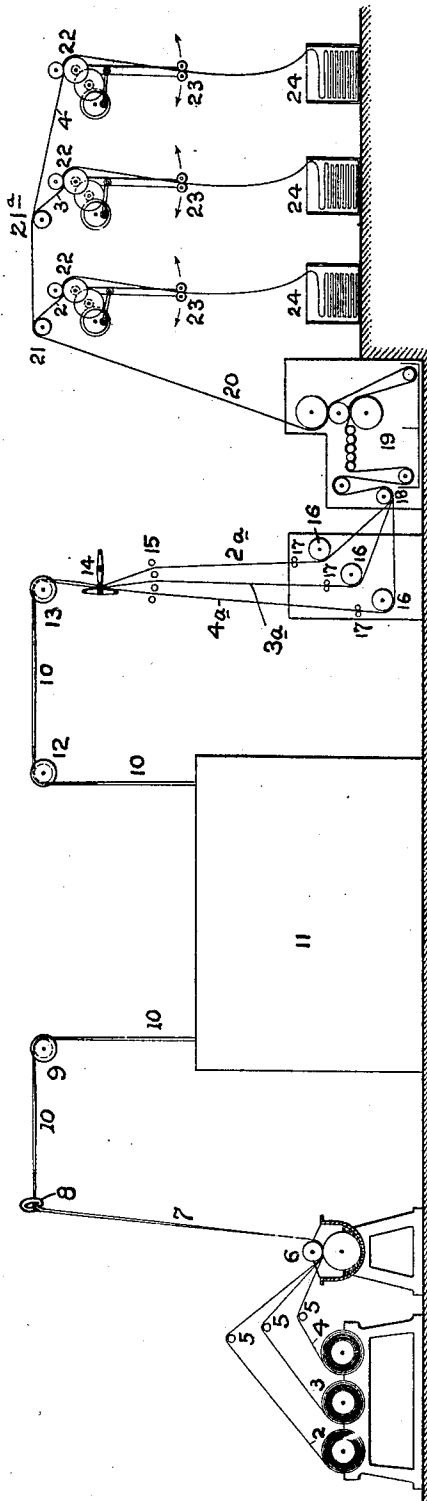
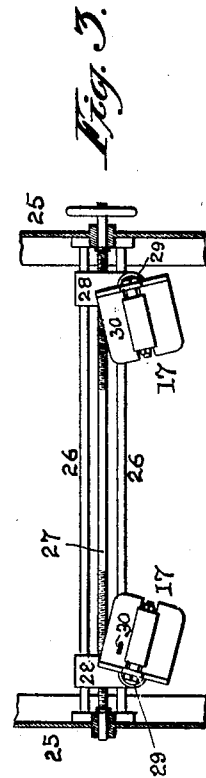


METHOD AND MEANS FOR TREATING LIGHT WEIGHT FABRICS.  
APPLICATION FILED OCT. 13, 1919.

Patented June 8, 1920.  
2 SHEETS—SHEET 1.

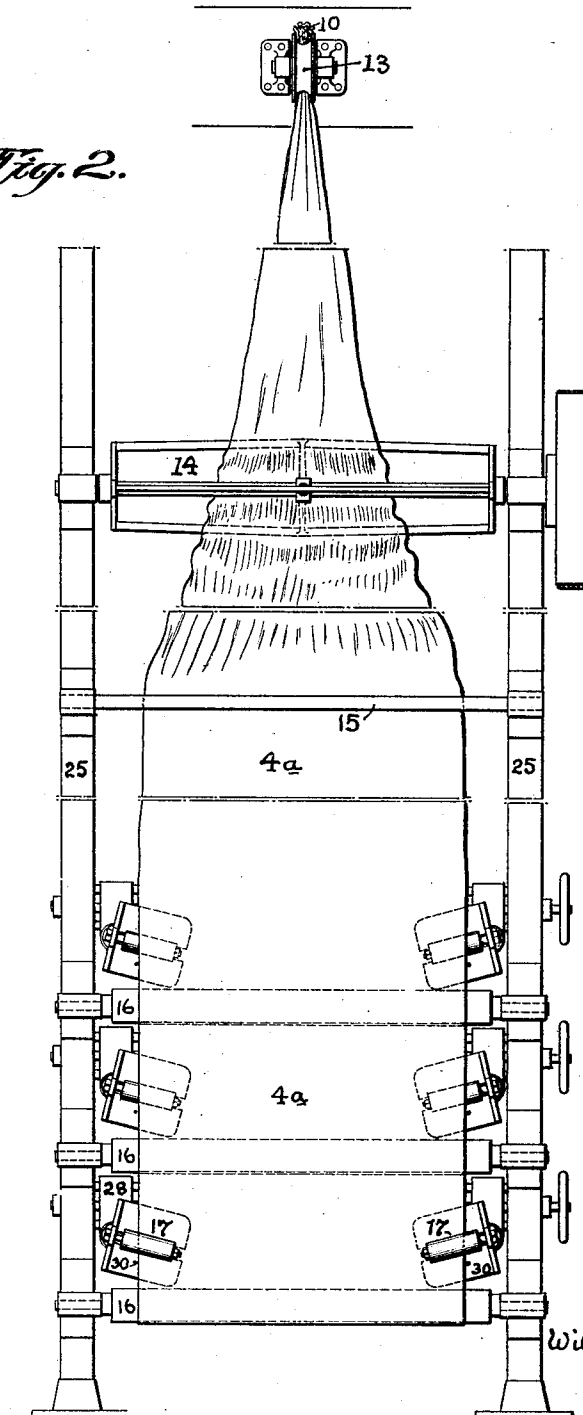


INVENTOR  
Wilfred Baucroft  
BY W. Baucroft  
ATTORNEY

## METHOD AND MEANS FOR TREATING LIGHT WEIGHT FABRICS.

**1,342,935.**

2 SHEETS—SHEET 2.



WILFRED BAUCROFT

**ATTORNEY**

# UNITED STATES PATENT OFFICE.

WILFRED BANCROFT, OF SLATERSVILLE, RHODE ISLAND.

## METHOD AND MEANS FOR TREATING LIGHT-WEIGHT FABRICS.

1,342,935.

Specification of Letters Patent.

Patented June 8, 1920.

Application filed October 13, 1919. Serial No. 330,309.

*To all whom it may concern:*

Be it known that I, WILFRED BANCROFT, a citizen of the United States, and resident of Slatersville, county of Providence, and State of Rhode Island, have invented an Improvement in Methods and Means for Treating Light-Weight Fabrics, of which the following is a specification.

My invention has for its object a method and means for treating light weight, low-count, piece goods in web form, during operations for bleaching, dyeing or other processes wherein delicate fabrics in web form must be treated and which, because of the nature of the weave, are liable to injury during such treatment.

In bleaching cotton cloth, it is customary to sew the pieces or web lengths, as they come from the loom, end to end to make a long length and which in this form is subjected to the various processes of bleaching. Such fabric after being thus sewed, is drawn through a ring, in order to change the cloth from the flat or open state in which it comes from the loom, into a strand or "rope" in which condition it is compact and easily handled. In this rope form, the fabric is fed into a keir where it is boiled, then it passes through pits containing bleaching chemicals, and through washing machines for thorough washing. During these operations, the rope is wet and before it can be dried and dyed, starched or otherwise finished, it must be opened out again into the flat form in which it was originally woven.

The usual operation for opening out of the rope is known as "scutching" which involves treatment in a machine called a "scutcher" and containing instrumentalities for beating back the twist in the rope so that the fabric may be opened and spread out to full width. The fabric during this latter operation is subjected to the action of a pair of scroll rolls, and thereafter to the operation of a guider bar which causes the cloth to travel straight, both through the machine and after leaving it. After the cloth leaves the scutcher, it may pass through one of several forms of machines, such as a mangle or drying cylinders and thereafter the cloth is delivered to boxes or other convenient receptacles or wound in rolls or batches.

The foregoing process has been found suitable for strong fabrics, but in all such methods of procedure, the rope comprised

only one ply of woven fabric from start to finish.

In bleaching very light weight fabric, with few threads to the square inch (known as "low-count" fabrics), it has not been found practical to handle it in rope form as heretofore practised, because of the tendency of the threads of the fabric becoming displaced upon each other and thereby delivering the goods in a defective condition. This slipping of the threads out of position, technically called "fraying", destroys the value of the cloth and is so serious that instead of employing this convenient method of bleaching in rope form, resort is had to "bolt-bleaching" or "lump-bleaching" and involving the separate handling of each piece of cloth received from the loom, notwithstanding the greater cost and slowness of the operation.

It is the object of my invention to so modify the rope method of handling fabrics, that it is possible to bleach the most delicate fabrics in rope form without danger of "fraying" and at the same time greatly increase the speed with which a given quantity of the fabric may be bleached.

Briefly stated, my invention consists in superimposing two or more pieces of cloth in web form, one upon another, at the beginning of the process of bleaching, and after passing through a wetting out machine, said multiple ply fabric is drawn through a ring to change the cloth from the flat to "rope" form of multi-strand construction, the number of strands being dependent upon the number of plies of cloth originally determined upon. The multi-strand rope thus provided, passes through all the usual machines and bleaching processes until the bleaching operation is completed and it is necessary to change the cloth webs from the rope form again to the flat form. During the treatment to the bleaching process, the several strands of the rope cooperate to relieve each strand from undue strain or thread displacing action, no matter how delicate the fabric; and in practice the greater the delicacy of the weave of the fabric, the greater number of superimposed webs are employed in making up the rope to secure protection against "fraying". After the bleaching of the multi-strand rope, it is subjected to a special scutcher treatment for separating the fabric webs

into flat and separated condition, whereby they may be separately received in suitable boxes; and in carrying out this part of my invention, I deliver the bleached rope from a grooved roller and downward to scutching devices wherein the beater bars beat back the twist and release the several strands in form of webs, which are next separately guided between sets of parallel guide bars, also parallel to the axes of rotation of the beaters, so that the shaking out of the twist by the beaters does not objectionably affect the cloth after it has passed through these guide bars on its way to the guiding and widening means. The plurality of fabric webs, thus separated, are led respectively about independent guide rolls so arranged that the webs are drawn apart or separated; and said webs before passing about the guide rolls are each subjected to action of a set of "guiders" which act upon the selvages to pull out the fabric to definite width and insure straightness thereof before passing about the guide roll to the mangle or drying rolls or cylinders. These webs are pulled through the beaters and guiders by the rolls of the mangle or drying cylinders so that the duty of the guiders is solely to straighten the fabric and bring it to proper width. From this, it is seen, that after the plurality of webs have been separated, widened and straightened, they are again superimposed and pass through the mangle or other power means for feeding the webs, through the apparatus; and thereafter, the webs are delivered to separate delivery mechanism for delivering the individual webs into separate boxes or receptacles.

The multiple strand rope permits rapid treatment and handling of the fabric without injury to the same in respect to "fraying" and as several webs are being simultaneously treated with the speed of a single web, it follows that the speed of bleaching is increased proportionally to the number of superimposed webs or plies employed; thereby not only enabling results to be secured which have heretofore been uncertain and difficult of accomplishment, but insuring the desired results at a greatly lessened time consumption per given length of fabric treated.

My invention also consists of improvements hereinafter described whereby the above objects and results are attained, said improvements comprising certain organization and combination of parts which are fully described hereinafter and more particularly defined in the claims.

For the purpose of illustrating my invention, I have shown in the accompanying drawings the embodiment thereof which is at present preferred by me, since the same is in form to give satisfactory and reliable results, but it is to be understood that the sev-

eral instrumentalities of which my invention consists can be variously arranged and organized and that my invention is not limited to the precise arrangement and organization of the instrumentalities herein shown and described.

Referring to the drawings: Figure 1 is a general elevation illustrating the more important features of apparatus employed in carrying out my improved method of treating fabrics in the rope; Fig. 2 is a front elevation of the scutching devices thereof; and Fig. 3 is a front elevation of one set of the guiders constituting a portion of the scutching devices.

2, 3 and 4 represent three rolls of cloth in condition as they come from the loom. These rolls of cloth are supported upon a suitable frame and the several webs therefrom are guided over rollers or guide bars and thence brought together in a superimposed condition to form a multiple web in passing through the wetting out machine or mangle 6. While, for the purpose of illustrating the practice of my invention, I have elected to employ three webs of fabric for simultaneous treatment, I may employ two or more, being only limited in number by the bulkiness of the rope or lack of sufficient exposure of all webs to insure uniform bleaching. My object will be answered by employing sufficient number of webs to prevent "fraying" and practice has demonstrated that satisfactory results may be had by employing a three ply web arrangement and three strand rope produced thereby.

The wet cloth 7 is then drawn through a ring 8 in order to change the cloth from the flat, opened-out state, into a strand constituting a multiply "rope" 10. This rope being formed of several strands will, by its nature, insure protection against the displacement of the threads of any strand, because each strand tends to relieve undue strain from the other strands, and the weakness of any single strand is protected by the combined strengths of the remaining strands. The multi-strand rope 10 is then guided over a grooved roll 9 and fed downward in the room indicated at 11 in which may be located the keir, pits and washing machines, and from which it emerges in a pure and white condition.

After being bleached the multi-strand rope 10 is guided over grooved rollers 12 and 13 and then led vertically downward through scutching devices of suitable construction. While I do not restrict myself in regard to the details of these devices, I prefer the following, as excellently adapted to the purpose of my special multi-strand rope.

14 are beaters such as used in scutching and rotate about horizontal axes and are so positioned that the fabric may pass vertically downward between them. The action

of these beaters 14 is to loosen the rope and beat back the twist therein to cause the webs to open up. In order that the beaters may have their fullest effect, I prefer to guide the respective webs of cloth through pairs of guide bars 15 placed parallel to the axes of the beaters, so that the shaking out of the twist by the beaters does not affect the cloth after it has passed through these guide bars on the way to the guiders which bring the cloth in the flat to proper width and straightness.

For convenient construction and support, the scutching devices may be secured to upright frames 25 extending from floor to ceiling and upon which the beaters may be journaled and the guide bars supported. At the lower portion of these frames 25 are journaled three guide rolls 16, one above the other and respectively out of vertical alinement. The three webs of cloth 2<sup>a</sup>, 3<sup>a</sup>, and 4<sup>a</sup>, descending from the guide bars 15 pass respectively about the three rolls 16 and thence to a roller 18 whereon the webs are superimposed again one upon another and in which condition they pass through the mangle 19 for washing and pressing the fabrics preliminary to their final separation. This machine 19, while having the function of a mangle, is a more vital element in the combination in that it provides the power for pulling the fabrics through the apparatus and more especially those portions thereof for scutching or opening up the fabric, changing it from rope to flat form.

17 represents three sets of guiders (generally known to the textile trade, as "Foxwell" guiders), one set being arranged for action upon the selvages of each web 2<sup>a</sup>, 3<sup>a</sup> and 4<sup>a</sup> before they reach the guide rolls 16, so that by their action the several webs may be brought to full width and straight condition and for accurate superimposing of one web upon another when they reach the mangle 19. These guiders 17 have their guiding rollers positioned with their axes oblique to the line of travel of the fabric (Fig. 2) and are adjustably pivoted upon carriages 28, in turn guided upon transverse guide rods 26 and under adjustment control of a screw shaft 27. The screw shaft has right and left hand screw threads at its respective ends so that when rotated it adjusts the two guiders 17 of a set to or from each other to suit fabrics of different widths. These guiders of the several sets are accurately positioned relatively to each other so that the several webs may be properly superimposed when they reach roller 18. It will not be necessary to describe in detail the construction of these guiders, as they are of the construction fully disclosed in Letters Patent No. 1,120,019, of December 8, 1914, and No. 1,312,153, of August 5, 1919, and to which reference is made. For

proper understanding of the nature of these guiders, it will suffice to say that they each comprise a fixed roller and movable roller arranged oblique to the line of travel of the cloth and between which the selvage passes. The movable roller is moved by a compressed air motor to pinch the fabric between the rollers as it is pulled forward when widening is required; and a trigger actuated by the selvage edge of the fabric is employed to relieve the air pressure of the motor and release the pinch when the fabric reaches proper width.

By this automatic action, the fabric is not only accurately widened to full width, but is straightened as well. The trigger is indicated at 30 in Figs. 2 and 3.

It is desirable that the several sets of guiders 17 be arranged reasonably close to the respective guide rollers 16; and it follows that these sets of guiders will be out of vertical and horizontal alinement, so that they and their respective fabrics in no way interfere with each other.

After the several pieces or webs of cloth have thus passed through the apparatus it only remains to deliver the several flat webs into different receptacles. This may be accomplished by a plurality of delivery mechanisms and such means is diagrammatically indicated in Fig. 1 and will now be briefly described.

The superimposed webs of cloth leaving the mangle 19 are indicated at 20 and these are guided over a roller 21 and at this point the lowermost web 2 is separated and drawn between feed rolls 22 and fed down to a swinging guide bar 23 whose oscillations lay the finished cloth in a receptacle 24, said feed rolls being synchronized as to speed with the speed of the mangle rolls. The remaining two webs pass over guide roller 21<sup>a</sup> and are thence separated into the webs 3 and 4 and respectively pass to the synchronized feed rolls 22 and guide bars 23 for delivery into separate receptacles 24, as in the case of web 2 first referred to. These means for delivering the fabric in finished form are well known and will need no further description, but the combination of a plurality of these delivery machines for separating superimposed fabric webs is novel and a material portion of my invention.

It is to be understood that in the practice of my process and employment of means for carrying it into effect, I am not to be restricted to details of construction in the elementary parts of the apparatus as it is my purpose and intention to utilize the most efficient features of textile machines now in commercial use, where possible, in adapting them to my invention. In this respect, the machine 19 may be a mangle or any other machine capable of putting an efficient pull upon the fabric being treated, whether said

machine be used for pressing or otherwise. Similarly, while I have indicated a commercial type of delivering mechanism, I do not restrict myself in this respect, as the fabrics may be rolled or bolted when separated, as  
5 may be found desirable. Furthermore, I have shown a very efficient scutching apparatus as the preferable form to be used, but I wish it to be understood that any other  
10 type or form of scutching apparatus may be employed, such for instance as those employing scroll rolls with the beaters and with other types of guide bars or devices for guiding the fabrics, as will be understood by those skilled in the art.

While my invention is specially intended for use in bleaching light weight, low-count fabrics, it may be employed with heavier weight goods of pliable nature and where an  
20 increased output is desired; and furthermore, while my process, involving the handling of the plurality of webs in a multi-strand rope form, is particularly adapted to bleaching, the same may be employed for  
25 other treatments such as dyeing where special processes are available. That is to say, the treatment of the rope within the confines of the room 11 may be for bleaching or any other purpose to which it may be desired to  
30 treat the fabric in the rope form and I, therefore, do not confine my invention to bleaching.

I have described my improved method and means in that particularity which I deem  
35 to be the best exposition of my invention, and that which I prefer in commercial practice, but I do not restrict or confine myself to the minor or secondary details, as such variations may be resorted to as matters of  
40 mechanical skill and without a departure from the spirit of the invention.

Having now described my invention, what I claim as new and desire to secure by Letters Patent, is:

45 1. The herein described method for treating woven fabrics in web form to processes such as bleaching, consisting in superimposing a plurality of flat webs of woven fabric, drawing them into a multi-strand rope form,  
50 thereafter subjecting the fabrics in the multi-strand rope condition to treatment for bleaching or the like, and finally separating the treated fabrics for independent handling.

55 2. The invention according to claim 1, further characterized by insuring the separating of the treated fabrics by beating out the multi-strand rope, separating the several webs from contact, stretching the webs  
60 transversely to full width while in action, and finally collecting the webs separately.

3. The invention according to claim 2, further characterized by again superimposing the several webs after being stretched  
65 to full width, subjecting the superimposed

webs to a pressing operation, and thereafter separating the webs in their finished condition for final separation.

4. The invention according to claim 1, characterized by beating out the multi-strand rope after treatment into a plurality  
70 of webs in the flat, guiding the webs in superimposed relation through a mangle by which the plurality of fabrics are pressed and simultaneously pulled through the apparatus, and subjecting the several webs between their treatment by the beaters and  
75 mangle to lateral stretching whereby they are brought to full and substantially equal width before pressing and final separation. 80

5. The method of treating light-weight, low-count, woven fabrics of web form to bleaching or like treatment, consisting in forming a multi-strand rope from a plurality of said woven fabrics, subjecting the  
85 multi-strand rope to the special treatment, separating the multi-strand rope again into the plurality of webs in flat form by scutching treatment and simultaneously therewith stretching the several webs to full width,  
90 simultaneously pulling upon all of the webs to draw them and the multi-strand rope through the apparatus, and finally separating the several webs one from another.

6. An apparatus for treating woven fabrics to bleaching or like treatments which consists of means for feeding a plurality of webs of fabric in superimposed relation, combined with means for changing the superimposed webs into a multi-strand rope,  
100 means for subjecting the multi-strand rope to bleaching or like treatment, means for beating out the multi-strand rope to separate the webs, means for guiding and stretching the webs to desired width, means for superimposing the several webs one upon the other, means for pulling simultaneously upon all the webs to feed them through the apparatus, and means for finally separating and delivering the finished webs. 110

7. An apparatus for treating woven fabrics to bleaching or like treatments which consists of means for feeding a plurality of webs of fabric in superimposed relation, combined with means for changing the superimposed webs into a multi-strand rope,  
115 means for subjecting the multi-strand rope to a bleaching or like treatment, means for beating out the multi-strand rope to separate the webs, guiding devices arranged in pairs for acting upon the respective selvages of the webs for independently guiding and stretching the webs to desired width, said pairs of guiding devices for the several webs of fabric arranged out of vertical and horizontal alignment, means for receiving the webs from the guides and superimposing the several webs one upon the other, means for pulling simultaneously upon all of the webs in superimposed relation to feed them 130

through the apparatus, and means for finally separating and delivering the finished webs.

8. An apparatus for treating woven fabric to bleaching or like treatments, which consists of means for feeding a plurality of webs of fabric in superimposed relation, combined with means for changing the superimposed webs into a multi-strand rope, means for subjecting the multi-strand rope to a bleaching or like treatment, means for subjecting the rope to a scutching operation to separate the several webs in flat form, and means for delivering the treated webs separately.

9. An apparatus for treating woven fabrics to bleaching or like treatments which consists of means for feeding a plurality of fabric in superimposed relation, combined with means for changing the superimposed webs into a multi-strand rope, means for subjecting the multi-strand rope to a bleaching or like treatment, means for subjecting the rope to a scutching operation said means having guiding devices for separating the several webs and independent devices for stretching each of the webs when separated, whereby they are all brought to substantially the same width and straightened, and means for delivering the treated webs separately.

10. In apparatus for treating woven fabrics to bleaching or like treatments, means for treating web fabric in the rope form, combined with guiding means for the treated rope, guiding bars between which the fabric in flat web form passes, beaters between the guiding means and guiding bars for beating out the rope of cloth as it travels toward the beaters, said guiding bars acting to prevent undue vibration or oscillation to the cloth, and means for guiding

and stretching the cloth to width arranged to act thereon after it leaves the guide bars, said guide bars enabling the guiding and stretching means for the cloth to function advantageously.

11. Means for combining a plurality of webs of fabric into a multi-strand rope, means for subjecting the rope to bleaching or like treatment, beaters for beating out the rope into the several webs, guide bars for guiding the webs after leaving the beaters and keeping the webs separate, guides at a distance from the guide bars for separately guiding the webs whereby they are guided part, means acting upon the selvages of the respective webs for stretching the webs to width while separated, and means for delivering the finished webs of fabric separately.

12. Means for combining a plurality of webs of fabric into a multi-strand rope, means for subjecting the rope to bleaching or like treatment, beaters for beating out the rope into the several webs, guide bars for guiding the webs after leaving the beaters and keeping the webs separate, guides at a distance from the guide bars for separately guiding the webs whereby they are guided apart, means acting upon the selvages of the respective webs for stretching the webs to width while separated, rolls between which the superimposed webs of fabric pass and are pressed and by which they are simultaneously drawn through the apparatus, and means for delivering the finished webs of fabric separately.

In testimony of which invention, I hereunto set my hand.

WILFRED BANCROFT.

Witnesses:

WILLIAM F. O'KEEFE,  
CHARLES H. SCOTT.