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D E C I S I O N
of 8 December 2003

Case Number: T 0898/01 - 3.2.7

Application Number: 95108974.7

Publication Number: 0686578

IPC: B65D 88/72

Language of the proceedings: EN

Title of invention:
High consistency pulp tower

Patentee:
SULZER PUMPEN AG

Opponent:
Kvaerner Pulping Technologies AB

Headword:
-

Relevant legal provisions:
EPC Art. 54, 56, 114(2)

Keyword:
"Late filed documents (no)"
"Novelty (yes)"
"Inventive step (yes)"

Decisions cited:
-

Catchword:
-



Case Number: T 0898/01 - 3.2.7

D E C I S I O N
of the Technical Board of Appeal 3.2.7
of 8 December 2003

Appellant: Kvaerner Pulping Technologies AB
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Representative: -

Respondent: SULZER PUMPEN AG
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CH-8401 Winterthur (CH)

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Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 5 June 2001
rejecting the opposition filed against European
patent No. 0686578 pursuant to Article 102(2)
EPC.

Composition of the Board:

Chairman: A. Burkhart
Members: H. E. Felgenhauer
C. Holtz

Summary of Facts and Submissions

- I. The appellant (opponent) filed an appeal against the decision of the opposition division rejecting the opposition against European patent No. 0 686 578.

The opposition had been filed against the patent as a whole based on the grounds of opposition according to Article 100(a) EPC (lack of novelty and inventive step), referring inter alia to the prior art documents

D1: US-A-2 938 824

D2: CA-A-1 068 526

D5: US-A-4 158 597

The Opposition Division held that the grounds for opposition did not prejudice the maintenance of the European patent unamended and rejected the opposition.

- II. The appellant requested that the decision under appeal be set aside and the patent be revoked.

The respondent (patentee) requested the appeal to be dismissed and auxiliary oral proceedings to be held.

In support of the grounds of appeal and in addition to the documents referred to in the opposition proceedings, the following documents were referred to by the appellant

D6...brochure "DISCHARGE SCRAPER - FOR EFFECTIVE TOWER DISCHARGE" of AHLSTROM MACHINERY

D7...brochure "Ahlstrom Pumps and Mixers" of AHLSTROM PUMPS

D8...US-A-5 688 369 (published after the priority date of the patent in suit)

D9...US-A-3 579 421

D10: Kamyр Bulletin NO KGD 1815-RW491.

III. Claim 1 as granted reads as follows:

"A high consistency pulp tower (10), comprising an upstanding tower wall (12), a bottom (22), a bottom portion (20) defining a so-called dilution zone of said tower, means (40, 50) for diluting high consistency pulp, arranged in the bottom portion (20), discharge means (60) for diluted pulp arranged in the bottom portion (20), and a parting member (31, 31', 31'', 31''') arranged in the upper section of the bottom portion (20) whereby the cross-sectional flow area defined by the wall (12) of tower (10) and said parting member (31, 31', 31'', 31''') is smaller than the corresponding cross-sectional flow area below the parting member, characterized in that said dilution means comprises at least one mixer arranged entirely below the smallest cross-sectional flow area in such manner as to generate a circulating pulp flow in the bottom portion (20) and prevent the pulp flow from rising to a level of the parting member (31, 31', 31'', 31''') which is higher than the largest diameter of the parting member or the smallest cross-sectional flow

area between the parting member and the wall of the tower (10)."

IV. The appellant has argued essentially as follows:

- (i) The high consistency pulp tower according to claim 1 lacks novelty with respect to any of documents D1, D2 or D5.

The fundamental question in the appeal is whether a scraper according to either document D1, D2 or D5 could be regarded as a mixer in the same manner as an agitator according to document D7 is considered to be a mixer. It is well known in the art that scrapers as well as agitators perform a mixing function. The functional characteristics of the mixer according to the patent in suit (paragraph 0018) cited by the opposition division are exactly the same as the ones obtained according to document D1.

Furthermore, corresponding to the pulp tower according to claim 1, the one according to document D1 comprises means, namely wall nozzles, outside the scraper for dilution of the high consistency pulp.

The contested decision is thus erroneous in that - with respect to the flow being generated - different functions are postulated for a mixer on the one hand and a scraper on the other.

- (ii) In this connection it also needs to be considered that neither in claim 1 nor in the remainder of the patent in suit the structure of the mixer and the specific nature of the circular flow to be generated by the mixer are further defined.

- (iii) The fact that the scraper provided within the pulp tower according to document D1 is a mixer like the one arranged in the pulp tower according to claim 1 of the patent in suit can also be derived from considering documents D6 - D9.

In document D6 the function of a scraper is referred to as simultaneously diluting the pulp uniformly and discharging the tower. Reference to the first function as a uniform dilution implies that the scraper functions as a mixer and does indeed need to be considered as constituting a mixer.

According to document D9 in particular, the mixing function is one of the most essential functions a scraper has.

In document D7 a device referred to in claim 1 of the patent in suit as a mixer is referred to as an agitator. In parallel with this perception, if an agitator is considered as being a mixer, the known scraper must also be classified as a mixer.

Concerning the mixing of high consistency pulp, it is well known that slowly rotating scrapers such as the ones known from documents D2, D5 and D9 are normally used. This type of scraper must have

the capacity to start the mixing which, together with appropriate dilution, leads to a uniform pulp consistency.

That a bottom scraper, especially in dilution operation in digesters and towers, will and must operate as a mixer can also be derived from document D10.

- (iv) The opposition division was correct in its initial observation that "the subject-matter of claim 1 is completely anticipated by the D1 disclosure".

V. The respondent argued essentially as follows:

- (i) Considering the pulp tower according to claim 1 of the patent in suit in view of the prior art, a mixer as referred to in claim 1 needs to be clearly distinguished from the application of a scraper as known in the prior art and the flow generated in each case is not the same.

Even though a scraper might be considered as having a certain mixing function, the term "mixer" used in claim 1 of the patent in suit and in the pulp industry in general designates a device having a function which is not obtainable with a scraper. A scraper functions to push lumps of pulp with its blades in a sweep area, whereas outside this sweep area a significant flow need not be produced. A mixer, on the contrary, is intended to function so as to generate significant faster flows and, in particular, to homogenise the pulp.

(ii) Documents D6 - D10 are late-filed and should not be admitted since they are not more relevant than the documents filed in the opposition proceedings.

(iii) None of the documents cited by the appellant discloses that the particular scraper used in each case has the function of a mixer. For the scraper according to document D1 in particular it is indicated that it scrapes off material underneath and feeds it through an outlet.

According to document D6 dilution liquid is fed by a scraper into a descending pulp tower. For this reason the arms of the scraper are provided with a high number of openings through which dilution liquid is supplied. This scraper functions such that while the scraper arms slice pulp from the bottom of the pulp tower, they also introduce a certain amount of dilution liquid into the pulp to decrease its consistency to a desired level. Consequently the known scraper does not function as defined for the mixer according to claim 1 of the patent in suit. In view of the behaviour of the pulp it further needs to be noted that the pulp consistency according to document D6 is higher than the one according to the patent in suit.

(iv) Insofar as arguments of the appellant focus on the treatment of chips they are not relevant since the patent in suit does not concern the treatment of such material but a high consistency pulp tower, wherein the high consistency pulp does not comprise chips.

- (v) From documents D7 - D9 it cannot be derived that a mixer as comprised in the pulp tower according to claim 1 is the same device as a scraper as known from these documents.

In document D7 a clear distinction is made between the mixers and scrapers referred to therein.

Since document D8 was not published prior to the priority date of the patent in suit it cannot be considered as prior art. Even if this document were considered it cannot be derived from it that a mixer is the same device as a scraper.

From documents D9 and D10 likewise it cannot be derived that a scraper functions as the mixer comprised within the pulp tower of claim 1.

The argument that both scrapers and mixers are agitators and thus have the same function is based on an extremely broad interpretation of the term "mixer" which, in view of the disclosure concerning mixers given by the patent in suit is not justified.

- (vi) As was the case during the opposition proceedings no arguments have been raised with respect to the alleged lack of inventive step. In this respect the reason given in the decision of the opposition division should be confirmed, since there is no prima facie obvious combination of the cited documents leading to the subject-matter of claim 1.

Reasons for the decision

1. *Subject-matter of claim 1*

Claim 1 of the patent in suit defines a high consistency pulp tower.

In this claim the structure of the pulp tower itself is defined as comprising an upstanding tower wall, a bottom, and a bottom portion defining a so-called dilution zone of said tower.

According to claim 1, the pulp tower further comprises means for diluting high consistency pulp, arranged in the bottom portion, discharge means for diluted pulp arranged in the bottom portion, and a parting member arranged in the upper section of the bottom portion, whereby the cross-sectional flow area defined by the wall of the tower and said parting member is smaller than the corresponding cross-sectional flow area below the parting member.

The dilution means referred to in the entering clause of claim 1 is further defined in the characterizing portion defining that said dilution means comprises at least one mixer arranged entirely below the smallest cross-sectional flow area in such manner as to generate a circulating pulp flow in the bottom portion and to prevent the pulp flow from rising to a level of the parting member which is higher than the largest diameter of the parting member or the smallest cross-

sectional flow area between the parting member and the wall of the tower.

As indicated by the respondent the subject-matter of claim 1 defines as features essential for the invention that the dilution means comprises at least one mixer and that this mixer is arranged below the smallest cross-sectional flow area, such that the flow defined in claim 1 can be generated.

The provision of at least one mixer as dilution means and its arrangement has the effect of generating a circulating pulp flow in the bottom portion and preventing the pulp flow from rising to a level of the parting member which is higher than the largest diameter of the parting member or the smallest cross-sectional flow area between the parting member and the wall of the tower.

The last feature thus limits the lengthwise extent of the pulp flow in the bottom portion, which itself is defined in claim 1 as being of certain lengthwise extent. This can be derived from the features according to which the pulp tower comprises a bottom and a bottom portion defining a so-called dilution zone of the pulp tower, according to which means for diluting high consistency pulp as well as discharge means are arranged in the bottom portion and according to which a parting member is arranged in the upper section of the bottom portion.

The features of claim 1 relating to the generation of a circular pulp flow in the bottom portion thus define a circulating pulp flow having a lengthwise extent in the

bottom portion, the lengthwise extent of the flow being limited by the features defining that at least one mixer is arranged in such a manner as to generate a circulating pulp flow in the bottom portion and prevent the pulp flow from rising to a level of the parting member which is higher than the largest diameter of the parting member or the smallest cross-sectional flow area between the parting member and the wall of the tower.

2. *Novelty*

Although the appellant alleges lack of novelty with respect to any of documents D1, D2 or D5, the specific arguments of the appellant concern exclusively document D1.

2.1 Document D1 discloses a pulp tower which comprises an upstanding tower wall, a bottom, a bottom portion defining a so-called dilution zone of said tower (column 4, lines 3 to 5 and 22 to 24), means for diluting ... pulp, arranged in the bottom portion (column 3, lines 61 to 63; column 4, lines 3 to 5) and discharge means for diluted pulp arranged in the bottom portion (column 4, lines 22 to 24).

Concerning the provision of dilution means, which according to claim 1 of the patent in suit comprises at least one mixer, document D1 discloses that "the pulp has been diluted by and mixed with the relatively cool digesting liquor supplied by nozzle or nozzles 50 (column 4, lines 1 to 5; cf. also column 4, lines 21 to 24).

Besides the nozzle or nozzles no other element is referred to in document D1 as means for diluting the pulp.

The pulp tower according to document D1 is further provided with a scraper, which according to this document is comprised by a discharge means (column 2, lines 40 to 43). In this connection the function of this scraper is described stating "The scraper 17 preferably extends substantially over the whole cross-sectional area of the digester and scrapes off the column of material underneath, so that the column of material will descend uniformly" (column 2, lines 47 to 51) and further "Pulp diluted with returning digesting liquor supplied through the spray nozzle or nozzles 50 is fed by scraper 17 through the outlet 27" (column 4, lines 22 to 24).

Although not explicitly mentioned in document D1 it can be derived that due to the scraper feeding pulp to an outlet 27 arranged in the bottom of the tower near its center (column 2, lines 53 to 56; figure) a motion imparted on the pulp scraped off by the scraper has to be directed to the outlet and thus the center of the bottom.

Contrary to the allegations of the appellant from the disclosure explicitly given in document D1 it cannot be derived that the scraper acts like the "at least one mixer" provided within the pulp tower according to claim 1 of the patent in suit, since no indication is given that the scraper is comprised by the dilution means and furthermore that the scraper generates a

circular flow as defined for the "at least one mixer" within claim 1.

This also holds true considering the argument of the appellant, that within claim 1 of the patent in suit the structure of the at least one mixer and the nature of the circular pulp flow are not further defined. The wording of document D1 "The scraper 17 ... scrapes off the column of material underneath" (column 2, lines 47 to 51) cannot be understood in the sense that a circulating pulp flow is generated by the scraper. Consequently, due to the differences concerning their respective functions the "at least one mixer" comprised according to claim 1 by the dilution means is not anticipated by the provision of the scraper known from document D1.

2.2 According to the appellant the subject-matter of claim 1 of the patent in suit further lacks novelty since the provision of a scraper in a pulp tower as known from document D1 also implies that a mixer or an agitator encompassing both scrapers and mixers, is arranged in a pulp tower.

2.2.1 In support of this argument concerning the implicit disclosure of document D1 the appellant cited documents D6 - D10 with the grounds of appeal.

Of these documents document D8 was not published before the priority date of the patent in suit. It therefore cannot be considered as a prior art document or as a source for technical knowledge to be considered with respect to the patent in suit and is thus not admitted.

Reference to documents D6, D7, D9 and D10 can be seen as an attempt to overcome the opinion expressed within the decision of the opposition division, according to which the term "mixer" as referred to in claim 1 of the patent in suit implies that a device thus designated is different from the device called "scraper" as known from document D1.

The Board therefore exercising its discretion under Article 114(2) EPC admits documents D6, D7, D9 and D10.

- 2.2.2 According to the appellant it can be derived from these documents that a scraper provided within the pulp tower according to document D1 is a mixer like the one arranged in the pulp tower according to claim 1 of the patent in suit.

Document D6 is a brochure having the title "DISCHARGE SCRAPER" followed by the subtitle "FOR EFFECTIVE TOWER DISCHARGE". In this document bottom scrapers are referred to which have been successfully used in the discharging of high-consistency storage and bleaching towers (page 2, paragraph 1). Concerning the discharge it is indicated that the discharge scraper scrapes the pulp over the complete bottom area and leads it to the suction opening to a pump, thus enabling an even discharge (page 2, paragraphs 2 and 3).

In addition to the discharge scraper disclosed in document D6, which corresponds to the scraper provided according to document D1, a diluting scraper is likewise referred to (page 2, paragraph 4 and paragraph at the bottom of page 2). According to document D6 the diluting scraper comprises holes through which dilution

water is discharged into the pulp which is thus diluted. The statement according to which "the diluting scraper simultaneously dilutes the pulp uniformly, discharges the tower without interference ..." makes it clear that in addition to the scraping action of the discharge scraper the diluting scraper also dilutes the pulp.

Although as alleged by the appellant due to its dilution action the dilution scraper can be considered as performing a mixing action to a certain degree, this diluting scraper cannot be considered as leading to the scraper according to document D1 having to be understood as being a mixer as referred to in claim 1 of the patent in suit. The reason for this conclusion is that it cannot be derived from document D6 that the diluting scraper is able to generate a pulp flow as defined in claim 1 for the mixer, namely one which is circulating and which is of a lengthwise extent in the bottom portion (cf. section 1. above). For completeness sake it should be indicated that, due to the pulp tower according to document D1 comprising a scraper of the type referred to in document D6 as discharge scraper, the disclosure of document D1 cannot implicitly comprise a scraper of a different type, namely a diluting scraper, since no indication in support of such an assumption is given by the disclosure of document D1. This applies likewise with respect to the remaining documents D7, D9 and D10 as far as devices other than discharging scrapers or the arrangement of more than one discharge scraper are concerned.

2.2.3 Document D7 is a brochure having the title "Ahlstrom Pumps and Mixers", in which a variety of different devices are presented individually. The main portion of the brochure concerns pumps of various types. Additionally "SLB/SLG chest agitators", a "MC discharge scraper" for discharging high consistency towers concerns pumps and an "AHLMIX chemical mixer" designed for mixing both gaseous and liquid bleaching chemicals and also steam into paper stock are presented.

According to the appellant, from a comparison of the "at least one mixer" referred to in claim 1 and the "SLB/SLG chest agitators" disclosed in document D7 it can be concluded that an agitator is a mixer as referred in claim 1 which further implies that a scraper likewise qualifies as being such a mixer.

The Board cannot agree to these assumptions. In document D7 various pieces of equipment are referred to individually. No indication is given in support of the assumption that the agitator and the scraper shown within this brochure are for the same purpose and function alike. Furthermore the portion of the brochure dedicated to the "MC discharge scraper" does not disclose that such a scraper, be it with or without dilution, generates a circulating pulp flow as defined within claim 1 of the patent in suit for the mixer.

2.2.4 Document D9 discloses digesters with a single scraper and a central discharge opening where pulp of the cross-section at which the scraper is installed gets mixed in the outlet opening so that a unitary final product is obtained (column 1, lines 32 to 42). Since pulp from the core area of the bottom and one from the

peripheral zone can have different properties, document D9 proposes instead of these pulps being mixed the use of two scrapers, each serving a different outlet for one of the two kinds of pulp (column 1, lines 43 to 65). Document D9 does not disclose that any of the scrapers generates a flow as defined in claim 1 for the "at least one mixer" (cf. column 4, lines 27 to 34).

- 2.2.5 Document D10 is part of a book having the title "Continuous Digesters". The scraper shown in Figure 2.17 is not referred to in the text. Consequently this document cannot be considered as disclosing a scraper functioning as the mixer defined in claim 1 of the patent in suit.
- 2.2.6 For completeness sake it should be indicated that the above considerations apply irrespective of the consistency of the pulp since none of the documents D1, D6, D7, D9 and D10 referred to above discloses that a scraper acts on the pulp in a manner different to the one outlined above in cases where the conditions with respect to consistency of the pulp are comparable to the ones referred to in claim 1 of the patent in suit.
- 2.3 The appellant has not argued why claim 1 lacks novelty with respect to document D2 or D5.

These documents disclose pulp towers, each being provided with a scraper in a way similar to the scraper according to document D1. Thus for reasons corresponding to the ones given above with respect to document D1, the scraper according to document D2 or D5 likewise cannot be considered as being a mixer within the meaning of the "at least one mixer" comprised

within the dilution means of the pulp tower and generating a circular pulp flow as defined in claim 1 of the patent in suit.

Thus the subject-matter of claim 1 of the patent in suit is not anticipated by the explicit or implicit disclosure of each of these documents.

2.4 The subject-matter of claim 1 is thus novel within the meaning Article 54 EPC.

3. *Inventive step*

In the opposition proceedings, although referred to as a ground of opposition, the opponent did not submit any specific arguments with respect to the alleged lack of inventive step. According to the decision of the opposition division the subject-matter of claim 1 involves inventive step since none of the cited documents nor any combination of these documents renders the subject-matter of claim 1 obvious.

The only argument given with respect to lack of inventive step in the appeal proceedings by the appellant is the statement in the grounds of appeal that all documents relied upon in the opposition proceedings disclose the use of "scrapers". However, in view of the opinion expressed by the opposition division that a scraper as disclosed by the prior art documents cannot be understood as being a mixer as referred to in claim 1 of the patent in suit, it could not be argued that a combination of such documents leads to the subject-matter of claim 1.

As indicated above and stated in the Communication dated 27 June 2003 expressing the preliminary opinion of the Board, none of the cited documents gives an indication from which it can be derived that a scraper or an agitator as disclosed in these documents can be understood as being a device of the kind of the "at least one mixer" as referred to in the characterising part of claim 1 of the patent in suit. Therefore, none of the cited documents can render obvious the subject-matter of claim 1 of the patent in suit.

The subject-matter of claim 1 thus involves an inventive step in view of the available documents (Article 56 EPC).

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

D. Spigarelli

A. Burkhart