

PATENT NO. 347173
A METHOD OF EVALUATION AND GRADING OF TEXTILE OR FABRIC OR
GARMENT APPEARANCE

APPLICATION NO. 2304/DEL/2009

APPLICANT

Indian Institute of Technology, Delhi

ABSTRACT

The present invention relates to a method of objective evaluation and grading of textile or fabric or garment appearance. More particularly, the present invention relates to an objective method of quantifying seam pucker in stitched fabrics using phase shifting optical fringe profilometry using two dimensional 2D measurements. More particularly, in 2D analysis, a structured light in the form of fringes is projected over fabrics in a dark room and an image of the fabric is obtained by a camera positioned at an angle. The structure of light is extracted using digital image processing. The deviations of the line profiles from a straight line are determined using various attributes and are correlated with AATCC subjective pucker grades. These attributes can be used to quantify pucker/appearance of textile materials.

INVENTOR

R.S. Rengasamy

H. Manikandan

D.S. Mehta

Indian Institute of Technology Delhi

Hauz Khas, New Delhi

CLAIM 1

A method of objective evaluation and grading of textile or fabric or garment appearance, comprising the steps of (a) fixing the fabric on a fabric holder, (b) projecting a laser beam over the said fabric wherein projecting of laser beam includes the steps of 1. Expanding the laser beam by a beam expander and spatial filter unit 2. collimating the said expanded light by a collimating lens and obtaining the collimated light 3. directing the said collimated light on a shear plate interferometer, 4. generating two wave fronts by interferometer, one reflected from the front surface and another reflected from the bottom surface, 5. generating pure sinusoidal structured light which is essential for the measurement of the phase accurately, 6. obtaining the structured light pattern and projecting the same on the fabric using a projection lens, (c) Capturing the two gray images of the structural light by a CCD camera using imaging lens at a slant angle, (d) Conversion of gray scale image to binary image using adaptive thresholding technique, (e) subjecting the said binary image to the line detection process by which the transition points from black region to the white region and vice-versa are enhanced, (f) performing the steps (b) to (d) for the images obtained from a reference plane, (g) obtaining final image, evaluating and grading the variability of the profile lines extracted from fabric images and the reference image through various attributes/ characteristics of lines such as mean deviation and variance such as herein described.