

UNITED STATES PATENT OFFICE.

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PRINTING-INK AND PROCESS OF MAKING SAME.

No. 841,156.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, EMANUEL KLEIN, a citizen of the United States, and a resident of the borough of Manhattan, city, county, and State of New York, have invented certain new and useful Improvements in Printing-Ink and Process of Making the Same, of which the following is a specification.

This invention relates to the art of making printing-inks, particularly for the purpose of marking tobacco and for stenciling, painting, or printing trade-marks, names, or designs upon cigars and the like, so that subsequently the colored design, which is incombustible when an incombustible color or pigment is used, appears upon the ashes. The product is made from some suitable fatty matters—such as fat, oil, and wax—with some foreign matter added, depending upon whether the base of the ink is to have a characteristic color or is simply used as a vehicle for a color. The ink is also well adapted for other purposes.

In carrying my invention into effect the procedure is as follows: The first part of the operation consists in mixing in an open, preferably wooden, vessel the product from treating marrow or its equivalent from the groups of solid fats, such as vegetable or animal fat, with an oily substance, such as axin or its equivalent, from the group of vegetable, seed, or animal oils, and a waxy substance, such as wool-wax or its equivalents, from the group of solid or liquid waxes. Advantageous results are obtained by a mixture containing forty per cent. of marrow, forty per cent. of axin, and twenty per cent. of wool-wax. The product from treating marrow which is used is of light yellow color, insoluble in water or alcohol, having a specific gravity at 15° centigrade of 0.931 to 0.938, a melting-point of 37° to 45°, and a solidifying-point of from 29° to 31°. Axin is obtained from the fat of the Mexican cochineal and consists of the glycerids of lauric and axinic acids, being a brown oily compound generally conceded to conform to the formula $C_{18}H_{38}O_2$. There is then introduced into this mixture an equivalent weight of a solution of common salt, or the mixture is treated with some other suitable menstruum, in which the mixture is thoroughly stirred and washed so as to remove dirt and other impurities. The menstruum is then suitably removed from the mass, which is then placed in an open copper

vessel communicating with a worm, and the mass is then stirred and suitably subjected to heat, as by the use of superheated steam, during the stirring process until a temperature of 360° centigrade or preferably 400° or above is reached, whereby the mass is decomposed and the residue further concentrated acquires the property of more rapidly drying to a varnish. During this stirring and heating process white vapors will escape which are liquefied in the worm and may be utilized for different purposes. Gradually the vapors in the vessel will become stronger, which purifies the glycerid and drives out acrolein and will suddenly ignite, whereupon the vessel is closed by a hermetic lid and the heat-supply withdrawn, the contents being allowed to cool to obtain the best results. Acrolein, which is emitted from the mass when it is rapidly heated, is formed according to equation



and is a low-boiling liquid having a very penetrating smell and whose vapors are very irritating to the eyes.

The heating operation is repeated in connection with a stirring apparatus in an open vessel, which is heated by a direct fire or in any other suitable manner, there being thoroughly stirred into the mass an inorganic or organic material, such as kali permanganate or potassium permanganate or borate of manganese, termed "driers." Such driers presumably act as carriers of the oxygen until all the mass has been thoroughly subjected to the influence of the oxidizing material, causing the mass to foam and to express gray vapors until they ignite. A part of the glycerids is decomposed and insoluble, gummy anhydrides are formed, while some acrolein is set free, so that the residue when allowed to cool off becomes an inspissated, thick, sticky, viscid mass. The residue of the mass is again heated up to 250° centigrade, after which it is filtered through some organic or inorganic filtering material, such as powdered glass, marble-dust, burned deers' bones, &c., used in connection with an asbestos filter. It is to be remarked that this boiling is really a decomposition or, perhaps, a polymerization process. The fatty product obtained is an odorless substance of dark-brown fluorescent color, consisting of a mixture of fatty acids and higher alcohols of the fatty series

and possesses great adhesiveness, will dry quickly, and is insoluble in water or alcohol. This product may, if desired, be bleached by blowing ozone or other suitable bleaching agent into it and is used as the basis for a printing-ink for tobacco, &c.

The second part of the process consists in preparing an incombustible inorganic or organic color or pigment which will retain its appearance under the influence of heat by subjecting metallic oxids or salts, or even finely-pulverized metal, to a red heat and then cooling off and grinding the material. If a blue is desired, it may be made with cobaltic oxid; black, with copper oxid or pyrolusite or hausmannite; green, with chromic oxid; orange, with selenium; yellow, with ocher; red, with hematite, or brown with umber.

The third part of the process in the manufacture of ink consists, preferably, in cooking for several minutes in the proportion of forty per cent., by weight, of the prepared base with about forty per cent., by weight, of the prepared organic or inorganic color or pigment. Best results are obtained when the mass is allowed to cool, it being then ground in a suitable mill. After grinding the ink composition has incorporated therein about twenty per cent., by weight, of volatile ethers. The so-prepared product has a little odor when first prepared and mixed, but the perfume is developed by exposure to the air. Any volatile ether may be used which acts to keep the ink in working condition for a long time. Without the addition of a volatile ether the ink quickly becomes thick and hard and unworkable.

The described composition is applied by brush, stamp, stencil, or printing-machine to tobacco-wrappers of cigars, cheroots, cigarettes, or any other suitable article in the desired design. When the tobacco is consumed, the design or name will be retained conspicuously in color upon the ashes, whether they are light or dark. The composition will set quickly after being applied. The applied design or print is insoluble in water and is fireproof. The prepared base for printing-ink for tobacco has the advantage that it intimately unites with the cigar, no matter whether the tobacco is wet, fresh, dry, or old, the color being indelibly fixed thereon. The printing-ink base will be consumed by the fire without giving off odors or impairing the burning quality of the tobacco.

Having thus described my invention and without limiting myself to the exact steps in the process or to the exact ingredients, what I claim as new therein, and desire to secure by Letters Patent, is—

1. The process of preparing a base for a printing-ink, which consists in subjecting a suitable mixture containing fat to washing with a suitable menstruum exemplified by

salt water and heating the mixture while being stirred until a temperature in the mixture approximating 400° centigrade is obtained, substantially as described.

2. The process of preparing a printing-ink, which consists in subjecting a suitable mixture containing fat to washing with a suitable menstruum exemplified by salt water, heating the mixture while being stirred until a temperature in the mixture approximating 400° centigrade is obtained, and mixing therewith a suitable coloring-matter, substantially as described.

3. The process of producing a base for a printing-ink, which consists in subjecting a suitable mixture of fatty matters to washing, heating the same, while being stirred, until a temperature approximating 400° centigrade is obtained, cooling, and again heating the same to reduce its consistency, substantially as described.

4. The process of producing a printing-ink, which consists in subjecting a suitable mixture of fatty matters to washing, heating the same, while being stirred, until a temperature approximating 400° centigrade is obtained, cooling and again heating the same to reduce its consistency and mixing therewith a suitable coloring-matter, substantially as described.

5. The process of producing a base for a printing-ink, which consists in forming a mixture of a fat, oil and wax, substantially as explained, washing the same, and heating the same to a high temperature a number of times to form an inspissated mass, substantially as described.

6. The process for producing a base for a printing-ink, which consists in washing a suitable mixture of fatty matters, with a solution of salt water, and repeatedly heating and cooling the mass, substantially as described.

7. The process of producing a base for a printing-ink, which consists in washing a suitable mixture of fatty matters, heating the same at high temperature to eliminate acrolein and glycerin, and filtering the residuum, substantially as described.

8. The process of producing a base for a printing-ink, which consists in washing a suitable mixture of fatty matters, heating the same at a high temperature, cooling the same, again heating to a less temperature, and filtering the residue, substantially as described.

9. A printing-ink base from fatty matters composed of a plurality of fatty acids and higher alcohols of the fatty series, said base being insoluble in water or alcohol.

10. A printing-ink containing a mixture of a plurality of fatty acids and higher alcohols of the fatty series, substantially as described.

11. A printing-ink, composed of a mixture

of a plurality of fatty acids and higher alcohols of the fatty series, and a suitable coloring-matter, substantially as described.

12. A printing-ink, containing in its ingredients a prepared incombustible substance, exemplified by metallic elements which will retain its appearance under the influence of heat of 400° centigrade, and a mixture of fatty matters, substantially as described.

13. A printing-ink, containing in its ingredients a prepared incombustible sub-

stance, exemplified by metallic elements which will retain its appearance under the influence of heat of 400° centigrade, a mixture of fatty matters, and a volatile oil, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

EMANUEL KLEIN.

Witnesses:

E. VAN ZANDT,

GEO. L. WHEELOCK.