

No. 722,869.

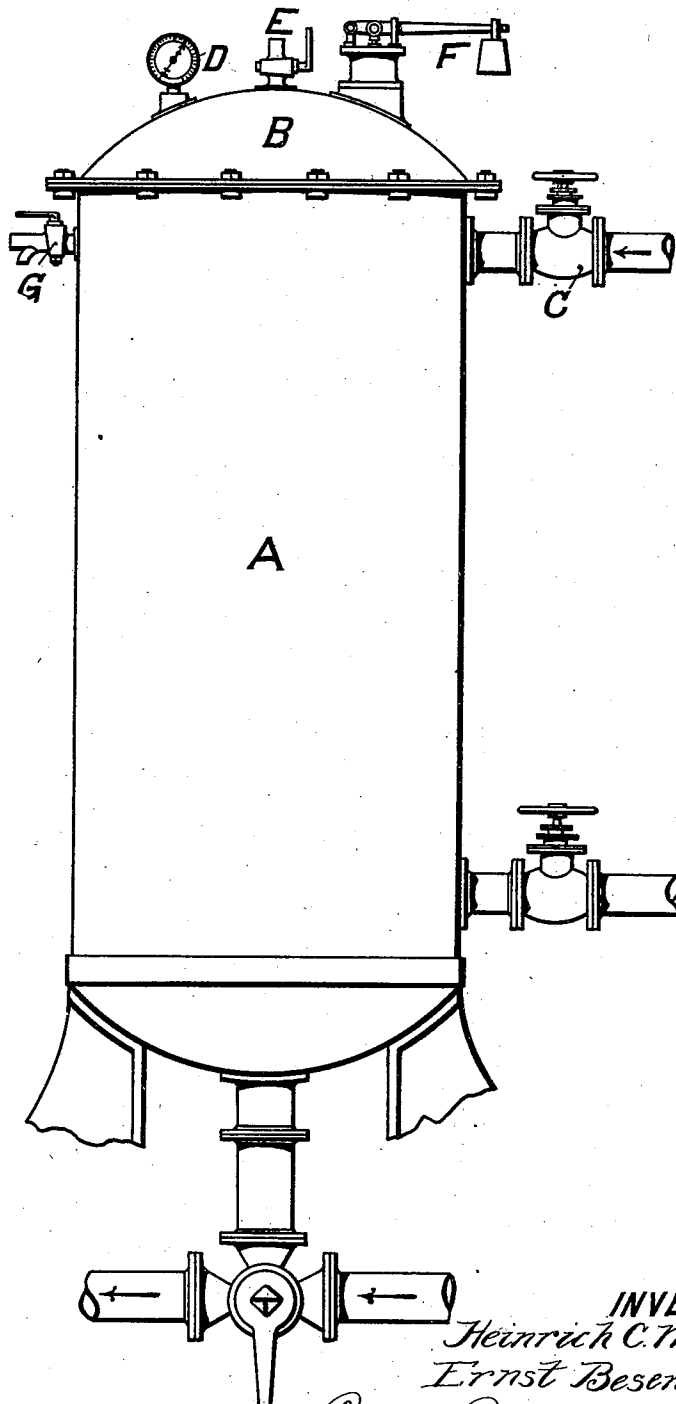
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H. C. MEYER & E. BESENBRUCH.

PROCESS OF BLEACHING CANE.

APPLICATION FILED JUNE 20, 1898.

NO MODEL.



WITNESSES:

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PROCESS OF BLEACHING CANE.

SPECIFICATION forming part of Letters Patent No. 722,869, dated March 17, 1903.

Application filed June 20, 1898. Serial No. 683,978. (No specimens.)

To all whom it may concern:

Be it known that we, HEINRICH CHRISTIAN MEYER and ERNST BESENBRUCH, subjects of the German Emperor, residing at Harburg-on-the-Elbe, German Empire, have invented an Improved Process of Bleaching and Dyeing Glazed or Smooth Cane, (Case No. 1,) of which the following is a full, clear, concise, and exact description.

Our invention relates to an improved process for treating and bleaching natural or non-desilicified cane, and has for its object the provision of a method for treating cane without affecting the silicious or silicified coats or layers thereof.

By following the process herein outlined different varieties of cane of various natural shades may be treated and subsequently bleached to produce a commercial article which, in addition to being uniform in color, retains the cane otherwise in its natural condition.

In making cane chairs and the like it has become customary for some time to dye the cane employed, in order to thereby obtain special artistic effects. As, however, the natural cane is variously colored, it must be bleached before being dyed, at least with the exception of the very clearest sorts. In the natural Bengal or ratan cane three different layers exist—namely, first, the inner core, the so-called “pith,” consisting of woody substances; secondly, a layer only partially composed of organic substance and strongly impregnated with silicic acid, the so-called “bast” or “bark,” and, finally, a smooth polished or glazed outer course composed almost exclusively of pure silicic acid. Seeing that in the bleaching of the cane it has been found that the outer layer of silica, as well as the bast, which is thoroughly permeated with silicic acid in a natural condition, are practically unattackable in the bleaching-bath, the conclusion was arrived at that in the manufacture of colored goods the treatment must always commence with the complete removal of the silicic acid. The removal of the silicic acid in the processes hitherto employed must be regarded as a necessary evil, not only because it offers great technical difficulties, but,

above all things, because the layer of silica must be regarded as a very valuable constituent of the cane, as owing to its fine natural polish and its capability of resisting almost all chemical and mechanical influences it adds not inconsiderably to the beauty and durability of the cane. While, therefore, the process of treatment hitherto adopted for the cane has been limited, after the removal of the layer of silica, to bleaching superficially the layer of bast lying immediately beneath the same, the inventors of the present process have endeavored to leave the natural layer of silica unattacked or unaffected and to produce the bleaching and dyeing in such a way that the whole thickness of the layer of bast lying beneath it is entirely bleached and dyed through, which was hitherto regarded as impossible. The measures adopted for this must be varied according to whether it is a question of making the so-called “weaving-cane”—that is to say, the mechanically-drawn-off upper layer of the cane or rod—or of treating the natural raw product. Even in the latter case it is not difficult to bring the bleaching liquid from the interior in contact with the layer of bast, because the Bengal cane, as is well known, is longitudinally extremely porous and may be comparatively easily filled with liquid with the use of slight pressure. If, however, this process is followed, the result is that the upper layers, which are permeated with silicic acid, are not attacked by the bleaching substance. If the bleaching process be continued long enough, a thorough bleaching can be obtained; but as the bleaching fluid exerts a disintegrating action on the fibers those parts of the woody fiber in which the bleaching action has already started at the commencement of the operation are entirely decomposed when the treatment is continued for too long a period. The bleaching must thus be carried on for a given time, and therefore care must be taken that a bleaching action may be exerted simultaneously on all parts of the cane from the start of the operation. For this object we employ various means. Sometimes the cane is brought in closed vessels into the bleaching-bath and exposed to great varia-

tions of pressure in order to saturate it thoroughly from the commencement. We have shown in the annexed drawings apparatus for practicing this portion of the process, which consists of a chamber or kettle A, adapted to be hermetically sealed by means of a cover B. The cane which is to be treated having been placed within the chamber, the bleaching or other fluid is forced into the kettle through valve C, and the contents of the kettle are subjected to any desired pressure. Upon the cover are mounted a pressure-gage D, an air-cock E, and a safety-valve F. Situated at the side of the kettle is a cock G, which is designed for drawing off sample portions of the liquid for the purpose of testing the same. Steam-coils or other well-known apparatus for heating the contents may be employed in connection with the device for securing the desired temperature. As, however, the layer of bast permeated with silicic acid is very slightly permeable in a transverse direction, it has been found to be preferable to subject the cane to a chemical treatment in addition to the mechanical treatment by variations of pressure, the object of the chemical treatment being to open the pores of the cane in such a way that they allow free access to the subsequent bleaching. For this object a treatment with alkaline solutions, preferably solutions of potash compounds, has been found particularly suitable; but care must be taken that the concentrations and temperatures of these solutions are not made so great that a solution of the layer of silica itself takes place. If, for artistic reasons, it be desired to obtain intentionally a dull surface, the layer of silica may be easily attacked to any desired degree by a suitable raising of the temperatures or the concentrations in the preliminary treatment.

We have found the following methods of treatment to be particularly satisfactory in preparing cane for the purpose of bleaching and dyeing the same. A solution of potassic hydrate ranging in strength from six to ten per cent., applied cold, is permitted to act upon the cane from twelve to twenty-four hours. It may frequently be found advantageous, however, to employ this solution at a temperature of about sixty degrees. We have also used a ten to fifty per cent. solution of silicate of potash, which is maintained at approximately sixty degrees and is allowed to act upon the treated cane from two to twenty-four hours. After treating the cane as above indicated the same is subjected to any suitable bleaching-bath. This may, for example, consist of potassic hypochlorite, the bleaching being conducted in a manner well known to those skilled in the art. If desired, the alkaline and bleaching reagents may also frequently be employed in a single bath with good results. If so-called "weaving-cane" is to be made by the present process, it is preferable to first split the cane and then subject it to the above-mentioned preliminary treat-

ment, in which case a mechanical treatment by variations of pressure may be entirely dispensed with. Said alkaline solutions may also be added directly to the bleaching-bath.

We have found that the treatment of Bengal cane with alkaline solutions has already been described, with the object of removing the silica. This process, as is well known, has not been worked practically, mainly for two reasons: First, the energetic treatment with soda necessary for removing the silica had a deleterious action on the mechanical properties of the fibers, and, secondly, any alkaline treatment produced a strong brown coloring of the cane, which in the bleaching processes hitherto employed could not be entirely removed, but imparted a yellowish effect to the subsequent dyeing, which did not produce readily-marketable cane. If the bleaching was then further continued, the color of the cane took on a grayish tone, which was also undesirable. We have found that, on the one hand, a treatment with cold or moderately-heated weak alkali, which is necessary in order to open the pores, does not appreciably affect the mechanical properties of the cane, and, on the other hand, the formation of the undesirable so-called "yolk-of-egg" color is to be ascribed to an unequal bleaching of the different layers, as the layer lying under the surface is essentially more slowly attacked than the other layers. If, however, on the other hand, care be taken, as is intended in the present process, that the bleaching liquid from the start can simultaneously attack all layers of the cane, a corresponding complete and even bleaching through is obtained, and the formation of the yolk-of-egg color is avoided. We have also observed that in the use of potash compounds instead of the soda hitherto employed in the alkaline removal of the silica the deleterious yolk-of-egg color did not arise to the same extent, although at first a material darkening or browning of the cane was observable. By the means hereinbefore described the possibility is thus afforded, which was hitherto not recognized, of completely bleaching through the desilicated cane, and a new technical effect is thereby produced, in that any sort of cane of no matter how dark a natural color may be bleached through to the same degree of clearness, so that any subsequent sorting may be entirely dispensed with.

Having now described processes which we preferably practice for bleaching and dyeing glazed cane, we claim as new, together with such modifications as may be made by those versed in the art, the following:

1. The herein-described process for bleaching natural or non-desilicified cane, which consists in treating the same with an alkaline fluid whose concentration and temperature are adapted to retain or preserve the silicious layer of the cane, and thereafter treating said cane in a bleaching-bath.

2. The herein-described process for bleach-

ing natural or non-desilicified cane, which consists in treating the cane with a solution of postash-lye, the concentration and temperature of which are so regulated that the silicious layer of the cane is preserved, and thereafter subjecting said cane to the action of a bleaching fluid.

3. The herein-described process of treating natural or non-desilicified cane, which consists in placing the cane in a solution containing from six to ten per cent. of potassium hydroxid, the same being maintained at a normal temperature, and thereafter subjecting the cane to the action of a bleaching-bath.

4. A process for bleaching natural or non-desilicified cane, which consists in subjecting the treated cane to solutions containing a low percentage of alkali which do not materially affect the silicious coating or layer of the cane and which permit the entrance of the bleaching solution into the pores of the cane and thereafter treating with a bleaching solution, substantially as described.

5. A process for bleaching natural or non-desilicified cane, which consists in subjecting the cane to a weak alkaline solution adapted to maintain the silicious coating of the cane intact, and to a bleaching agent which is thereby adapted to fill the pores and act upon the darkened portions of the cane, substantially as described.

6. The process of bleaching cane in a natural or non-desilicified state, which consists in treating the said cane under varying pressure with a potassium salt in solution, the strength of which is from six to ten per cent., whereby the silicious layer of the cane is unattacked and retained, and thereafter expos-

ing the cane to the action of a bleaching-bath, substantially as described.

7. A process for bleaching natural or non-desilicified cane, which consists in subjecting the treated cane to a solution containing a low percentage of potassium hydrate of normal or moderate temperature which does not materially affect the silicious coating or layer of the cane and which permits the entrance of the bleaching solution into the pores of the cane, substantially as described.

8. The process of bleaching cane, which consists in subjecting the cane to a penetrating reagent that will not effect the removal of the silicious coating, nor the disintegration of the fibers of the cane, and which will open the pores of the cane to permit of access of a bleaching reagent, and passing a bleaching reagent, that will not effect the removal of the silicious coating nor the disintegration of the fibers of the cane, through the opened pores, whereby all portions of the cane are speedily reached by the bleaching reagent substantially as described.

9. The herein-described process of preparing cane which consists in treating the same so as to open the pores thereof, and subjecting said cane to the action of a bleaching fluid.

In witness whereof we have hereunto subscribed our names this 3d day of June, A. D. 1898.

HEINRICH CHRISTIAN MEYER.
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Witnesses:

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