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6 April 1990

Dear Sirs,

European Patent Application No. 87 303 681.8
E. I. DU PONT DE NEMOURS AND COMPANY

This is in reply to the official letter dated 28th March 1990.

I should first explain that my letter dated 18 January 1990 was not intended to be in reply to the second official letter (which I did not, in fact, receive until 12 February 1990), but rather was a supplementary response to the first official letter. However, I apologise for any confusion caused by my letter of 18 January 1990.

A revised main claim is now proposed to deal with the objection raised under Article 84 EPC. The amended claim makes it clear that the TiO_2 particle surfaces have the cerium cations and acid anions bound thereto and are provided with a top coating of alumina or alumina silica. The amendment is fully supported by the passage on page 3, lines 25 to 29 of the Description.

Amended claims are filed herewith in triplicate.

Yours faithfully,

DAVID C. WOODCRAFT
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CLAIMS

1. A pigment consisting essentially of rutile TiO_2 particles bearing a coating of alumina or alumina-silica, the TiO_2 particle surfaces having bound therewith 0.05-2%, by weight of the TiO_2 , of cerium cations and an associated quantity of borate anions or polyfunctional organic acid anions having a solubility in water of at least 10 grams per liter at 25°C , said coating of alumina or alumina-silica forming a top coat on the TiO_2 particles.

2. A pigment according to claim 1, wherein the alumina or alumina-silica coating constitutes 0.5-10% of the total weight of the TiO_2 particles.

3. A pigment according to claim 2, wherein the alumina or alumina-silica coating constitutes 1-6% of the total weight of the TiO_2 particles.

4. A pigment according to claim 3, wherein the alumina or alumina-silica coating constitutes 2-4% of the total weight of the TiO_2 particles.

5. A pigment according to any one of the preceding claims wherein the associated anions are borate ions.

6. A pigment according to claim 1, wherein the associated anions are polyfunctional organic acid anions having a solubility in water of at least 10 grams per liter at 25°C .

7. A pigment according to any one of claims 1 to 4, wherein the associated anions are citrate, succinate, fumarate, adipate, tartrate or maleate ions.

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

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9. A method of producing coated TiO_2 pigment particles which comprises (a) forming an aqueous slurry containing 200 to 450 grams per litre of TiO_2 and having a pH at which cerium ions will remain in solution, (b) adding sufficient cerium salt to provide a cerium ion concentration in the slurry of 0.05 to 2% by weight of TiO_2 , (c) adding a sufficient quantity of a source of borate or polyfunctional organic acid anions to provide a concentration of said anions of from 100 to 300% of the cerium ion concentration thereby causing the cerium ions to precipitate onto the surfaces of the TiO_2 particles in association with the said borate or polyfunctional organic acid anions and (d) depositing an alumina or silica-alumina coating on the treated TiO_2 particles.

10. A method according to claim 9 wherein in step (d) alumina is precipitated onto the treated TiO_2 particles by adding enough sodium aluminate to the slurry to provide a concentration of about 2 to 8% by weight of the TiO_2 and adjusting the pH to within the range of 6 to 9 during the precipitation step.