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PROCESS OF AND COMPOSITION FOR BLEACHING AND IMPROVING MILLING PRODUCTS.

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This invention relates to a process of and composition for treating flour and other milling products to bleach and otherwise improve them.

Many attempts have been made to satisfactorily bleach flour to produce a whiter loaf and also to improve it whereby for example, a larger loaf can be produced from a given quantity of flour, such loaf having finer bubbles more evenly or uniformly distributed throughout. Materials employed for such improvement in the baking and other qualities of flour and loaves produced therefrom are known in the art as "flour improvers".

Heretofore certain organic peroxids, notably benzoyl peroxid, have been used in bleaching flour but the organic peroxids heretofore used in such bleaching do not so far as we have been able to find, improve the size of the loaf or its quality.

We have discovered that the bleaching, "improving", and bread yield of flour and other milling products will be simultaneously, efficiently and advantageously enhanced by treating them with a composition which contains materials having the properties of bleaching and "improving" the flour, increasing the bread yield and overcoming or lessening the inflammability of the organic peroxid used in the composition.

In the preferred practice of our process we employ an organic acid peroxid or mixture of peroxids of either the active or inactive type such as caproyl peroxid, stearyl peroxid, benzoyl peroxid, fumaryl peroxid, succinyl peroxid, benzoylacetyl peroxid, phthalyl peroxid, and a flour "improver" such as ammonium lactate, ammonium sulfate, ammonium carbonate, ammonium chlorid, free tartaric acid and its salts, magnesium sulfate, fumaric and other unsaturated acids and their salts and other materials which not only improve the flour but also exert an activating or possibly catalytic action or influence on the organic peroxid or peroxids accompanying their bleaching action. Such improvers by their action produce, per se, not only a larger yield and a better quality of bread, but by their activation of the organic peroxids enable such peroxids to act more rapidly, thoroughly and economically in their bleaching action. The use of these improvers is particularly advantageous with inactive or relatively inactive organic peroxids which normally exercise little or no bleaching action but which under the influence of such improvers, bleach effectively. Some of these flour improvers as for example, magnesium sulfate, are adapted also to act as fillers. In using improvers which are not adapted to act as fillers we also use a filler such as talc, "filter-cel" (an infusorial earth) or any other suitable filler. We also may use together flour improvers which are capable of acting as fillers and additional fillers such as talc which are not improvers.

In our preferred bleaching and improving treatment we subject the flour or other milling product to be treated to the action at ordinary atmospheric temperature, of an extremely small proportion of a composition comprising about 1 to 30 parts by weight of a dry organic acid peroxid such for example, as benzoyl, fumaryl or phthalyl peroxid, 1 to 30 parts by weight of a flour improver, preferably of the character hereinbefore referred to, and from 40 to 98 parts by weight of the filler. In some cases we may materially increase the proportion of the improver and proportionately lessen that of the filler. We have in some cases wholly replaced the filler by the improver, as indicated above. This can satisfactorily be done where the improver is adapted also to act as a filler.

In some cases where an unusual degree of bleaching is necessary or desired as in the case of an unusually dark flour, the proportion of the organic peroxid to the flour may be increased. Similarly where an unusual degree of improving is necessary or desired as for example, in the treatment of flour from very new wheat to give it the desirable qualities of flour made from old wheat, a composition containing an increased proportion of the improver is employed. This increased proportion advantageously may be attained by using a material which is both a filler and an improver.

More than one organic peroxid and more than one improver obviously may be used in the same composition to meet the requirements of individual milling products to be treated. Similarly more than one filler may if desired, be used.

The following examples illustrate the practical use of our invention:

Example a.—200 parts by weight of flour are intimately mixed with 1 part by weight of

a composition containing .5 per cent. by weight of an organic peroxid bleaching agent such as phthalyl peroxid, 84.5 per cent. by weight of a flour improver such as acid calcium phosphate and 15 per cent. by weight of a filler such as talc and the thus treated flour stored for 48–96 hours before using.

Example b.—200 parts by weight of flour are intimately mixed with 1 part by weight of a composition containing 1 per cent. by weight of an organic peroxid bleaching agent such as benzoyl peroxid, and 99 per cent. by weight of a material which is both a flour improver and a filler such as magnesium sulfate, and the treated flour stored for 48–96 hours before using.

Example c.—100 parts by weight of flour are intimately mixed with 1 part by weight of a composition containing 1 per cent. by weight of an organic peroxid bleaching agent such as stearyl peroxid, 69 per cent. by weight of a flour improver such as ammonium lactate, and 30 per cent. by weight of a filler such as talc, and the mixture stored for 48–96 hours before using.

Example d.—100 parts by weight of flour are intimately mixed with 1 part by weight of a composition containing 2 per cent. by weight of an organic peroxid bleaching agent such as caproyl peroxid and 98 per cent. by weight of a material which is both a flour improver and a filler, such as magnesium sulfate, and the mixture stored for 48–96 hours before using.

Example e.—100 parts by weight of dark flour are intimately mixed with 1½–2 parts by weight of a composition containing 5 per cent. by weight of an organic peroxid bleaching agent such as succinyl peroxid, 50 per cent. by weight of a flour improver such as tartaric acid and 45 per cent. by weight of a filler such as "filter-cel", and the mixture stored for 48–96 hours before using.

While flour improvers of the activating or catalytic character hereinbefore set forth act as activators for the organic peroxids it appears that the action of the peroxids and improvers is to some extent mutual, each serving to improve the beneficial action of the other.

By the term "inactive organic peroxids" we refer to such peroxids whose available oxygen content is normally ineffective in bleaching organic materials by being merely intimately mixed therewith.

By the term "synthetic flour improver" employed in the claims is meant a compound capable of improving flour in the manner described above which has been synthetically prepared or which is capable of synthetic preparation.

Our invention is of particularly great industrial advantage where we employ improvers which are activators for organic peroxids since it permits of the use of inactive organic peroxids which are relatively inexpensive to produce and which have an unusually high content of available oxygen but which exercise little or no bleaching action except in the presence of an activator. It is however, of industrial importance in the case of all organic peroxids and improvers.

While we have described in detail the preferred practice of our process and the preferred ingredients and proportions of ingredients it is to be understood that our invention is not restricted thereto except as set forth in the subjoined claims.

We claim:

1. A process of bleaching and improving flour and other cereal milling products comprising intimately mixing therewith a mixture of an organic peroxid and a synthetic flour improver.

2. A process of bleaching and improving flour and other cereal milling products comprising intimately mixing therewith a mixture of an organic peroxid and a synthetic flour improver which also is a filler.

3. A process of bleaching and improving flour and other cereal milling products comprising intimately mixing therewith a mixture of an organic peroxid, a synthetic flour improver and a filler.

4. A process of bleaching and improving flour and other cereal milling products comprising intimately mixing therewith a mixture containing about 1 to 30 parts by weight of an organic peroxid, 1 to 30 parts by weight of a synthetic flour improver and 40 to 98 parts by weight of a filler.

5. A process of bleaching and improving flour and other cereal milling products comprising intimately mixing therewith a mixture containing an organic peroxid and a synthetic flour improver which is an activator for the peroxid making the latter more efficient in its bleaching action.

6. A process of bleaching and improving flour and other cereal milling products comprising intimately mixing therewith a mixture containing an organic peroxid, a synthetic flour improver which is an activator for the peroxid, and a filler.

7. A process of bleaching and improving flour and other cereal milling products comprising intimately mixing therewith a mixture of a normally inactive organic peroxid and a synthetic flour improver which is an activator for the inactive peroxid.

8. A process of bleaching and improving flour and other cereal milling products comprising intimately mixing therewith a mixture of a normally inactive organic peroxid, a synthetic flour improver which is an activator for the inactive peroxid, and a filler.

9. A composition for bleaching and improving flour and other milling products consisting of a mixture of an organic peroxid and a synthetic flour improver.

10. A composition for bleaching and improving flour and other milling products consisting of a mixture of an organic peroxid and a synthetic flour improver which also is a filler.

11. A composition for bleaching and improving flour and other milling products consisting of a mixture of an organic peroxid, a synthetic flour improver and a filler.

12. A composition for bleaching and improving flour and other milling products consisting of a mixture containing about 1 to 30 parts by weight of an organic peroxid, 1 to 30 parts by weight of a synthetic flour improver and 40 to 98 parts by weight of a filler.

13. A composition for bleaching and improving flour and other milling products consisting of a mixture containing an organic peroxid and a synthetic flour improver which is an activator for the organic peroxid.

14. A composition for bleaching and improving flour and other milling products consisting of a mixture containing an organic peroxid, a synthetic flour improver which is an activator for the peroxid, and a filler.

15. A composition for bleaching and improving flour and other milling products consisting of a mixture of a normally inactive organic peroxid and a synthetic flour improver which is an activator for the inactive peroxid making the latter more efficient in its bleaching action.

16. A composition for bleaching and improving flour and other milling products consisting of a mixture of a normally inactive organic peroxid, a synthetic flour improver which is an activator for the inactive peroxid, and a filler.

In testimony whereof we affix our signatures.

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