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Mr. David J. Gould
E. I. Du Pont de Nemours and Company
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U.S.A.

12 May 1987

Dear Mr. Gould,

New European Patent Application
Your ref: CH 1370 - JACOBSON

This is to report the filing of the European application requested in your order letter dated March 4, 1987.

The application was filed on 27th April 1987, when it received the filing number 87 303 682.6. The filing receipt is enclosed. Prior to filing the application, I reviewed the specification and claims and reduced the number of claims to 14 by making claim 14 appendant to claims 1 to 7 and cancelling the subsequent claims. Two copies of the claims and abstract as filed are enclosed.

The following states were designated in the application, namely: Germany, United Kingdom, France, Netherlands, Belgium and Spain. Please check the list of designated countries and let me know as soon as possible if you wish to add any further states.

The priority document was filed with the application and we have paid the initial filing fees. The next stage will be the publication of the application or the issue of the search report. In the meantime, I enclose our account covering the cost of filing this application.

Yours sincerely,

DAVID C. WOODCRAFT

Encl

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Service to start date, 11/11/87 + appln. # 5/21/87 AP.

CLAIMS

1. A pigment consisting essentially of rutile TiO_2 particles bearing coatings comprising SiO_2 and B_2O_3 .
2. A pigment according to claim 1, wherein the TiO_2 particles have coatings consisting essentially of from 60-98 percent by weight SiO_2 and 0.5-30 percent by weight B_2O_3 , based on coating weight.
3. A pigment according to claim 2, wherein the TiO_2 particles have coatings consisting essentially of from 80-90 percent by weight SiO_2 and 2-20 percent by weight B_2O_3 , based on coating weight.
4. A pigment according to claim 3, wherein the TiO_2 particles have $\text{SiO}_2/\text{B}_2\text{O}_3$ coatings constituting 2-10% of the total pigment weight.
5. A pigment according to claim 4, wherein the TiO_2 particles have $\text{SiO}_2/\text{B}_2\text{O}_3$ coatings constituting 4-8% of the total pigment weight.
6. A pigment according to any one of the preceding claims, wherein the TiO_2 particles have outer coatings of alumina constituting 0.5-5% of the total weight of the particles.
7. A pigment according to claim 6, wherein the TiO_2 particles have outer coatings of alumina constituting 1-4% of the total weight of the particles.
8. A process for preparing TiO_2 particles bearing coatings of boron-modified silica, comprising:
 - (a) forming an aqueous slurry of rutile TiO_2 at a temperature from about 65°C to about 90°C ;

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(b) adjusting pH of the slurry to the range 7-10.5;

5 (c) adding a predetermined quantity of a solution comprising Na_2SiO_3 and B_2O_3 , under conditions which maintain silicate and boria ions in solution;

10 (d) gradually lowering pH of the slurry to about 7.5-8.5 by addition of acid, thereby depositing a coating of silica and boria; and

15 (e) curing the resulting coated pigment at a temperature from about 65°C to about 90°C for a period of at least 15 minutes.

9. A process according to claim 8, wherein sufficient Na_2SiO_3 and B_2O_3 are added in step (c) to provide a coating consisting essentially of from 60-98 percent by weight SiO_2 and 0.5-30 percent by weight B_2O_3 based on coating weight.

10. A process according to claim 9, wherein sufficient Na_2SiO_3 and B_2O_3 are added in step (c) to provide a coating consisting essentially of from 80-90 percent by weight SiO_2 and 2-20 percent by weight B_2O_3 , based on coating weight.

11. A process according to claim 10, wherein sufficient Na_2SiO_3 and B_2O_3 are added in step (c) to provide a $\text{SiO}_2/\text{B}_2\text{O}_3$ coating constituting 0.5-10% of the total pigment weight.

12. A process according to claim 11, wherein sufficient Na_2SiO_3 and B_2O_3 are added in step (c) to provide a $\text{SiO}_2/\text{B}_2\text{O}_3$ coating constituting 4-8% of the total pigment weight.

13. A process according to any one of claims 8 to 12 comprising the following additional step:

5 (f) adding sufficient NaAlO_2 to the slurry, at a temperature from about 50°C – 90°C , to provide a concentration of about 2–8% by weight of the TiO_2 , while adding mineral acid to maintain the pH of the slurry from 6–9.

14. A coating composition comprising a pigment 10 according to any one of claims 1 to 7, a film-forming material, and a liquid carrier.

ABSTRACT

Titanium Dioxide Pigment
Coated with Boria-Modified Silica

Pigments are disclosed which consist essentially of rutile TiO_2 particles bearing densified coatings comprising SiO_2 and B_2O_3 .

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ATTENTION: M.S. TUKE, LEGAL DEPARTMENT

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