

**PCT**WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

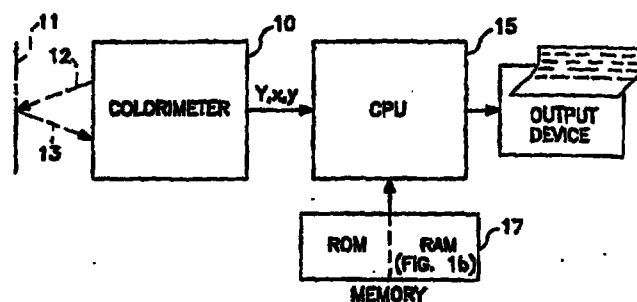
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : G01J 3/50, A61B 5/103		A1	(11) International Publication Number: WO 96/41140
			(43) International Publication Date: 19 December 1996 (19.12.96)
(21) International Application Number: PCT/IB96/00732		(81) Designated States: AL, AM, AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US, UZ, VN, ARIPO patent (KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, 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).	
(22) International Filing Date: 6 June 1996 (06.06.96)			
(30) Priority Data: 08/481,177 7 June 1995 (07.06.95) US			
(71) Applicant (for all designated States except US): CHROMATICS COLOR SCIENCES INTERNATIONAL, INC. [US/US]; 5 East 80th Street, New York, NY 10021 (US).			
(72) Inventors; and (75) Inventors/Applicants (for US only): MACFARLANE, Darby, S. [US/US]; 10 Old Jackson Avenue, Unit 28, Hastings-on-Hudson, NY 10706 (US). MACFARLANE, David, Kenneth [US/US]; 10 Old Jackson Avenue, Unit 28, Hastings-on-Hudson, NY 10706 (US). BILLMEYER, Fred, W., Jr. [US/US]; 1294 Garner Avenue, Schenectady, NY 12309-5746 (US).			
(74) Agents: MACBLAIN, Thomas, D. et al.; Brumbaugh, Graves, Donohue & Raymond, 44th floor., 30 Rockefeller Plaza, New York, NY 10112-0228 (US).			

Published*With international search report.**Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.*(54) Title: **METHOD AND APPARATUS FOR DETECTING AND MEASURING CONDITIONS AFFECTING COLOR**

(57) Abstract

A method and apparatus for determining the condition of a test subject based on color uses a color measuring instrument to detect change in a color factor indicative of a condition such as a disease, spoilage, ageing, etc. A medical condition such as hyperbilirubinemia that affects skin color can be detected. One measures color factors such as Hunter b and L in the subjects' skin color. For predetermined ranges of one color factor, in particular L, changes in the other color factor, e.g. Hunter b, above predetermined levels are indicative of the medical condition. In many cases, a single measurement of the color factors can be utilized as a warning of the likelihood of the medical or contaminated condition, if the ordinary range of the color factor is known for healthy individuals with skin coloration like that of the test subject. Even if there has been no baseline measurement and the test subject's color is such that a single reading of one or two color factors will not warn of the possible presence of the medical condition or contamination, sequential readings can indicate the presence or absence of the condition based upon changes in the measured color factor, or lack of changes. The color measuring techniques apply to a wide range of biological test subjects (e.g. hair, teeth, tissue, excretions, foods, soil, animals, plants).



RANGES OF L	
TABLE II DATA	
TABLE III DATA	
ΔL INDICATIVE OF ERROR	18a
Δb INDICATIVE OF CONDITION	
Δb WARNING LEVEL	
CALIBRATION VALUES	18b
BASELINE VALUES	
PREVIOUS (AVG.) HUNTER $L_{a\&b}$	
CURRENT MULTISITE (UNAVERAGED) HUNTER $L_{a\&b}$	
CURRENT (AVG.) HUNTER $L_{a\&b}$	