

No. 791,470.

PATENTED JUNE 6, 1905.

E. D. JEFFERSON.
VOMITING KIER.
APPLICATION FILED MAR. 9, 1903.

2 SHEETS—SHEET 2.

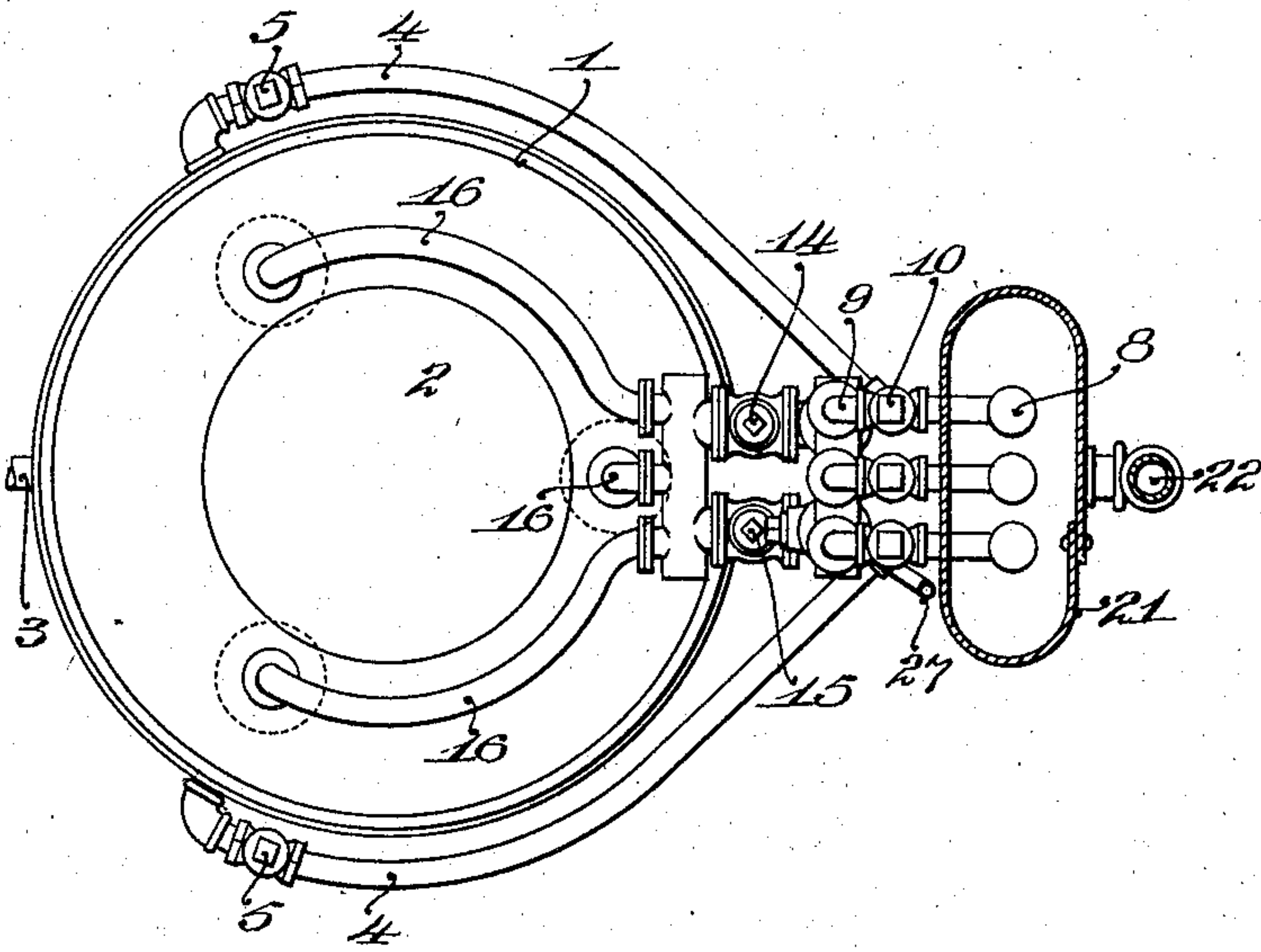


Fig. 2.

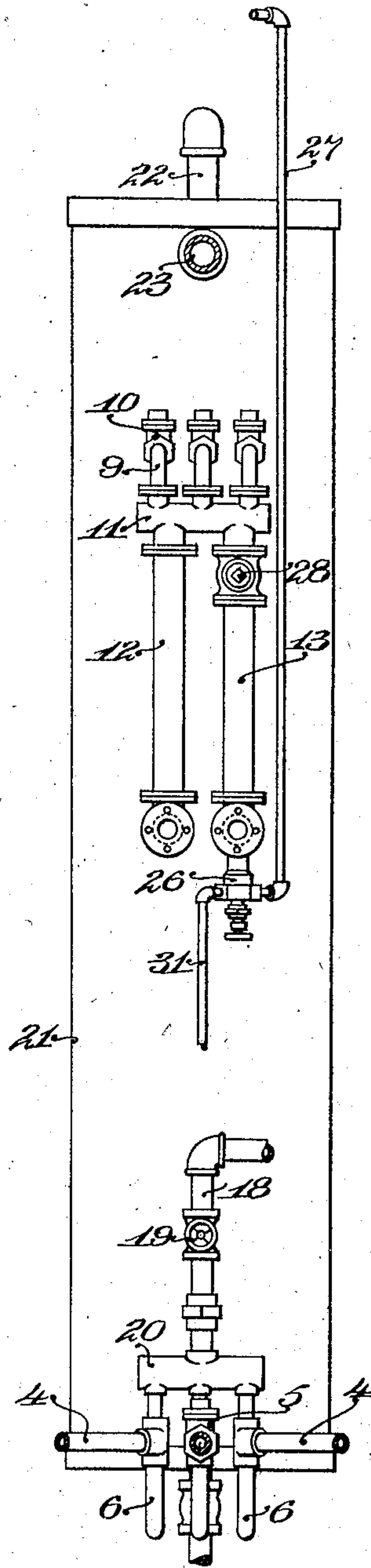


Fig. 3.

Witnesses
Edward S. Day
Furnum F. Dorsey

Inventor.
Eugene D. Jefferson
by his Attorneys
Phillips Van Euren & Fish

UNITED STATES PATENT OFFICE.

EUGENE D. JEFFERSON, OF LOWELL, MASSACHUSETTS.

VOMITING-KEIR.

SPECIFICATION forming part of Letters Patent No. 791,470, dated June 6, 1905.

Application filed March 9, 1903. Serial No. 146,813.

To all whom it may concern:

Be it known that I, EUGENE D. JEFFERSON, a citizen of the United States, residing at Lowell, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Vomiting-Keirs; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to an improvement in vomiting-keirs.

In bleaching silk it has been the practice to place the silk in a vat or keir and to fill the same with bleaching liquor, then to admit the steam at the bottom of the vat to heat the bleaching liquor or "acid," as it is ordinarily termed by bleachers. The admission of the steam is continued until the temperature of the bleaching liquor has been raised thereby to the desired extent. In bleaching silk it is important that the temperature of the bleaching liquor in contact with the silk should never exceed a certain predetermined amount, and this fact has necessitated watchful care on the part of the operator to prevent the steam from raising the temperature of the bleaching liquor above such point. Furthermore, it has been found by experience that the bleaching of silk is slower when the silk is completely immersed in the bleaching liquor than when the bleaching liquor is applied to a mass of the silk and allowed to percolate therethrough. I do not fully understand why this should be so, but the fact remains.

The object of the present invention is to produce an apparatus for bleaching silk in which the bleaching liquor percolates through the silk and in which, preferably, the silk is not immersed in the body of the bleaching liquor, but in which the bleaching liquor is applied to the top of the mass of silk and percolates downward, being returned by circulatory pipes to the top of the keir.

More especially considered, the object of the present invention is to reorganize and improve the vomiting-keir patented to me and another October 25, 1898, No. 612,874, to adapt the same to use in washing and bleaching silk, and

to provide means which when the apparatus is used for bleaching silk will prevent the temperature of the bleaching liquor from rising above a predetermined point.

In the drawings, Figure 1 represents in vertical elevation, partly in section, the vomiting-keir embodying the present invention. Fig. 2 is a horizontal section upon the line 2 2, Fig. 1. Fig. 3 is a sectional elevation of the cooling-chamber and part of its connections with the keir, taken upon the line 3 3, Fig. 1, looking from left to right.

The illustrated embodiment of the present invention is a form of the keir patented to me and another October 25, 1898, No. 612,874, to which have been applied means for preventing the temperature of the bleaching liquor from exceeding a predetermined maximum. The apparatus is constructed as follows: A keir 1, to which access is had through a manhole closed by a cover 2, has a valved inlet 3 and a plurality of outlets 4, provided with check-valves 5, opening away from the keir. The outlets 4 are connected, through traps 6, with vertical risers 7, which enter condensing-chambers 8. Pipes 9, provided with check-valves 10, opening away from the risers 7, are connected by a suitable fitting 11 with drop-legs 12 and 13. The bottoms of said drop-legs are provided with valves 14 and 15. Inlet-pipes 16, connected with the drop-legs by a branch T through the said valves, pass into the top of the keir and are provided with deflectors 17. The steam-pipe 18 is connected, through a valve 19, with a branch T 20, through which it communicates with the traps 6. The risers 7 and the condensing-chambers 8 are inclosed within a cooling-chamber 21, having an outlet 22 and an inlet-pipe 23, in which there is a valve 24, controlled by a diaphragm mechanism 25. In the drop-leg 13 is a thermostat 26 of an ordinary commercial form having a water connection 31 and a drip-pipe 32. This thermostat is connected by a pipe 27 with the diaphragm mechanism 25. A valve 28 is placed in the drop-leg 13 above the thermostat.

The operation of the apparatus above described is as follows: The silk to be bleached is inserted in the keir through the manhole,

which is then closed by the cover 2. The silk rests upon the grating 30 above the bottom of the keir. Water is then admitted to the keir through the inlet 3. A part of the water runs out through the outlets 4 and the check-valves 5 into the traps 6. Live steam is then admitted through the steam-pipe 18, which entering the traps on the keir side thereof forces the water in the traps up through the risers 7 and discharges the same through the pipe 12, above described, upon the top of the silk in the keir. The valves 28 and 15 of the pipe 13 are closed during the operation of washing the silk, because it is not necessary that the temperature should be prevented from rising to the boiling-point of water. This thermostat being a delicate instrument, it is prejudicial to it to permit it to be raised to temperatures above those at which it is normally used, and consequently the means above described are employed to cut off the said thermostat from contact with the washing liquor during the washing of the silk. After the silk has been properly washed by the continued operation of the apparatus the water is drawn off from the keir through the inlet 3 and bleaching liquor is introduced. The valves 28 and 15 in the pipe 13 are now opened and the valve 14 in the pipe 12 is closed. The operation of the apparatus is substantially the same as in washing, except that the bleaching liquor is caused to pass by and in contact with the thermostat 26. In bleaching, the thermostatic apparatus is thrown into operation and the cooling-chamber is employed. When the temperature of the bleaching liquor passing through the pipe 13—that is, the temperature of the bleaching liquor as applied to the silk—reaches a predetermined point, which for silk is about 140° Fahrenheit, the thermostat operates to communicate fluid-pressure through the pipe 27 to the diaphragm mechanism 25, expanding the diaphragm and opening the valve 24 and permitting water or other cooling agent to flow through the pipe 23 into the cooling-chamber 21, thus cooling the risers 7 and their contents and reducing the temperature of the bleaching liquor as it circulates through the apparatus. The extent to which the reduction of temperature is carried is automatically governed by the thermostat, so that as soon as the bleaching liquor passing down through the pipe 13 in contact with the thermostat is cooled below the temperature at which the thermostatic apparatus opens the valve 24 the said valve is then closed and held closed

until the temperature of the bleaching liquor again rises to the danger-point.

It is to be understood that the present invention is not limited to embodiment in connection with the vomiting-keir of the said patent, but that it may be employed in connection with keirs of other construction. It is also to be noted that the present invention, although especially designed for bleaching silk, is not intended exclusively for such use, as it may be employed in other connections.

Having thus described the invention, what is claimed is—

1. A vomiting-keir, having, in combination, a keir, a vomiting-pipe connecting the top and bottom of the keir, and a cooling-chamber surrounding a part of the vomiting-pipe, substantially as described.

2. A vomiting-keir, having, in combination, a keir, a vomiting-pipe connecting the top and bottom of the keir, means for cooling the liquor in its passage therethrough, and means controlled by the temperature of the liquor for automatically regulating the operation of the said cooling means, substantially as described.

3. A vomiting-keir, having, in combination, a keir, a vomiting-pipe connecting the top and bottom of the keir, a cooling-chamber surrounding a portion of the vomiting-pipe, a valve for controlling the flow of cooling medium therethrough, a thermostat affected by changes of temperature of the liquor in the keir, and means operatively connecting the thermostat with the said valve for controlling the same and regulating the flow of cooling medium through the cooling-chamber, substantially as described.

4. A vomiting-keir, having, in combination, a keir, a vomiting-pipe connecting the top and bottom of the keir, a steam-pipe connected with the vomiting-pipe and acting to heat the contents of the keir in its passage from the vomiting-pipe from the top to the bottom of the keir, and to raise it from the bottom to the top thereof, means for cooling said vomiting-pipe and its contents, and means controlled by the temperature of the liquor for automatically regulating the operation of said cooling means, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

EUGENE D. JEFFERSON.

Witnesses:

HORACE VAN EVEREN,
FARNUM F. DORSEY.