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# PLASTIC MODELING COMPOSITION OF A SOFT, PLIABLE WORKING CONSISTENCY

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This invention relates to a plastic modeling composition of a soft pliable, working consistency for being molded into any desired shape or form and is slow-drying so as to be retained in a workable moldable condition for a long period of time to be repeatedly reworked and molded into different shapes and forms. It particularly pertains to a modeling composition for children's play, and is clean, non-sticky and non-staining.

This case is a continuation-in-part of application Serial No. 735,985, filed May 19, 1958, now abandoned.

One of the main objects of the invention is a modeling composition which may be reworked and remolded, or may be used for modeling objects which are more or less permanent.

Another object of the invention is a modeling composition which is easily compounded and is efficient in use

Another object of the invention is a modeling composition which is non-toxic.

Another object of the invention is a modeling composition in which different colors may be incorporated without affecting its moldable consistency.

Still another object of the invention is a modeling composition which can be molded into objects adapted to be painted with conventional water and oil paints.

Further objects, and objects relating to details of construction and composition, will readily appear from the detailed description to follow. We have accomplished the objects of the invention by the means set forth in the following specification. The invention is clearly defined and pointed out in the appended claims, example compositions are also set forth for carrying out the invention. Generally described the invention comprises a composition consisting essentially of vegetable flour, such as grain flour which is adapted to be gelatinized; water, a hydrocarbon distillate preferably falling within the class consisting of a complex mixture of aromatic and aliphatic liquid hydrocarbon distillate derived from crude petroleum or shale or which may be made synthetically by combining lower boiling hydrocarbons and preferably having an initial boiling point of at least 60° C., and a soluble saline extender. Preferably also a drying agent, a hardener and astringent agent for binding the composition into a cohesive mass sometimes are included. Relatively small amounts of perfume or coloring, or both, may be added if desired. These latter two ingredients are not essential but optional to be used or not as may be desired.

Although any hydrocarbon distillate falling within the class defined above may be used it has been found that an excellent product is produced by the use of a hydrocarbon petroleum distillate such as typified by kerosene and preferably but not necessarily kerosene which has been deodorized. A kerosene of this type having an initial boiling point of approximately 150° C. has the advantage of not being so volatile as to be explosive. It is believed that the hydrocarbon distillate forms a thin film coating around the solid particles of the composition to give the composition a nice soft pliable texture. The coated flour particles, when extended by moist heat will gelatinize with the other particles into a homogenous mass which is soft and pliable without forming undesirable lumps therein. The homogenous mass is maintained



lump-free. The thin film coating in addition to giving the process mixture a soft and pliable texture also renders the mixture smooth and velvety so that it will not be sticky when coming into contact with other objects or the hands of the user.

Any grain flour may be used but wheat flour is preferred. However, any of the other grain flours may be used, and they may be used alone or in combination. Rye flour is preferred next to wheat flour. The grain flour forms the body of the mixture after gelatinzation occurs. It has been found during the manufacturing process that when wheat flour is used swelling begins at approximately 50° C. and gelatinization starts at approximately 65° C.

Any common salt that is soluble in water and is non-toxic may be employed. While sodium chloride is preferred, sodium hypochlorite and sodium chlorite may be used. The former is a common salt and is commonly used in tanneries and the latter is a bleaching agent commonly used for textile and paper pulp. In addition to the above, another common salt potassium chloride may also be used. None of the above salts will injure the flour. The term salt is used in its common ordinary meaning for indicating those materials which are commonly referred to as salt and are water soluble.

The drying agent includes such solid or powdered materials as borax, salicylic acid, sodium benzoate, sorbic acid, sodium and calcium propionate, calcium oxide, colemanite, resorite, and kernite. These materials may be used alone or in combination. All of these materials function as a drying agent and as such they have an antiseptic effect upon the compound in that they inhibit or prohibit the growth and activity of micro-organisms and thus preserve the desirable properties of the compound. Of these materials borax is preferred. Borax is a hydrous borate, and commercial borax under Federal specifications call for not less than 95.5% of hydrous sodium borate in three grades from large crystals to fine white powder. Although all three grades are suitable, the fine white powder is preferred. Thus, the purpose of these materials is to maintain the composition in good physical condition and to prevent it from getting wet and sticky and further as an agent to inhibit microbiological growth in the composition which would cause the product to mold and in other ways deteriorate.

The hardener and astringent agent may be any of the well known alums, such as potash and soda alum. The term alum refers to hydrated double sulphates of aluminum and univalent or trivalent metals, such as sodium, potassium or ammonium, chromium and iron. Some suitable alums are listed below, they being used alone or in combination:

$Na_2SO_4Al_2(SO_4)_324H_2O$, sodium aluminum sulphate
$K_2SO_4Al_2(SO_4)_324H_2O$, potassium aluminum sulphate
$Al_2(SO_4)_3(NH_4)_2SO_424H_2O$, aluminum ammonium sulphate
$CrNH_4(SO_4)12H_2O$, chromium ammonium sulfate
$CrK(SO_4)_212H_2O$, chromium potassium sulfate
$(NH_4)_2SO_4Fe_2(SO_4)_324H_2O$, ammonium ferric sulphate

A hardener and astringent other than alum such as aluminum sulfate ($Al_2(SO_4)_3.18H_2O$) may be used, and in fact is preferable because it is iron free. This aluminum sulphate or its hydrates are sometimes incorrectly referred to as alums. Accordingly, they are included in the general class of alums although they have been separately grouped here.

The foregoing examples include some alums which are not iron-free, but iron-free alums such as

$$Al_2(SO_4)_3.18H_2O$$

are preferred because they do not stain. The term alum is used in its common ordinary meaning and refers to