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**Datasheet for the decision
of 24 May 2007**

Case Number: T 0306/06 - 3.2.07

Application Number: 99907732.4

Publication Number: 1095182

IPC: D21B 1/02

Language of the proceedings: EN

Title of invention:

Method, apparatus and plant for the recovery of wood fibre
from compressed fibreboard scrap

Patentee:

Thorpe, Alan, et al

Opponent:

Fraunhofer-Gesellschaft zur Förderung der angewandten
Forschung e.V.

Headword:

-

Relevant legal provisions:

EPC Art. 54, 56, 114(1)

Keyword:

"Late filed documents (admitted)"
"Novelty: first and second auxiliary request (no)"
"Inventive step: third auxiliary request (no)"

Decisions cited:

-

Catchword:

-



Case Number: T 0306/06 - 3.2.07

DECISION
of the Technical Board of Appeal 3.2.07
of 24 May 2007

Appellant: Fraunhofer-Gesellschaft zur Förderung
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Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted
19 December 2005 concerning maintenance of the
European No. 1095182 in amended form.**

Composition of the Board:

Chairman: H. Meinders
Members: K. Poalas
I. Beckedorf

Summary of Facts and Submissions

I. The appellant (opponent) lodged an appeal against the interlocutory decision of the Opposition Division maintaining in amended form European patent No. 1 095 182.

Opposition had been filed against the patent as a whole based on Article 100(a) EPC (lack of novelty and lack of inventive step).

The Opposition Division held that the subject-matter of independent claims 1 and 8 of the main request filed with letter of 26 February 2004 fulfilled the requirements of Articles 54 and 56 EPC. The following documents were *inter alia* taken into consideration:

D5: WO-A-95/24998

D7: G. Schlipphak: "Das Sandberg-Verfahren zur Rückgewinnung von Spänen aus Spanplattenabfällen", in "Aus Forschung, Wirtschaft und Betrieb", April 1965, pages 154-155

D8: DE-A-1 201 045.

With letter dated 9 February 2007 the appellant filed the following documents:

D12: Michanickl, Andreas: "Chemisch-Technologische Untersuchungen zur Wiederverwendung von Holzwerkstoffen aus Altmöbeln und Produktionsrückständen der Holzwerkstoffindustrie zur Span- und Faserplattenherstellung",

Braunschweig, Januar 1996, cover page, first and second pages, picture page, contents pages I to VII, pages 205 to 221

D13: copy of an internet page of the "Campus-Katalog" of the University of Hamburg.

II. Oral proceedings before the Board took place on 24 May 2007.

(a) The appellant requested that the decision under appeal be set aside and that the European patent No. 1 095 182 be revoked.

(b) The respondents (patentees) requested that:

1. the appeal be dismissed (main request),
2. the European patent No. 1 095 182 be maintained in the version of the claims of the first auxiliary request as filed with the letter dated 31 August 2006,
3. the European patent No. 1 095 182 be maintained in the version of the claims of the second auxiliary request as filed during the oral proceedings,
4. the European patent No. 1 095 182 be maintained in the version of the claims of the third auxiliary request as filed with the letter dated 31 August 2006.

III. Independent claim 1 according to the main request (ie. as maintained by the Opposition Division) reads as follows:

"A method of recovering wood fibres from compressed fibreboard scrap, involving the steps

- a) admitting the scrap into a container (6);
- b) subjecting the scrap in the container to steam;
- c) screening the scrap to separate wood fibres from the remainder of the scrap;
- d) agitating the scrap in the container concurrently with step b)".

Independent claim 1 according to the first auxiliary request reads as follows:

"A method of recovering wood fibres from compressed fibreboard scrap, involving the steps of

- a) admitting the scrap into a container (6);
- b) injecting steam into the container to subject the scrap therein to steam;
- c) agitating the scrap in the container concurrently with step b),
- d) screening the scrap to separate wood fibres from the remainder of the scrap".

Independent claim 1 according to the second auxiliary request reads as follows:

"A method of recovering wood fibres from compressed fibreboard scrap, involving the steps of

- a) admitting the scrap into a container (6);
- b) injecting steam into the container to subject the scrap therein to steam at a pressure in the range of 3 p.s.i to 10 p.s.i (2.1×10^4 to 6.9×10^4 Pa) above atmospheric pressure;
- c) agitating the scrap in the container concurrently with step b),

d) screening the scrap to separate wood fibres from the remainder of the scrap".

Independent claim 1 according to the third auxiliary request reads as follows:

"A method of recovering wood fibres from compressed fibreboard scrap, involving the steps of

- a) admitting the scrap into a container (6);
- b) injecting steam into the container to subject the scrap therein to steam at a pressure greater than 1 p.s.i (6.9×10^3 Pa) above atmospheric pressure for a period of time greater than 30 minutes;
- c) agitating the scrap in the container concurrently with step b),
- d) subsequent to subjecting the scrap to steam, subjecting the scrap in the container to a low pressure less than atmospheric pressure, the scrap being agitated whilst being subjected to said low pressure;
- e) screening the scrap to separate wood fibres from the remainder of the scrap".

IV. The appellant argued essentially as follows:

(a) *Admittance of D12 into the proceedings*

D13 is evidence for the availability to the public of D12 in 1996, ie. before the priority date of the patent in suit.

D12 and D13 were filed as a reaction to the decision of the opposition division. The features of claim 1 of the main request "subjecting the

scrap in the container to steam" and "agitating the scrap in the container" were decisive for that decision. These features can be found in several passages of D12, see page 206, lines 1 to 3; the paragraph bridging pages 208 and 209; page 209, the first complete paragraph; the graphic on page 212; page 213, the first paragraph and table 101; page 215, table 103, rendering the subject-matter of claim 1 of the main request not novel. D12 is therefore more pertinent than D5 and prima facie a relevant document.

For the above-mentioned reasons D12 should be admitted into the appeal proceedings.

(b) *Novelty, Article 54 EPC*

(i) *Claim 1 according to the main request*

Figures 75 and 76 of D12 show a disintegration plant with a disintegration container and its peripheral apparatuses. According to the corresponding passages on pages 205 to 221 of D12 a comminuter first reduces fibreboard to scrap. The fibreboard scrap is admitted into the container as shown in the middle upper part of figure 76. Steam is introduced into the container through four peripheral conduits and a steam lance as shown in the middle part of figure 76 and as described on page 206, lines 2 to 3. After treatment in the disintegration container the scrap is discharged and screened in order to separate

wood fibres from the remainder of the scrap by using a sieve drum as shown in the right part of figure 75, see page 211, lines 1 to 2.

In lines 2 to 4 of page 213 of D12 high costs in combination with a further breaking up of the scrap are mentioned as an obstacle for not using a rotating container in the experimental installation as described in D12. On the other hand, it is also stated that a rotating container is a construction which allows an easier introduction of the steam into the container. The use of such a container is therefore suggested by D12 where a better introduction of steam into the container is desirable. It is obvious that such a container rotates while the steam is injected in the container and the scrap is agitated and subjected to steam.

Therefore, the subject-matter of claim 1 according to the main request is not novel over D12.

- (ii) *Claim 1 according to the first auxiliary request*

Injecting steam as presently claimed is identical to the introduction of steam under pressure into the disintegration container as described in D12, see figure 76, table 101, step 8.

Therefore, the subject-matter of claim 1 according to the first auxiliary request is not novel over D12.

(c) *Inventive step, Article 56 EPC*

(i) *Claim 1 according to the second auxiliary request*

According to step 8 of table 101 of D12 a pressure above atmospheric pressure is created by introducing steam into the container; the steam interacts directly with the scrap. During the subsequent step 9 a relaxation valve is opened in order to reduce the pressure within the container. It is well-known to the person skilled in the art to apply a pressure which is somewhat higher than the atmospheric pressure when steam is applied in order to disintegrate fibreboard scrap. For example, D8 proposes subjecting scrap to steam at a pressure range of 1 to 5 atü, ie. at an absolute pressure range of 19.6×10^4 Pa to 58.8×10^4 Pa. In the patent in suit no mention is made of a surprising effect due to the choice of the claimed steam pressure range. On the contrary, paragraph [0021] of the patent specification states that depending on the circumstances a high pressure may also be used. Therefore, the skilled person would choose a steam pressure falling within the range as claimed in claim 1 according to the

second auxiliary request without exercising an inventive activity.

(ii) *Claim 1 according to the third auxiliary request*

Exposing fibreboard scrap in a container to steam at a pressure greater than 1 psi (6.9×10^3 Pa) above atmospheric pressure for a period of time greater than 30 minutes in order to disintegrate fibreboard scrap is known from D7 or D8, see the paragraph bridging the two columns of page 155 of D7 and column 2, line 50 to column 3, line 12 of D8.

Step 10 of table 101 of D12 describes as a step after treating the scrap with steam subjecting the scrap in the container to a vacuum in order to pre-dry the scrap. It is well-known to the skilled person that agitating accelerates the drying process. Therefore, it is obvious to the skilled person applying the process according to table 101 of D12 and using a rotating container to continue the rotational movement of the container also during the application of a vacuum, thereby agitating the scrap.

Therefore, the subject-matter of claim 1 of the third auxiliary request is not inventive.

V. The respondents argued essentially as follows:

(a) *Admittance of D12 into the proceedings*

D12 is no more pertinent than D5, which is already in the proceedings. Therefore, D12 should not be admitted, being late-filed and *prima facie* not relevant.

(b) *Novelty, Article 54 EPC*

(i) *Claim 1 according to the main request*

Firstly, subjecting the scrap to steam is not proposed in D12, since in the third complete paragraph of page 218 and in lines 3 to 5 of page 219 of D12 it is stated that the application of steam to the scrap does not achieve satisfactory results. Accordingly, the skilled person derives from the above-mentioned passages that steam is only used for heating the container's housing and would refrain from applying steam directly to the scrap. Therefore, the step of subjecting the scrap to steam is not proposed in D12.

In the paragraph bridging pages 205 and 206 of D12 it is not specified whether steam is introduced into the interior of the container or whether steam is applied onto the casing of the container in order to raise the container's temperature. Containers as shown in figure 76 normally

have a double- or multi-wall casing and steam is introduced into the space between said casing walls in order to heat the container. Therefore, lines 2 and 3 on page 206 of D12 can only refer to steam introduced between the container's casing walls and not to steam introduced directly into the interior of the container.

Furthermore, a rotation of the container does not automatically mean that the material moves with respect to said container and therefore an agitation of the scrap in the container is not known from D12.

Hence, the subject-matter of claim 1 of the main request is novel.

(ii) Claim 1 according to the first auxiliary request

For the same reasons as mentioned in point (i) above, the subject matter of claim 1 of the first auxiliary request is novel.

(c) Inventive step, Article 56 EPC

(i) Claim 1 according to the second auxiliary request

There exists no teaching in the art that the application of steam with a relatively low pressure lying within the claimed range of 3

psi to 10 psi above atmospheric pressure delivers satisfactory results.

The subject-matter of claim 1 according to the second auxiliary request therefore involves an inventive step.

(ii) Claim 1 according to the third auxiliary request

Simultaneously subjecting the scrap in the container to a low pressure less than atmospheric pressure and to agitation is neither known nor taught in the prior art.

Therefore, the subject-matter of claim 1 according to the third auxiliary request involves an inventive step.

Reasons for the decision

1. *Admittance of D12 into the proceedings*

1.1 D13 being a copy of an internet page of the library catalogue of the University of Hamburg is accepted by the Board as evidence for the availability of D12 to the public in 1996. D12 therefore represents state of the art according to Article 54(2) EPC. The fact that D12 was available to the public before the priority date of the patent in suit was also not disputed by the respondents.

The respondents argued that D12 should not be admitted into the proceedings since it is not more relevant than D5, the latter already being in the proceedings.

- 1.2 The Board does not agree with the respondents on this question, for the following reasons:

D12 discloses additional detailed information about the working conditions of a fibreboard disintegration process and a plant for performing such a process.

- 1.2.1 In its reasons for the decision the Opposition Division considered that the expression "subjecting the scrap in the container to steam" of claim 1 of the patent in suit "means that the scrap is treated by direct application of steam", see point 2.2.2. In point 2.2.5 of its decision it stated that according to lines 4 to 8 of page 14 of D5 "the disintegration container is heated via its outer surface or via direct heat supply through hot air, steam or any other gaseous heat transfer medium" and that it cannot be derived unambiguously from D5 that "the impregnated scrap is subjected to steam in the disintegration container". The Opposition Division concluded thereafter that the subject-matter of claim 1 differs from the method known from document D5 in that the scrap in the container is subjected to steam while being agitated, see point 2.2.9 of the decision.

The feature "subjecting the scrap in the container to steam" is a feature which was clearly decisive for the decision of the Opposition Division.

1.2.2 The Board notes that in D5 there is only one mention of the use of steam in connection with the invention therein described, which is the passage mentioned above.

In D12, however, there exist several passages referring to the use of steam and to the way it is introduced into the container, see page 206, lines 1 to 3; the paragraph bridging pages 208 and 209; page 209, the first complete paragraph; the graphic on page 212; page 213, the first paragraph and table 101; page 215, table 103. In view of this, the Board finds that D12 is more pertinent than D5. Furthermore, the Board concurs with the appellant that lines 1 to 3 of page 206 and lines 1 to 4 of page 213 of D12 disclose the information of injecting steam into the container and suggest using a rotating container, so that D12 could be seen *prima facie* as a novelty destroying document.

Therefore, the Board admits D12 into the appeal proceedings exercising its discretion in accordance with Article 114(2) EPC.

2. *Novelty, Article 54 EPC*

2.1 *Claim 1 according to the main request*

Figure 76 on page 212 of D12 shows a disintegrating plant for fibreboard scrap. Said plant involves a 12m³ container which can be loaded with 2,5t of pre-broken fibreboard, ie. fibreboard scrap, which is thus admitted into the container (step a) of claim 1). A steam generator, a steam distributor and different feeding circuits and tanks are also foreseen. The steam generator shown at the right hand side of said figure

is connected to a distributor which *inter alia* provides steam to the container via four side conduits and steam nozzles. A further, fifth, conduit connects the steam distributor with a conduit placed within the container and extending along the longitudinal central axis thereof.

According to the paragraph bridging pages 205 and 206 of D12 the temperature within the container and the scrap was measured at several measuring points within and at the surface of the scrap. It is mentioned that it was very difficult to bring the heat constantly into the container and the scrap. In order to achieve an even introduction ("Einbringen") of the required steam quantity a large number of steam nozzles in the wall of the container ("Düsenstöcke am Behältermantel") and a steam lance ("Dampflanze") were used.

In view of the above-mentioned passages of D12 the four side conduits must be the ones which supply the steam nozzles in the container wall with steam. The vertical conduit in the container can only be the mentioned steam lance. This entire arrangement introduces steam into the container, which comes into contact with a scrap. Thus the scrap is subjected to steam (step b) of claim 1).

2.2 The respondents presented the following counter-arguments:

Firstly, subjecting the scrap to steam as claimed is not proposed in D12, since in the third complete paragraph of page 218 and in lines 3 to 5 of page 219 it is stated that the application of steam to the scrap

does not achieve satisfactory results. Accordingly, the skilled person derives from the above-mentioned passages that steam is only used for heating the container's housing. Secondly, in the paragraph bridging pages 205 and 206 of D12 it is not specified whether the steam is introduced into the interior of the container or whether steam is applied onto the casing of the container in order to raise the container's temperature. Thirdly, containers as shown in figure 76 normally have a double- or multi-wall casing and steam is introduced into the space between said casing walls in order to heat the container. Therefore, lines 2 and 3 on page 206 of D12 can only refer to steam introduced between the container's casing walls and not to steam introduced directly into the interior of the container.

2.3 The Board comments on the respondents' argumentation above as follows:

Firstly, the indicated passage of page 218 of D12 refers to the negative influence on the scrap of saturated steam at a temperature higher than 140°C. Therefore, it is proposed on page 219 to use steam at about 110°C. In the absence of any indication to the contrary, one must assume that steam is still applied to the scrap. Secondly, there is no reference whatsoever in D12 to a container having the alleged double-wall casing; the respondents presented no evidence supporting their allegation that multi-wall casing containers are "normally" used for disintegrating fibreboard scrap. Thirdly, reading the sentence bridging pages 205 and 206 referring to the difficulty of bringing heat into the container and the

scrap, and the following sentence referring to the "introduction of the required steam quantity" ("Einbringung der erforderlichen Dampfmenge") using a plurality of injection nozzles at the container's wall and a steam lance, it is evident to the skilled reader that the steam is injected into the interior of the container by this arrangement, in order to contact and heat the scrap directly.

The Board further notes that even accepting the respondents' argument that the four side conduits at the periphery of the container at most introduce steam into the space between the walls of a double-walled container, the steam lance still remains within the container to introduce steam therein, thereby subjecting the fibreboard scrap to steam.

2.4 Automatic self-cleaning sieve drums are foreseen in D12 in order to separate wood chips from coating-, plastics- and other material, see page 211, lines 1 to 2 and figure 75, thereby performing the method step of screening the scrap to separate wood fibres from the remainder of the scrap according to feature c) of claim 1.

2.5 The respondents argued that a rotation of the container does not automatically impose a movement of the material within said container, ie. the claimed agitation (step d) of claim 1) of the scrap was not disclosed.

In the first two sentences of page 213 of D12 the advantages and the disadvantages of a non-rotating and of a rotating container are listed, as well as reasons

why a non-rotating container was used in the experimental plant according to D12. It is stated that a non-rotating container is cheaper and avoids a further breaking-up of the wood chips, whereas a rotating container simplifies the introduction of steam. For the Board, the indicated breaking-up of the wood chips which is avoided by having a stationary container as opposed to a rotating container can only lead to the conclusion that in the rotating container there occurs an agitation of the wood chips which makes them break up into smaller pieces, but at the same time favours the introduction of steam into the scrap.

Hence, if the introduction of steam into the container and the wood scrap is the decisive criterion, D12 suggests a disintegrating plant as shown in figure 76 with a rotating container, resulting in an agitation of the chips (step d) of claim 1) and taking for granted a further break-up of the chips.

- 2.6 The Board concludes from the above that in pages 205 to 213 of D12 a method is described according to which fibreboard scrap is brought into a disintegrating container, that steam is introduced into the container coming into direct contact with the fibreboard scrap and that the scrap coming out from the disintegrating container is screened for separating wood fibres from the remainder of the scrap. The Board further derives from the first two sentences of page 213 of D12 that in cases where costs and further break-up of the scrap are not an issue but the introduction of the steam is more important, then a rotating disintegrating container is used, which obviously rotates when the scrap is subjected to steam, agitating it in order to achieve a

homogeneous distribution of steam within the container and the scrap. Thus, the method involves all steps in the order as claimed in claim 1.

Therefore, the subject-matter of claim 1 is not novel over the disclosure of D12 (Article 54 EPC).

2.7 *Claim 1 according to the first auxiliary request*

Claim 1 according to the first auxiliary request differs from claim 1 according to the main request in that method step b) now reads as follows:

"injecting steam into the container to subject the scrap therein to steam".

As it is shown in the upper right hand side of figure 76 and discussed on page 206, lines 2 and 3 one steam lance and a set of steam nozzles introduce steam into the container. The steam coming from the steam generator and passing through the steam distributor is introduced under pressure and therefore can be considered "injected" by the nozzles and the lance into the container. This is also documented in tables 101 and 103 of D12. The fibreboard scrap positioned within the container is thus subjected to steam.

Accordingly, also this method step b) is known from D12 and claim 1 of the first auxiliary request does not meet the requirements of Article 54 EPC.

3. *Inventive step, Article 56 EPC*

3.1 *Claim 1 according to the second auxiliary request*

Claim 1 according to this request differs from claim 1 according to the first auxiliary request in that the scrap within the container is subjected to steam at a pressure in the range of 3 psi to 10 psi (2.1×10^4 Pa to 6.9×10^4 Pa) above atmospheric pressure, ie. at an absolute pressure in the range of 17.22 psi to 24.22 psi (11.9×10^4 Pa to 16.7×10^4 Pa).

According to step 8 of table 101 of D12 steam valves allowing the introduction of steam into the container are opened, the steam heats and interacts with the scrap within the container and the steam valves are closed. During step 8 a pressure higher than the atmospheric pressure is developed within the container. This higher pressure already follows from the subsequent step 9 according to which a pressure relaxation valve is opened for up to three minutes.

D12 itself gives no direct information about the pressure level of the steam within the container during the process step 8. On the other hand, in the patent in suit no specific or surprising effect is mentioned as obtained by the claimed pressure range. On the contrary, in paragraph [0021] of the patent in suit it is stated that "Advantageously, any increase in pressure over atmospheric pressure of greater than 1 psi (6.9×10^3 Pa), preferably in the range of 3 to 10 psi (2.1×10^4 to 6.9×10^4 Pa) is used, although in certain circumstances a higher pressure may be utilised". This statement confirms that the claimed pressure range is

an arbitrary choice without any apparent specific and/or surprising effect. Accordingly, the selection of such a pressure range having an upper limit (16.7×10^4 Pa) close to the lower limit of the pressure range known from D8 (19.6×10^4 Pa) does not necessitate an inventive activity.

Therefore, the subject-matter of claim 1 according to the second auxiliary request does not involve an inventive step.

3.2 *Claim 1 according to the third auxiliary request*

Claim 1 according to the third auxiliary request differs from claim 1 according to the first auxiliary request in that the scrap is subjected to steam at a pressure greater than 1 psi (6.9×10^3 Pa) above atmospheric pressure, ie. at an absolute pressure greater than 15.2 psi (10.49×10^4 Pa) for a period of time greater than 30 minutes and that, subsequent to subjecting the scrap to steam, the scrap in the container is subjected to a low pressure less than atmospheric pressure, the scrap being agitated at the same time.

It is known from step 8 of table 101 of D12 that for disintegrating fibreboard scrap it is subjected for 35 minutes to steam under pressure. Although D12 itself gives no direct information about the pressure level of the steam within the container during the process step 8 both documents D7 and D8 propose for disintegrating fibreboard scrap steam pressure values falling within the claimed pressure range. D7 teaches namely subjecting the scrap to a steam pressure of 4 atü ($49 \times$

10^4 Pa absolute pressure) for a period of time between 2.5 and 3 hours, see paragraph bridging the two columns of page 155 and D8 suggests a maximum pressure value of 5 atü (58.8×10^4 Pa absolute pressure), whereby the duration of steam treatment can vary between 30 minutes and four hours, see column 2, line 50 to column 3, line 12. Hence, the application of steam at an absolute pressure higher than 10.49×10^4 Pa for a period of time greater than 30 minutes for disintegrating fibreboard scrap is a process step well known to the skilled person and thus not demanding an inventive activity.

According to table 101 of D12, after the scrap in the container has been treated by steam according to step 8 and has had some "relaxation" ("Entspannen") in step 9, the scrap is further subjected in step 10 to vacuum, ie. to a pressure less than the atmospheric pressure, in order to pre-dry the scrap ("Vortrocknung") in the container.

According to the Board (see point 2.6) the container advantageously used will be a rotating one, agitating the scrap while subjecting it to steam. The agitation has the positive effect of facilitating the steam to reach more easily the fibreboard scrap particles. In the opinion of the Board the skilled person would use the same rotation of the container and the agitation of the scrap also during the subsequent pre-drying step 10 under vacuum, thus facilitating the drying of the scrap. This is comparable to what happens in a tumble dryer at home.

Since also this distinguishing step is obvious to the skilled person the subject-matter of claim 1 according

to the third auxiliary request does not involve an inventive step and accordingly it does not fulfil the requirements of Article 56 EPC.

Order

For these reasons it is decided that:

The decision of the Opposition Division dated 19 December 2005 is set aside.

The patent is revoked.

The Registrar:

The Chairman:

G. Nachtigall

H. Meinders