

UNITED STATES PATENT OFFICE

1,966,987

METHOD OF ACCURATELY BLENDING
COLORS IN OIL AND PAINTS

Daniel J. McCrudden, Jr., Philadelphia, Pa.

No Drawing. Application May 16, 1933,
Serial No. 671,421

7 Claims. (Cl. 134—39)

This invention relates to the preparation of accurately blended semi-liquid paste colors in oil.

The industry has, heretofore, been handicapped, due to excessive stocks of merchandise, in that the merchant, contractor or dealer in paints was forced to stock large quantities of paint products in order to have a complete stock from which to supply the demands of the consumers. These large stocks consist of gallons upon gallons of paint tinted different shades, and not only represent a large investment on the part of the merchant, contractor or dealer, but also require a large storage space. Many of these paint products lost consumer demand, and as a result stood deteriorating in the cans.

In this invention I have developed a process overcoming the difficulties encountered by the paint merchant, contractor, dealer and consumer with the old-fashioned paint products. My process consists broadly in specially preparing a paint base for use with specially prepared semi-liquid paste colors in oil for distribution in separate containers of the proper sizes. The consumer mixes the contents of the paint base container and the semi-liquid paste colors in oil to produce the paint that he desires.

Prior to the development of my process attempts were made to develop a process for producing paints that could be economically and conveniently marketed. One of these processes consisted of placing paints of different colors into different containers together to produce a different color or individually. Numerous problems were encountered in this process. In the solution of these problems I have developed the present process which is set forth in detail in the following specification.

In the developing of the present process I have found that the tintorial strength of white lead in oil varies considerably, although its chemical composition may be uniform, therefore, in order to use white lead in oil in this process I have found it necessary to match the white lead in oil with a plurality of different colors in oil, and thus standardize it, as will be presently set forth in detail.

A batch of white lead in oil is prepared by grinding a quantity of white lead in linseed or other oil. This is thoroughly ground and wetted with the oil until the white lead is fine enough so that it readily remains suspended in the oil. Several samples are then carefully measured from the batch. One of these samples is thoroughly mixed with a standard quantity of a blue color in oil, another sample is mixed with a standard

quantity of red color in oil and still another sample is mixed with a standard quantity of a yellow color in oil. Other colors in oil are used under certain conditions depending upon the result desired, the more that are used the more uniform will be the white lead in oil product.

It is essential that at least three preferably the primary colors, be used in order that a certain standard be maintained.

These different mixed samples of colors in oil and white lead are then brushed upon different surfaces and arranged with respect to the standard painted surface in the following manner:

Several small surfaces are brushed uniformly with each sample; these surfaces are then placed, one above and one below the standard surface and compared in an open light, preferably light on the north side of a building. By arranging the sample brushed surfaces one above and one below the standard surface a more accurate comparison is obtained through visual examination of the surfaces. The red, blue and yellow surfaces are thus compared with their respective standard surfaces. The tintorial strength of the white lead in oil is determined for the different colors. If it is found to require less of the red color in oil, than was normally required, then more white lead is added until the tintorial strength for the red is brought up to the predetermined normal. When the white lead is above normal in its blue tinting strength then more white lead is added to the oil to compensate for this.

The resulting white lead in oil has a uniform tintorial strength for all of the standard colors in oil.

After this batch of white lead in oil is tested in the manner set forth it is placed into containers of predetermined sizes always leaving a small space at the top of the container for the addition of a quantity of colors in oil for mixing purposes. This same procedure is employed when using a titanium base or a formula base instead of a lead base.

The colors in oil manufactured for use of the paint consumer are also adjusted in accordance with my process. Without adjusting these colors in oil no uniformity over a period of time could be maintained and for that purpose I have developed colors in oil adapted for use with the white lead in oil which was carefully adjusted for tintorial strength.

Colors in oil are manufactured from dry colors or pigments which vary greatly in their coloring

or tinting strength. This cannot be controlled successfully in the present manufacturing methods and I have accordingly developed the present method of obtaining a uniform product by adjusting the tintorial strength of the colors in oil to maintain uniformity in the product distributed to the ultimate user.

In general the maximum painting value is obtained from painting material when the pigments used are ground exceedingly fine. Some manufacturers have standardized on the 325 mesh screen United States Standard as a means for testing the fineness of the ground pigments. Generally the finer the pigment the greater the hiding power. Other characteristics which affect the opacity or hiding power of the paint pigment are its refractive index and oil absorption, opacity increasing inversely with the quantity of oil absorbed. Pigments ground to extreme fineness also have a tendency to form a true colloidal condition with the linseed oil vehicle. This, of course, enhances their cementing and adhesive values. Painting materials left standing in this condition, particularly in contact with air, deteriorate rapidly, the oil taken therefrom showing cloudiness, causing precipitation of some of the pigment and also producing a gelatinous condition in the oil.

I have overcome these and other defects in the preparation and distribution of paint pigments, still, however, permitting the use of the extremely finely ground pigments. My process of preparing the colors in oil to be used in the tinting of the base material consists of passing the pigment material through the grinding machines several times in order to insure the proper degree of fineness in grinding and also uniformity of material. The pigments are ground in oil until they are completely mixed with the oil and until they are fine enough to be held in suspension by the oil. These fine particles of pigment are thus individually encased in a protecting film of oil which can be removed only by extremely painstaking processes. This encasing film of oil not only protects the pigment but also enhances the tinting strength of the pigment and decreases the tendency of the color to fade.

After the pigments are thus ground, mixed and wetted with oil they are adjusted to a certain tinting strength for a given weight by mixing samples of one pigment with samples of other pigments and carefully brushing on sample surfaces which are compared with standard painted surfaces in the same manner as samples of the white lead in oil were compared. I have found that the inter-comparison of different samples of colors in oil mixed in samples of white lead in oil taken from different batches facilitates the production of a product having a uniform color value.

After the proper shade is obtained through inter-comparison and adjustment by the proper mixing of pigments the mixed oil and pigments are left to stand as a semi-liquid paste in vats for a period of at least two weeks after which the colors in oil are again compared to determine any variation therein.

Prior to packaging the colors in oil the small jars into which they are placed are sorted into three different sizes. These three different size jars are for use with three different size cans of base material. For example, one size jar is used with the gallon size container of base. Another smaller size jar is to be used with the half gallon size container of base material. These jars are

accurately filled with the colors in oil in a semi-liquid paste as will be presently described. A semi-liquid paste is used because it is not desired to use oil in excess of an amount that is readily absorbed by the oil wetted pigments.

The jars of each of these sizes are weighed and the jars within one half gram above or below a certain predetermined weight are placed into a certain group; others within one half gram above or below another weight are placed into another group in order to properly classify the different jars into groups according to their weight. The jars from each of these groups are then filled accurately by an automatic weight controlled feeding mechanism which accurately weighs the contents of each of the jars together with the jar as the latter is being filled.

In accordance with this process which I have developed it is possible to maintain uniformity in the color of the final product sold to the consumer in as much as any variation therein can be readily checked during the process of manufacture. It will be readily understood that this process may undergo certain variations in the details thereof and that therefore I do not desire to be limited to those details except in so far as they are defined by the claims appended hereto.

This application is a continuation in part of my application Serial No. 535,809.

What I claim and desire to secure by Letters Patent is as follows:

1. In the manufacture of base paint of uniform color characteristics from material varying in color characteristics and tintorial strength, the steps of grinding the base material to a fine consistency in oil to bring out its coloring characteristics, mixing a plurality of samples of said base material each with a different one of a plurality of predetermined standard colors in oil, determining the coloring characteristics of said base material from a comparison of said mixtures with predetermined standard mixtures and adjusting the coloring characteristics of said base material so that the mixtures of said base material and the predetermined standard colors will agree with the predetermined standard mixtures.

2. In the manufacture of base paint of uniform color characteristics from material varying in color characteristics and tintorial strength for use with separately packaged semi-liquid oil paste colors of predetermined uniform color characteristics, the steps of blending a sample of said base material with a prepared standard sample in oil of each of the primary colors and adding additional pigment to said base material, where necessary, to compensate for any deficiency in color characteristics found to exist on comparison of the color of the said blended samples with standard samples of predetermined color characteristics.

3. In the manufacture of semi-liquid oil colors of uniform color characteristics and tintorial strength from pigments varying in color characteristics and tintorial strength, the steps of blending the necessary pigments into a single batch, grinding said batch in oil to a fine semi-liquid consistency, taking samples of said batch and mixing each of these samples with a different one of a plurality of different standard pigments, comparing samples of each of said mixtures with samples of predetermined standards to determine the color characteristics of the pigment batch and correcting deficiencies in color characteristics of said batch by adding necessary pigments thereto.

4. In the manufacture of base white paint of uniform color characteristics and tinctorial strength from material varying in color characteristics and tinctorial strength, the steps of grinding the base material to a fine consistency in oil to bring out its color characteristics, blending portions of said base material in oil with predetermined standard samples of colors in oil differing materially from said base materials in color characteristics, determining the color characteristics of said base material from a comparison of said blended samples with predetermined standard color mixtures and adjusting the color characteristics of said base material to a predetermined standard from said comparison.

5. In the manufacture of base paint of uniform color characteristics for use with separately packaged semi-paste oil colors of predetermined uniform color characteristics, the steps of blending samples of said base material with a plurality of prepared standard samples of colors in oil of different colors, determining the color characteristics of said base material by comparing said blended samples with prepared standard color mixtures and adjusting the color characteristics of said base material to a predetermined standard from said comparisons.

6. In the manufacture of an oil color of uniform color characteristics and tinting strength

from a mixture of pigments varying in color characteristics and tinctorial strength, the steps of determining the tinting strength and color characteristics of the pigment mixture used to make up the oil color by mixing definite quantities of these pigments with a definite quantity of each of a plurality of other pigments differing therefrom in color characteristics and with a vehicle to bring out the color characteristics and tinting strength of the resultant mixture of pigments and comparing each of these resultant mixtures with a standard color.

7. In the manufacture of a semi-paste oil color of uniform color characteristics and tinctorial strength from a pigment or pigments varying in color characteristics and tinctorial strength, the steps of mixing definite quantities of said pigment or pigments with predetermined quantities of different standard pigment material of substantially different color characteristics from the predominating color of the pigment or pigments being tested to bring out the tinting strength and color characteristics of said pigment or pigments being tested, and comparing samples of said mixtures with standard colors for determining the tinting strength and coloring characteristics of said pigment or pigments being tested.

DANIEL J. McCRUDDEN, JR.

80

85

90

95

100

105

110

115

120

125

130

135

140

145

150

30

35

40

45

50

55

60

65

70

75