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# UNITED STATES PATENT OFFICE

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## DENTAL IMPRESSION WAX COMPOSITION

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This invention relates to new and useful improvements in thermoplastic dental impression wax compositions, and processes of compounding the same.

An object of the invention is to make a thermoplastic dental impression wax composition particularly adapted for making impressions, and for the manufacture of plates and bridge work such as used in dental practice.

A further and particular object of the invention is to produce a thermoplastic dental impression wax composition that is quite soft when warm, and is both rigid and strong when cool, and which may be quickly cooled so as not to produce distortion after the impression has been taken.

A further object is to produce thermoplastic dental impression wax compositions in suitable colors, particularly in pink shades simulating the color of human gums.

Shellac, and shellac mixtures have been frequently used for dental impression wax compositions, but heretofore such compositions containing shellac have not been entirely satisfactory for dental service.

Many substances which function as plasticizers have been added to shellac with the hope that satisfactory compositions would be produced thereby, but as far as I know not any of such compositions fully meet the exacting requirements demanded of a successful dental impression wax.

After a long period of research on this class of work, I have found that if shellac is blended or plasticized with certain mixed fatty acids and suitable inert material, in the proper proportions, entirely successful dental impression wax compositions may be made therefrom. I have also found that such improved compositions may be readily colored so as to be entirely acceptable for dental impression waxes.

Of the numerous materials that I have used for plasticizing shellac to produce a composition suitable for an impression wax, and for dental plate work, I have found that the combined fatty acids from Japan wax, palm oil, and certain grades of tallow, have produced entirely satisfactory compositions. When beef tallow is used I prefer to use the harder grades. Such single acids as stearic acid, palmitic acid, oleic acid, and similar liquid and solid acids have been used, but the fatty acids from Japan wax, palm oil, and tallow, are preferred. Fatty acids from drying oils are less suitable than those above noted, due to their tendency to a gradual hardening of the mass, and the rendering of said mass more brittle in the course of time.

The fatty acids derived from Japan wax, palm oil, and tallow, have proved to be entirely satisfactory when used alone, but I have also used compositions containing such acids with a small amount of rosin, and such rosin-containing compositions have been found to be highly efficient. Compositions consisting of pure rosin, or largely of rosin, have not proved to be satisfactory because of the brittleness of the final product, but the presence of a minor proportion of rosin mixed with the mixed fatty acids, produces a composition which is entirely satisfactory for the exacting demands of dental service.

When I have used rosin, I have found it advantageous to dissolve ordinary rosin-containing laundry soap and warm water, and to set free the combined fatty and resin acids therein with an acid, such as a diluted sulphuric acid, the separated and fatty acids are now washed thoroughly and used as indicated in formulas given herein. Such separated acids may be substituted for a part of the fatty acids described above, from less than one percent to upwards of about fifty percent thereof.

I have found that a small amount of one or more polyhydric alcohols may be added to the composition with advantage, as it adds to the plasticity. Examples of such polyhydric alcohols as have been found to be beneficial in this class of work are gylcerine, a glycol such as ethylene glycol, or diethylene glycol, as indicated hereafter.

Entirely satisfactory compositions for dental impression wax service may contain the following ingredients in approximately the proportions indicated; after the melted ingredients have been thoroughly stirred until

they are homogeneous, they may be poured into the molds to harden.

| | |
|---|---|
| Shellac | From about 33 percent to about 50 percent by weight; |
| Filler (talc or French chalk) | From about 25 percent to about 45 percent by weight; |
| Coloring matter (sufficient to produce the desired shade) | |
| Fatty acids | Remainder. |
| Shellac | From about 33 percent to about 50 percent by weight; |
| Filler (talc or French chalk) | From about 25 percent to about 45 percent by weight; |
| One or more polyhydric alcohols | From about 1 percent to about 5 percent by weight; |
| Coloring matter (sufficient to produce the desired shade) | |
| Fatty acids | Remainder. |
| Shellac | From about 33 percent to about 50 percent by weight; |
| Filler (talc or French chalk) | From about 25 percent to about 45 percent by weight; |
| One or more polyhydric alcohols | From about 1 percent to about 5 percent by weight; |
| Coloring matter (sufficient to produce the desired shade) | |
| Mixed acids, including one or more fatty acids, and resin acids | Remainder. |
| Shellac | From about 33 percent to about 50 percent by weight; |
| Filler (talc or French chalk) | From about 25 percent to about 45 percent by weight; |
| Glycerine | From about 1 percent to about 5 percent by weight; |
| Coloring matter (sufficient to produce the desired shade) | |
| Fatty acids | Remainder. |
| Shellac | From about 33 percent to about 50 percent by weight; |
| Filler (talc or French chalk) | From about 25 percent to about 45 percent by weight; |
| A glycol | From about 1 percent to about 5 percent by weight; |
| Coloring matter (sufficient to produce the desired shade) | |
| Fatty acids | Remainder. |
| Shellac | From about 33 percent to about 50 percent by weight; |
| Filler (talc or French chalk) | From about 25 percent to about 45 percent by weight; |
| Coloring matter (sufficient to produce the desired shade) | |
| Japan wax fatty acids | Remainder. |
| Shellac | From about 33 percent to about 50 percent by weight; |
| Filler (talc or French chalk) | From about 25 percent to about 45 percent by weight; |
| Coloring matter (sufficient to produce the desired shade) | |
| Tallow fatty acids | Remainder. |
| Shellac | About 45 percent by weight; |
| Filler (talc or French chalk) | About 30 percent by weight; |
| Palm oil fatty acids | About 24.95 percent by weight; |
| Coloring matter (ceresin red B.—oil soluble dye) | About .05 percent by weight; |
| Shellac | About 45 percent by weight; |
| Filler (talc or French chalk) | About 30 percent by weight; |
| Palm oil fatty acids | About 22.45 percent by weight; |
| Glycerine | About 2.5 percent by weight; |
| Coloring matter (ceresin red B.—oil soluble dye) | About .05 percent by weight; |

Instead of the ceresin red B, other colors may be used. I have found that so-called "toluidin toners" to be suitable, for example, about one-half percent of the color is an entirely satisfactory proportion to add to the composition.

The above composition may be varied in percentage of some of its components without departing from the present invention. The preparations may be compounded in different ways so as to produce smooth and homogeneous compositions as to color and filler; but an entirely satisfactory method is to melt the shellac at a temperature of about 250° F. to 260° F., which may be done in a jacketed kettle with steam under moderate pressure, and to this is added one-half of the total quantity of the fatty acids, which is thoroughly stirred into the melted shellac; in another kettle the balance of the fatty acids are melted to which is then added the coloring matter, and finally the filler, and the entire mass thoroughly stirred; after the second part of the mixture has been thoroughly blended, it is added to the first part containing the shellac, and the entire mass thoroughly stirred until a homogeneous mass is obtained. When glycerine is used, it is preferable to add it as the last ingredient, after the remaining components have been melted, and the mass thoroughly stirred to distribute the glycerine uniformly therethrough.

I claim:—

1. A dental wax composition consisting of

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|---|---|
| Shellac | About 45 percent by weight; |
| Filler | About 30 percent by weight; |
| Coloring matter | Sufficient to produce desired shade; |
| A polyhydric alcohol | About 2.5 percent by weight; |
| Mixed acids, including one or more fatty acids, and resin acids | Remainder. |

2. A dental wax composition consisting of

| | |
|---|---|
| Shellac | About 45 percent by weight; |
| Filler | About 30 percent by weight; |
| Coloring matter | Sufficient to produce desired shade; |
| A polyhydric alcohol | About 2.5 percent by weight; |
| Mixed acids, including one or more fatty acids and up to about fifty per cent of resin acids | Remainder. |

3. A dental wax composition consisting of

| | |
|---|---|
| Shellac | About 45 percent by weight; |
| Filler | About 30 percent by weight; |
| Coloring matter | Sufficient to produce desired shade; |
| Glycerine | About 2.5 percent by weight; |
| Fatty acids | Remainder. |

4. A dental wax composition consisting of

| | |
|---|---|
| Shellac | About 45 percent by weight; |
| Filler (talc, French chalk and the like) | About 30 percent by weight; |
| Coloring matter | Sufficient to produce desired shade; |
| Palm oil fatty acids | Remainder. |

5. A dental wax composition consisting of

| | |
|---|---|
| Shellac | About 45 percent by weight; |
| Filler (talc, French chalk and the like) | About 30 percent by weight; |
| Coloring matter | Sufficient to produce desired shade; |
| Glycerine | About 2.5 percent by weight; |
| Palm oil fatty acids | Remainder. |

6. A dental wax composition consisting of

| | |
|---|---|
| Shellac | About 45 percent by weight; |
| Filler (talc, French chalk and the like) | About 30 percent by weight; |
| Coloring matter | Sufficient to produce desired shade; |
| Tallow fatty acids | Remainder. |

7. A dental wax composition consisting of

| | |
|---|---|
| Shellac | About 45 percent by weight; |
| Filler (talc, French chalk and the like) | About 30 percent by weight; |
| Coloring matter | Sufficient to produce desired shade; |
| Glycerine | About 2.5 percent by weight; |
| Tallow fatty acids | Remainder. |

In testimony whereof I hereby affix my signature.

ANGELO C. ANTONUCCI.