

PATENT SPECIFICATION

Application Date : March 19, 1928. No. 8302/28. 312,728

Complete Left : Dec. 15, 1928.

Complete Accepted : June 6, 1929.

PROVISIONAL SPECIFICATION.

Improvements relating to Glass.



We, CHANCE BROTHERS AND Co. LIMITED, a Company duly incorporated under the Laws of Great Britain, CHARLES EDWIN GOULD, WILFRED MARSH HAMPTON and HAROLD SHARPE MARTIN, British Subjects, all of Glass Works, West Smethwick, in the County of Stafford, do hereby declare the nature of this invention to be as follows:—

10 This invention relates to glass of the kind which is especially transparent to ultra-violet radiation of wave lengths below 3200 Angstrom units. One of the difficulties encountered with such glass as at present made is that it is subject to a deterioration termed "fading". It is found that after exposure to ultra-violet radiation the transparency to such radiation becomes diminished. Investigation has established that minute quantities of iron, titanium or vanadium oxides, or other deleterious substances in the glass cause absorption of ultra-violet radiation, and that the transparency of the glass is affected by the state of oxidation of such substances. Fading is due to changes from lower to higher states of oxidation of the deleterious substances.

30 We have found that the change of the oxides from the relatively harmless to the harmful condition under the action of ultra-violet radiation is associated with

the presence of gaseous oxides dissolved in the glass.

The object of the present invention is to minimise "fading", and for this purpose the invention comprises the employment in the manufacture of the glass, of ingredients which avoid the occurrence in the finished glass of dissolved gaseous oxides.

In one manner of carrying the present invention into effect, we employ for the manufacture of the glass, such ingredients as silica, borax and a metallic powder (such as zinc, aluminium or tin) in suitable proportions.

By the use of such ingredients deleterious gaseous oxides (for example carbon dioxide) are not produced, and consequently the harmful conversion of lower to higher oxides of small quantities of iron or other undesirable substances that may be present in the finished glass cannot occur. It is desirable as far as possible to employ anhydrous ingredients, but even when water is present in small quantities, glass made from such ingredients as those above mentioned has been found to be much less subject to "fading" than glasses of the compositions employed hitherto.

Dated this 17th day of March, 1928.

MARKS & CLERK.

COMPLETE SPECIFICATION.

Improvements relating to Glass.

65 We, CHANCE BROTHERS AND Co. LIMITED, a Company duly incorporated under the Laws of Great Britain, CHARLES EDWIN GOULD, WILFRED MARSH HAMPTON and HAROLD SHARPE MARTIN, British Subjects, all of Glass Works, West Smethwick, in the County of Stafford, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

75 This invention relates to glass of the kind which is especially transparent to ultra-violet radiation of wave lengths
[Price 1/-]

below 3200 Angstrom units. One of the difficulties encountered with such glass as at present made is that it is subject to a kind of deterioration variously termed "fading", solarisation or ageing. It is found that after exposure to ultra-violet radiation the transparency to such radiation becomes diminished. Investigation has established that minute quantities of iron, titanium or vanadium oxides, or other deleterious substances in the glass cause absorption of ultra-violet radiation, and that the transparency of the glass is affected by the state of oxidation of such substances. Fading is due to changes

from lower to higher states of oxidation of the deleterious substances.

We have found that the change of the oxides from the relatively harmless to the harmful condition under the action of ultra-violet radiation is associated with the presence of gaseous oxides, such as carbon dioxide, dissolved in the glass. These oxides usually occur as a result of the use of sodium or potassium carbonates or of the organic compounds which are sometimes employed, in the manufacture of glass, as reducing agents.

The object of the present invention is to minimise "fading", and for this purpose the invention comprises the employment in the manufacture of the glass, of ingredients which substantially avoid the occurrence in the finished glass of dissolved gaseous oxides.

In one manner of carrying the present invention into effect, we employ for the manufacture of the glass, in suitable proportions, such ingredients as silica, borax and a powdered metal (such as zinc, aluminium, or tin) which combines readily with oxygen and acts as a reducing agent and forms oxides which are stable and are transparent in the glass to ultra-violet radiations. One example of a glass made in accordance with this invention consists of the following ingredients in the proportions mentioned, namely, silica 560 parts, borax 527 parts and powdered zinc 8 parts. It will be understood however, that these proportions may be widely varied.

By the use of such ingredients,

deleterious gaseous oxides (for example carbon dioxide) are not produced, and consequently the harmful conversion of lower to higher oxides of small quantities of iron or other undesirable substances that may be present in the finished glass cannot occur. It is desirable as far as possible to employ anhydrous ingredients, but even when water is present in small quantities, glass made from such ingredients as those above mentioned has been found to be much less subject to "fading" than glasses of the compositions employed hitherto.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that we are aware of Specification No. 8704/07 and we make no claim to anything described therein but what we claim is:—

1. In the manufacture of glass of the kind specified, the employment of ingredients which substantially avoid the occurrence in the finished glass of dissolved gaseous oxides.

2. Glass of the kind specified and produced from ingredients which substantially avoid the occurrence in the finished glass of dissolved gaseous oxides.

3. Glass of the kind specified, in which silica, borax and a powdered metal such as zinc, aluminium or tin, are used as the main or only ingredients, substantially as and for the purpose described.

Dated this 14th day of December, 1928.
MARKS & CLERK.