to continue oxygen delignification. One of skill in the art is clearly taught to use this impregnation, and we affirm this rejection. As noted above, we also find the evidence of record insufficient to overcome this case of obviousness.

C. Claims 5-8, 11-12, 17 and 19 are rejected under 35 U.S.C. §103(a) as being unpatentable over Ahs with or without Manbro, and further in view of Canadian Patent 2,132,056 or Admitted Prior Art (Finnish Patent 924,805)

The Appellants state that the prima facie case of obviousness generally is defective in that the references do not teach medium consistency oxygen delignification with mechanical mixing of oxygen into the pulp and then between the first and second stages treating the reject fraction by mechanical action and that the Final Rejection did not demonstrate where the features in all of claims 6 through 8, 11, 12, and 19 might be found in the art. With respect to claim 17 only, the Appellants state that the art does not teach the particular location of the mixer recited in claim 17. (Appeal Brief, page 14, lines 1-6).

Turning first to claims 5 and 17, we note that claim 5 requires a first and second consecutive distinct delignification stages, with mechanical mixing before each stage, and treating the reject fraction by mechanical action in the main fiber line, while claim 17 requires mechanical action on the shives in the main fiber line.

As noted by the Examiner in the discussion of claims 5 and 17, Canadian Patent 2132056 discloses the two-stage delignification with mixing prior to the reactors. Also, the Examiner pointed to the mixers of Canadian Patent 2,132,056 as providing mechanical working.

The Canadian patent (which has one inventor in common) discloses bleaching pulp by using a plurality of bleaching agents (page 1, lines 3-6). One method of oxygen delignification contained therein is two-stage upflow delignification (figure 1; figure 2; page 3, lines 17-20), which is suggested to improve the kappa number over time (page 4, lines 21 et seq.). Further, mixing before the stages is suggested to break big bubbles into micro bubbles to improve the treatment result (Page 5, lines 10-12). We note that mixers in the main line are disclosed at page 6 lines 24-25 which illustrates the mixer 24 between the first and second reaction chambers.

We therefore disagree with the arguments put forth by the Appellants as regards claims 5 and 17 and the subject matter of these claims would have been obvious to one of skill in the art. There is a clear teaching to use these specific upflow reactors, in-line mixing, and mechanical working without refining to improve quality.

However, as regards claims 6, 7, 8, 11, 12, and 19, we believe that the Examiner has failed to meet the initial burden of putting forth a prima facie case of obviousness, as no clear discussion of the individual claims, or even a general discussion of their limitations, is found within the record. See, e.g., In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992) (Examiner has initial burden of presenting prima facie case of obviousness). We therefore reverse this rejection as it applies to claims 6, 7, 8, 11, 12, and 19.

D. Claims 9, 10 and 15 are rejected under 35 U.S.C. §103(a) as being unpatentable over Mannbro with or without Ahs, further in view of Prough.

Claims 9 and 15 recite the additional step of chelating between delignifying and screening, while claim 10 recites additional washing. Relying on Prough, the Examiner's Answer states that Prough teaches that the chelating agent can be added to

the pulp during the washing stage and prior to the oxygen stage and concludes that it would have been obvious to add the chelating agent during or after the washing stage (Examiner's Answer, page 5, lines 8-14).

The Appellants state essentially that Prough does not teach effecting chelating treatment of the pulp between steps c and d (Appeal Brief, page 15, lines 4-6).

We agree with the Appellants. It appears that the Examiner has misapprehended the steps of claim 1. Step c is delignification, while step d is screening. The rejection seems to state it would have been obvious to add the chelating agent before the oxygen treatment stage, whereas claims 9, 10 and 15 call for chelating treatment after the oxygen treatment stage but before screening.

We therefore reverse this rejection as no prima facie case of obviousness has been established for claims 9, 10, and 15.

E. Claims 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ahs with or without Mannbro, with or without Prough, further in view of Canadian Patent 2,132,056 or Admitted Prior Art.

The Appellants have first challenged the combination of Ahs with Mannbro in the prima facie case of obviousness. As noted above, this argument is without merit.

The Appellants additionally challenge that nowhere in the prior art is found a teaching of step d of claim 21("during the practice of step (c), [oxygen delignification] subjecting the pulp to mechanical action without refining so as to produce an oxygen-delignified chemical pulp substantially devoid of shives so that downstream screening of the oxygen delignified pulp is unnecessary".

We are unable to discern within the rejection that this feature or alleged difference has been recognized or addressed by the Examiner. Accordingly, we agree

with the Appellants that the Examiner has failed to meet the burden of putting forth a prima facie case of obviousness, and reverse this rejection as it applies to claims 21-24.

New Ground of Rejection

We enter a new ground of rejection under the provisions of 37 C.F.R. § 1.196(b).

Claim 14 is rejected under 35 U.S.C. § 112, second paragraph, as failing to particularly point out and distinctly claim the subject matter which applicants regard as their invention.

Specifically, recycling rejects from the washer of step (b) to another washer and then back to step (b) appears to create an endless loop of washing of rejects. Additionally, the Appellants have characterized the additional step in this claim as being "between steps (c) and (d)" (Appeal Brief, page 10, line 15) whereas the claim itself calls for the additional step to be between steps (b) and (c).

Other Issues

Upon return of this case, the Examiner should clarify the language of claim 14, and then reassess the patentability of the claims, with particular attention to claims 9, 10, 14, 15, and 21-24. If rejections are to be maintained, the Examiner should clearly identify each claim rejected and how the art or knowledge of one of skill in the art is applied.

Summary of Decision

The rejection of Claims 1, 3, 4, 13, 6, 18 and 20 under 35 U.S.C. 103(a) as being unpatentable over Ahs without Mannbro, is reversed. The rejection of Claims 1, 3, 4,

13, 6, 18 and 20 under 35 U.S.C. 103(a) as being unpatentable over Ahs with Mannbro, is affirmed. The rejection of Claim 14 in its entirety is vacated.

The rejection of Claim 2 under 35 U.S.C. 103(a) as being unpatentable over Ahs in view of Mannbro, further in view of Prough, is affirmed.

The rejection of Claims 5 and 17 under 35 U.S.C. 103(a) as being unpatentable over Ahs with or without Mannbro, and further in view of Canadian Patent 2,132,056 or Admitted Prior Art (Finnish Patent 924,805) is affirmed. The rejection of claims 6, 7, 8, 11, 12, and 19 is reversed.

The rejection of Claims 9, 10 and 15 under 35 U.S.C. 103(a) as being unpatentable over Mannbro with or without Ahs, further in view of Prough is reversed.

The rejection of Claims 21-24 under 35 U.S.C. 103(a) as being unpatentable over Ahs with or without Mannbro, with or without Prough, further in view of Canadian Patent 2,132,056 or Admitted Prior Art (Finnish Patent 924,805) is reversed.

Time Period for Response

In addition to affirming the examiner's rejection of one or more claims, this decision contains a new ground of rejection pursuant to 37 CFR § 1.196(b)(amended effective Dec. 1, 1997, by final rule notice, 62 Fed. Reg. 53,131, 53,197 (Oct. 10, 1997), 1203 Off. Gaz. Pat. & Trademark Office 63, 122 (Oct. 21, 1997)). 37 CFR § 1.196(b) provides, "A new ground of rejection shall not be considered final for purposes of judicial review."

Regarding any affirmed rejection, 37 CFR § 1.197(b) provides:

(b) Appellants may file a single request for rehearing within two months from the date of the original decision . . . .

37 CFR § 1.196(b) also provides that the Appellants, WITHIN TWO MONTHS FROM THE DATE OF THE DECISION, must exercise one of the following two options with respect to the new ground of rejection to avoid termination of proceedings (37 CFR § 1.197(c)) as to the rejected claims:

(1) Submit an appropriate amendment of the claims so rejected or a showing of facts relating to the claims so rejected, or both, and have the matter reconsidered by the examiner, in which event the application will be remanded to the examiner. . . .

(2) Request that the application be reheard under § 1.197(b) by the Board of Patent Appeals and Interferences upon the same record. . . .

Should the Appellants elect to prosecute further before the Primary Examiner pursuant to 37 CFR § 1.196(b)(1), in order to preserve the right to seek review under 35 U.S.C. §§ 141 or 145 with respect to the affirmed rejection, the effective date of the affirmance is deferred until conclusion of the prosecution before the examiner unless, as a mere incident to the limited prosecution, the affirmed rejection is overcome.

If the Appellants elect prosecution before the examiner and this does not result in allowance of the application, abandonment or a second appeal, this case should be returned to the Board of Patent Appeals and Interferences for final action on the affirmed rejection, including any timely request for reconsideration thereof.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a)

AFFIRMED IN PART, VACATED IN PART, REVERSED IN PART

37 C.F.R. 1.196(b)

WILLIAM F. SMITH Administrative Patent Judge	)
FRED E. McKELVEY Senior Administrative Patent Judge	) BOARD OF PATENT)) APPEALS AND)
JAMES T. MOORE Administrative Patent Judge	) INTERFERENCES)

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