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UNITED STATES PATENT OFFICE.

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ETCHING COMPOUND.

No Drawing.

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To all whom it may concern:

Be it known that we, AARON M. HAGEMAN, a citizen of the United States, and a resident of Bloomfield, in the county of Essex and State of New Jersey, and JULIUS M. KOVACHY, a citizen of the United States, and a resident of Cleveland, in the county of Cuyahoga and State of Ohio, have invented a new and useful Improvement in Etching Compounds, of which the following is a specification.

This invention relates to a compound used for etching glass and is particularly adapted for producing the frosted effect commonly observed on the bulb of an electric incandescent lamp.

All compounds, of which we are aware, that are used for frosting purposes have, as one of their ingredients, free hydrofluoric acid. This renders these compounds not only injurious to the clothing but also dangerous to the health of persons applying the same.

It is one of the objects of our invention to overcome these objectionable features by providing an etching compound that shall have no material which may be harmful to wearing apparel or which may produce poisonous effects, such as are incident to the use of hydrofluoric acid.

Another object of the invention is the provision of an etching compound which may be readily applied, functions in a short period of time and is easily removed by rinsing or the like.

Other objects of the invention relate to the simplification and rendering safe the process of frosting incandescent lamp bulbs or other glass objects and will be apparent from a reading of the following detailed description.

The invention resides in a compound composed of ammonium bifluoride, sodium bisulphate, barium sulphate, molasses and water. The function of sodium bisulphate is to increase the acidity of the compound by the introduction of a harmless acid salt and without the introduction of hydrofluoric acid and the poisonous properties pertaining thereto.

Another important function of the sodium bisulphate or similar harmless acid salt is to increase the amount of ammonium bifluoride which will be dissolved by the

water contained in the compound. Since the ammonium bifluoride is the primary etching agent of the compound, the etching powers of such compound are appreciably increased by an increased amount of this salt held in solution.

In the preparation of this compound, ammonium bifluoride, sodium bisulphate, barium sulphate, molasses and water may be used preferably in the following proportions by weight:

	Per cent.
Ammonium bifluoride.....	22
Sodium bisulphate.....	6
Barium sulphate.....	33
Water.....	21
Molasses.....	18
	100

The proportions of the various ingredients may be varied within the following limits:

	Per cent.
Ammonium bifluoride.....	20—35
Sodium bisulphate.....	5—15
Barium sulphate.....	25—40
Water.....	15—30
Molasses or similar viscous material.....	10—25

When the above ingredients are mixed in the proportions given, a viscous paste is formed which may be applied by covering the object to be etched with the compound.

This may be done, in the case of an incandescent lamp bulb, by merely dipping the same in the compound and allowing it to dry thereon for a period of time ranging from 3 to 5 seconds, depending upon the kind of glass of which the bulb is made, etc. The compound may then be rinsed off with water or removed in any other satisfactory manner. Inasmuch as the compound does not contain free hydrofluoric acid, it is not injurious to the hands and no great care need be exercised in applying or removing the compound.

Variations may be made in the substances and proportions of the substances used in forming our compound without departure from the spirit or scope of the invention, as defined in the appended claims. For example, starch has been found to be a valuable substitute for barium sulphate when it is desired to use the compound on objects

having sharp or irregularly shaped boundaries. This is probably due to the fact that starch is more easily held in suspension than is barium sulphate.

- 3 When a liquid is desired instead of a paste, the viscous material and barium sulphate or similar material may be omitted. If it is desired to use the compound for cleaning and polishing metals, an abrasive
10 may be added, such as emery flour or carborundum, and other changes may be made, as will be apparent to those skilled in the art.

What is claimed is:

- 15 1. A compound consisting of ammonium bifluoride, sodium bisulphate and water.
2. A compound consisting of ammonium bifluoride, sodium bisulphate, barium sulphate, molasses, and water.
20 3. A compound consisting of ammonium bifluoride, sodium bisulphate, barium sulphate, a viscous organic material, and water.
4. A compound consisting of ammonium
25 bifluoride, sodium bisulphate, a finely powdered inactive material, a viscous organic material, and water.
5. A compound consisting of ammonium

bifluoride, the bisulphate of an alkali metal, finely powdered inactive material, a viscous 30 organic material, and water.

6. A compound consisting of 22% ammonium bifluoride, 6% sodium bisulphate, 33% barium sulphate, 18% molasses, and 21% water. 35

7. A compound suitable for etching glass having, as its active ingredient, a harmless acid salt.

8. A compound suitable for etching glass consisting of ammonium bifluoride, a harmless acid salt, and water. 40

9. A compound suitable for etching glass having, as one of its ingredients, sodium bisulphate.

10. A compound suitable for etching glass 45 having, as one of its ingredients, a salt capable of appreciably increasing the solubility of ammonium bifluoride.

In testimony whereof I have hereunto subscribed my name this 16th day of August 1920. 50

AARON M. HAGEMAN.

In testimony whereof I have hereunto subscribed my name this 28 day of July 1920.

JULIUS M. KOVACHY.