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WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau



96/1075-4
IP05

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : G02B 5/22	A2	(11) International Publication Number: WO 96/12205	(43) International Publication Date: 25 April 1996 (25.04.96)
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(21) International Application Number: PCT/US95/14114
(22) International Filing Date: 11 October 1995 (11.10.95)
(30) Priority Data:
08/321,405 12 October 1994 (12.10.94) US
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(81) Designated States: AM, AU, BB, BG, BR, BY, CA, CN, CZ,
EE, FI, GE, HU, IS, JP, KG, KP, KR, KZ, LK, LR, LT,
LV, MD, MG, MN, MX, NO, NZ, PL, RO, RU, SG, SI,
SK, TJ, TM, TT, UA, UZ, VN, European patent (AT, BE,
CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT,
SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML,
MR, NE, SN, TD, TG), ARIPO patent (KE, MW, SD, SZ,
UG).

Published

Without international search report and to be republished
upon receipt of that report.

(54) Title: METAL-PIGMENTED COMPOSITE MEDIA WITH SELECTABLE RADIATION-TRANSMISSION PROPERTIES AND
METHODS FOR THEIR MANUFACTURE

(57) Abstract

Composite materials that can be used to block radiation of a selected wavelength range or provide highly pure colors are disclosed. The materials include dispersions of metal particles that exhibit optical resonance behavior, presenting to the selected radiation absorption cross sections that substantially exceed the particles' geometric cross sections. The particles are preferably manufactured as uniform nanosize spheres, and dispersed evenly within a carrier material having compatible dielectric characteristics. The large absorption cross sections ensure that a relatively small volume of particles will render the composite material fully opaque (or nearly so) to incident radiation of the resonance wavelength, blocking harmful radiation or producing highly pure colors. The durability of the particles themselves ensures resistance to mechanical wear forces and the bleaching effects of intense radiation (e.g., sunlight).

