

No. 685,085.

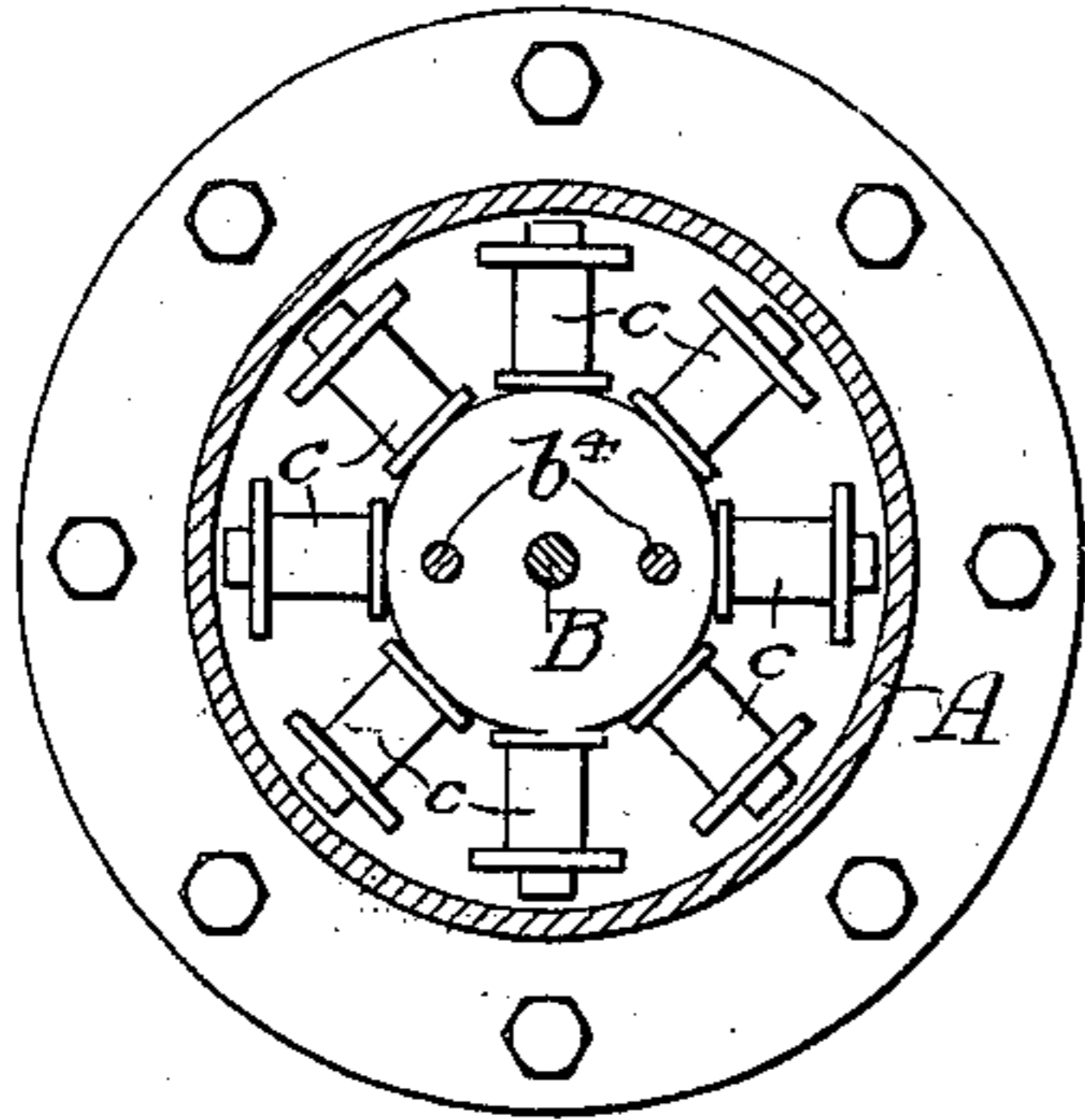
Patented Oct. 22, 1901.

W. D. ASHWORTH.  
PROCESS OF MERCERIZING.

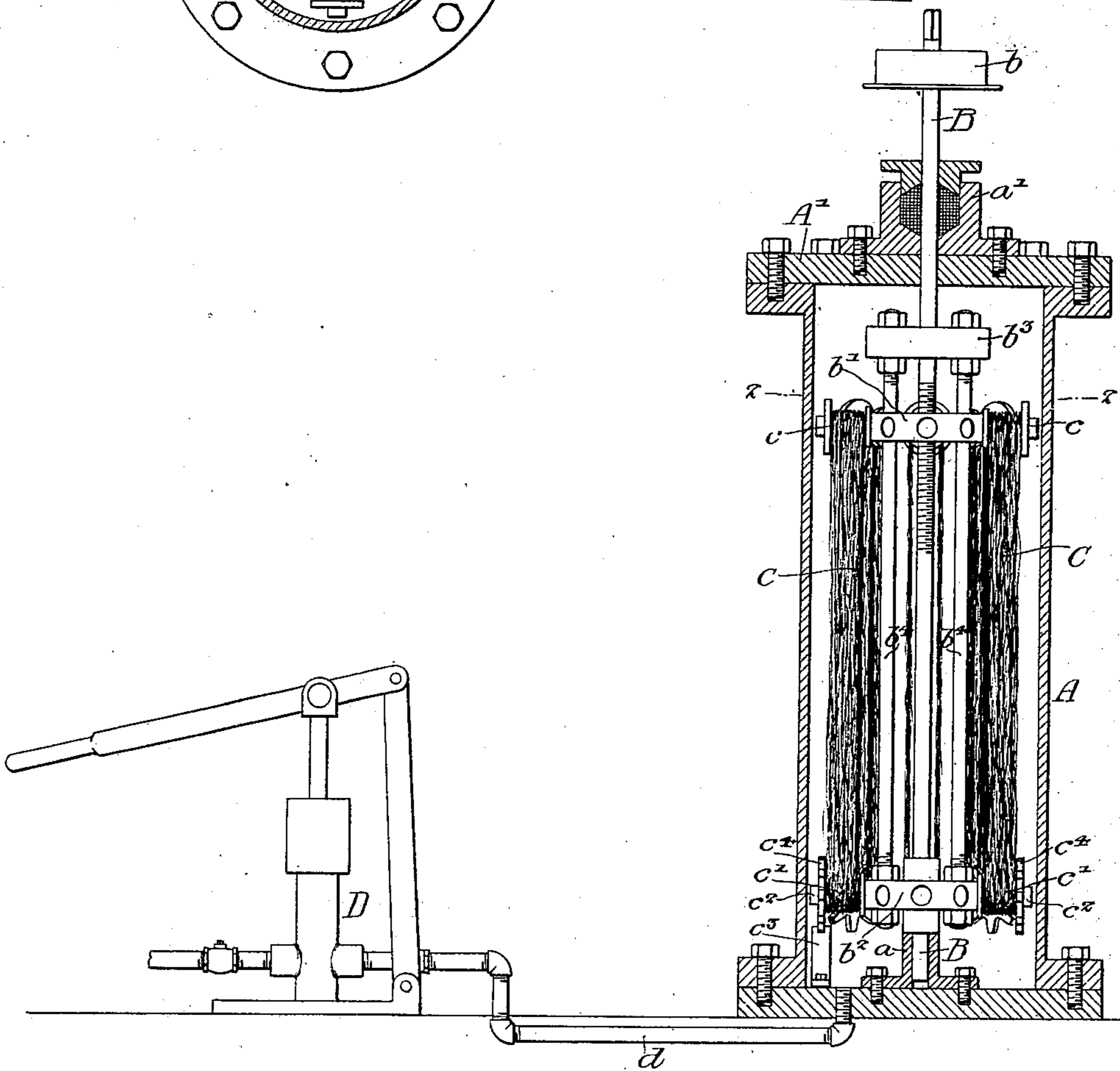
(Application filed May 9, 1901.)

(No Model.)

*Fig. 2.*



*Fig. 1.*



Witnesses:  
Herman C. Wikius.  
Esaias P. Lundahl

Inventor:  
William D. Ashworth  
by his Attorneys;  
Humm & Humm

# UNITED STATES PATENT OFFICE.

WILLIAM D. ASHWORTH, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO  
THE PHILADELPHIA TEXTILE MACHINERY COMPANY, OF PHILADEL-  
PHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

## PROCESS OF MERCERIZING.

SPECIFICATION forming part of Letters Patent No. 685,085, dated October 22, 1901.

Application filed May 9, 1901. Serial No. 59,396. (No specimens.)

*To all whom it may concern:*

Be it known that I, WILLIAM D. ASHWORTH, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented  
5 an Improved Process of Mercerizing, of which the following is a specification.

My invention relates to certain improve-  
ments in the process of mercerizing articles  
or material made from cotton or other vege-  
10 table fibers, having for its object the produc-  
tion of a more brilliant luster than has hith-  
erto been obtainable by the various methods  
at present in use, a further object being to  
prevent shrinkage of the material under  
15 treatment. These objects I attain as herein-  
after set forth, reference being had to the ac-  
companying drawings, in which—

Figure 1 is an elevation, partly in section,  
of one form of apparatus in which my im-  
20 proved process can be carried out, a number  
of the yarn-carriers being removed for the  
sake of clearness; and Fig. 2 is a sectional  
plan view of the same, taken on the line 2 2,  
Fig. 1.

25 When cotton yarn in skeins or in hanks,  
for example, is immersed in a vessel of caustic  
alkali, it immediately tends to shrink,  
this being overcome by keeping the material  
in a stretched or tense condition. For this  
30 purpose special devices are used and the sub-  
stance is held to its original dimensions till  
the tendency to contract has ceased. It will  
be understood by those skilled in the art that  
while in this tense or stretched condition the  
35 material under treatment resists the pene-  
trative action of the alkaline bath to an ex-  
tent proportional to the amount of tension to  
which it is subjected. In order, therefore,  
to insure thorough action of the bath by  
40 which the desired lustrous appearance is at-  
tained much time is required, for, unlike its  
action when in a loose condition, the yarn does  
not readily absorb the said alkali.

In carrying out my improved process, which  
45 has been found to overcome the difficulties  
above noted, as well as to reduce the time of  
treatment, I preferably employ a closed ves-  
sel A, provided with an easily-removable but  
air-tight cover A', through which passes a

shaft B. This shaft is supported in a bear- 50  
ing *a* within the vessel and passes through a  
stuffing-box *a'* on the cover A'. A driving-  
pulley *b* is fixed to the upper end of the shaft,  
upon which are mounted two disks *b'* and *b*<sup>2</sup>  
within the casing A, which disks are free to 55  
turn upon the shaft. The upper disk *b'* is  
threaded upon the shaft and is adapted to be  
revolved by means of two vertical bars *b*<sup>4</sup>,  
which extend between the lower disk and a  
60 piece *b*<sup>3</sup>, immovably fixed to the shaft, and  
the upper disk is free to slide vertically upon  
said bars. A series of carriers *c* and *c'* are  
placed around the peripheries of the disks *b'*  
and *b*<sup>2</sup>, respectively, and between these the  
65 yarn or other material C is hung. Star-wheels  
*c*<sup>4</sup> are fixed to the pins or shafts *c*<sup>2</sup> of the  
lower series of carriers *c'*, and there is a sta-  
tionary tappet *c*<sup>3</sup> suitably placed to engage  
the teeth of these wheels as the shaft B is re- 70  
volved, thereby rotating the carriers, as the  
corresponding star-wheel of each carrier en-  
gages the tappet while the shaft B is rotat-  
ing. An air-pump D of any desired construc-  
tion is placed in communication with the in- 75  
terior of the casing A by means of the pipe *d*.

In operating my process the casing A is  
partly filled with mercerizing liquid, into  
which the shaft B, with its attached disks and  
carriers, is introduced, the yarn, &c., having  
80 been previously stretched to dimensions some-  
what greater than normal by turning the  
shaft before the piece *b*<sup>3</sup> is fixed in place.  
After the vessel has been made air-tight by  
screwing down the cover the pressure within  
85 the vessel is raised, by means of the pump D,  
to a point which is determined by experience  
to be most advantageous, such increase of  
pressure being sufficient to force the alkaline  
solution thoroughly and evenly through the 90  
fiber, the whole operation occupying but lit-  
tle time. In order to further increase the  
luster of the material treated, it is moved at  
a high rate of speed through the liquid with-  
in the mercerizing vessel while the same is 95  
still under pressure through the medium of  
the tappet *c*<sup>3</sup>, engaging the star-wheels *c*<sup>4</sup>,  
thereby causing the carrier to rotate, and  
thus causing the yarn to move through the

bath, the speed of such movement being controlled by the rate of the revolution of the shaft B, and the rapid motion thus imparted to the yarn through the bath insures its uniform exposure to the mercerizing liquid. The washing and subsequent treatment of the fiber are preferably accomplished outside of the vessel in which the pressure is applied, although it will be understood that I may, if desired, perform these operations in the same vessel.

By means of my process shrinkage of the material treated is prevented and an even, thorough, and quick penetration of the same by the alkaline solution is secured.

I claim as my invention—

1. The herein-described process of mercerizing, said process consisting in maintaining

the fiber in a condition of tension while it is immersed in a bath of mercerizing liquid maintained under fluid-pressure, substantially as described.

2. The herein-described process of treating fabrics, said process consisting in maintaining the fiber in a condition of tension while it is immersed in a bath of mercerizing liquid maintained under fluid-pressure, and moving said fiber through said bath, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM D. ASHWORTH.

Witnesses:

WILLIAM E. BRADLEY,  
JOS. H. KLEIN.