

1

2

3,510,653

TEST PROCEDURE FOR VINYL-COATED GLASS

Thomas Render Holbrook, Cornelia, Ga., assignor to Johnson & Johnson, a corporation of New Jersey

No Drawing. Filed Oct. 12, 1967, Ser. No. 674,765

Int. Cl. G01n 21/38

U.S. Cl. 250—71

4 Claims

ABSTRACT OF THE DISCLOSURE

The process of determining the continuity of vinyl coating on shaped articles made substantially of glass by exposing said article to a short wave length light source.

Heretofore, no satisfactory method has been available for continuously and for nondestructively inspecting vinyl-coated shaped articles made of glass to determine that the vinyl coating, which has been applied to the article, is uniformly applied without skips or voids occurring, and thus provide a procedure useful for quality control and a basis for the acceptance or rejection of vinyl-coated glass shaped articles or of materials constructed of such articles.

Specifically there has been no method for testing vinyl coating glass filaments or yarns to determine if these substances can be put to process and result in first quality materials. There has been no satisfactory method for inspecting such yarn for skips, i.e. voids, in the vinyl coating, and for off-centered core yarn which causes splits and glass fiber protrusions. At the present time manufacturers of such vinyl-coated glass filaments or yarns have rather elaborate quality control procedures for inspecting their yarn production. It is extremely expensive and involves considerable waste of yarn because of the number of reelings made from put-up packages. Also a great amount of manpower is devoted to coated yarn inspection on a 100% basis.

Concurring with the above is expense and delay, with additional quality control checks required before fabrication of an article of manufacture utilizing such filaments or yarn. Yet with all this expense, waste and manpower, existing procedures are ineffective (other than for uncovering glaring or obvious defects) as a means for determining coated yarn quality. Evidence of this is the continued presence of fill bands, skips and uncoated sections.

The basic problem is that these defects are extremely hard to see and to detect in the yarn. Also, at any time a coating die can be "starved" either continuously or intermittently, resulting in either skips in the coating or uncoated sections of almost any length. Thus the outside of a given yarn package could or could not bear a relationship to the covered or uncovered portions of the yarn on the package insofar as quality is concerned.

The present invention provides the method of determining the continuity and uniformity of vinyl coating on shaped articles made substantially of glass and of determining the presence of voids in such coating which comprises exposing said shaped articles to a light source having a wave length within the range of from about 2000 angstroms to about 4000 angstroms, to determine the existence of varying hues and colors of fluorescence.

Vinyl chloride or vinyls generally do not absorb the shorter wave lengths of light and consequently do not respond to produce fluorescent effects in the presence of a short wave length light source of the above given range. However, glass shaped articles, e.g. filaments or yarns, radiate in the yellow portion of the visible spectrum under these conditions. Thus when the vinyl is substantially uniformly coating the glass shaped article there is an absence of any pronounced glow or fluorescence by the coated article; whereas, areas having ruptures, splits, or

non-continuity of vinyl coating or having the complete absence of such coating are instantly determined when exposed to a short wave length light source within the range of from about 2000 angstroms to about 4000 angstroms, since the characteristic radiations of glass which occur in the yellow portion of the visible spectrum present varying fluorescent hues of yellow color to the naked eye. The vivid yellow radiation of glass alone under these conditions is clearly visible and defines the sections of the glass shaped article which are not coated with vinyl or over which there is substantially no such coating. Thus the instant procedure establishes a color test, defined by clearly discernible color differences, which establish the quality and continuity of the vinyl coating on filaments, yarns or other shaped articles of glass which are coated with such vinyls.

While quite generally a range of from about 2000 angstroms to about 4000 angstroms can be utilized in the process of this invention, it is preferred that the light source have a wave length within the range of from about 2400 angstroms to about 3800 angstroms.

"Vinyl coating" as it is used herein shall define coating materials comprising pigmented polyvinyl chloride containing heat and ultraviolet light stabilizers. The vinyl compound is applied to the glass core yarn or to the shaped glass article as a plastisol.

The fluorescent glass materials which may be employed in the instant invention are many but of prime importance is the flexible glass filaments, fibers and yarns, i.e. fibrous glass textiles, which are presently enjoying significant commercial success. These fibers, etc., are normally uncombustible, inorganic and high tensile strength, although these and other of its properties can be varied by the addition of pigments, finishes and fiber lubricants.

It will be apparent that many widely different embodiments of this invention may be made without departing from the spirit and scope thereof. Thus, this invention is not intended to be limited except as indicated in the appended claims.

I claim:

1. The method of determining the continuity and uniformity of vinyl coating on shaped articles made substantially of glass which comprises exposing said vinyl coated glass shaped articles to a light source having a wave length within the range of from about 2000 angstroms to about 4000 angstroms to determine (1) the existence of varying hues and colors of fluorescence indicating the discontinuity of said vinyl coating on the glass shaped article and the fluorescent capability of the exposed glass or (2) the absence of varying hues and colors of fluorescence indicating the continuity of said vinyl coating and the lack of fluorescent capability of the continuously vinyl-coated glass shaped article.

2. The method of claim 1 wherein said wave length is within the range of from about 2400 angstroms to about 3800 angstroms.

3. The method of claim 1 as it applies to vinyl-coated glass filaments and to articles made of said filaments.

4. The method of claim 1 wherein the vinyl coating is polyvinyl chloride.

References Cited

UNITED STATES PATENTS

3,076,723	2/1963	Covington	250—83.3 X
3,216,809	11/1965	Slabodsky	250—71 X
3,374,381	3/1968	Albinak et al.	250—71 X

RALPH G. NILSON, Primary Examiner

D. L. WILLIS, Assistant Examiner

U.S. Cl. X.R.

250—83.3