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PACKAGED BAKERY PRODUCTS AND PROCESS THEREOF

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This invention relates to packaged bakery products such as bread, crackers and the like, in which the product is enclosed in a material which acts as a color screen for shielding such products that are affected by light. More specifically, it relates to a bakery product color screen which absorbs all of the ultra-violet, violet, and blue, as well as a substantial amount of light in the region delimited by 6300 to 6700 Angstrom units of the spectrum.

Such a screen or wrapper has been found very effective for enclosing and/or shielding bakery products such as bread and crackers which are affected by light in the region below 4900 Angstrom units and in the region delimited by 6300–6700 Angstrom units, and which naturally absorb copious amounts of light in the blue region of the spectrum as well as absorb a lesser amount of light in the red region of the spectrum.

I have found that those wave lengths of light which are most harmful to bakery products containing vitamins, enzymes and porphyrins are those wave lengths lying in the region below 4900 Angstrom units as well as lying in the region of 6300 to 6700 Angstrom units, and that the other wave lengths of the spectrum are not deleterious or harmful to these said products. Therefore it follows that when a color screen is interposed between the light source and said products or commodities, to intercept and absorb said harmful and deleterious wave lengths of light and transmit to the products limited beneficial wave lengths of light, said products are improved, enhanced and protected.

In the practice of this invention, there is provided a color screen as a shielding element for bakery products and the like containing vitamins, enzymes and porphyrins, which color screen may be of any suitable material which is translucent, as for example paper, or substantially transparent, but which is definitely absorbent of light having wave lengths below 4900 Angstrom units and absorbent of wave lengths lying in the region between 6300 and 6700 Angstrom units and therefore to which wave lengths of light the material is substantially opaque. It will be understood, on the other hand, that an otherwise completely transparent material may be used which, however, has been combined, impregnated, and/or coated with a substance such as to make the material a color screen which is substantially absorbent of or opaque to light as delimited in the preceding sentence.

It is desired to be emphasized that the dyestuffs and/or coloring substances which may be utilized, in producing such a color screen, are selected without regard for the visual color effect but rather for their light absorptive characteristics in the ultra-violet, violet, and blue regions of the spectrum, and also in the region delimited by 6300 to 6700 Angstrom units. Further, and more specifically, they are, for example only, a suitable yellow combined with Malachite green, or chlorophyll. The necessary concentration of the dyestuff is dictated by the purpose for which the sheet material is to be used.

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The effective element of the present invention may be utilized in various forms, as protection shields, plates, caps, tubing, bands, wrapping blanks, bags and formed containers such as cartons, boxes, packs, including linings of bags and formed containers.

In a preferred embodiment the novel and improved article of the invention is in the form of a transparent wrapping for a bakery product comprising a flexible sheet of any of the transparent sheet materials, used in the packaging field, combined with a suitable dyestuff or pigment in sufficient combinations to render the sheet substantially opaque to light waves lying in the region below 4900 Angstrom units and in the region delimited by 6300 to 6700 Angstrom units of the spectrum.

The novel feature of the present invention over other known arts in this field is pertinent and specific to the region of light absorptions below 4900 and the region delimited by 6300 to 6700 Angstrom units in combination with the substantial transmission of light particularly in the region between 4900 and 6300 Angstrom units.

Vegetable oils contain the pigment chlorophyll which accounts for the spectral absorption by the oil of wave lengths of light below 4900 Angstrom units as well as in the region delimited by 6300 to 6700 Angstrom units. The color screen used in the present invention has the property of protecting the oil from deterioration through the development of rancidity, and is an improvement over that disclosed in the Coe Patent 1,880,813 in that a higher degree of transparency is obtained by this present invention, and there is provided a color screen which is more appealing to the eye from a sales point of view.

This same chlorophyll pigment is present in unripened fruits and vegetables, as well as in the stage of early flowering of plants. Chlorophyll is the photosensitizer for the chemical action in plant life brought about in the presence of light.

Haemoglobin in meat and meat products has practically the same absorption characteristics as chlorophyll, and also acts as a photosensitizer when exposed to light. Vitamins and enzymes are in bakery products containing the following photosensitizers, namely, porphyrins including chlorophyll and haemoglobin, as well as other photosensitizers, and therefore the characteristics and potency of vitamins and enzymes are more or less controlled by the presence of such photosensitizers. Therefore, the present invention provides a color screen which has for its function the property of absorbing substantially the same light as is absorbed by nature in growing vegetation and in meat and meat products.

The well known Grotthus-Draper law states that where there is photochemical absorption there is usually photochemical action which may and usually does result deleteriously in the case of bakery products. As a result of numerous experiments, I have discovered that each of Malachite green, Monastrel green, or Fast green (A–5832) with the addition of a suitable yellow dye or pigment can be used to produce a color screen having a spectral absorption in the regions specified above.

The effectiveness of my color screen does not depend on the color as seen by the eye, but on the spectral properties of this screen as hereinbefore stated. Suitable dyestuffs and coloring matters for use in this invention are those which absorb appreciably, or are substantially opaque to the wave lengths of light in the ultra-violet, violet, and blue regions and in the region delimited by 6300 to 6700 Angstrom units of the spectrum.

The dyestuff or coloring matter may be incorporated in the screen material either during or after the manufacture thereof. It is preferred that the dyestuff, or the coloring matter, or the light absorbing material be present in this protective element in such a concentration that the light transmission in the specified regions of absorption is not greater than 10 percent and preferably less than 5 percent, i. e. in the region below 4900 Angstrom units, and is preferably less than 10 percent in the region delimited by 6300 to 6700 Angstrom units.

The color screen may comprise materials normally translucent or transparent to visible light; for example, glass, glassine, synthetic plastics, gelatine, casein, synthetic resins of various types, non-fibrous cellulosic materials as regenerated cellulose, and cellulose derivatives, as cellulose esters, cellulose ethers, and celluose oxy-ethers; or composite materials containing two or more of the above mentioned substances, viz. impregnated and/or coated materials, such as lacquered regenerated cellulose, as well as laminated products comprising laminated paper, textiles (especially silk), and the like.

Although the above remarks have applied more especially to the case where the dyestuff is combined with, dyed or impregnated in the shielding element, the invention also contemplates employing a protective element which may be coated with a substance or material rendering the element substantially opaque to light below 4900 Angstrom units and also to light of the region of the visible spectrum delimited by 6300 to 6700 Angstrom units.

In carrying on my experiments since the issuance of my Patent No. 1,880,813, I have discovered that the products hereinbefore mentioned, as well as oils, fats, and waxes need not have excluded therefrom all light having wave lengths above 5600 Angstrom units and in fact beneficial results have been obtained by extending the region of transmission from 4900 upwards with the exception of a critical region substantially delimited by 6300 to 6700 Angstrom units. This region 6300 to 6700 has been proved to be critical in that it constitutes the substantial equivalent of nature's chlorophyll, and/or haemoglobin, and hence the resultant color screen should have a pigmentation or color which will absorb wave lengths of light lying in this critical region.

The present application is a continuation-in-part of my prior copending application Serial No. 406,909, filed August 14, 1941 now Patent No. 2,418,818, granted April 15, 1947.

It is obvious that those skilled in the art may vary the details of construction as well as the arrangements of parts constituting the articles of this invention, as well as vary the steps and combinations of steps constituting the method covered by this invention, without departing from the spirit of this invention, and therefore it is desired not to be limited to the exact foregoing disclosure except as may be required by the claims.

I claim:

1. The process of inhibiting deleterious photochemical action in bakery products which normally would result from the absorption thereby of certain wave lengths of light, which comprises shielding the product from rays of light with a material such as to admit to the commodity those wave lengths of light between approximately 4900 and 6300 as well as above approximately 6700 Angstrom units while excluding wave lengths of light in all other regions.

2. The process of inhibiting deleterious photochemical action in bread which normally would result from the absorption thereby of certain wave lengths of light, which comprises shielding the bread from rays of light with a material such as to admit to the commodity those wave lengths of light between approximately 4900 and 6300 as well as above approximately 6700 Angstrom units while excluding wave lengths of light in all other regions.

3. The process of inhibiting deleterious photochemical action in crackers which normally would result from the absorption thereby of certain wave lengths of light, which comprises shielding the bread from rays of light with a material such as to admit to the commodity those wave lengths of light between approximately 4900 and 6300 as well as above approximately 6700 Angstrom units while excluding wave lengths of light in all other regions.

4. An article of commerce comprising a bakery product, a material shielding said bakery product from rays of light, said material having the property of admitting to the product those wave lengths of light between approximately 4900 and 6300 as well as above approximately 6700 Angstrom units while excluding wave lengths of light in all other regions.

5. An article of commerce comprising bread, a material shielding said bread from rays of light, said material having the property of admitting to the bread those wave lengths of light between approximately 4900 and 6300 as well as above approximately 6700 Angstrom units while excluding wave lengths of light in all other regions.

6. An article of commerce comprising crackers, a material shielding said crackers from rays of

light, said material having the property of admitting to the crackers those wave lengths of light between approximately 4900 and 6300 as well as above approximately 6700 Angstrom units while excluding wave lengths of light in all other regions.

7. An article of commerce comprising bakery products packaged in a container to shield the bakery products from rays of light, said container having the property of admitting to the bakery products those wave lengths of light between approximately 4900 and 6300 as well as above 6700 Angstrom units while excluding wave lengths of light in all other regions.

8. An article of commerce comprising bread packaged in a container to shield the bread from rays of light, said container having the property of admitting to the bread those wave lengths of light between approximately 4900 and 6300 as well as above 6700 Angstrom units while excluding wave lengths of light in all other regions.

9. An article of commerce comprising crackers packaged in a container to shield the crackers from rays of light, said container having the property of admitting to the crackers those wave lengths of light between approximately 4900 and 6300 as well as above 6700 Angstrom units while excluding wave lengths of light in all other regions.

MAYNE R. COE.

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