



UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/138,355	08/21/98	YU	Q 03639.75768

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IM22/1003

EXAMINER

SPEER, T

ART UNIT PAPER NUMBER

1775

DATE MAILED: 10/03/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary	Application No. 09/138,355	Applicant(s) YU, ET AL.
	Examiner Timothy M. Speer	Group Art Unit 1775

☒ Responsive to communication(s) filed on Mar 17, 2000

☐ This action is FINAL.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) 1-109 is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1-109 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☐ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 4

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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DETAILED ACTION

Election/Restriction

1. The provisional restriction made at the interview on 03-15-00 has been withdrawn on further consideration. Therefore, claims 1-109 will be treated on the merits.

2. *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-109 are rejected under 35 U.S.C. 103(a) as being unpatentable over Knauf (U.S. 3,770,468).

Knauf teaches a method of making set gypsum articles and the articles produced by the method wherein a phosphonic acid, as presently claimed, e.g., sodium trimetphosphate, is incorporated into the gypsum mix (col. 1, lines 65-67, for instance). Knauf fails to teach the concentration of the additive presently claimed. However, where, as here, the prior art teaches the general conditions of a claim, it is not inventive to discover optimum or workable ranges through routine experimentation. In the instant case, to adjust the amount of the additive, a result effective variable, such as to obtain an optimum or workable range would certainly require no

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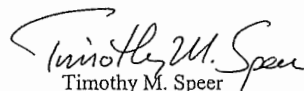
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more than routine experimentation by one having ordinary skill in the art. Therefore, it is the Examiner's position that the instant claims are *prima facie* obvious over the applied prior art.

Information Disclosure Statement

5. The Information Disclosure Statement filed on 03-05-99 has been considered and made of record. A copy of the 1449 initialed and dated by the Examiner is included herewith.
6. Any inquiry concerning this communication should be directed to Timothy M. Speer at telephone number (703) 308-3624.


Timothy M. Speer
Primary Examiner
Art Unit 1775

T.M. Speer/ts
September 30, 2000



#111/Amold
C. Green
PATENT 12/5/00

Attorney Docket No. 202591

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Qiang Yu et al.

Group Art Unit: 1772

Serial No. 09/138,355

Examiner: Timothy Spear

Filed: August 21, 1998

For: Gypsum-Containing Product Having
Increased Resistance to Deformation
And Method And Composition
For Producing It

AMENDMENT

Assistant Commissioner For Patents
Washington, D.C. 20231

RECEIVED
173-4 200
TECHNOLOGY CENTER 1700

Dear Sir:

This amendment is responsive to the Office Action mailed October 3, 2000.
Entry of this Amendment and reconsideration of the subject application in view of the
following remarks is respectfully requested.

Please amend the subject application as follows:

IN THE CLAIMS:

Please amend claims 43, 44 and 46 as indicated below.

Sub
D1
Q1

43. (Amended) A composition [useful for producing a gypsum board,]
comprising a mixture of: a calcium sulfate material, water, a pregelatinized starch and
one or more enhancing materials [chosen] selected from the group consisting of:
condensed phosphoric acids, each of which comprises 2 or more phosphoric acid
units; and salts or ions of condensed phosphates, each of which comprises 2 or more
phosphate units, wherein when said composition is cast in the form of a board, said

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Serial No. 09/138,355

board has a sag resistance, as determined according to ASTM C473-95, of less than about 0.1 inch per two foot length of said board.

44. (Amended) A composition[, useful for producing a gypsum board,] comprising a mixture of: a calcium sulfate material, water, an aqueous foam, and one or more enhancing materials [chosen] selected from the group consisting of: condensed phosphoric acids, each of which comprises 2 or more phosphoric acid units; and salts or ions of condensed phosphates, each of which comprises 2 or more phosphate units, wherein when said composition is cast in the form of a board, said board has a sag resistance, as determined according to ASTM C473-95, of less than about 0.1 inch per two foot length of said board.

46. (Amended) A composition [useful, when mixed with water, for producing a composite board] comprising set gypsum and host particles, at least a portion of the set gypsum being positioned in and about accessible voids in the host particles, wherein the composition comprises a mixture of: the host particles having the accessible voids therein; calcium sulfate hemihydrate, at least a portion of which is in the form of crystals in and about the voids of the host particles; and one or more enhancing materials [chosen] selected from the group consisting of: condensed phosphoric acids, each of which comprises 2 or more phosphoric acid units; and salts or ions of condensed phosphates, each of which comprises 2 or more phosphate units, wherein when said composition is cast in the form of a board, said board has a sag resistance, as determined according to ASTM C473-95, of less than about 0.1 inch per two foot length of said board.

Please add new claim 110 as follows:

110. (New) A gypsum board comprising a core of material sandwiched between cover sheets, wherein the core comprises an interlocking matrix of set gypsum, said board having been prepared by a method comprising:

forming or depositing a mixture between the cover sheets, wherein the mixture comprises a calcium sulfate material, water, and one or more enhancing materials selected from the group consisting of: condensed phosphoric acids, each of which

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comprises 2 or more phosphoric acid units; and salts or ions of condensed phosphates, each of which comprises 2 or more phosphate units, and

maintaining the mixture under conditions sufficient for the calcium sulfate material to form the interlocking matrix of set gypsum,

the enhancing material or materials having been included in the mixture in an amount such that the gypsum board has a sag resistance, as determined according to ASTM C473-95, of less than about 0.1 inch per two foot length of said board.

A copy of the pending claim set is enclosed for the convenience of the Examiner.

REMARKS

Applicants wish to thank the Examiner for the courtesy of the interview with the undersigned attorney.

Claim 110 has been added to more particularly point out and distinctly claim an embodiment of the present invention that is directed to a gypsum board formed by a process which includes the use of one or more enhancing materials selected from the group consisting of condensed phosphoric acids, each of which comprises two or more phosphoric acid units, and salts or ions of condensed phosphates, each of which comprises two or more phosphate units, the gypsum board, itself characterized by a sag resistance, as determined according to ASTM C473-95 of less than about 0.1 inch per two foot length of the board. Claims 43, 44 and 46 have been amended to more particularly point out the beneficial aspects of the compositions.

Claims 1-109, all of the claims pending in the application before the present amendment, stand rejected under 35 U.S.C. §103(a) as being unpatentable over Knauf, U.S. Patent No. 3,770,468 (hereinafter "Knauf"). The Office Action contends that Knauf teaches a method of making set gypsum articles and the articles produced by the method wherein a phosphonic acid, such as sodium trimetaphosphate, is incorporated into the gypsum matrix. The Office Action recognizes that Knauf does not teach the concentration of additive presently claimed, but contends that the determination of an optimum range would require no more than routine experimentation by one having ordinary skill in the art in view of Knauf's teaching of

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the general condition of the claims. The Office Action concludes that the pending claims are *prima facie* obvious over Knauf. The rejection of claims 1-109 is respectfully traversed.

Knauf is directed to a process for treating freshly "burnt plaster of Paris," that is, plaster of Paris prepared by calcining calcium sulfate dihydrate, with an aqueous solution of a "wetting effect material" to produce a plaster of Paris free of inhomogenities, such as calcium sulfate anhydrite III, and free of calcium sulfate dihydrate. The thus prepared plaster of Paris can be mixed, according to Knauf, with water to form a malleable mortar. In this regard, Knauf states, at col. 1, lines 19-34,

It is an object of the invention to treat burnt plaster of Paris in such a way that it can be mixed with water quickly and with complete uniformity and that the result achieved in this way is a malleable mortar that can easily be handled.

The invention consists in a process for the treatment of plaster of Paris in which an aqueous solution of a wetting effect material is mixed with ground, dry plaster of Paris, the amount of water being such that the plaster of Paris remains powdered but that anhydrite III contained in the plaster of Paris is converted to the hemihydrate. The aqueous solution is preferably sprayed onto the finely divided plaster of Paris while it is continuously mixed.

This treatment is to be carried out in the factory directly after manufacture of the plaster of Paris.

Knauf explains that the desired effect of a homogeneous dry plaster free of anhydrite III and calcium dihydrate can be achieved only by treating calcined plaster of Paris with an aqueous solution of a "wetting effect material," that is, a material which has a wetting effect on anhydrite III. (Col. 1, lines 53-63). Four general classes of compounds are disclosed, but Knauf does not express a preference for any one class of "wetting effect material" (Col. 2, lines 16-24).

Contrary to the contention in the Office Action, Knauf does not teach or suggest making any particular article of set gypsum. Knauf merely discloses a method for treating burnt plaster of Paris to form a dry plaster which remains powdered and in which anhydrite III is converted to calcium sulfate hemihydrate. The only use Knauf

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teaches for the dry plaster formed by the disclosed process is to make a more easily and uniformly malleable mortar with the addition of water and other additives, such as sand, lime or the like. That is the only problem that Knauf was trying to solve. Mortar, as is known, is not a set gypsum article. Accordingly, there is nothing in Knauf which discloses, teaches or suggests making any particular set gypsum articles, or set gypsum articles such as those claimed by applicants having certain improved properties, and there is nothing in Knauf which discloses, teaches or suggests any particular set gypsum articles which include a condensed phosphoric acid and/or a condensed phosphate as disclosed and claimed by applicants, including for example, sodium trimetaphosphate and the like.

Further, Knauf does not teach the general conditions of claims 1-109 and newly added claim 110. There is nothing in Knauf which teaches or suggests that condensed phosphoric acids, and/or the condensed phosphates as described and claimed by applicants should be included in specific articles comprising set gypsum in order to enhance the performance characteristics, such as resistance to permanent deformation (i.e., sag resistance or rigidity) and/or strength, of such set gypsum-containing article, or that such condensed phosphoric acids and/or condensed phosphates should be used to make such set gypsum-containing articles. One of ordinary skill in the art, confronted with the problem of increasing sag resistance or strength of a set gypsum article, would not look to the disclosure of Knauf, wherein one would not find a teaching or even a suggestion of how to solve the problem. Knauf is silent on the effect of its myriad wetting effect materials on the properties of set gypsum matrix-containing articles. Indeed, Knauf never addresses the effect of the wetting effect materials on the properties of set gypsum-containing articles because Knauf does not make such articles, and Knauf never suggests the use of the treated dry plaster of Paris to make any particular set gypsum-containing articles having certain properties. Moreover, one skilled in the art would not have been motivated by Knauf to determine optimum or workable ranges of the condensed phosphoric acids and/or the condensed phosphates applicants have taught and claimed because Knauf is completely silent on the use of the treated plaster of Paris to make any particular set gypsum-containing

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articles and on the effect, if any, the "wetting effect materials" would have on articles comprising set gypsum. Without the benefit of applicants' disclosure and the improper use of hindsight, the teachings of Knauf do not offer any guidance whatsoever to one skilled in the art to achieve either the set gypsum products as claimed or the benefits of the claimed invention. Thus, it is respectfully submitted that the present invention would not have been obvious to one skilled in the art in view of Knauf.

Turning now more particularly to the pending claims, applicants submit that each of the various embodiments as set forth in claims 1-109, and in newly added claim 110, is patentable over Knauf. Knauf does not teach or suggest the set gypsum-containing articles and methods encompassed by these claims.

Claims 75-103 are directed to gypsum board comprising set gypsum and at least one trimetaphosphate compound (claims 75-79, 88-91, 96, 97 and 102) or to gypsum board formed from at least calcined gypsum and at least one trimetaphosphate compound (claims 80-87, 92-95, 98, 99-101 and 103). The gypsum board of claims 75-103 are further characterized by having a sag resistance, as determined according to ASTM C473-95, of less than about 0.1 inch per two foot length of the board. The teachings of Knauf differ materially from the gypsum board encompassed by these claims.

Knauf is directed to a dry plaster to be used as mortar, not to gypsum board. Knauf does not disclose, teach or even suggest gypsum board, making gypsum board, or using the plaster of Paris made by its treatment process to make gypsum board. Further, Knauf does not disclose, teach or suggest gypsum board which includes a trimetaphosphate compound, the use of a trimetaphosphate compound to make gypsum board, that a trimetaphosphate compound can be used to make gypsum board in order to affect the sag resistance of the resulting gypsum board, or gypsum board comprising set gypsum and having the sag resistance defined by the claims. Moreover, in view of the Knauf disclosure, there would be no motivation for one of ordinary skill in the art to use a trimetaphosphate compound to make gypsum board, to use a trimetaphosphate compound to increase the sag resistance and/or strength of

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gypsum board, to use the amount of trimetaphosphate as claimed (claim 81) or to make gypsum board having the improved sag resistance claimed. Accordingly, it is submitted that each of claims 75-103 is independently patentable over Knauf.

Claims 16-36 and 104 are directed to a gypsum board having increased sag resistance comprising an interlocking matrix of set gypsum and prepared using an enhancing material selected from the group consisting of condensed phosphoric acids, each of which comprises two or more phosphoric acid units and/or salts or ions of condensed phosphates, as described. The gypsum board of claims 16-36 and 104 are further characterized by having a sag resistance greater than the sag resistance would have been for gypsum board without the enhancing material.

Each of claims 16-36 and 104 is independently patentable over Knauf. As explained above regarding claims 75-103, Knauf is not directed to a gypsum board, Knauf does not disclose, teach or even suggest gypsum board, making gypsum board or using the plaster of Paris made by its treatment process to make gypsum board. As with the trimetaphosphate compound, Knauf does not disclose, teach or suggest gypsum board which includes a condensed phosphoric acid or condensed phosphate as claimed, the use of such condensed phosphoric acids and phosphates to make gypsum board, that such condensed phosphoric acids and phosphates can be used to make gypsum board in order to affect the sag resistance of the resulting gypsum board, or gypsum board comprising a set gypsum matrix and having the improved sag resistance defined by the claims. Moreover, in view of the Knauf disclosure, there would be no motivation for one of ordinary skill in the art to use the condensed phosphoric acids and condensed phosphates disclosed and claimed by applicants to make gypsum board, to use such phosphoric acids and phosphates to increase the sag resistance of gypsum board or to use the amount of such phosphoric acids and phosphates claimed (claims 17-19). More particularly, as to claim 104, Knauf does not disclose, teach or suggest a gypsum board comprising the condensed phosphoric acids and/or phosphates as claimed and having the claimed sag resistance of less than about 0.1 inch per two foot length of board, according to ASTM C473-95.

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Knauf also does not teach the addition of a "wetting effect material" to calcium sulfate dihydrate. Therefore, the gypsum board of claim 24 is independently patentable on this basis as well. Accordingly, it is submitted that each of claims 16-36 and 104 is independently patentable over Knauf.

As discussed above, Knauf teaches only a dry plaster useful as mortar. Knauf does not disclose, teach or suggest a method for producing a set gypsum-containing product having increased strength, rigidity and dimensional stability comprising trimetaphosphate ion as claimed in claim 51. Accordingly, claim 51 is independently patentable over Knauf.

Similarly, each of claims 1-15 and 52-70 is independently patentable over Knauf. Knauf fails to teach or suggest a method of producing a set gypsum-containing product having increased resistance to permanent deformation comprising the condensed phosphoric acids and/or phosphates taught and claimed by applicants. Separately, there is nothing in Knauf to suggest the treatment of calcium sulfate dihydrate with these enhancing materials, as in claims 10-11, 14, 52-57 and 68 or the treatment of calcium sulfate dihydrate with phosphoric acid or with monobasic salts or monovalent ions of orthophosphates as in claims 52-57 and 68. Accordingly, each of claims 10-11, 14, 52-57 and 68 is separately patentable over Knauf for this reason as well.

Also, as discussed above, Knauf does not disclose, teach or suggest specific set gypsum articles (or products), or compositions useful to make such products. Further, there is nothing in Knauf to suggest to one skilled in the art to use the phosphoric acids and phosphates described by applicants and as claimed to make such products or compositions or to use such phosphoric acids and phosphates in order to improve the performance characteristics of such products, or of products made from the claimed compositions. Therefore, each of the specific products claimed by applicants, namely, in claims 37-38 and 105-106 for composite board, in claim 39 for a joint compound, in claims 40-41 and 107-108 for acoustical tile, and in claims 42 and 109 for a machineable product, is separately patentable over Knauf, and the corresponding compositions useful for producing certain products encompassed by the claims,

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Serial No. 09/138,355

namely, in claims 43-45 and 71-74 for gypsum board, in claim 46 for composite board, in claim 47 for machineable product, in claim 48 for joint compound, and in claims 49-50 for acoustical tile, are likewise each independently patentable over Knauf.

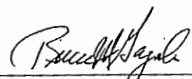
Claims 71-74 are directed to a composition useful for producing gypsum board which comprises an accelerator in addition to the disclosed and claimed condensed phosphoric acids and/or condensed phosphates. Knauf fails to disclose a composition which includes an accelerator. Knauf teaches only the inclusion of "further retarders of set." (Knauf, col. 2, lines 55-58). Thus, claims 71-74 are independently patentable over Knauf for this reason as well.

The present invention describes and claims products, compositions and processes which are not disclosed, taught or even suggested by Knauf. The present invention provides set gypsum products with enhanced performance characteristics, such as increased sag resistance and/or strength, not heretofore known and not apparent to those skilled in the art in view of Knauf. Thus, applicants submit that each of claims 1-110 is patentable over Knauf.

In view of the foregoing, reconsideration of the subject application is respectfully requested. Prompt and favorable consideration is earnestly solicited.

Respectfully submitted,

LEYDIG, VOIT & MAYER, LTD.



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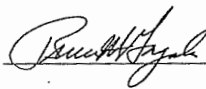
Date: November 20, 2000

In re Application of Yu et al.
Serial No. 09/138,355

CERTIFICATE OF MAILING

I hereby certify that this AMENDMENT (along with any attachments) is being sent via first-class mail, postage prepaid, addressed to: Examiner Timothy Spear, Assistant Commissioner For Patents, Washington, D.C. 20231, on November 20, 2000.

November 20, 2000
Date



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UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office

Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/138,355	08/21/98	YU	Q 03639.75768

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IM22/0213

EXAMINER

YOUNG, B


ART UNIT	PAPER NUMBER
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1775

DATE MAILED: 02/13/01

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Commissioner of Patents and Trademarks

Office Action Summary	Application No. 09/138,355	Applicant(s) Yu et al.	
	Examiner Bryant Young	Group Art Unit 1775	

☒ Responsive to communication(s) filed on Aug 21, 1998

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☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle* 35 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claim

☒ Claim(s) 1-110 is/are pending in the application

Of the above, claim(s) _____ is/are withdrawn from consideration

☒ Claim(s) 43-46, 75-105, and 107-110 is/are allowed.

☒ Claim(s) 1-42, 47-74, and 106 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☒ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) _____

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

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Attachment(s)

☐ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

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☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-42, 47-50, 52-74, and 106 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1, 16, 37, 38, 39, 40, 41, 42, 47-50, 52, 71, and 106 contain improper Markush language, rendering these claims indefinite. See MPEP 2173.05(h). The phrase "chosen from the group consisting of" should be changed to -- selected from the group consisting of-- (e.g., see claims 43, 44, and 46) for claim consistency.

Claims 1 (lines 1-2) and 52 (lines 1-2) contain the phrase "a set gypsum-containing product having increased resistance to permanent deformation". This limitation is based on unrecited comparisons; therefore the scope of the claim and those dependent therefrom is indefinite.

Claim 16 (line 1) contains the phrase "a gypsum board having increased sag resistance". This limitation is based on unrecited comparisons; therefore the scope of the claim and those dependent therefrom is indefinite.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-32, 36, 37, 39, 40, 41, 42, and 47-74 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugahara (US 4,126,599).

Sugahara teaches the composition, composite structure, and method of producing a gypsum-containing product (e.g., see col. 2, lines 7-52). The structures of gypsum are formed by hydrating and hardening calcium sulfates capable of being hardened by the hydration reaction, such as different types of calcium sulfate hemihydrate (col. 3, lines 30-38).

According to Sugahara certain process modifying or property enhancing additives, such as accelerators, retarders, weight reducing fillers, etc. may be added to the product slurry that forms the gypsum-containing product at known mixing ratios (col. 7, 50-53), and that the source of the gypsum may be from the by-product of a phosphoric acid process (col. 4, lines 34-44). Known reinforcers may also be incorporated in the composition of the gypsum-containing product that include wool and fibers of cellulose (pre-gelatinized starch), polyvinyl alcohol, polyesters, polyamides, polyolefins (col. 24-, lines 49), volcanic ashe and foamed perlite (i.e., perlite particles) (col. 7, lines 35-37), and polymerized water-soluble ethylenically unsaturated

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monomers (i.e., aqueous foam materials) (col. 7, line 66-col. 8, line 15). In addition, vinyl trimethyl ammonium chloride (chloride ions) may used (col. 8, lines 10-15).

The hard-shaped structure of gypsum-containing product, according to Sugahara, is also treated with an aqueous solution of a hardening agent of the phosphoric acid-type (col. 4, lines 4-33), or its water soluble salt (i.e., phosphoric acid salt) (col. 8, lines 59- 65). The water-soluble phosphoric acid salt is represented by the formula $M^1(M^2)_2 PO_4$, wherein M^1 stands for an alkali metal (sodium) and M^2 stands for hydrogen (col. 9, lines 1-11). The present claims are drawn to a gypsum-containing product, method, or composition that includes, for example, condensed phosphoric acids or sodium trimetaphosphate, which are derived from phosphoric acids. Therefore, it is the Examiner's position that one of ordinary skill in the art would employ, for example, condensed phosphoric acids or sodium trimetaphosphate, since the reference suggests the use of phosphoric acid type materials (col. 4, lines 4-33).

Sugahara further discloses that the gypsum-containing product may be shaped into a wall material, a tile, a ceiling material, a sheet, a paving material, etc. (col. 8, lines 37-38).

With respect to the phrase "the enhancing material or materials having been included in the mixture in an amount and manner such that the set gypsum-containing product has greater resistance to permanent deformation than it would have if the enhancing material had not been included in the mixture" (e.g., see claim 1) or "the enhancing material or materials having been included in the mixture in an amount and manner such that the set gypsum board has greater sag resistance than it would have if the enhancing material had not been included in the

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mixture”(e.g., see claim 16), it has been held that where the general conditions of a claim are disclosed in the prior art it is not inventive to discover optimum or workable ranges by routine experimentation. See MPEP 2144.05. In the instant case, discovering optimum or workable ranges, with respect to the amount or manner of including an enhancing material, would require no more than routine experimentation by one having ordinary skill in the art.

Likewise, it is the Examiner’s position that it would require no more than routine experimentation by one having ordinary skill in the art to optimize the claimed concentrations of the enhancing materials, as claimed (e.g., see claims 2-5).

Therefore, these claims are *prima facie* obvious over the prior art.

Allowable Subject Matter

5. Claims 43-46, 75-105, and 107-110 are allowed.
6. Claims 33-35, 38 and 106 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in the Office action and to include all the limitations of the base claim and intervening claims.

The prior art of record fails to teach or suggest the details of a composition or composite structure of a gypsum-containing product or board, wherein the gypsum board of claim 16 has voids uniformly distributed therein, and a mixture further comprising an aqueous foam; or the composite board of claim 38 comprising set gypsum and host particles, with at least a portion of the set gypsum being positioned in and about accessible voids .

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The prior art of record also fails to teach or suggest the details of a composition or composite structure of producing a gypsum-containing product or board, wherein the gypsum board has a sag resistance, as determined according to ASTM C473-95, of less than about 0.1 inch per two foot length of said board.

Response to Arguments

7. Applicant's arguments with respect to claims 1-109 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

8. Any inquiry to this communication or earlier communications from the Examiner should be directed to Bryant Young, whose telephone number is (703) 306-5480.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Deborah Jones, can be reached at (703) 308-3822.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0661.


bly

February 9, 2001


DEBORAH JONES
SUPERVISOR, PATENT EXAMINER

Notice of References Cited				Application No. 09/138,355		Applicant(s) Yu et al.	
				Examiner Bryant Young		Group Art Unit 1775	
Page 1 of 1							
U.S. PATENT DOCUMENTS							
		DOCUMENT NO.	DATE	NAME		CLASS	SUBCLASS
	A	4,126,599	11/1978	Sugahara et al.		260	42.13
	B						
	C						
	D						
	E						
	F						
	G						
	H						
	I						
	J						
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FOREIGN PATENT DOCUMENTS							
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NON-PATENT DOCUMENTS							
		DOCUMENT (including Author, Title, Source, and Pertinent Pages)					DATE
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PATENT
Attorney Docket No. 202591

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Qiang Yu et al.

Group Art Unit: 1775

Serial No. 09/138,355

Examiner: Bryant L. Young

Filed: August 21, 1998

For: Gypsum-Containing Product Having
Increased Resistance to Deformation
And Method And Composition
For Producing It

AMENDMENT

Assistant Commissioner For Patents
Washington, D.C. 20231

RECEIVED
MAY 17 2001
TC-1700 MAIL ROOM

Dear Sir:

This amendment is responsive to the Office Action dated February 13, 2001.
Entry of this Amendment and reconsideration of the subject application in view of the
following remarks is respectfully requested.

AMENDMENTS

IN THE CLAIMS:

Please cancel claims 1-42 and 47-74 without prejudice.

Please enter the following amended claims 43, 44, 46 and 106.

1
D

43. (Twice Amended) A composition comprising a mixture of: a calcium sulfate material, water, a pregelatinized starch and one or more enhancing materials selected from the group consisting of: condensed phosphoric acids, each of which comprises 2 or more phosphoric acid units; and salts or ions of condensed phosphates, each of which comprises 2 or more phosphate units, wherein when said composition is cast in the form of 1/2 inch gypsum board, said board has a sag resistance, as

D1
[In re Application of Yu et al.
Serial No. 09/138,355]

determined according to ASTM C473-95, of less than about 0.1 inch per two foot length of said board.

D2
2.44. (Amended) A composition comprising a mixture of: a calcium sulfate material, water, an aqueous foam, and one or more enhancing materials selected from the group consisting of: condensed phosphoric acids, each of which comprises 2 or more phosphoric acid units; and salts or ions of condensed phosphates, each of which comprises 2 or more phosphate units, wherein when said composition is cast in the form of 1/2 inch gypsum board, said board has a sag resistance, as determined according to ASTM C473-95, of less than about 0.1 inch per two foot length of said board.

D3
4.46. (Amended) A composition comprising set gypsum and host particles, at least a portion of the set gypsum being positioned in and about accessible voids in the host particles, wherein the composition comprises a mixture of: the host particles having the accessible voids therein; calcium sulfate hemihydrate, at least a portion of which is in the form of crystals in and about the voids of the host particles; and one or more enhancing materials selected from the group consisting of: condensed phosphoric acids, each of which comprises 2 or more phosphoric acid units; and salts or ions of condensed phosphates, each of which comprises 2 or more phosphate units, wherein when said composition is cast in the form of 1/2 inch gypsum board, said board has a sag resistance, as determined according to ASTM C473-95, of less than about 0.1 inch per two foot length of said board.

D4
3.6106. (Amended) A composite board comprising an interlocking matrix of set gypsum, host particles, and at least one enhancing material, wherein at least a portion of the set gypsum is positioned in and about accessible voids in the host particles, said board having a sag resistance as determined according to ASTM C473-95 of less than about 0.1 inch per two foot length of said board, said enhancing materials selected from the group consisting of: phosphoric acids, each of which comprises 1 or more

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Cost
In re Application of Yu et al
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phosphoric acid units; and compounds of condensed phosphates, each of which comprises 2 or more phosphate units.

A copy of the pending claim set is enclosed for the convenience of the Examiner.

REMARKS

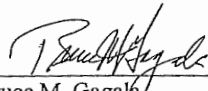
Applicants have amended claims 43, 44 and 46 in order to clarify the claims. This amendment has been done by applicants voluntarily, and is not due to any requirement by the Examiner or in response to any outstanding rejection of the claims prior to the present amendment. Support for the amendment to the claims is found in the specification at, for example, Example 3, page 29, line 14, page 30, lines 8-14, and Example 6, page 42, lines 8-9. Claim 106 has been amended merely to improve its form as suggested by the Examiner.

It is respectfully requested that the pending claims are allowable and that the application should be passed to issue.

In view of the foregoing, reconsideration of the subject application is respectfully requested. Prompt and favorable consideration is earnestly solicited.

Respectfully submitted,

LEYDIG, VOIT & MAYER, LTD.


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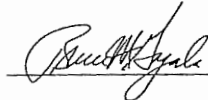
Date: May 11, 2001

In re Application of Yu et al.
Serial No. 09/138,355

CERTIFICATE OF MAILING

I hereby certify that this AMENDMENT (along with any attachments) is being sent via first-class mail, postage prepaid, addressed to: Assistant Commissioner For Patents, Washington, D.C. 20231, on May 11, 2001.

May 11, 2001
Date



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UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office

Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/138,355 08/21/98 YU

Q 03639.75768

EXAMINER

IM52/0604

Bruce M. Gagala
Leydig, Voit & Mayer LTD
Two Prudential Plaza
Suite 4900
Chicago IL 60601-6780

YUJING, R

ART UNIT

PAPER NUMBER

1775


DATE MAILED:

06/04/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Notice of Allowability	Application No. 09/138,355	Applicant(s) Yu et al.
	Examiner Bryant Young	Art Unit 1775



--The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance and Issue Fee Due or other appropriate communication will be mailed in due course. THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS. This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to May 15, 2001
2. ☒ The allowed claim(s) is/are 43-46 and 75-110
3. ☒ The drawings filed on Aug 21, 1998 are acceptable as formal drawings.
4. ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
 - a) ☐ All b) ☒ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____
5. ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. THIS THREE-MONTH PERIOD IS NOT EXTENDABLE FOR SUBMITTING NEW FORMAL DRAWINGS, OR A SUBSTITUTE OATH OR DECLARATION. This three-month period for complying with the REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL is extendable under 37 CFR 1.136(a).


6. ☐ Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient. A SUBSTITUTE OATH OR DECLARATION IS REQUIRED.
7. ☐ Applicant MUST submit NEW FORMAL DRAWINGS
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ Paper No. _____
 - (b) ☐ including changes required by the proposed drawing correction filed _____, which has been approved by the examiner.
 - (c) ☐ including changes required by the attached Examiner's Amendment/Comment or in the Office action of Paper No. _____

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings. The drawings should be filed as a separate paper with a transmittal letter addressed to the Official Draftsperson.
8. ☐ Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Any reply to this letter should include, in the upper right hand corner, the APPLICATION NUMBER (SERIES CODE/SERIAL NUMBER). If applicant has received a Notice of Allowance and Issue Fee Due, the ISSUE BATCH NUMBER and DATE of the NOTICE OF ALLOWANCE should also be included.

Attachment(s)

1 <input type="checkbox"/> Notice of References Cited (PTO-892) 3 <input checked="" type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) 5 <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449), Paper No(s). _____ 7 <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material 9 <input type="checkbox"/> Other	2 <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) 4 <input type="checkbox"/> Interview Summary (PTO-413), Paper No. _____ 6 <input type="checkbox"/> Examiner's Amendment/Comment 8 <input type="checkbox"/> Examiner's Statement of Reasons for Allowance
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 SUPERVISORY PATENT EXAMINER