

UNITED STATES PATENT OFFICE.

HERMAN ROSENBERG, OF NEW YORK, N. Y., ASSIGNOR TO STANDARD VARNISH WORKS, OF ELM PARK, PORT RICHMOND, STATEN ISLAND, NEW YORK, A CORPORATION OF NEW YORK.

VARNISH AND PROCESS OF MAKING THE SAME.

1,062,419.

Specification of Letters Patent.

Patented May 20, 1913.

No Drawing.

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To all whom it may concern:

Be it known that I, HERMAN ROSENBERG, a citizen of the United States, residing at New York, in the county of Richmond and State of New York, have invented certain new and useful Improvements in Varnishes and Processes of Making the Same, of which the following is a specification.

This invention relates to varnishes and processes of making the same; and it comprises a varnish, more especially a ragging varnish, adapted to produce on drying a thin but substantial protective and decorative film or coating and a wax-like or semi-gloss finish on a surface to which the varnish is applied, said varnish comprising a gum and oil base, specially treated as by a cooking, heating or oxidizing treatment prolonged beyond that usual in making ordinary varnishes, and a miscible thinning solvent, the viscosity, in the case of a ragging varnish being such as to render the varnish peculiarly suited to "ragging in" or application with a cloth; and it also comprises the process of making such a varnish in which a suitable varnish base, usually a gum and oil mixture, is subjected to a prolonged heating treatment which may be termed an overcooking or superoxidation, such treatment usually being in the presence of facilitating agents such as metallic oxides or salts, and the like, and the base so treated is then thinned down with a suitable miscible thinning solvent, or with a mixture of such solvents, to produce a homogeneous varnish of the desired viscosity; all as more fully hereinafter set forth and as claimed.

For many purposes it is desirable to provide wood and other surfaces with a varnish coating which, while affording the protection obtainable by the proper application of good quality varnish, shall nevertheless lack the high luster and gloss of the usual varnish coat. This is particularly true in the case of furniture, floors, etc., where a somewhat dull or wax-like finish is often preferred to a shiny or high gloss surface. In order to obtain this wax-like or semi-gloss finish, several expedients have hitherto been resorted to. Sometimes, after the usual varnish coating has been applied, the surface is rubbed down with a mixture of an oil and a finely powdered abrasive, the original brilliant gloss of the varnish coat being thus

softened and dulled to a greater or less extent. Such a procedure obviously involves considerable labor and it requires special skill. In other instances it has been attempted to secure the desired result by the application to a varnished or unvarnished surface of liquid compositions containing waxes or wax-like bodies which after drying down would give coatings of less brilliant luster than regular varnishes. Such coatings are unsatisfactory, however, chiefly since waxes do not produce permanent and durable protective coatings. They are too soft and they lack the toughness and resistant properties of good varnish gums and resins properly combined with oils in a true varnish base.

An object of the present invention is to avoid the above mentioned difficulties and objections and to produce a varnish which, after application to a surface, will dry down to give a true varnish coating possessing body, permanence and durability, but having a wax-like or semi-gloss luster, as distinguished from the brilliant gloss finish obtained with varnish heretofore known.

Another object of the invention is to provide a varnish of the character just described which is particularly adapted for "ragging" purposes, that is, for application with a cloth or similar material.

In the ordinary ways of finishing wood and the like with a varnish coat, the practice is to apply varnish compositions with a brush. This involves a relatively thick or viscous composition; one with adhesiveness and cohesiveness sufficient to produce at least a film coat against the pressure of the brush fibers. Much practice is necessary in making a smooth, uniform coating by brushing on varnish; and the operation is one which is practically beyond the skill of the average householder or amateur, at least so far as concerns the production of high-grade varnished surfaces, free of brush marks, streaks, striae, etc. In the practice of the present invention it is possible to produce a composition which can be applied by anybody with the production of a high grade coating without the exercise of special skill; a coating of smooth, hard uniform surface having a semi-gloss or wax-like finish. To do this, it is desirable to have a composition which can be applied otherwise than by

a brush since the use of a brush necessitates certain skill. Application with a cloth though permitting the formation of uniform, streakless films without much skill is not feasible with ordinary varnishes since these gum up the cloth and pile up in front of it while leaving behind a rough irregular surface, usually full of lint and fiber; and furthermore, ordinary varnishes do not yield the type of soft luster finish here contemplated.

I have discovered that by making a varnish of a viscosity such that it will show in the neighborhood of 140° when tested in a Tagliabue viscosimeter (or equivalent instrument) at a temperature of about 70 degrees Fahrenheit, it is thin enough to permit free application with a rag; entering and leaving the cloth readily and at the same time allowing a substantial film to form on the treated surface under the rag. It is necessary in practice however to resort to certain expedients in making up such a varnish if it is to leave the desired type of coating at such a viscosity; to leave a thin, film of varnish under the rag giving on drying a substantial filmlike coating with a soft luster. Ordinary brush varnishes if diluted or thinned down to about 140° viscosity will usually carry about 4 to 5 pounds of base or basis (varnish gum and drying oil) per gallon, the rest being solvent or thinner; say 40 per cent. base and 60 per cent. thinner. Even at this dilution, ordinary varnishes give a comparatively high gloss finish. According to the present invention, a composition is made up with specially treated varnish gums and oils; varnish gums and oils which have been heavily "oxidized" or heated for a relatively long time. With such materials, a ragging varnish can be made of the proper viscosity carrying only about 2 to 3 pounds, or even less, of varnish base per gallon but entering and leaving a rag freely, not piling up or linting, but leaving a substantial, hard, uniform, streakless coating film and applicable without great skill. This film upon drying will have the desirable wax-like or semi-gloss finish.

In practising the present process, a suitable varnish base is heated or cooked under regulated conditions for a relatively long period of time; and this is best done in the presence of a suitable facilitating agent such as a metallic oxid or salt of the proper character. It may however be done by simple prolonged heating. This cooking treatment is carried beyond the point at which the cooking of a varnish base terminates in the usual methods of making varnish. For ordinary varnish, the base thus produced would be considered overcooked and practically valueless. As to the exact nature of the changes effected in the varnish base by

such over-cooking, nothing very definite can be said, since the reactions involved are more or less complex and little understood. Oxidation occurs to a greater or less extent; and this prolonged heating may be conveniently termed a prolonged oxidation or superoxidation of the varnish base, although these terms are not to be understood too technically. Polymerization also occurs during this treatment. At all events, the modified base thus obtained, when dissolved in an appropriate thinning solvent, gives a varnish which after application to a surface and drying produces a true varnish film or coating which, however, has the desired dull-finish luster. By thinning down to within the range of viscosities hereinbefore mentioned, ragging varnishes may be produced which are also characterized by their ability to give a wax-like finish to wood and the like.

A notable characteristic of the varnish base produced by the present process is its ability to take up larger quantities of thinners than do ordinary varnish bases in producing compositions of the same viscosity. This is of great importance, particularly in connection with ragging varnishes which I regard as the most important embodiments of the present invention. For example, in making an ordinary varnish, 100 pounds of kauri would be cooked or heated for about one to two hours with 20 gallons of linseed oil. This amount of base would require 40 to 45 gallons of turpentine to produce a varnish of the viscosity of 140°; or a viscosity such as could be applied with a rag. But by taking the same amount of base and heating for 10 to 12 hours at approximately 500° F., the viscosity is so increased that it will take 100 to 125 gallons of turpentine to reduce it to the desired viscosity. A varnish so produced however, unlike the first stated composition with a basis cooked in the ordinary way, will dry with a wax-like appearance and it is much better adapted for application with a rag. The time of heating may be materially reduced by heating in the presence of a suitable metallic oxid or salt. Varnishes produced in this way work extremely well under the rag or cloth without gumming up or being otherwise troublesome. At the same time the coating produced has the requisite body and durability, as well as the desirable wax-like finish.

The base of the present varnish compositions should include a hard varnish gum or resin and a fixed oil. The resin is best a hard fossil or semi-fossil resin or gum such as kauri, Manila copal, East Indian copal, Brazilian copal, dammar, etc. Other resins, such as Pontianak resin, and even rosin may be used. The oil employed may be a fixed drying or semi-drying oil of vegetable or animal origin, such as linseed oil, perilla

oil, corn oil, Chinese wood or tung oil, soya bean oil, fish oil, etc. The resin should be fused in the fixed oil. With a fixed oil having coating properties, the viscosity may be made lower while still giving coating components sufficient to furnish the desired film. The diluent or thinner may be, and advantageously is, a hydrocarbon solvent of more or less volatile properties, such as spirits of turpentine, pine oil, wood turpentine, rosin oil, petroleum, distillates, benzin, gasoline, benzol, toluol, xylol, coal tar naphtha, etc. Other volatile solvents, such as carbon tetrachlorid, carbon bisulfid, chloroform, acetone, acetone oils, etc., may also be used. But whatever this third component or viscosity adjusting body may be, it should be one which will be readily miscible with the solution of the particular resin or gum in the particular fixed oil used, since, for the present purposes, the composition as a whole must be homogeneous. In producing a typical varnish under the present invention, for instance, 100 pounds of Manila gum, 15 gallons of linseed oil and 5 gallons of soya bean oil may be combined according to the usual practice and then 15 per cent. of oxid of calcium (good fat quicklime) added. After the addition the heating may be continued for 5 to 7 hours. This treatment will give a base requiring the addition of 110 to 125 gallons of turpentine to produce a varnish with a viscosity of 140°. This varnish will give the desired wax-like finish and is also particularly adapted for ragging in. In a typical formula, the varnish base comprises 50 pounds of kauri, 50 pounds of rosin, combined with 15 gallons of wood oil and 5 gallons perilla oil. To this base may be added 5 pounds of lime, 3 pounds of manganese dioxid and 1 pound of oxid of lead. The mixture should then be cooked for four or five hours at temperatures around 480° to 500° F. The resulting cooked base may then be thinned down with 120 gallons of turpentine. In another example, the base comprises 100 pounds of Pontianak combined with 15 gallons of linseed oil and 5 gallons of wood oil. As facilitating agents are employed 3 pounds of oxid of lead, 3 pounds of oxid of calcium and 1 pound of oxid of manganese, the mixture being cooked from five to six hours at about 520° F. About 110 gallons of turpentine are required to thin the base down to the proper viscosity for use as a ragging varnish. In a fourth specific example, 100 pounds of kauri are combined with 10 gallons of linseed oil to give a varnish base, after which is added 5 pounds of oxid of lead. The mixture is cooked for seven or eight hours at about 500° F. A proper ragging viscosity is obtained by thinning the resulting product down with 125 gallons of turpentine. While metallic oxids have been specified in the above

examples as facilitating agents, certain metallic salts, such as perborates and resins, are also suitable and may be used under certain conditions. Various oxids of lead may be employed, such as litharge, red lead, orange mineral and lead peroxid. Instead of turpentine, other solvents such as those hereinbefore named may be employed for thinning down. Any of these compositions, although too thin for efficient application with a brush, may be readily applied to wood with the aid of a cloth and will be found to enter and coat the wood pores and to produce a smooth, hard varnish coating of substantial thickness on the wood free of streaks and striations. The composition does not gum up cloth but enters the cloth pores well and is as readily given up to the surface under treatment. It may be rubbed in such surface with some degree of force without sticking or producing a streaky surface.

In finishing wood surfaces by applying a homogeneous fluent composition of the described type with a cloth, a much better result is obtained, as regards smoothness and luster of the coating, the production of a thin but substantial coating and the filling of the pores than by the use of the regular varnish coatings brushed on. There can be, of course, no brush marks. And in one operation results can be attained which cannot be produced by any method of treatment with non-homogeneous, emulsion-like compositions, such as French polishes. All the pores are entered and filled instead of being merely to a large extent bridged over as with thick brushed-on varnishes, and a good finish is given in one operation. In preliminarily combining the gums and oils in the examples given above it is best to follow the usual procedure. The gums are first melted alone and then run to render them soluble in the oils, the oils being then added to give the true varnish base. There is some loss by elimination of volatile matters during the running of the gums and this may amount to 10 per cent. in a typical example. The proportion of solvent added, after modification of the base by the heat treatment to produce a ragging varnish, varies somewhat, as shown in the examples, according to the character of the treated base. Roughly speaking, however, it may be stated that to obtain a final viscosity of 140° or thereabout, the weight of turpentine necessary is approximately three times that of the combined original weights of the gums and oils entering into the base. Where turpentine is employed as the solvent thinner the proportion of varnish base in the final product averages about 25 per cent., by weight. This percentage varies more or less of course according to the particular thinner used, but the figures given are typically approximate.

It is to be understood that the degree of viscosity hereinbefore specified as suitable for my new ragging varnish is an arbitrary figure which is determined under standard conditions and whose numerical value depends entirely upon the particular method employed for determining viscosity. Instruments other than the Tagliabue give other readings; and the readings also vary with the temperature of observation. For convenience, the viscosity desired in my ragging varnish may be designated as a viscosity approximately equivalent to a reading of 140 Tagliabue at 70 degrees test.

What I claim is:—

1. The process of making varnish compositions which comprises preparing a suitable varnish base and subjecting said base to a prolonged heat treatment, said heat treatment being continued until a dry film of the base deposited from a suitable solution thereof shows a wax-like or semi-gloss finish.

2. The process of making varnish compositions which comprises preparing a suitable varnish base and subjecting said base to prolonged heat treatment in the presence of a facilitating agent, said heat treatment being continued until a dry film of the base deposited from a suitable solution thereof shows a wax-like or semi-gloss finish.

3. The process of making varnish compositions which comprises preparing a suitable varnish base and subjecting said base to prolonged heat treatment in the presence of a metallic oxid, said heat treatment being continued until a dry film of the base deposited from a suitable solution thereof shows a wax-like or semi-gloss finish.

4. The process of making varnish compositions which comprises preparing a suitable varnish base, subjecting said base to a prolonged heat treatment, said heat treatment being continued until a dry film of the base deposited from a suitable solution thereof shows a wax-like or semi-gloss finish, and dissolving the treated base in sufficient thinning solvent to produce a ragging varnish having a viscosity of about 10° Tagliabue under standard conditions.

5. The process of making varnish compositions which comprises preparing a suitable varnish base, subjecting said base to a prolonged heat treatment, said heat treatment being continued until a dry film of the base deposited from a suitable solution thereof shows a wax-like or semi-gloss finish, and dissolving the treated base in a suitable quantity of a hydrocarbon solvent.

6. The process of making varnish compositions which comprises preparing a varnish base by suitably combining a varnish gum and a fixed oil, heating the base thus prepared until a dry film of the base deposited from a suitable solution thereof shows a

wax-like or semi-gloss finish, and dissolving the base thus modified in a suitable solvent.

7. The process of making varnish compositions which comprises preparing a varnish base by suitably combining a varnish gum and a fixed oil, heating the base thus prepared for a period of not less than about four hours at temperatures around 500° F., and dissolving the treated base in a suitable varnish solvent.

8. The process of making varnish compositions which comprises preparing a varnish base by suitably combining a varnish gum and a fixed oil, heating the base thus prepared for a period of not less than about four hours at temperatures around 500° F., and adding a thinning solvent to obtain a ragging varnish having a viscosity of approximately 140° Tagliabue under standard conditions.

9. The process of making varnish compositions which comprises preparing a varnish base by suitably combining a varnish gum and a fixed oil, heating the base thus prepared for a period of not less than about four hours at temperatures around 500° F., and adding a thinning solvent to obtain a ragging varnish having a viscosity of approximately 140° Tagliabue under standard conditions, the weight of solvent added being about three times that of the materials constituting the varnish base.

10. As a new article of manufacture, a varnish consisting of a base of gum and oil dissolved in a suitable thinner, said varnish being free of waxlike bodies and capable of producing a wax-like finish upon wood or other surfaces by a ragging application.

11. As a new article of manufacture, a varnish consisting of a true varnish base dissolved in a suitable varnish solvent and free of wax-like bodies and capable of producing a wax-like finish upon wood or other surfaces by a ragging application.

12. As a new article of manufacture, a ragging varnish comprising a true varnish base dissolved in a suitable varnish solvent and having a viscosity of about 140° Tagliabue under standard conditions, said varnish being capable of producing a wax-like finish upon wood or other surfaces.

13. As a new article of manufacture, a ragging varnish comprising a true varnish base dissolved in a suitable varnish solvent and having a viscosity of about 140° Tagliabue under standard conditions, the percentage of varnish base present being approximately 25 per cent. of the complete varnish, and said varnish being capable of producing a wax-like finish upon wood or other surfaces.

14. As a new article of manufacture, a ragging varnish consisting of a true varnish base of gum and oil dissolved in a hydrocarbon solvent, said varnish being free of

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wax-like bodies and having a viscosity adapting it to application with a cloth, said varnish being capable of producing a wax-like finish upon wood or other surfaces.

5 15. As a new article of manufacture, a ragging varnish comprising a true varnish base of gum and oil dissolved in a hydro-carbon solvent and having a viscosity of 140° Tagliabue or thereabout under stand-
10 ard conditions, and the proportion of base

present being about 25 per cent. of the complete varnish.

In testimony whereof, I affix my signature in the presence of two subscribing witnesses.

HERMAN ROSENBERG.

Witnesses:

MAX WOLF,

ARTHUR L. PORTER.

Correction in Letters Patent No. 1,062,419.

It is hereby certified that in Letters Patent No. 1,062,419, granted May 20, 1913, upon the application of Herman Rosenberg, of New York N. Y., for an improvement in "Varnishes and Processes of Making the Same," an error appears in the printed specification requiring correction as follows: Page 4, line 49, numeral and degree mark, for "10°" read 140°; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 14th day of October, A. D., 1913.

[SEAL.]

R. T. FRAZIER,

Acting Commissioner of Patents.

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