

1

3,135,612

**PROCESS FOR AGGLOMERATING  
CULINARY MIXES**

Eddy R. Hair, Colerain Township, Hamilton County,  
and Benjamin Lawrence, Springfield Township, Hamil-  
ton County, Ohio, assignors to The Procter & Gamble  
Company, Cincinnati, Ohio, a corporation of Ohio  
No Drawing. Filed Apr. 19, 1962, Ser. No. 188,887  
4 Claims. (Cl. 99-94)

This invention relates to the agglomeration of pulverulent materials, and more particularly, to the agglomeration of flour-containing food particles to provide a non-sticky, free-flowing culinary mix which can be readily blended with or mixed in water and other aqueous systems.

In recent years there has been a trend toward providing the consumer with ready-to-use products having various built-in convenience and time-saving qualities. This has been particularly notable in the culinary arts such as in the field of the prepared mixes of one sort or another.

For example, it is now possible for household consumers, as well as commercial bakeries, to prepare baked goods from prepared mixes which contain many of the essential ingredients of the finished food product in a pre-mixed condition.

Frequently however, the prepared food mixes contain ingredients which are not readily dispersible in aqueous systems, such as in a cake batter. One of the important ingredients which is usually incorporated in a cake batter is flour. However, it is well known that fine particles of flour commonly wet with difficulty upon admixture with water, and form unwetted lumps in the cake batter instead of a smooth mixture. A means for providing improved wettability and dispersibility of such difficultly soluble food materials would find much use in the culinary arts.

Accordingly, it is a primary object of this invention to provide a free-flowing flour-containing culinary mix having improved wettability and dispersibility in aqueous systems.

Another object is to provide a method of forming a dry culinary mix which is non-sticky and highly flowable and can be readily mixed or blended with water to form a lump-free dough or batter.

Still another object is to provide an improved process for combining the various ingredients of a flour-containing culinary mix into aggregates to prevent their mechanical segregation into layers of particles of differing sizes and densities during storage or other handling.

A further object is to provide a simplified process for agglomerating flour particles with edible liquids to produce a free-flowing, non-sticky culinary mix without drying.

Still a further object is to provide a method for combining flour with sugar and/or shortening to produce a dry culinary mix having enhanced blending and mixing properties.

Briefly stated, the process of this invention comprises contacting the pulverulent food particles with a finely atomized spray of a sticky cohesive binding liquid substance and thoroughly agitating the mass of said particles in a gentle manner sufficient to blend the sticky liquid uniformly therein and roll up the treated particles into non-sticky, free-flowing aggregates without drying, said aggregates having a larger particle size than the unagglom-

2

erated particles and improved mixing and blending properties in aqueous systems.

By means of the aforesaid agglomerating process, it is possible to provide free-flowing, non-sticky culinary mixes having a great variety of ingredients. For example, among those materials which can be agglomerated by the process of this invention are cake mixes containing flour, sugar, shortening, and other ingredients; pancake mixes; party mixes; confectionery mixes; powdered beverages; and other pulverulent substances in general. This invention is particularly useful for the preparation of flour-containing mixes having sugar and/or shortening incorporated therein.

Most of the prior art agglomerating methods require a final drying step in order to recover a product that is both non-sticky and microbiologically stable. The usual agglomerating methods which require substantial amounts of steam or water as the agglomerating fluid generally require drying of the final aggregates to reduce their moisture content to a level which does not impart stickiness to the product and which does not support the growth of bacteria and mold. A primary advantage of the process of the present invention is its ability to provide a free-flowing aggregate having improved mixing properties that is both non-sticky and resistant to microbial spoilage, yet requires no drying of product subsequent to the treatment with the agglomerating fluid.

It has now been found possible to avoid the usual drying procedure by providing for a unique depositing of an edible sticky cohesive binding liquid onto the dry particles while they are tumbled or otherwise agitated in a manner whereby the said binding liquid loses its stickiness and becomes an integral constituent of the agglomerated mix.

As used herein, the term "liquid" is intended to define a fluid agglomerating substance existing in a liquid phase and excludes the presence of functional crystalline or other solid particles greater than about  $0.2\mu$  in diameter. However, it is not hereby intended to exclude the presence in the agglomerating liquid of minor amounts of non-functional, inert solid matter.

The agglomerating liquids of this invention are edible, sticky, cohesive, binding substances such as a melted or normally liquid glyceride shortening or a highly concentrated aqueous sugar solution which can be deposited on the mix in certain levels and intimately blended therewith to become an integral constituent of the said mix.

Shortening and sugar solution are the preferred substances to be used as agglomerating liquids for the preparation of dry flour-containing mixes. Both substances are common ingredients of flour-containing products such as cakes, pancakes and the like, while shortening is also an important ingredient of pastry products such as a dough. These ingredients are usually blended with flour and other materials by ordinary mixing methods during the preparation of a batter or dough by the consumer or during the production of a dry prepared mix by the manufacturer. It has now been found, however, that if these substances are blended in liquid form, as hereinafter described, in certain proportions with the flour and other materials, a superior dry prepared mix with markedly enhanced blending and mixing properties can be prepared.

Although these agglomerating liquids may be added to the mix before it is agitated, it is preferable to add the