

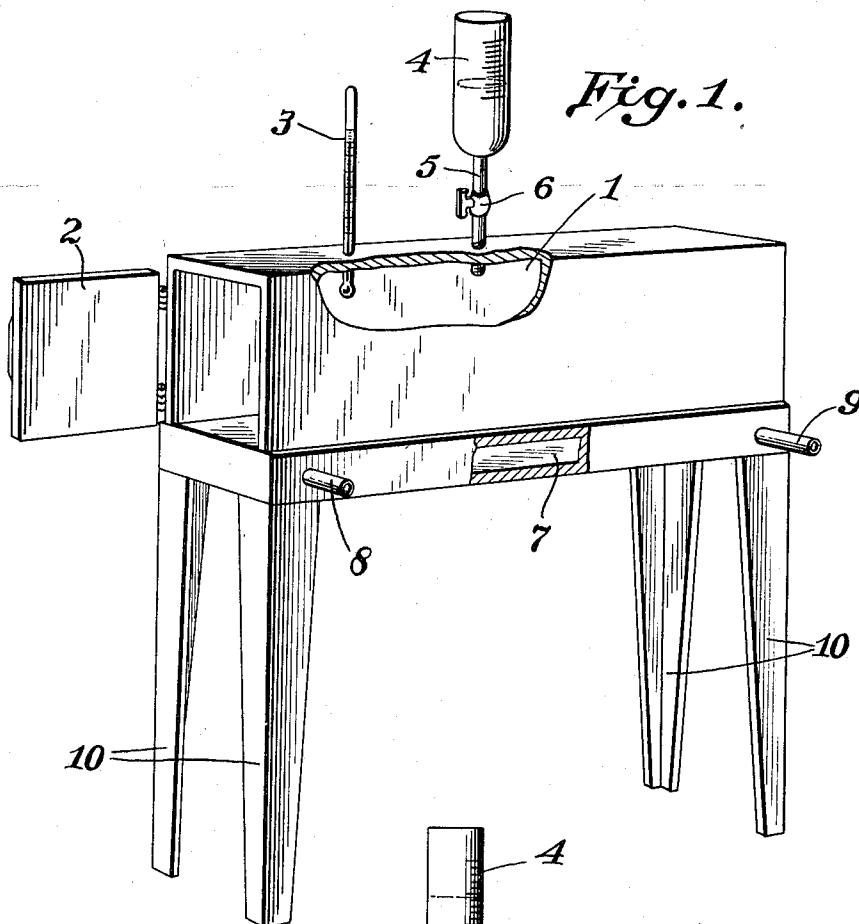
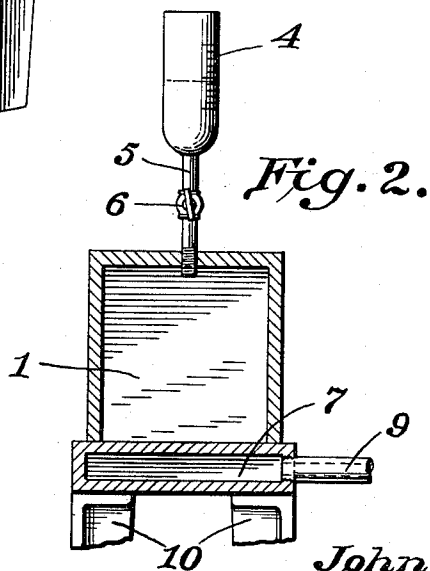
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J. W. BAYMILLER

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TREATMENT OF WOOD

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Inventor:

John W. Baymiller,

By

Spear, Donaldson & Hall
Attorneys

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TREATMENT OF WOOD

John William Baymiller, Chicopee, Mass., assignor to A. G. Spalding & Bros. Inc., a corporation of Delaware

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3 Claims. (Cl. 8—111)

The present invention relates to improvements in the treatment of wood, and more particularly to processes of bleaching wooden articles.

5 In processes heretofore employed for the bleaching of pieces of wood, either in finished shapes or in the rough, the wood was placed in a bleaching liquid, and soaked therein for a relatively long period of time. As a result, the wood absorbed the liquid to a considerable extent, and although it had been previously dried, it was necessary to carefully dry the wood again. Upon drying wood after long treatment with a bleaching liquid, there is danger of checking which results in production of inferior articles, or articles which are unsatisfactory for commercial purposes.

15 An object of the present invention is to provide an improved method of bleaching wood, and more particularly the invention has as an object the treatment of articles having wood surfaces, to bleach the said surfaces. A further object is to provide means for treating wood in accordance with the process described below.

25 Another object is to provide an improved method of treating wood in which method the tendency of a wood to develop subsequent defects, such as discoloration of the wood after bleaching or such as checking while drying or both, is checked or practically eliminated.

30 The present process comprises the application of reagents to wood surfaces in such a manner as to rapidly bleach such surfaces. The process is so conducted that there is at the most little more than a slight penetration of bleaching liquid into the body of the wood. A bleaching agent, such as a solution of hydrogen peroxide, is applied to the surface of the wood for a relatively short period of time, and then the wood is subjected to an alkaline atmosphere thereby causing increased activity of the bleaching agent. After a relatively short period of exposure to the alkaline atmosphere, the bleaching of the wood is completed.

45 By way of a specific example which will serve to illustrate the invention, articles such as baseball bats, for instance, after being turned and sanded, are dipped quickly into a 30 percent solution of hydrogen peroxide, or they are immersed therein for a relatively short or predetermined period of time. If desired, the solution of hydrogen peroxide may contain a wetting-out agent. The articles thus treated are then placed in a chamber, preferably heated, and ammoniacal vapors are brought into contact

with the articles. The temperature of the chamber may be about 180° F. to about 190° F.

One means of charging the air in the container with ammoniacal vapors may be a hot plate provided in the chamber and upon which aqua ammonia of suitable concentration may be dropped. The ammonia vaporizes, mingles with the hot air, and contacts with the wooden articles in the treating chamber. A predetermined amount of aqua ammonia of about 25° Baumé, for instance, may be employed with each charge of wood, the amount depending upon the volume of wood treated and the size of the treating chamber.

15 In a chamber forty-two inches long, twelve inches wide, and twelve inches high, in which six baseball bats at a time may be treated, about thirty cubic centimeters of aqua ammonia 25° Baumé, may be introduced for vaporization, and the bats contacted with the vapors for a period of about twelve minutes. The bats are removed from the chamber in bleached condition.

20 A suitable apparatus in which the bleaching of bats, tennis rackets or of other wooden articles of relatively small size may be conducted is shown in the accompanying drawing in which Figure 1 is a perspective view of the apparatus, and

Figure 2 is a sectional view thereof partly in elevation.

30 The chamber 1 is provided with a door 2, shown in open position for the insertion or removal of wooden articles. A thermometer 3 is shown with its bulb in the chamber 1 and its stem projecting from the top thereof. A vessel 4 which may be a glass measuring tube is connected to the chamber 1 by a tube 5 having a valve or stop cock 6 by which ammonia solution may be introduced into the chamber 1 at a desired rate. The floor of the chamber is heated, as for instance, by steam admitted into a space 7 beneath the floor made of suitable heat conducting material and which serves as a hot plate. An inlet pipe 8 and an outlet pipe 9 may serve for circulating steam or other heating media through the space 7. Pipes 8 and 9 may be provided with suitable valves for controlling the supply of the heating medium and hence the temperature of the chamber 1. For convenience the chamber 1 of about the size indicated above, may be supported on legs 10.

50 If desired, in cases where there is a tendency for the wood to turn yellow after the above bleaching operation during subsequent treatment, the wooden article, before providing a

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finish with stains, fillers, or lacquers, or before impregnation, is dipped into hot water at, for instance, about 190° F. for about one minute or it is treated with steam for a relatively short 5 period. Such treatment inhibits yellowing during the finishing operations. Yellowing is also inhibited if after the bleaching operation and before the finishing operations the wooden article is permitted to stand in air at room tempera- 10 ture for a relatively long period such as several weeks, for instance. The hot water or steam treatment is preferred for overcoming yellowing because of the considerable decrease in time necessary.

15 A particularly effective treatment in preventing checking after the hot water or steam treatment in the application of ethylene glycol to the surface of the wood, particularly at the end grain where the pores are exposed. The glycol tends 20 to slow up the drying of the wood to a safe rate. It is also volatile enough to evaporate readily substantially completely without affecting adhesion and so forth of the filler and lacquer. After application of the glycol a drying period 25 of about eight hours may be allowed before finishing. A humidity controlled kiln or other apparatus for slowing up the drying tends to prevent checking, but the application of glycol is far simpler.

30 It is to be understood that the temperature, the time of treatment, and the concentrations of the reagents, may be varied depending upon the extent of bleaching required. Regarding temperatures employed in the bleaching operation, good results are obtained between about 35 room temperature and about 212° F. The results obtained at around 180° F. are noticeably better than those obtained at room temperature. The higher temperatures have the advantage in 40 that the wood is dried by the heat and the water tends to evaporate before it has much opportunity to penetrate the wood.

The concentration of the hydrogen peroxide solution may be varied within wide limits up to 45 the most concentrated obtainable. The concentration may be as low as 3% but preferably 30%.

The wetting agent mentioned above may be included to facilitate contact between the peroxide solution and the wood surface. Such wetting 50 agents are for example suitable sulfonic acid compounds including sodium hexadecylsulfonate. Sodium sulfate of palmityl alcohol (sodium-

lauryl-sulfate) can also be used. By way of example, one part by weight of the wetting agent in 1,000 parts by weight of a 30% hydrogen peroxide solution has been found satisfactory.

The above process includes primarily a surface 5 treatment which results in the rapid bleaching of wooden articles without undue penetration of the wood. Only one application of the bleaching solution is generally required, although 10 in refractory cases more than one application may be made. Instead of dipping the wood into the hydrogen peroxide solution, the solution may be painted on. Instead of employing aqua ammonia, ammonia gas may be introduced from 15 some outside source.

In place of aqua ammonia or ammonia gas, other nitrogen bases including volatile substituted ammonias, such as monomethyl-amine, or monoethyl amine may be used although aqua 20 ammonia or the gas are preferred.

I claim:

1. A process of treating articles having wood surfaces before applying finishing material thereto, which process comprises subjecting the said wood surfaces to the action of a solution 25 containing hydrogen peroxide for a period sufficient to bleach the said wood surfaces but insufficient to penetrate substantially below the surface of the wood and without saturation thereof, subjecting the said wood surfaces to the 30 action of an alkaline atmosphere to increase the bleaching action, subjecting the bleached wood surfaces to the action of heated water for a relatively short period to avoid discoloration of the wood during subsequent treatment thereof, 35 drying the said article, and while drying the article subjecting the wood surfaces to the action of ethylene glycol to prevent checking of the wood, thereby obtaining an article having 40 bleached wood surfaces substantially free from checks and any tendency toward discoloring after applying wood-finishing materials.

2. In a process of treating an article having wood surfaces, the steps comprising bleaching a wood surface of the article, and drying the wood 45 in the presence of ethylene glycol, the said ethylene glycol inhibiting checking of the wood.

3. In a process of treating an article having wood surfaces, during a drying step applying ethylene glycol to the said surfaces, the said 50 ethylene glycol inhibiting checking of the wood.

JOHN WILLIAM BAYMILLER.