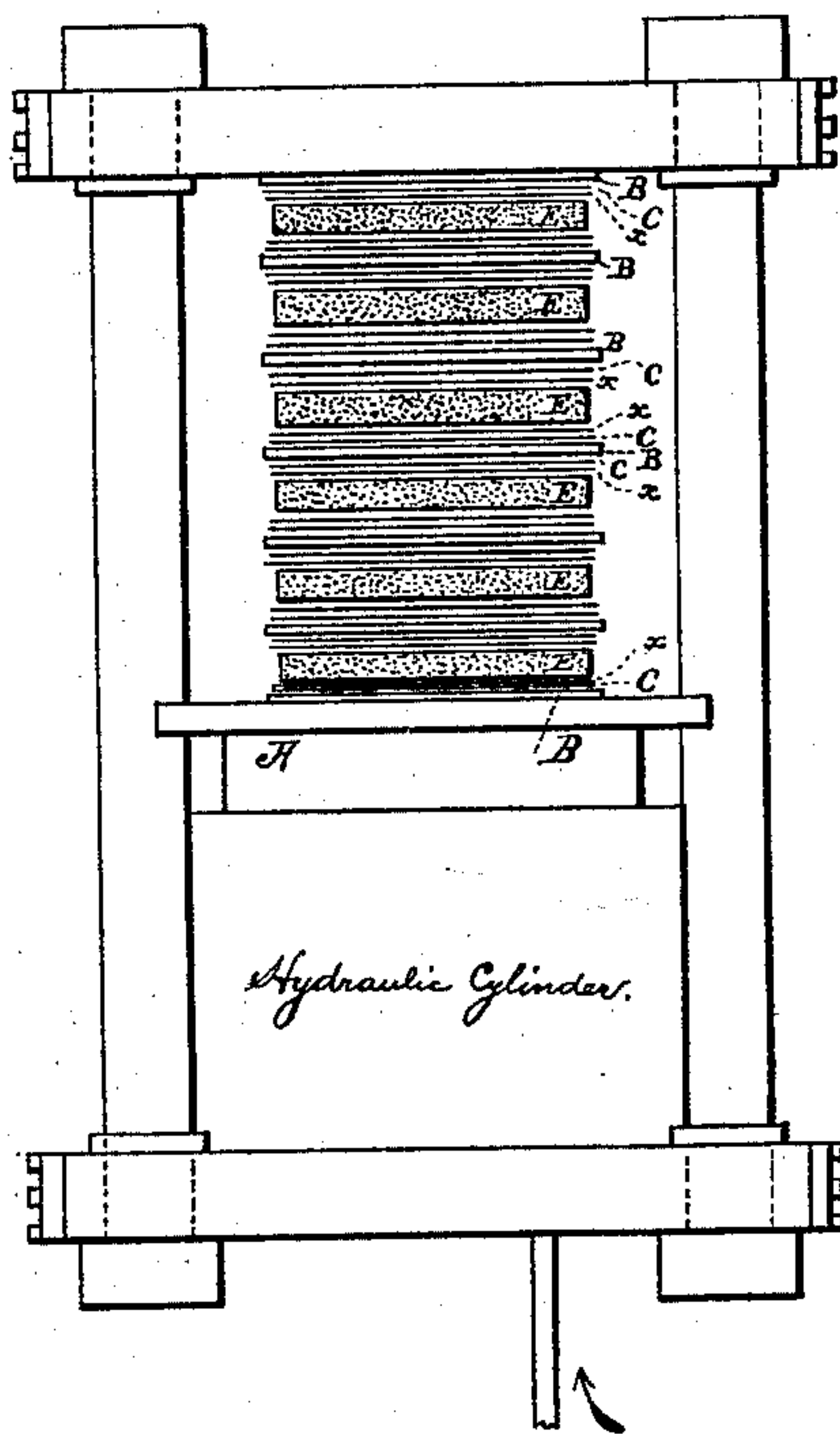


(No Model.)

J. W. HYATT, W. H. WOOD & J. H. STEVENS.
PROCESS OF AND APPARATUS FOR EFFECTING THE DESICCATION OF
PYROXYLINE PULP.

No. 296,968.

Patented Apr. 15, 1884.



WITNESSES:

Herman Gustow
William B. Ellison

INVENTORS:

John W. Hyatt,
Wm H. Wood and
BY *John H. Stevens*
Chas. O. Bill
ATTORNEY

UNITED STATES PATENT OFFICE.

JOHN W. HYATT, WILLIAM H. WOOD, AND JOHN H. STEVENS, OF NEWARK,
NEW JERSEY, ASSIGNORS TO THE CELLULOID MANUFACTURING COM-
PANY, OF NEW YORK, N. Y.

PROCESS OF AND APPARATUS FOR EFFECTING THE DESICCATION OF PYROXYLINE PULP.

SPECIFICATION forming part of Letters Patent No. 296,968, dated April 15, 1884.

Application filed February 11, 1884. (No model.)

To all whom it may concern:

Be it known that we, JOHN W. HYATT,
WILLIAM H. WOOD, and JOHN H. STEVENS,
citizens of the United States, and residents of
Newark, in the county of Essex and State of
New Jersey, have invented certain new and
useful Improved Processes and Apparatus for
Effecting the Desiccation of Pyroxyline Pulp,
of which the following is a specification.

The invention has relation to an improved
process and apparatus for effecting the desic-
cation of pyroxyline. We contemplate espe-
cially the treatment of pyroxyline pulp either
before or after the pulp has been mixed with
solvents, pigments, or other substances; but
it may be successfully employed in the treat-
ment of pyroxyline which has not been re-
duced to the form of pulp.

The instrumentalities which we use in car-
rying out our process are a hydraulic press
which is so constructed that enormous press-
ure can be produced, and metallic or other
suitable sheets or pieces and pads or sheets of
bibulous material, the sheets being adapted to
the size of the press. The drawing shows a
vertical section of such a press.

The pyroxyline is by preference made into
the form of a cake or layer, and a pile erected
or built up consisting of, first, a pad of bibu-
lous material; second, a layer of pyroxyline;
third, a pad of bibulous material; and, fourth,
a metallic or other suitable sheet, the whole
built up in this way to consist of as many lay-
ers as may be convenient. The pile thus
formed is subjected to enormous pressure,
whereby the aqueous particles are expelled
from the pyroxyline, suitable provision being
made for their escape, after which the pyroxy-
line is treated to remove any of the aqueous
particles which may not have been expelled
by the principal operation. The method in
so far as it involves the use of sheets of bibu-
lous material is not new, the use of bibulous
sheets being described and claimed in Letters
Patent of the United States No. 133,229,
granted to I. Smith Hyatt and John W.
Hyatt for improvement in process of and ap-
paratus for manufacturing pyroxyline, dated

November 19, 1872; but in the said Hyatt pro-
cess the water is extracted by absorption by
means of dry blotting-papers under pressure,
the operation being repeated several times by
removing the wet papers and substituting dry
ones until the cakes of pyroxyline are dry.
The pressure used is about five hundred and
fifty pounds to the square inch of cake surface,
and the water is entirely absorbed by the pa-
pers, which are afterward dried and reused.
In our process the bibulous agents or blotting-
papers are used in a different way, as herein-
after more fully explained.

We are also aware that the employment of
great pressure for the purpose of expelling the
water from wet pyroxyline is not new; but we
have found that even where enormous press-
ure is used there are difficulties in effecting
the permanent removal of the water that is
expelled and preventing its being in part re-
absorbed by the pyroxyline as soon as the
pressure is discontinued. The object of our
invention is to render the employment of great
pressure by discarding or retaining control of
the water as fast as it is expelled from the
pyroxyline. This we accomplish by the use
of bibulous material or blotting-pads in such
a manner as to afford a ready escape for the
water, and at the same time prevent the re-
turn of any considerable percentage to the
cake of pyroxyline when the pressure is dis-
continued. Various bibulous substances—
such as sponge, cloth, linen, and felting—may
be used; but we prefer to employ blotting-pa-
per for many reasons. We do not find it nec-
essary to renew them until they are worn out;
nor is it necessary that they be dried, because,
although still containing considerable moist-
ure after being subjected to the great press-
ure used in the operation, they retain suffi-
cient capillary attraction to absorb whatever
water may be present when the pressure is
discontinued, thus preventing its return to the
cake. By the use of our pads in connection
with enormous pressure we are enabled to ex-
pel a large percentage of the water, leaving
only about five per cent. to the weight of the
cake, which small amount is readily removed

by a subsequent pressure between dry blotting-papers or otherwise.

In practice we prefer to grind the pyroxyline to a pulp by suitable means, at the same time mixing in camphor and such pigments or coloring materials as may be desired. As the pyroxyline in a dry condition is very inflammable, we prefer to leave about, say sixty per cent. of water in it, so that it can be mixed and ground without danger of ignition. After the grinding has been effected it is necessary to extract the moisture before the pyroxyline can be dissolved or converted into a solid compound, to effect which is the object of our invention; but it is obvious, as hereinbefore stated, that the pyroxyline can be deprived of its water by our process without grinding it or mixing it with camphor.

We take the pulp impregnated with water, as aforesaid, and form it into cakes of convenient thickness, and of a size adapted to the size of the press. Upon the platform A we place a metallic sheet, B, then a layer of bibulous material C, formed of, say, a dozen sheets of blotting-paper, then a cake of pulp, E, then a layer of bibulous material, C, then a metallic sheet, a layer of bibulous material, a cake of pulp, and so on, a pile of any desired height being formed in this way in which the layers of bibulous material are separated by metallic sheets and the cakes of pulp brought in contact with the bibulous surfaces, substantially as illustrated in the drawing; and for the purpose of preventing the bibulous surface from adhering to the cake of pulp a sheet of linen, *x*, may be placed on each side between the paper and the pyroxyline cake or layer. After the pile has been formed, as hereinbefore set forth, pressure is applied, elevating the movable platform with immense power, causing the compression of the pile and the expulsion of the aqueous particles which are run off by means of the waste-pipe *p* or otherwise discarded.

We have found that the thickness of the cake or layer of pyroxline, the thickness of the bibulous pad, the degree of pressure, and length of time the pressure is continued are considerations of controlling importance. For instance, a cake of pulp twelve inches square ought to weigh after it has been desiccated say about thirty ounces, and each pad when formed for the same consisting, say of a dozen sheets of blotting-paper, should when dry weigh about twelve ounces. To accomplish the desiccation of the cake, the pressure used should be about seven thousand five hundred pounds to the square inch, and the pile of cakes should be left under pressure from forty to sixty minutes. To use a lighter or heavier cake or fewer sheets of blotting-paper would render the process less effective. In regard to the degree of pressure, to use less would not cause the removal of as large a percentage of water, and to use more would tend to wear out too rapidly the pads of bibulous material;

and where the continuance of the pressure is for a shorter time the percentage of water removed is considerably reduced. Under the conditions just stated the cakes of pulp retain say about five per cent. of water, which can be removed by one subsequent pressure in dry blotting-papers, or the final desiccation can be effected in a drying-room or otherwise, as may be convenient. We prefer to use the blotting-papers both for convenience and greater safety. However, where it has heretofore been the practice to dry the pyroxyline in quantities in warm air, the use of this process would leave so little moisture to be removed that the drying could be safely performed in fractional lots.

In using the term "metallic sheets" it is not to be understood that it is essential that the sheet shall be made of metal, as a sheet or plate of any material which will serve to divide the layers of bibulous material, and having sufficient strength to resist the pressure and retain the shape of the pile may be successfully made use of.

While the use of plates is desirable as enabling the treatment of a considerable number of cakes or charges of pyroxyline simultaneously, it is obvious that a single cake or charge may be successfully desiccated by using only the bibulous or absorbing pads, the desiccation being as effectually accomplished as when the plates are used.

It is also obvious that the press which we have described is not in any sense of the essence of our invention, except as an illustration of a means whereby the process can be successfully carried out.

It will also be understood that different kinds of bibulous material may be employed, and that we do not limit ourselves to any particular kind.

We strongly recommend the use of blotting-paper, the advantages of which have been referred to; but we do not limit our claim to the use of any particular kind of bibulous material, nor to bibulous material in any particular condition.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. The process herein described of effecting the desiccation of pyroxyline containing water, which consists in, first, subjecting it, with an absorbing agent, to great pressure in a press, whereby a large percentage of the aqueous particles are expelled; and, second, removing the moisture that remains by subsequent treatment of an analogous character or otherwise, substantially as set forth.

2. The process of effecting the desiccation of pyroxyline pulp containing water herein described, which consists in, first, forming the pulp into a cake; second, subjecting the cake to great pressure in contact with a surface of bibulous material, whereby a large percentage of the aqueous particles is removed; and, third, completing the desiccation by subjecting the

partly-desiccated material to the action of a surface of dried bibulous material or otherwise, substantially as set forth.

3. The process herein described of effect-
5 ing the desiccation of pyroxyline containing water, which consists in forming a pile composed of a series of layers of pyroxyline, bibulous material, and plates B, and subjecting the pile thus formed to pressure, substantially
10 as set forth.

4. The process herein described of effect-
ing the desiccation of pyroxyline containing water, which consists in forming a pile composed of a series of layers of pyroxyline, bib-
15 ulous material, and plate B, and subjecting the pile thus formed to pressure, and then subjecting the pyroxyline to further treatment by means of dry bibulous material, or otherwise, to free it from the moisture which
20 remains, substantially as set forth.

5. The process herein described of effect-
ing the desiccation of pyroxyline containing water, which consists in forming a pile composed of a series of layers of pyroxyline, pads
25 of blotting-paper, and plates B, and subjecting the pile thus formed to pressure, substantially as set forth.

6. The process herein described of effect-

ing the desiccation of pyroxyline containing water, which consists in forming a pile com- 30
posed of a series of layers of pyroxyline, blotting-paper, and plate B, and subjecting the pile thus formed to pressure, and then subjecting the pyroxyline to further treatment
35 by means of dry bibulous material, or otherwise, to free it from the moisture which remains, substantially as set forth.

7. The process herein described of effect-
ing the desiccation of pyroxyline, which consists in, first, subjecting it with an absorbing 40
agent to great pressure in a press, the pressure being continued for a given time; and, second, effecting the removal of the moisture which remains by subsequent treatment with
45 a dry absorbing agent or otherwise, substantially as set forth.

Signed at New York, in the county of New York and State of New York, this 2d day of February, A. D. 1884.

JOHN W. HYATT.
WILLIAM H. WOOD.
JOHN H. STEVENS.

Witnesses:

CHAS. C. GILL,
HERMAN GUSTOW.