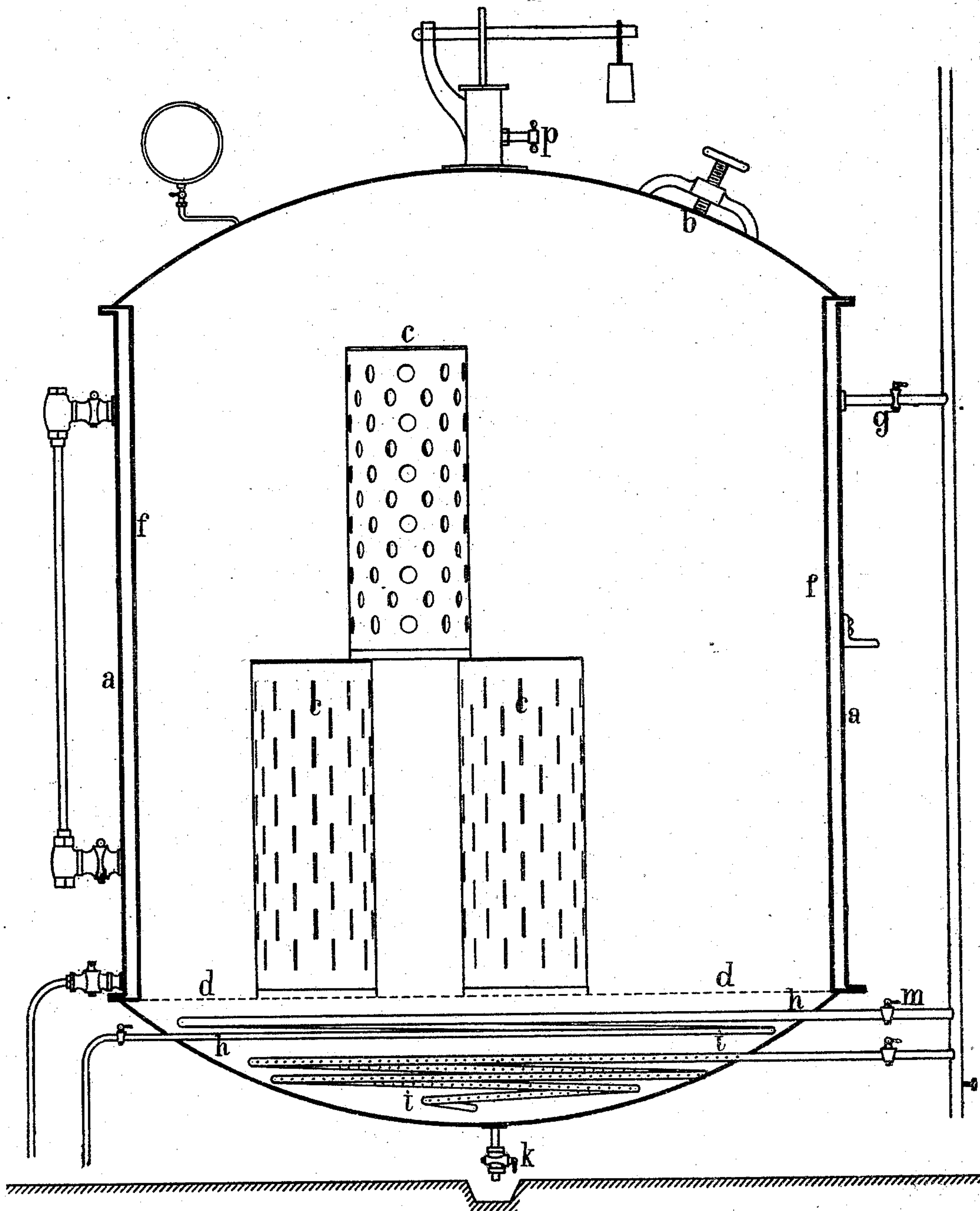


(No Model.)

H. ANTHONI.
PROCESS OF TREATING COTTON.

No. 500,732.

Patented July 4, 1893.



Witnesses

Arthur H. Ceb.
Rever Lewis.

Inventor

Henry Anthoni
by *Poland Drano*
his attorney

UNITED STATES PATENT OFFICE.

HENRI ANTHONI, OF RENINEMONT, FRANCE.

PROCESS OF TREATING COTTON.

SPECIFICATION forming part of Letters Patent No. 500,732, dated July 4, 1893.

Application filed August 30, 1892. Serial No. 444,562. (No specimens.) Patented in France May 15, 1882, No. 148,959; in Belgium May 20, 1882, No. 57,977; in Germany June 12, 1882, No. 21,573; in England August 14, 1882, No. 3,875, and in Austria-Hungary November 10, 1882, No. 31,271 and No. 44,132.

To all whom it may concern:

Be it known that I, HENRI ANTHONI, a citizen of France, and a resident of Reninemont, in the Department of the Vosges, France, have invented a new and useful Improvement in Processes of and Means or Apparatus for Treating Cotton, of which the following is a specification, and for which Letters Patent have been obtained as follows: in France, No. 148,959, dated May 15, 1882; in Belgium, No. 57,977, dated May 20, 1882; in Great Britain, No. 3,875, dated August 14, 1882; in Germany, No. 21,573, dated June 12, 1882, and in Austria-Hungary, No. 31,271 and No. 44,132, dated November 10, 1882.

This invention has for its object new means for treating cotton, whereby the bleaching, dyeing or chemical treatment of the fibers is or are effected before they have been subjected to the final spinning process, which enables either a bleaching or a dyeing to be effected in a manner equal, or even superior, to that now obtained by bleaching or dyeing of spun goods in hanks.

The dyeing of raw cotton or cotton fibers, which have been partially straightened and made parallel has been heretofore prevented by the difficulty of causing the liquids (physical and chemical agents) to penetrate the minute fibrous materials, which are not readily impregnated, and which are in a high degree liable to settle, to become felted, and to form filtering layers; in consequence of which it has not been heretofore possible to produce a uniform action in all parts of the mass to be treated, that is to treat the fibers with the liquid agents in a regular and complete manner without twisting or entangling them. Moreover, the same causes have rendered impossible the purifying or cleansing of the dyed fibers, that is to eliminate the foreign matters, impurities and residues which are contained in the fibers, or are produced by the dyeing baths, so that the subsequent spinning was rendered very difficult or even impossible. By the new process these inconveniences are entirely avoided, all disturbance of the primary direction of the fibers is obviated, and the physical and chemical actions take place uniformly upon all parts of the material.

In other words, by the new process a preliminary and perfect cleansing and purifying of fibers, and if necessary an energetic scouring are effected; and then this important result being obtained, the various dyeing or rinsing baths may be applied to the fibers without twisting, entangling or disturbing their direction. Thus is solved the problem which has for a long time occupied the spinning industry, viz: the production on a spinning frame of materials bleached or dyed in all shades and particularly in shades known as ingrain or fast colors. In order to obtain these results I operate on the cotton already formed into slivers by the preparing, carding or drawing machines, but I dispose of it, by means of the apparatus known as the "coiler" (which serves generally for receiving the slivers of carding and drawing machines, &c.) under the form of superposed coils. Thus disposed the operations are as follows:

Ungumming or scouring in coilers the slivers delivered by the preparatory machines.— In order to effect the first wetting, or, when necessary, the simultaneous wetting and ungumming or scouring, I use the receptacles which usually serve to contain the sliver, and which are known as "coilers." The latter, filled as usual with the sliver, and having perforated bottoms and walls, are provided with a cover also perforated, then set into a boiler which is hermetically closed. The use of the ordinary coilers, perforated as described, is a matter of convenience, and obviously the same result could be obtained by utilizing other perforated or open-work receptacles.

The operation will be clearly understood by reference to the accompanying drawing, which represents in vertical section an apparatus suitable for use in carrying out the invention.

The boiler shell *a* has a man-hole *b* through which the coilers *c* containing the cotton fiber are introduced, the coilers being all perforated or slitted in the sides, top and bottom. The said boiler has a perforated false bottom *d*, beneath which is a perforated steam coil *i* and an imperforate steam pipe *h'* controlled by a cock *m*. The boiler has also a

steam jacket *f* into which steam may be admitted by cock *g* and waste cock *k* in the discharge pipe. After the admission of the coilers, the boiler is closed and preferably a vacuum is produced therein, after which a convenient pipe (as *p*) is opened to introduce the liquid intended to ungum or scour the sliver. The action of atmospheric vacuum favors the regular and complete imbibition of the matter, and I recommend to use it, although the impregnation may also be effected without employing it, by using special liquids which have the property of rapidly penetrating the fibers, as for instance, the alkaline sulpholeates. When by the cock *k* on the bottom of the boiler, the whole excess of the liquids introduced is let off, the perfect impregnation is obtained, and also a partial ungumming or scouring, which the usual liquids produce even cool.

If the ungumming or scouring must be energetic, steam may be introduced by the coil *i*, in order to raise the fibers impregnated with the liquid to a sufficiently high temperature to complete the reaction. The washing may then be effected in the boiler by admitting cold water through suitable pipes. The wetting and ungumming or scouring are thus effected under the most favorable conditions, and the arrangement of the fibers is in no wise disturbed, either at the moment of their imbibition by the agents or liquors, or by the admission of steam for completing the action of these agents. Therefore, by this first operation, which is the essential basis of my sliver-dyeing process, the sliver is rendered particularly qualified to undergo the subsequent bleaching and dyeing operations which can then be applied to it in several ways.

Bleaching or dyeing proper.—After having passed the sliver into a hydro-extractor and squeezed it, I may after the wetting and ungumming or scouring, while retaining the disposition of this sliver in superposed coils, impregnate it, with the help of vacuum in the boiler, with chemical compositions, which will effect the bleaching or dyeing. For this purpose the operations or washings are repeated as often as necessary and the nature of the agents varied as required. However, in cases where this method of operating is not employed, I intend to withdraw the “coilers” from the boiler, after the wetting and scouring, and to subject the slivers to the bleaching or dyeing operations by other means, either by maintaining the special form which the coiler has given to them, or by disposing them in a different way, such as, for instance, by forming them into banks or laps in order to squeeze them methodically after each bath.

I am the first who has treated the cotton sliver by maintaining, during the bleaching or dyeing, its primitive form and direction of fibers, so that I may after these operations resume directly the spinning process, at the precise point where it had been arrested.

Heretofore various attempts have been made to bleach and dye cotton in the course of spinning, but in all these attempts the primitive form and direction of the sliver, thread or yarn, has been altered. For example, it has been proposed, prior to my invention, to wind the yarn or roving upon hollow perforated cops or spools, through which the liquid may penetrate to the cotton. All attempts of this character have failed, and it is well understood that sliver cannot be dyed in this manner, because when once so impregnated the absence of twist will produce the adhesion of the different layers of sliver, so that it becomes impossible to unwind them for further operations. Moreover, the sliver when so wound upon cops or spools is in such condition that the liquid cannot penetrate and act uniformly upon the mass. By my invention the dyeing of cotton in the sliver has become a practical and industrial operation; and the essential characteristic of the process, to which this successful result is due, and by which it is clearly distinguished from other processes, is that the ribbon or film of sliver is deposited in the perforated receptacles (herein called “coilers”) in the form of superposed epicycloidal rings. It is well known in the art of spinning that the film or ribbon takes this special form when deposited from the carding devices, and I have discovered that it is indispensable to maintain this characteristic form during the impregnation by the liquids, which penetrate into the material through the perforations of the receptacles, in contradistinction to a penetration from within hollow cores or cops. It is owing to this disposition that the bleaching and dyeing is a success, that the impregnation may be effected without disturbance of the form or condition of the sliver, and that the ribbon or film may be subsequently removed and subjected to the usual spinning operations.

What I claim as my invention is—

1. In the art of treating cotton preparatory to spinning, the improvement consisting in depositing the ribbon or film of sliver from the carding devices, in the form of superposed epicycloidal rings in perforated receptacles, and without disturbing the arrangement or direction of the sliver, subjecting the same to impregnation by liquids penetrating the material through the perforations in the inclosing walls of said receptacles, substantially as described.

2. The described process of treating cotton fibers, consisting in first, scouring and cleansing cotton in the form of sliver deposited loosely in the form of superposed rings in perforated receptacles, and second dyeing or bleaching the said sliver without disturbing the arrangement or direction of the fibers, substantially as described.

3. The described process of treating cotton preparatory to spinning, consisting in arrang-

ing cotton sliver in the form of superposed
rings in perforated receptacles, and subject-
ing the same to the successive operations
of cleansing, scouring or ungumming, and
5 bleaching or dyeing without disturbing the ar-
rangement and direction of the sliver, sub-
stantially as described.

In testimony whereof I have signed this
specification in the presence of two subscrib-
ing witnesses.

HENRI ANTHONI.

Witnesses:

H. TOM,
G. DELORN.