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BINDING AGENT FOR MOLDING CERAMIC ITEMS

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Translation of "Svyazuyushcheye dlya pressovaniya keramicheskikh izdeliy", Russian Patent 885218, published in Buelleten Izobreteniy, No. 44, Jan. 30, 1980, 2 pp.

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15. Abstract The invention refers to the fabrication of ceramic items by the molding method. It can be used to produce items of complicated configuration, in particular composition of binding agent for electroceramic items.			
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The invention refers to the fabrication of ceramic items by /1 *
the molding method. It can be used to produce items of complicated
configuration, in particular composition of binding agent for
electroceramic items.

It is common knowledge that the binding agent for molding
ceramic items [1] includes the following, percent by weight: water
76.4-76.9, kerosene 20.2-20.7, and olein 2.5-2.9.

A shortcoming of this binding agent is the presence in it of
the scarce and expensive component of olein which contains up to
90% vegetable oils.

The molding powder of low-voltage porcelain based on this
binding agent has the following composition, percent by weight:

Water	76.7
Kerosene	20.7
Olein, brand A	2.6

It was introduced in a quantity of 12.5% and has low viscosity
(50 mm) and insufficient apparent density (2.45 g/cm^3).

The binding agent for molding ceramic items [2] which con-
tains, percent by weight of water 76.4-76.9, kerosene 20.2-20.7,
synthetic fatty acid STK $C_{10} - C_{20}$ 2.5 - 2.9 is the closest
solution to the invention in technical essence and attained result.

* Numbers in the margin indicate pagination in the original text.

In order to determine the properties of the molding powder, a binding agent of the following composition is prepared, percent by weight:

Water	76.7
Kerosene	20.7
Synthetic fatty acids SZHK C ₁₇ - C ₂₀	2.6

The binding agent is added to a powder of low-voltage porcelain in a quantity of 12.5% and the viscosity of the molding of the molding powder is determined on samples made of this mass. The molding powder of low-voltage porcelain on this binding agent has low viscosity (60 mm) which does not make it possible to obtain a high-quality intermediate product. In addition, before the synthetic fatty acids are added to the powder, it is necessary to heat it to 30 - 35°C to dissolve them in kerosene. This causes definite difficulties and inconveniences under production conditions.

The purpose of the invention is to improve the molding powder viscosity.

This goal is attained because the binding agent for molding ceramic items which includes water, kerosene and synthetic fatty acids of fraction C₁₀ - C₂₀ also contains bottoms of higher fatty alcohols of fraction C₁₀ - C₂₀ with the following ratio of components, percent by weight:

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Water	76.0 - 89.0
Kerosene	7.0 - 22.0
Synthetic fatty acids of fraction C ₁₀ - C ₂₀	1.0 - 3.0
Bottoms of higher fatty alcohols of fraction C ₁₀ - C ₂₀	1.0 - 3.0

The bottoms of the higher fatty alcohols contain 50% water and 50% solid. The composition of the solid portion in conversion for dry substance is a mixture, percent by weight:

Sodium soaps of fatty acids C ₅ - C ₂₀	25 - 65
Secondary higher fatty alcohols of glycols and keto-alcohols C ₁₀ - C ₂₅	35 - 75

The organic binding agent is made as follows.

A mixture of synthetic fatty acids and bottoms of higher fatty alcohols are dissolved in kerosene, then water is added and low-voltage porcelain is added to the powder in a quantity of 12.5%.

Example 1. The binding agent is prepared with the following composition

Water, percent by weight	77.0
Kerosene, percent by weight	21.0
Synthetic fatty acids of fraction $C_{10} - C_{16}$, percent by weight	1.0
Bottoms of higher fatty alcohols of fraction $C_{10} - C_{20}$, percent by weight	1
Viscosity, mm	66
Apparent density, g/cm^3	2.5

Example 2. The binding agent is prepared according to the following composition:

Water, percent by weight	89.0
Kerosene, percent by weight	7.0
Synthetic fatty acids SZhK $C_{17} - C_{20}$, percent by weight	3.0
Bottoms of higher fatty alcohols of fraction $C_{10} - C_{20}$, percent by weight	1.0
Viscosity, mm	71.0
Apparent density, g/cm^3	2.5

Example 3. Binding agent is prepared according to the following composition:

Water, percent by weight	78.0
Kerosene, percent by weight	18.0
Synthetic fatty acids SZhK $C_{10} - C_{13}$, percent by weight	2
Bottoms of higher fatty alcohols of fraction $C_{10} - C_{20}$, percent by weight	2
Viscosity, mm	72.0
Apparent density, g/cm^3	2.5

The magnitudes of viscosity of the molded powder in the proposed invention exceed the viscosity of the molded powder made on the known binding agent.

Higher values of viscosity make it possible to obtain items with more uniform density and greater strength.

The proposed binding agent can be used to prepare molded powders made of steatite, cordierite and other ceramic materials.

Formula of the Invention

The binding agent for molding ceramic items which includes water, kerosene and synthetic fatty acids of fraction $C_{10} - C_{20}$ is distinguished by the fact that in order to increase the viscosity of the molded powder, it additionally contains bottoms of higher fatty alcohols of fraction $C_{10} - C_{20}$ with the following ratio of components, percent by weight:

Water	76.0 - 89.0
Kerosene	7.0 - 22.0
Synthetic fatty acids of fraction $C_{10} - C_{20}$	1.0 - 3.0
Bottoms of higher fatty alcohols of fraction $C_{10} - C_{20}$	1.0 - 3.0

Sources of Information Considered in the Expert Evaluation

1. OST 16 0 686.139.74
2. USSR Certificate of Authorship for application No. 2740738/29-33, k1. S 04 V 35/00, 1979.

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