United States Patent

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[72] Inventors **Viktor Mironovich Fridman**
Karetny Ryad, 5/10, kv. 180;
Stanislav Konstantinovich Ushanov, 2
Khutorskaya Ulitsa, 18/20, korpus 5, kv.
70; Galina Alexandrovna Sapogova,
Leningradsky prospekt, 57, kv. 110, all of
Moscow, U.S.S.R.

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[54] **APPARATUS FOR MIXING AND DISPERSING LIQUIDS AND LIQUIDS WITH SOLIDS**
2 Claims, 2 Drawing Figs.

[52] **U.S. Cl.** **259/107,** 259/8, 415/64, 415/84
[51] **Int. Cl.** **B01f 7/16**
[50] **Field of Search** 259/107, 7, 8, 11, 14, 15, 48, 50, 51; 415/64, 83, 84, 19.3

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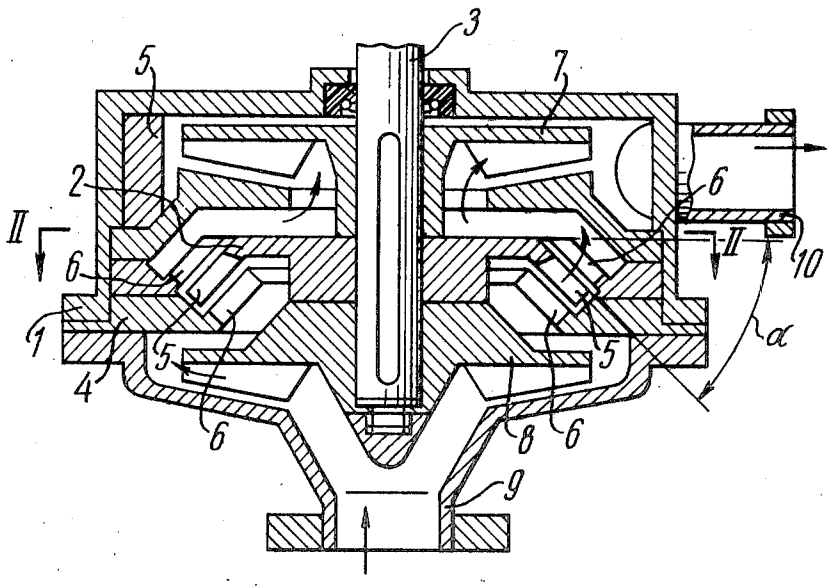
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Primary Examiner—Jordan Franklin
Assistant Examiner—Geo. V. Larkin
Attorney—Waters, Roditi, Schwartz & Nissen

ABSTRACT: An apparatus for mixing and dispersing liquids and liquids with solids comprises a rotor with teeth on its periphery and a stator with at least two rows of teeth, the rotor teeth being arranged between the stator teeth and at least one face of the rotor tooth and the corresponding gap-forming face of the stator tooth being set at an oblique angle to the rotation plane of the rotor.



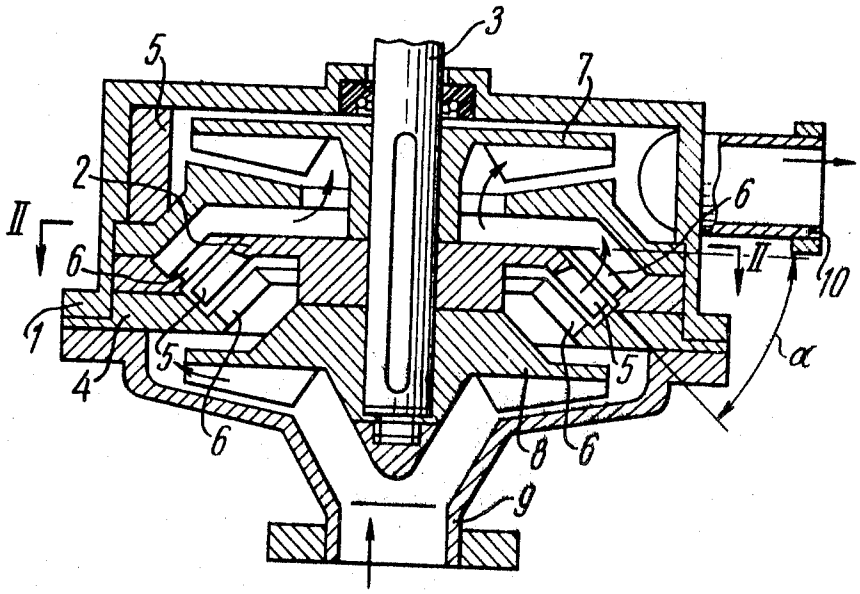


FIG. 1

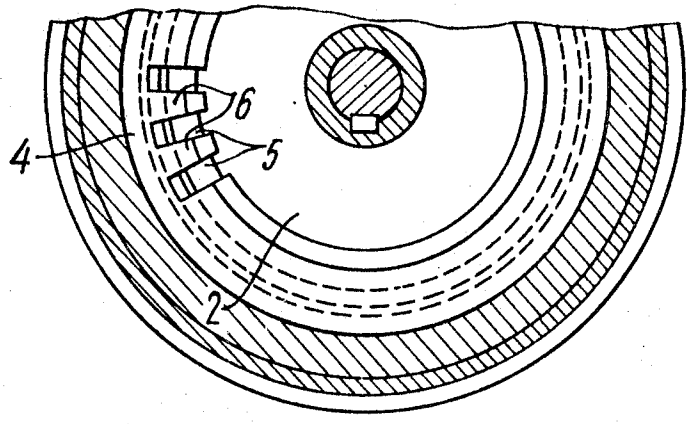


FIG. 2

APPARATUS FOR MIXING AND DISPERSING LIQUIDS AND LIQUIDS WITH SOLIDS

The present invention relates to apparatus for rise in chemical industry and more specifically it relates to apparatus for mixing and dispersing liquids and liquids with solids. The apparatus can be used most effectively for processing viscose masses.

Known in the art are apparatuses for mixing and dispersing liquids and liquids with solids comprising a rotor in a casing, said rotor being provided with rows of rectangular teeth on its periphery, and a stator with coaxial rows of rectangular teeth. The rotor teeth are located between the stator teeth and mounted at right angles to the plane of rotor rotation. The handled product (various liquids and liquids with solids) passes in the apparatus through the gaps between the stator teeth and the teeth of the rotating rotor. As a result, the product is mixed or dispersed, depending on the processing requirements.

However, the known apparatuses have a serious disadvantage, which is in that their efficiency drops sharply with increase in the viscosity of the product handled. Moreover, the design of the known apparatus does not provide for pumping the product through the apparatus without the use of special pumps which, as a rule, are expensive and have a short service life.

An object of the invention resides in providing an apparatus for mixing and dispersing liquids and liquids with solids whose rotor and stator can ensure a high quality of processing of products of any viscosity and, in addition, will allow pumping of the product through the apparatus, i.e., deliver it where required without the use of an additional pump.

This object is accomplished by providing an apparatus for mixing and dispersing liquids and liquids with solids comprising a casing with a rotor which has at least one row of teeth located on the periphery, and a stator which has at least two coaxial rows of teeth, the rotor teeth being arranged between the rows of the stator teeth, wherein at least one face of the rotor tooth and the corresponding gap-forming face of the stator tooth are set at an oblique angle relative to the plane of the rotation of the rotor.

Now the invention will next be described in detail by way of example with reference to the accompanying drawings in which:

FIG. 1 is a schematic sectional view of an apparatus for mixing and dispersing liquids and liquids with solids, according to the invention; and

FIG. 2 is a section taken along line II—II of FIG. 1.

The apparatus for mixing and dispersing liquids and liquids with solids comprises a casing 1 (FIG. 1) accommodating a rotor 2 mounted on a shaft 3, and a stator 4.

The rotor 2 (FIGS. 1 and 2) has teeth 5 while the stator 4 has teeth 6, the teeth 5 of the rotor 2 being located between the teeth 6 of the stator 4.

The faces of the teeth 5 of the rotor 2 and of the teeth 6 of the stator 4 are located at an oblique angle α (FIG. 1) relative to the plane of rotation of the rotor.

Such a design of the teeth 5 and 6 improves the quality of processing of the product handled and ensures its pumping.

For still further efficient pumping of the product, the shaft 3 of the apparatus can be provided with pumping wheels 7 and 8 in the form of, e.g., discs with blades or of any other shape promoting the pumping effect.

The apparatus also has a pipe connection 9 for supply of the handled product and a pipe connection 10 for its discharge.

The apparatus for mixing and dispersing liquids and liquids with solids operates as follows.

The rotor 2 and the pumping wheels 7 and 8 rotate together with the shaft 3. The product (various liquids or liquids with solids) is drawn into the apparatus by the pumping wheel 8. Passing through the gaps between the teeth 5 of the rotor 2 and the teeth 6 of the stator 4, the product is subjected to a complex mechanical action, thus being mixed and dispersed. The processed product is discharged from the apparatus through the pipe connection 10, the pumping wheel 7 imparting an additional pressure to the flow of the discharged product (the direction of the product flow through the apparatus is indicated in the drawing by arrows).

The disclosed apparatus can be used to advantage for processing materials of different viscosity, including highly viscous materials such as viscose and mineral fertilizers, without the use of special pumps for forcing the product through the apparatus. It can be used for dispersing and homogenizing serrasol in water which produces an oiling agent utilized in the manufacture of synthetic fibers.

For processing low-viscosity products, it is recommended to use the apparatus with pumping wheels which again will allow said apparatus to be utilized without special pumps for forcing the product through the apparatus.

The disclosed apparatus is characterized by high reliability, economy, small size and ease of handling.

What is claimed is:

1. Apparatus for mixing and dispersing liquids and liquids with solids, said apparatus comprising a casing having an inlet for the substances to be mixed and an outlet for the mixed substances, a rotor in said casing and having a periphery with at least one row of teeth thereon, a stator in said casing including at least two coaxial rows of spaced teeth, said row of teeth of the rotor extending between said two rows of teeth on the stator, said teeth being parallel and extending at an acute angle relative to the axis of rotation of said rotor, said stator and rotor respectively including sections extending perpendicular to said axis of rotation, said teeth being bent at said acute angle respectively from the planes of said sections of the rotor and stator only at the peripheries thereof.

2. Apparatus as claimed in claim 1, comprising pumping wheels secured to said rotor on opposite sides of said rows of teeth between the inlet and outlet respectively, each pumping wheel comprising a disc with blades thereon.

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