

Formation of Waterproofing Agent from Natural Sources for Protection of Articles Vulnerable to Water

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Abstract— The present research paper gives the composition of the waterproofing agent used for treating articles against water damage. Here "Treating" means embellish. While the primary use of the composition is waterproofing. That is obtained at the end of the process. Which describe later in this research paper. The composition consists about 40% percent by weight to 60% percent by weight of beeswax obtained from natural sources, 20% percent by weight to 30% percent by weight of oil obtained from natural sources. and about 20% percent by weight to 30% percent by weight of turpentine.

Keywords: Waterproofing-Agent synthesis, surface coating, eco-friendly, economic, hydrophobicity

I. INTRODUCTION

The given research paper gives a composition of waterproofing agent for treating and conditioning articles mainly leather articles against the water damage. Utilizing a combination of a natural oil natural wax and turpentine. In our composition, the oil is linseed oil and the wax is beeswax and turpentine acts as a solvent. The oil component protects and waterproofs leather as well as non-leather items. The purpose and motivation behind the use of Beeswax are that it solidifies and improve the life period of the given composition when applied on a leather article. The composition will easily spread onto leather and non-leather articles such as plastics as well as some metals, house walls, cotton cloths, etc. As used herein, the phrase "leather article" refers to laptop-sleeve, mobile cases, watch bands, pet accessories, men and women accessories, camera and guitar straps portfolio cases, generally any objects that made up of leather.

II. BACKGROUND

Leather polish that is used for the purpose of protection of leather against water is known in the art since the early ninety's. But at present For the protection of leather waterproofing agents or polishes used are made from petrochemical-based products, silica, based artificial as well as natural components. But sadly, the waterproofing agent made from above-stated materials and their production treatments has drastic effects on accessories as well as the environment after prolonged exposure. An especially waterproofing agent that is made from petroleum-based material are very harmful to humans and the environment. And it would be advantageous to formulate leather treatments without including these undesirable components.

III. LITERATURE REVIEW

A. U.S. Pat. No. 5,614,005

Gives a method regarding the formation of water-resistant shoe polish for the care of leather shoes. Composition stated

in the above method is form in addition to a tradition base mixture of wax (for ex. ski wax) and turpentine oil, petroleum benzene, high vacuum silicone grease, glycerin, glycerol stearate, and stearic acid. The composition also provides shine and water as well as salt resistance to the shoes. Unfortunately, however, the compositions in these patents are made up with the help of chemical such as petroleum benzene (petroleum ether), which are harmful from an environmental perspective. Exposure to these chemicals may possess health risks [1].

B. U.S. Pat. No. 4,804,413

Provide information about the composition of non-caking shoe polish. The composition is the mixture of paraffin wax and turpentine oil, refined petroleum jelly, silicone oil, and optionally, camphor oil, silicone powder, and color ink. It is also noted that when we use compositions containing paraffin wax for treating leather against water causes blooming on the surface of the leather [2].

C. U.S. Pat. No. 6110230A

Provide info about hydrophobicizing leather with help of emulsion made up of carboxy amide-polysiloxanes. But the strength of the waterproofing effect and its durability is not good enough. Besides they are also of limited availability on the industrial scale and are expensive as well. The service properties and performance results of such silicone oil emulsions, however, are still not optimal. Also, the emulsion has very less stability during storage [3].

D. U.S. Pat. No. 2772988

Provide info about water-proofing leather (tanned leather) with the help of an organic metal complex compound [4].

E. U.S. Pat. No. US3019133A

Found that waterproofing property is obtained in leather especially pastel-shade and white suede or grained leather by treating it with solutions of condensation products formed by metal alcoholates and acid high-molecular organic derivatives of phosphoric acid [5].

F. U.S. Pat. No. US2032097A

Gives info about waterproofing vegetable tanned leather with help of aqueous solution of a sulphonium salt like cetyldimethylsulphonium methyl sulfate [6].

So we try a few attempts to utilize natural materials in leather treatment compositions. In one attempt we use paraffin oil in composition. However, the paraffin oil makes the composition not suitable for production because of its toxicity concerns. Eventually, it is very important to develop a new waterproofing agent which is eco-friendly has prolonged life and ease in application.

IV. SUMMARY

The present research paper provides a composition of a waterproofing agent that is used on leather accessories.

The composition mainly consists of beeswax, linseed oil, and turpentine. Beeswax is present in 50% to 60%; from about 20% to 30% of linseed oil; and from about 20% to 30% of turpentine. All composition is in “%(W/W)” means percent by weight i.e. weight of the individual component/weight of the entire composition.

A further aspect of the present research paper gives a method to obtain a waterproofing composition that consists of majorly wax and oil derived from natural sources. The oil used in the present disclosure is used for maintaining moisture. And it generally obtains by extraction of triglycerides presents in plants.

V. METHODOLOGY

The beeswax used in the present disclosure is used as a Thickening agent as well as a binding agent. And it generally obtains from natural resources. Here the term thickening agent means a substance that is used to increase viscosity without changing the original properties of a given fluid.

However, the wax can have many other functions other than being a thickener such as it's a good lubricant, it is used in the candle industry, it is used in making paints, etc. For present disclosure instead of beeswax, one can use orange wax, palm wax, or insect i.e. Chinese wax. But we prefer to use beeswax and the suitable beeswax for the present method is commercially available by -

ANP BEE Pure Unrefined Beeswax, Triple Filtered highest grade which is sold by Ambrosia Natural Products, 47-A, Satyam Enclave, Jhilmil, Near Vivek Vihar Police Station, Delhi 110095, India through <https://www.amazon.in>

If beeswax is mixed with linseed oil in the proportion stated in given research paper a soft and applicable substance is formed.

Composition for Linseed oil in a present disclosure vary from about 20% (w/w) to about 30% (w/w). The suitable Linseed Oil for the present method is commercially available by -

Pure Linseed Oil (*Linum usitatissimum*) 100% Natural Therapeutic Grade Cold Pressed which is sold by Deve Herbes, Village Rakkar, Nagal Road, Una, HP – 58, India through <https://www.amazon.in>

Composition for turpentine in a present disclosure vary from about 20% (w/w) to about 30% (w/w). The suitable Turpentine for the present method is commercially available by-

Natural, Organic, Vegan & Cruelty-Free Turpentine which is sold by Eco Aurous, H-1429 DSIDC Narela, New Delhi 110040 India through <https://www.amazon.in>

The given research does not state or force to use of specific linseed oil or beeswax stated above. It's also noticed and studied that many commercially available linseed oil and beeswax may be used to fulfill the desire need. In the compositions of the present disclosure, we can also optionally include one or more additives for better results such as emulsifiers, stabilizers, colorants, fragrances. The number of additives to be included vary depending on need and use. As our main chemicals and ingredients are derived from natural

sources we prefer additives that are environment-friendly and natural. The product that we obtain at the end of the process followed by the present disclosure is a semisolid. Semisolid are covalent substances that have properties of paste i.e. both solid and liquid phases at room temperature and get softer and softer until they melt. A sample example for a given process is stated below -

- 1) In a 400 ml beaker made from borosilicate glass, 125 grams of beeswax provided by Ambrosia Natural Products (Amazon.in Order Number - 40241074478699522) weighted down by (electronic weight balance) is added.
- 2) Then the beaker is placed over the meshed heating mantle
- 3) And Heated at 140 oF. (Temperature is measured with help of standard mercury thermometer)
- 4) 60 ml of Linseed oil provided by Deve Herbes (Amazon.in Order Number 40295625048209151 -) is then slowly added to molten beeswax with constant and continues stirring using laboratory stirrer
- 5) Then afterword 60 ml of Turpentine provided by Eco Aurous (Amazon.in Order Number - 40200413653022752) is slowly added to the mixture with constant and continues stirring.
- 6) Then the heating mantle is extinguished and the uniform solution is allowed to cool at room temperature about 12 to 13 hour. Then the obtained semi-solid product has the following advantages

VI. METHOD OF APPLICATION

After forming the semi-solid composition of the present disclosure, it is “apply” on lather or any other article made from cotton, wood, and metal. In short “apply” means spread the emulsion evenly using a brush, cloth or electric polisher on to the article; where prevention from water damage is necessary. And allow it to dry.

VII. PRECAUTION'S DURING PROCESS

- 1) The mixture is highly flammable so make sure you have a fire extinguisher device if the situation goes out of control.
- 2) Make sure you have personal safety tools such as hand gloves, eye goggles and so on before starting the process
- 3) If the oil, turpentine, and beeswax are present less than or more than the desired proportions provided in the present disclosure, there will direct effect on waterproofing property.
- 4) Constant stirring is very necessary during the whole process to form a homogeneous mixture.

VIII. CONCLUSION

The present disclosure has many advantages which are stated below

- 1) Waterproofing agent made in accordance with the present disclosure formed from natural ingredients and thus is environmentally friendly.
- 2) Waterproofing agent made in accordance with the present disclosure avoids the inclusion of toxic synthetic and petroleum products.

- 3) The primary ingredients i.e. natural oil and natural wax are relatively inexpensive.
- 4) The manufacturing process is very quick, less time consuming and does not require many steps.
- 5) The waterproofing agent made according to this disclosure can be produced efficiently and economically.
- 6) The waterproofing agent is easy to apply to any articles.
- 7) Treatment of articles with the waterproofing agent having a composition of the present disclosure improves the life as well as the appearance of articles while simultaneously providing resistance to water damage.
- 8) Especially for leather articles the waterproofing agent is rapidly absorbed in leather, and also give long life to the leather being treated.
- 9) The waterproofing agent made according to this disclosure also retained the natural appearances and luster of the leather surface for a long-lasting duration. Also, the composition leaves a soft and treated leather surface without being either sticky or slippery.

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IX. DATA AVAILABILITY

The raw/processed data required to reproduce these findings cannot be shared at this time as the data also forms part of an ongoing study.

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