

Internal distribution code:

- (A) [] Publication in OJ
(B) [] To Chairmen and Members
(C) [X] To Chairmen
(D) [] No distribution

**Datasheet for the decision
of 28 April 2006**

Case Number: T 0164/04 - 3.3.05

Application Number: 96908826.9

Publication Number: 0815175

IPC: C09C 3/06

Language of the proceedings: EN

Title of invention:

Recycling of mineral fillers from the residue of a paper
deinking plant

Patentee:

MINERALS TECHNOLOGIES INC.

Opponent:

Behnisch, Werner, Dr.

Headword:

Ash of mineral pigments/MINERAL TECHNOLOGIES

Relevant legal provisions:

EPC Art. 54(1), (2), 56

Keyword:

"Novelty (yes)"

"Inventive step: third auxiliary request (yes), other requests
(no)"

Decisions cited:

-

Catchword:

-



Case Number: T 0164/04 - 3.3.05

D E C I S I O N
of the Technical Board of Appeal 3.3.05
of 28 April 2006

Appellant: Behnisch, Werner, Dr.
(Opponent) Friedrichstrasse 31
D-80801 München (DE)

Representative: -

Respondent: MINERALS TECHNOLOGIES INC.
(Patent Proprietor) 405 Lexington Avenue
New York, NY 10174-1901 (US)

Representative: GROSSE BOCKHORN SCHUMACHER
Patent- und Rechtsanwälte
Frühlingstrasse 43A
D-45133 Essen (DE)

Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 28 November 2003
rejecting the opposition filed against European
patent No. 0815175 pursuant to Article 102(2)
EPC.

Composition of the Board:

Chairman: M. Eberhard
Members: J.-M. Schwaller
S. Hoffmann

Summary of Facts and Submissions

- I. The appeal was lodged against the decision of the opposition division to reject the opposition against the European patent EP-B-0815175.

Independent claims 1 and 7 of the patent read as follows:

"1. A composite particulate material comprising an inner portion of an ash particle of mineral inorganic pigments, and an outer portion of calcium carbonate which completely covers the available surface of said ash particle.

7. A process for making composite precipitated calcium carbonate particulates which process comprises: incinerating a wastepaper deink residue comprising mixed mineral pigments at high temperature to form ash particles; forming a slurry of calcium hydroxide and the ash particles; carbonating the slurry to precipitate calcium carbonate directly onto the ash particles; to form composite precipitated calcium carbonate particles, wherein said calcium carbonate completely coats said ash particles."

- II. During the opposition proceedings, the following prior art documents were *inter alia* relied upon:

E1: EP-A-0604095

E2: DE-A-2911973

E5: English translation of JP-A-02149421

A3: Annex III filed during the oral proceedings before the opposition division, Römpp Lexikon Chemie, page 1377

III. The decision can be summarized as follows:

The subject-matter of claim 1 of the patent in suit is novel over E5 because the fly ash described therein is different from an ash particle of mineral inorganic pigments. Claim 7 of the patent in suit is novel over E5, because the latter does not describe the incineration of a wastepaper deink residue comprising mixed mineral inorganic pigments.

E5 is considered to be the closest prior art document. The problem to be solved by the invention is to recycle the mineral pigments of a wastepaper deink residue in a manner that results in useful products rather than as landfill material. The solution to this problem is represented by the process according to claim 7 of the patent-in-suit in which mineral pigments of a wastepaper deink residue are incinerated to form ash particles on which a continuous layer of calcium carbonate is subsequently deposited. This solution is not suggested by the documents E1, E2 or E5.

IV. With the grounds of appeal of 29 March 2004, the appellant (opponent) filed six new documents E6-E11, which are excerpts from the Internet, and further relied upon US-A-5018459 (E12) and US-A-4932336 (E13), both cited in the patent in suit. It submitted that the arguments put forward during the oral proceedings before the opposition division neither appeared in the minutes nor had they been taken into consideration in

the contested decision and requested therefore to remit the case to the opposition division.

- V. Along with observations, the respondent (patentee) requested to disregard E6-E11, these documents being late filed and not relevant.
- VI. During the oral proceedings, which took place on 28 April 2006, the respondent withdrew its request to disregard E6-E11 and filed three new sets of claims respectively as 1st to 3rd auxiliary requests. The appellant withdrew its request to remit the case to the first instance and requested not to admit the said auxiliary requests into the appeal proceedings, as having been late filed.

Independent claim 6 of the 1st and 2nd auxiliary requests is identical to independent claim 7 of the main request.

Independent claims 1 and 5 of the 3rd auxiliary request read as follows:

"1. A composite particulate material comprising an inner portion of an ash particle of mineral inorganic pigments, said ash particle being obtained from the incineration of wastepaper deink residue and comprising Gehlenite, Anorthite, Perovskite, or mixtures thereof, and an outer portion of calcium carbonate which completely covers the available surface of said ash particle.

5. A process for making composite precipitated calcium carbonate particulates which process comprises:

incinerating a wastepaper deink residue comprising mixed mineral pigments at high temperature to form ash particles;
forming a slurry of calcium hydroxide and the ash particles;
carbonating the slurry to precipitate calcium carbonate directly onto the ash particles;
to form composite precipitated calcium carbonate particles, wherein said calcium carbonate completely coats said ash particles, which further comprises adding at least one calcium, aluminium, or titanium compound or mixture thereof to the wastepaper deink residue prior to incineration."

VII. The appellant essentially presented the following arguments:

Claim 1 as granted, which is directed to a "*composite particulate material comprising an inner portion of an ash particle of mineral inorganic pigments ...*", is to be considered as a product-by-process claim because an ash necessarily derives from an incineration process. However, independently of whether the particle of mineral inorganic pigments defined in claim 1 has been obtained by an incineration process or by any other manufacturing process, an absolute product protection is given to the subject-matter defined in said claim 1. Since the origin of the pigments, i.e. whether they are derived from an incineration process or not, is not reflected in the chemical composition of the inorganic pigments, the expression "ash particle of mineral inorganic pigments" is to be interpreted as "particle consisting exclusively of mineral inorganic pigments".

E5, which discloses a composite having as a core material a mineral pigment such as silica, kaolinite or titanium oxide, and having calcium carbonate evenly deposited as a film on the surface of said core material destroys the novelty of claim 1 of the main request, in particular because claim 1 does not require that the inner portion be derived from an incineration process as explained before. Furthermore fly ash is also disclosed as a possible core material in the products of E5.

The documents E6-E10 have been filed in answer to the decision of the opposition division, in order to show that fly ashes are produced during incineration of paper or paper wastes. E6 shows in particular that fly ashes contain calcium silicates and calcium aluminates, which are pigments, like gehlenite and anorthite, which both are calcium silicates. A3 shows that fly ash from exhaust gas cleaning processes may contain calcium salts.

As to inventive step, as acknowledged in the patent in suit, it was common general knowledge that wastes from the paper industry were incinerated in boilers and that the ash recovered therefrom was either deposited in a landfill or recycled in construction materials. Ashes, in particular fly ashes, produced during incineration of wastes from the paper industry, such as in E12 or E13, inevitably contain mineral inorganic pigments.

The skilled person faced with the problem of looking for a valuable use of the fly ash resulting from the incineration of deink residues knows - as confirmed by paragraphs [0002] to [0006] of the patent in suit -

that fly ashes are produced in incinerating wastes from the paper industry. Such an ash being itself a waste product, the skilled person would try to recycle it, like in E5 which discloses a material having a core particle coated with calcium carbonate, said core particle being *inter alia* fly ash. Fly ash is presented in E5 as an equivalent to other core mineral particles, such as silica, kaolin or titanium oxide, which themselves are mineral pigments. E5 teaches that these coated particles have excellent whiteness and opacity and can be used as pigments in the paper manufacturing. Since the fly ash described in E5 is not limited to a specific type of fly ash, the skilled person faced with the above problem would take into consideration any type of fly ash, including those emanating from the paper industry, which contain necessarily mineral inorganic pigments. The subject-matter of claims 1 and 7 of the main request therefore lacks an inventive step.

Starting from E5 as the closest prior art, the claimed subject-matter also does not involve an inventive step in view of the teaching of E5 in combination with that of E13.

The 1st to 3rd auxiliary requests should not be admitted into the appeal proceedings because they have been late filed.

The insertion of the features "obtained from the incineration of wastepaper deink residue" in independent claim 1 of the 1st auxiliary request introduces subject-matter which extends beyond the content of the application as originally filed, because

the above features, which have their origin in dependent claim 3 of the patent in suit, have not been transferred into independent claim 1 simultaneously with all the features of dependent claim 3. Since there is no basis in the application as originally filed for claim 1 of the 1st auxiliary request, the requirements of Article 123(2) EPC are not met.

The claims of the 3rd auxiliary request lack an inventive step, in particular because incineration of deink residues from the paper industry is generally done in fluidized beds working at temperatures between 800 and 1200°C, and at such temperatures, the crystalline phases gehlenite, anorthite and/or perovskite are inevitably formed. The addition of a compound of Ca, Al and/or Ti is trivial when the purpose is to prepare a gehlenite, anorthite and/or perovskite phase.

VIII. The respondent principally argued as follows:
Gehlenite, anorthite and perovskite are mineral inorganic pigments, but CaO cannot be considered as such due to its high reactivity in particular with water. The expression "*an ash particle of mineral inorganic pigments*" is to be understood as meaning "an ash particle obtained by an incinerating process and comprising inorganic pigments".

The term "fly ash" does not destroy the novelty of "an ash particle of mineral inorganic pigments".

Starting from E13 as the closest prior art, which discloses the incineration of a "reject", the problem to be solved may be seen in finding a way for reusing a

deink residue as a high value material in the paper industry, instead of reusing the ash derived from such a residue in building materials. E5, which deals with another problem, namely giving a specific form to calcium carbonate particles, cannot suggest the solution as defined in the claims of the patent in suit. E5 does not deal with the treatment of deink residue. Incineration is one possible processing option among others, such as filtering out the water or extracting the hydrocarbons, as regards the first step for recycling a deink residue. The idea of recycling in the paper manufacturing an ash derived from the incineration of a deink residue is not obvious, because an ash is generally dark or blackish in colour whilst paper is generally white in colour and furthermore the incineration of a deink residue might destroy the mineral pigments.

The gehlenite, anorthite and/or perovskite phases defined in claim 1 of the 3rd auxiliary request provide good nucleation sites for the direct precipitation of calcium carbonate onto the ash particles, thus providing high adherence of the calcium carbonate coating without impairing the optical properties of the composite material thus obtained. The addition of a calcium, aluminium and/or titanium compound, as presently defined in claim 5 of the 3rd auxiliary request, allows in particular when the deink residue is deficient in one or more of these elements, to supplement the residue with appropriate amounts thereof to form the mineral phases (such as gehlenite, anorthite and/or perovskite) necessary for an adequate precipitation and adherence of calcium carbonate.

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

The respondent requested that the appeal be dismissed (main request) or in the alternative that the decision under appeal be set aside and that the European patent be maintained in amended form on the basis of either of the sets of claims of the 1st, 2nd and 3rd auxiliary requests, all filed during the oral proceedings.

Reasons for the Decision

1. Admissibility of the auxiliary requests

Although the three auxiliary requests were filed during the oral proceedings of 28 April 2006, i.e. at a late stage of the appeal procedure, the appellant's request to disregard them is rejected for the following reasons. In general an opponent should be prepared that, as a defense against his attacks, claims are limited during oral proceedings to subject-matter of one of the dependent claims, especially, as in this case, if all the claims as granted are attacked in the statement of grounds of appeal. In the present situation, the amended claims 1 of the three new requests are based on the combination of granted claim 1 with additional features already present either in dependent claim 3 and/or in dependent claim 4 of the granted patent; the amended independent process claim 5 of the 3rd auxiliary request is based on the combination of granted claim 7 with dependent claim 9. The patent specification contained only three claims dependent on independent product claim 1 and only six claims

dependent on independent process claim 7, so that the appellant could not be surprised by these amendments made in direct response to the further arguments developed during the oral proceedings. The auxiliary requests I to III are therefore admitted.

2. *Interpretation of the expression "ash particle of mineral inorganic pigments"*

In view of the parties' divergent interpretations of the above expression, it is necessary to clarify its meaning on the basis of the disclosure in the description.

In this respect, the board observes that it has not been contested at the oral proceedings that gehlenite, anorthite and perovskite are mineral inorganic pigments. Concerning calcium oxide (CaO), the appellant argued that this was an inorganic pigment but the respondent vehemently contested this allegation arguing that CaO was very reactive in particular with water, and was thus not a pigment. It is furthermore noted that the patent in suit discloses in Example II a composite particulate material having, according to Table 4, an inner portion containing *inter alia* the above mentioned three mineral inorganic pigments in addition to a considerable amount of lime (CaO). Since CaO cannot be considered as an inorganic pigment in the present context, taking into account its reactivity in particular with an aqueous medium as used in the production of paper, when the description and in particular Example II and Table 4 are used to interpret claim 1, the expression "ash particle of mineral inorganic pigments" is to be construed as meaning "an

ash particle **containing** mineral inorganic pigments" and not "an ash particle consisting exclusively of mineral inorganic pigments", as argued by the appellant. In other words, the ash particle may also contain additional components.

Claim 7 includes an incineration step and none of the granted claims suggest that a process other than incineration could be carried out in order to obtain an ash particle of mineral inorganic pigments. The description is also completely silent about the possibility of preparing the claimed product by a process step other than incineration. For these reasons, the board cannot accept the appellant's construction that the expression "ash particle" could mean a particle which can be obtained by a process other than incineration, or in other words a product the inner portion of which could be something other than an ash particle. Furthermore, the term "ash particle" itself clearly involves a calcination or an incineration step.

In conclusion, for the above reasons, the expression "ash particle of mineral inorganic pigments" is understood as meaning a "particle derived from an incineration process and containing mineral inorganic pigments".

3. *Main request*

3.1 Although the novelty of claim 1 of this request has been disputed, the question whether or not the composite material of claim 1 is novel may remain open

since this request has to be rejected for lack of inventive step of claim 7 (see below).

- 3.2 As mentioned at page 2, lines 5-8, 28-29 and 38-40 of the patent specification, at the date of priority, wastes from papermaking or from wastepaper recycling, such as deink residues comprising mixed inorganic pigments (clays, calcium carbonates, titania, etc ...), were often incinerated for their fuel content and the residual ash thus recovered deposited in landfills or used to produce aggregate materials, typically for use in construction applications.
- 3.3 Starting from this known technique as closest prior art, the problem to be solved by the subject-matter of claim 7 can be seen in providing a process which enables recycling of the wastepaper deink residue in a manner that results in a product useful in the paper industry (see in this respect the paragraphs [0005] and [0012] of the patent in suit).
- 3.4 The subject-matter of independent claim 7 of the present request, which is proposed to solve the above problem, differs from said closest prior art in that:
- (i) a slurry of calcium hydroxide and the ash particles is formed;
 - (ii) the slurry is carbonated to precipitate calcium carbonate directly onto the ash particles, to form composite precipitated calcium carbonate particles, wherein said calcium carbonate completely coats said ash particles.

In view of the information in the description, in particular the Examples, it is credible that the above problem has actually been solved.

- 3.5 The respondent argued that the skilled man would not find a solution to the above problem in E5, because this document not only addresses a problem different to that of the patent in suit, namely giving a non-conventional form to calcium carbonate particles, but also concerns technical fields, such as cosmetics, paints, inks, plastics and rubber, which have nothing to do with the paper industry or with the recycling of deink residues. The board is not convinced by these arguments for the following reasons. It is true that E5 (page 2, lines 8-9) addresses the problem stated above, however in the next sentence (see page 2, lines 10-13) reference is made to the paper manufacturing industry, in particular to the shape of the calcium carbonate used as pigment for coated paper. The use of such particles as a pigment in paper manufacturing is reiterated at page 7, line 11 and the sole use extensively exemplified in E5 concerns paper manufacturing as can be seen in the Table bridging pages 6 and 7 and at page 7, lines 4-6, wherein the preparation of coating compositions and of coated paper using said pigments as well as the properties of the said coating compositions and coated paper are described. As to the other technical fields in which the calcium carbonate of "non-conventional" shape are supposed to be used, very few details are given in the description of E5 and no concern at all is given to them in the Examples. Under these circumstances, there is no doubt that E5 belongs to the same technical field as the patent in suit, namely the paper industry, and

the skilled person faced with the problem stated above would thus consider this document with interest.

3.6 E5 discloses, in particular at page 4, lines 17-23 (see also the Examples) a process for producing non-conventional form calcium carbonate particles by forming an aqueous suspension of core mineral particles into which are introduced a 5-20% solution of a water soluble calcium salt, e.g. calcium sulphate or calcium chloride at 10-50°C, then 5-20 molar % of aqueous ammonia at 10-50°C with stirring and, without interruption, 10-30% vol. of carbon dioxide at 10-50°C at a rate of 1-30 ml/min per g of calcium hydroxide. Calcium hydroxide being generated *in situ*, this process thus discloses the features (i) and (ii) identified in item 3.4 *supra*. As indicated at page 4, lines 22-23 of E5, the said process thus allows calcium carbonate to be deposited as a film on the surface of said core particles.

3.7 E5 furthermore discloses fly ash as one of the core mineral particles among a list of potential particles of very different nature and composition (page 3, last three lines to page 4, line 16). The calcium carbonate particles prepared according to the process identified in item 3.6 *supra* are furthermore described as suitable for paper manufacturing, in particular as pigments in papers coated therewith (see E5, page 2, lines 24-27; Table bridging pages 6 and 7; page 7, lines 4-6 and 11).

Bearing in mind, on the one hand, that fly ash is described in E5 as a potential core mineral particle for preparing calcium carbonate particulates suitable as pigments for paper manufacturing, and on the other

hand, that it was known to incinerate deink residues comprising mixed mineral pigments, thus producing ashes of deink residues (see item 3.2 above) and that very different kinds of core particles with very different compositions are used in the process of E5, the skilled person would consider the process of E5 as a promising way of solving the problem stated above.

3.8 Since at the priority date of the patent in suit, it was usual to incinerate deink residues to reduce the volume thereof (see item 3.2 *supra*) and since E5 suggests to use fly ash as a core material, i.e. a product derived from an incineration process, the skilled person had no reason to ignore this technology. In this respect, the respondent argued that the skilled person would have tried other technologies, such as filtering out the water or extracting the hydrocarbons as the first step of its process for recycling deink residues, instead of incineration. The board notes that, as can be seen from the wording of claim 7 of this request, further steps such as filtering out the water are not excluded therefrom and may be carried out, e.g. before the incineration operation claimed.

3.9 The respondent further pointed out that E5 does not deal with the recycling of deink residues. Although this is correct, it cannot be contested that fly ash is a waste product. Moreover, the fact that E5 discloses the conversion of such a waste product resulting from an incineration step into a more valuable product, e.g. a pigment for paper manufacturing, would give the skilled person an incentive to also apply the process of E5 to the known ashes from the incineration of deink residues in order to solve the problem stated above,

all the more so as there is no limitation in E5 as to the type of fly ash to be used as the core particle for the calcium carbonate coating.

3.10 As to the respondent's argument that such an ash being generally dark in colour, it would not be obvious to recycle it in the paper production, the board notes that the same considerations apply to the ash disclosed in E5, which is not necessarily light coloured, and which is nevertheless plainly suitable for the said production of a product useful in the paper industry after precipitation of a calcium carbonate film onto the core particle.

3.11 The respondent further argued that:

(i) the skilled person would not perform an incineration because the mineral pigments contained in the deink residue could be damaged by incineration; and that

(ii) incineration is carried out without addition of combustible material in the present invention, i.e. in a different way than in the known technique wherein the deink residue is incinerated together with other combustibles. These arguments also did not convince the board because claim 7 neither excludes the presence of any other combustible material nor does it indicate any precise incineration temperature. It is also not indicated in claim 7 that the incinerated product still contains several inorganic pigments. Furthermore E5 shows that an incinerated product can lead to a product useful in the paper industry.

3.12 For all the reasons indicated above, in the board's judgment the skilled person faced with the stated problem would contemplate using the process for making composite precipitated calcium carbonate particulates disclosed in E5 for recycling the ash produced in the known technique of incineration of wastepaper deink residues and would thus arrive at the subject-matter of claim 7 of the present request, which thus lacks an inventive step under Article 56 EPC. The main request is therefore rejected.

4. *1st and 2nd auxiliary requests*

Claim 6 of these requests being identical to claim 7 of the main request, for the same reasons as those indicated above, its subject-matter does not meet the requirements of Article 56 EPC. Said requests are therefore rejected.

5. *3rd auxiliary request- Allowability under Article 123(2) and (3) EPC - Novelty*

5.1 The appellant objected that the insertion into claim 1 of this request of the features "obtained from the incineration of wastepaper deink residue" contravened the requirements of Article 123(2) EPC because these features, which have their origin in dependent claim 3 of the patent, have been picked out from this claim without inserting into claim 1 the remaining features of dependent claim 3.

5.2 As to this objection, it is noted that it is not the patent in suit, but the application as originally filed, which corresponds to the published PCT application

WO 96/28517, which has to be taken into consideration for the issue of allowability of the amendments under Article 123(2) EPC. According to claim 3 of this application, the inorganic mineral material comprises an ash obtained from the incineration of wastepaper deink residue. It is furthermore directly and unambiguously derivable from the description of the PCT application, in particular from the passages at page 5, lines 6-15; page 6, lines 4-14 and 35-37 and from the Examples, that ash particles derived from the incineration of wastepaper deink residue are contemplated, so that the above contested insertion of features cannot be considered as going beyond the content of the application as originally filed.

- 5.3 The other amendment carried out in claim 1 of this request has its origin in claim 4 of the PCT application. The amendment in independent claim 5 of this request is based on claim 9 of the PCT application.

The scope of protection conferred by the amended claims of this request has furthermore not been extended over that of the claims of the patent in suit.

- 5.4 For all the above reasons, the requirements of Article 123(2) and (3) EPC are therefore fulfilled.

- 5.5 No objection under Article 54 EPC having been raised against any of the amended claims of this request and the board also considering that the requirements of novelty are met, no further comments on this matter is needed.

6. *3rd auxiliary request - Inventive step of claim 1*
- 6.1 Starting from the closest prior art indicated in point 3.2 above, the problem underlying the product claim 1 of the present request can be seen in finding a way to recycle the wastepaper deink residue, which leads to a product useful in the paper industry. It is proposed to solve this problem by the product as defined in claim 1, which differs from said closest prior art at least in that the ash particle of mineral inorganic pigments comprises gehlenite, anorthite, perovskite or mixtures thereof, and said ash particle is in the inner portion of a composite particulate material having an outer portion of calcium carbonate which completely covers the available surface of said ash particle.
- 6.2 The Examples of the patent in suit show that the above problem has effectively been solved by the composite particulates as defined in present claim 1, which can be used in papermaking in the same manner as virgin precipitated calcium carbonate (see in particular paragraphs [0033], [0042] and Table 7).
- 6.3 The board notes that none of the prior art documents cited during the opposition and appeal procedures disclose or suggest the presence of gehlenite, anorthite and/or perovskite in an ash particle of mineral inorganic pigments obtained from the incineration of a deink residue and the incorporation of such an ash particle as the inner portion of a composite particulate material as well as the possible use of such a material in the papermaking.

E5 itself indeed discloses an outer portion of calcium carbonate which forms a film on the surface of an inorganic core material, but does not describe an ash particle comprising gehlenite, anorthite, perovskite or mixtures thereof as the core material.

Concerning the closest prior art, there is nothing in the background art as analysed in paragraphs [0002] to [0006] of the patent in suit suggesting that after incineration of the deink residue, the ash particles obtained would comprise gehlenite, anorthite and/or perovskite.

This is also not suggested in E13 which concerns a method for the disposal of wastes from wastepaper recycling in the paper industry, which method includes a combustion step (see claim 1). In fact, in this document, a fly ash is recovered from the combustion gas and discharged thereafter into the furnace and trapped in the slag (see column 3, lines 17-21 and column 5, lines 40-51). E13 does not mention how incineration is carried out nor does it suggest that the slag which is used in the construction industry (see page 6, lines 17-18) or the fly ash contains gehlenite, anorthite, perovskite or mixtures thereof.

E12 discloses the incineration, e.g. in a rotary kiln or a fluidized bed incinerator, of a paper pulp sludge at a temperature between 800°F (~ 427°C) and 3500°F (~ 1927°C) and the collecting of an incineration product consisting essentially of carbonate particles (claim 1; column 2, lines 36-46). Again, nothing is said about the presence of gehlenite, anorthite and/or perovskite in the incineration product.

6.4 The appellant argued that the deink residues from the paper industry are generally incinerated in fluidized beds working at temperatures between 800 and 1200°C and that gehlenite, anorthite and/or perovskite are then inevitably formed under such operating conditions. The board notes that this allegation is not in agreement with the patent in suit which teaches at paragraph [0020] that when calcium carbonate, kaolin clay and titanium dioxide are mixed in various proportions and heated to 800 to 1200°C, typically 1000°C, two, three, or more new phases in varying proportion are produced, including Gehlenite ($\text{Ca}_2\text{AlSiO}_7$) and/or Anorthite ($\text{CaAl}_2\text{Si}_2\text{O}_8$) with some Perovskite (CaTiO_3), the relative amount of each phase formed being dependent upon the amount of each mineral present in the original mixture and the combustion temperature. This means that the formation of these phases implies the selection of a certain range of temperature for the calcination as well as the presence of calcium carbonate, kaolin clay and titanium dioxide in the feed to the incinerator. There is no information in the background art cited in paragraphs [0002] to [0006] of the patent in suit or in E13 that the temperature of incineration of deink residue lies from 800 to 1200°C. Although E12 discloses a broad incineration temperature range encompassing the range 800-1200°C, the product obtained therein essentially consists of carbonate particles, i.e. a product different from gehlenite, anorthite and/or perovskite. Although E5 discloses that the inorganic core particles may be fly ash, it cannot be inferred therefrom that gehlenite, anorthite and/or perovskite would be suitable as core particles, let alone that they would provide nucleation sites for the direct

precipitation of calcium carbonate on the surface of the ash. The appellant did also not provide any evidence in support of his allegation that deink residues were generally incinerated at a temperature between 800 and 1200°C, which allegation was contested by the respondent.

6.5 For all the reasons indicated above, the subject-matter of claim 1 cannot be considered as obvious to a person skilled in the art and the requirements of Article 56 EPC are therefore met as regards this claim.

7. *3rd auxiliary request - Inventive step of claim 5*

7.1 The subject-matter of independent process claim 5 of this request differs from the independent process claims rejected in the previous requests in that the process further comprises adding at least one calcium, aluminum or titanium compound, or mixture thereof, to the wastepaper deink residue prior to incineration.

7.2 Concerning the appellant's argument that the addition of said compounds is trivial for a skilled person faced with the preparation of gehlenite, anorthite and/or perovskite phases, the board observes that the problem solved by claim 5 of this request is not just preparing gehlenite, perovskite and/or anorthite. As indicated in point 3.3 above, the problem is to provide a process which enables recycling of a deink residue in a manner that results in a product useful in paper industry.

7.3 This problem is solved by the addition of at least one calcium, aluminum or titanium compound, or mixture thereof, to the wastepaper deink residue prior to

incineration in combination with the remaining process steps defined in claim 5 of this request. As submitted by the respondent, the addition of at least one of the above compounds - in particular when the wastepaper deink residue is deficient in one or more of the elements calcium, aluminium or titanium - contributes to the formation of the appropriate mineral phases gehlenite, anorthite, perovskite and mixture thereof during the combustion of said deink residue. These phases provide nucleation sites for the direct precipitation of calcium carbonate onto the surface of the ash; see also the patent in suit at page 4, lines 31-42 and 47-49.

- 7.4 None of the cited documents suggest to add at least one calcium, aluminum or titanium compound, or mixture thereof to the waste paper deink residue prior to incineration, let alone to enhance the formation of new phases which provide nucleation sites for the direct precipitation of calcium carbonate on the ash particles. As neither the known technology of incineration of deink residue nor the documents cited contain information suggesting the additional process feature of claim 5, let alone in combination with the remaining features thereof to solve the problem stated above, claim 5 also meets the requirements of Article 56 EPC.

8. *Third auxiliary request - Inventive step of the remaining claims*

Claim 2 being dependent on independent product claim 1 and claims 6-10 on independent process claim 5, their subject-matter also involves an inventive step.

Similarly, independent claim 3 (directed to a paper including the composite particulate material of claim 1 or 2) and independent claim 11 (directed to a method of making paper comprising forming precipitated calcium particles according to the process of claim 5, 6 or 7) do also meet the requirements of Article 56 EPC, since they include the inventive features of either independent product claim 1 or independent process claim 5.

Order

For these reasons it is decided that:

1. The decision under appeal be set aside
2. The case is remitted to the first instance with the order to maintain the patent on the basis of the claims of auxiliary request III submitted during the oral proceedings and the description/drawing to be adapted.

The Registrar:

The Chairman:

C. Vodz

M. Eberhard