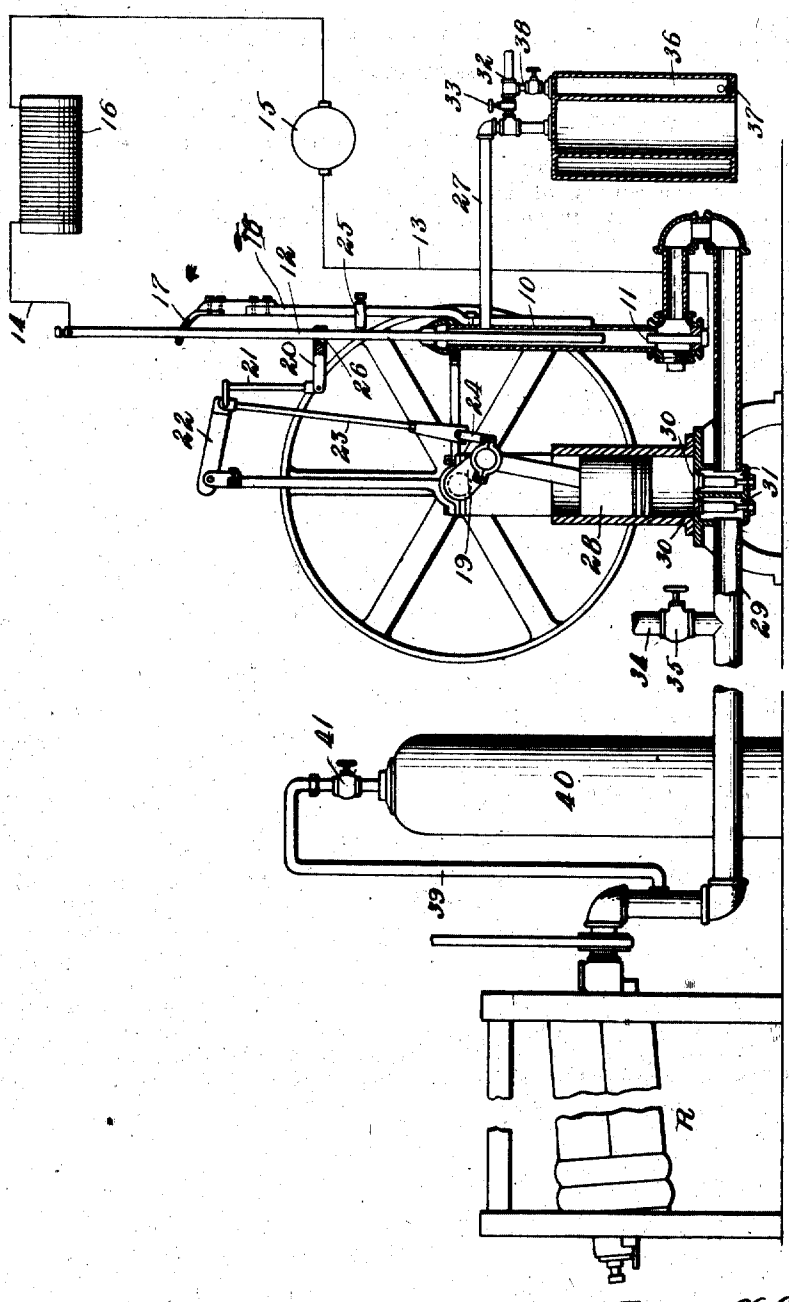
J. N. ALSOP.

PROCESS OF BLEACHING AND MATURING FLOUR.

APPLICATION FILED MAR. 15, 1915.

1,250,072. Patented Dec. 11, 1917.



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PROCESS OF BLEACHING AND MATURING FLOUR.

1,250,072. Specification of Letters Patent. Patented Dec. 11, 1917.

Application filed March 15, 1915. Serial No. 14,485.

To all whom it may concern:

Be it known that I, JAMES N. ALSOP, a citizen of the United States, residing at Owensboro, in the county of Daviess and State of Kentucky, have invented new and useful Improvements in Processes of Bleaching and Maturing Flour, of which the following is a specification.

This invention relates to a process of treating flour and more particularly to the artificial bleaching and maturing of the same.

In the United States pending application, Serial No. 873,038, filed by me on November 19, 1914, is set forth a process of treating flour which has proved very advantageous and of great commercial value. The process, as set forth therein, consists broadly in the process of treating flour to an atmosphere which has been subjected to a disruptive electric discharge, and to which moisture has been added.

The bleaching qualities of chlorin are well-known, and chlorin has been used in the art of bleaching flour. However, it has been found that by treating flour with chlorin as the sole bleaching agent, a partial bleach only is obtained, and although the flour be repeatedly subjected to the action of chlorin it cannot be made as white in color as is desired commercially.

I have discovered that, while excellent results are accomplished and a high degree of bleach is obtained by proceeding according to the process of my said application, a higher degree of bleach is procured, the quality and color of the flour is greatly improved, and the beneficial results are greatly increased by adding chlorin to the atmosphere treated in accordance with the process of my said application.

My invention, therefore, consists broadly in the process of treating flour to the combined action of chlorin and an atmosphere which has been subjected to a disruptive electric discharge and to which moisture has been added; also in the particularities set forth and claimed.

In the accompanying drawings, I have illustrated an apparatus suitable for carrying the invention into practical use, the apparatus being shown more or less conventionally and largely in cross-section.

A description of the process of treating flour utilizing the illustrated apparatus will be sufficiently descriptive of such process when other apparatus is employed for carrying the same into use.

In said drawing, the reference numeral 10 designates a chamber in which the atmosphere is subjected to the action of disruptive electric discharge, and preferably this is an intermittent flaming discharge, as contemplated in my aforesaid application for Letters Patent. 11 designating the fixed electrode and 12 the movable electrode, having suitable connections 13 and 14 with a source of electricity, in the present instance, a dynamo 15 being shown. The wire 14 leads to a coil 16 having high self-induction, and from said coil to the movable electrode 12, the coil being introduced for the purpose of causing the potential at the electrodes to rise to meet the resistance of the air between them as the distance between the electrodes is increased. The electrodes are preferably of carbon, although electrodes of other material, such as iron, which will not introduce any deleterious substance into the atmosphere or gas, may be employed. The movable electrode 12 is guided in its movement by an eye 17 carried by an arm 18 supported, as shown, suitably from the treating chamber 10, and is intermittently moved toward and from the fixed electrode 11 to strike, elongate, and break the electric discharge by link connections from the operating crank 19 of the pump by which the atmospheric air is caused to flow through the treating chamber and the ultimate atmosphere or gas passed into contact with the flour. As shown in the drawing, the electrode 12 is gripped by an arm 20 pivotally connected by a link 21 of insulating material to one end of a walking beam 22, which in turn has link connection 23, 24, with the crank 19. To feed the electrode 12 as it is consumed, an abutment 25 of insulating material carried by the arm 18 is arranged in the path of movement of the gripper arm 20, so that at each forward reciprocation of the electrode the abutment engages the gripping arm, turns it upon its pivotal connection with the link 21, and by reason of the flaring wall of the perforation 26 of the gripper arm frees the electrode from the latter and allows it to feed. The object of this arrangement is, generally, to bring the electrode into contact with the stationary one to strike an arc, so that a low

voltage may be employed, then move it away to elongate the arc until it breaks, a rapid succession of arcs being made and broken during the operation of the apparatus, which character of electric discharge is preferred. The invention, however, it is not restricted to such discharge, as a stable arc, now well-known in electro-chemical art, may well serve the purpose.

The numeral 27 designates a suitable air conduit by which atmospheric air is drawn into, through and out of the chamber 10 by means of a suitable pump 28, and by which pump the atmosphere or gas is sent through a suitable conduit 29 into a reel R, the pump having appropriate valves 30 arranged in appropriate valve chambers 31. 32 designates a conduit suitably provided with a regulating valve 33 through which steam from any suitable source is introduced into the atmosphere in conduit 27, and by which steam is conveniently regulated in respect to such atmosphere. The moisture may be introduced into the air or gas either before or after the action of the arc, and should the latter alternative be selected, the steam will be introduced into the conduit 29 leading to the flour treating chamber through a suitable conduit 34 provided with an appropriate regulating valve 35; or, should it be desirable, steam may be introduced at both points simultaneously.

It is preferable, as the best results are secured thereby, to add sufficient moisture, such as steam, to the air or gaseous mixture to saturate it; that is, to bring it to that condition immediately preceding that in which moisture collects or condenses in the form of dew or drops. The regulating valves 33 and 35 enable the operator to introduce the desired quantity of moisture to the air, and while it is preferable to saturate the air or gas it is obvious that the operator may vary the amount of moisture introduced into the atmosphere or gas according to particular conditions with varying degrees of beneficial results, and, therefore, my invention is not limited to the saturation of the air with moisture.

The process is, I believe, facilitated by a suitable preheating of the atmospheric air, and, therefore, preferably it is so preheated, this being accomplished by providing an annular hollow chamber 36 provided with a drain cock 37 into which steam may be introduced through the valved pipe 38, so that the air passing through this hollow annular chamber into the conduit 17, may be preheated.

The chlorin may be added to the atmosphere—the atmosphere having been treated as above set forth,—by introducing the same into the conduit 29 through a suitable conduit 39 leading from an appropriate source of supply of chlorin, in the present instance, a tank 40 of compressed chlorin being disclosed. A suitable valve 41 is provided to enable the operator to introduce the desired quantity of chlorin to the atmosphere or gas.

The atmosphere modified by the arc as above set forth, the moisture added thereto, together with the chlorin are all sent through the conduit 29 into contact with the flour in the reel R to be treated while the flour is in a state of fine division as is customary in a bolting reel, so that all particles of the flour are exposed to the action of the gaseous mixture.

As shown in the drawing, the chlorin is added to, or mixed with, the treated atmosphere prior to the introduction of said atmosphere to the flour, but this is not necessary as the chlorin may be introduced directly into the reel where the chlorin mixes with the treated atmosphere, it being sufficient for the purposes of bleaching the flour that the flour be subjected to the combined action of the chlorin and treated atmosphere in the bolting reel.

I have found that the relative proportions of atmospheric gas, moisture and chlorin may be varied to a certain extent without appreciably affecting the result attained. If there is any appreciable difference it is only in the length of time during which the flour is subjected to the treatment, and this can be readily determined by testing the flour as to its color.

I desire it to be understood that my invention is not limited to the introduction of moisture in the form of steam, but that the moisture may be introduced in various forms and ways, and that various other modifications and changes may be made which would be within the spirit of the invention without departing from the scope of the following claims.

I claim:

1. The process of bleaching and maturing flour which consists in subjecting the flour to a mixture of chlorin and atmospheric air modified by disruptive electric discharge.

2. The process of bleaching and maturing flour which consists in subjecting the flour to a mixture of chlorin and atmospheric air, the atmospheric air having been modified by disruptive electric discharge and having had moisture added thereto.

3. The process of bleaching and maturing flour which consists in subjecting the flour to the action of a mixture of chlorin and atmospheric air, the atmospheric air having been modified by disruptive electric discharge and having moisture added thereto prior to the action of the electric discharge thereon.

4. The process of bleaching and maturing flour which consists in subjecting the flour

to the action of a mixture of chlorin and atmospheric air, the latter having been modified by disruptive electric discharge and having moisture added thereto to the point of saturation of the atmosphere.

5. The process of bleaching and maturing flour which consists in subjecting the flour to the action of a mixture of chlorin and atmospheric air, the latter having been modified by disruptive electric discharge, and having had steam added thereto.

6. The process of bleaching and maturing flour which consists in subjecting the flour to the action of a mixture of chlorin and atmospheric air, the latter having been preheated, modified by disruptive electric discharge, and having had moisture added thereto.

7. The process of bleaching and maturing flour which consists in subjecting the flour to the action of a mixture of gases comprising chlorin, atmospheric air, and moisture, the atmospheric air having been modified by disruptive electric discharge.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JAMES NATHANIEL ALSOP.

Witnesses:
J. S. MILLER,
R. W. SLACK.