

Oct. 21, 1952

O. TARKKONEN

2,614,923

DIGESTER FILLING IN SULFATE PULPING

Filed Feb. 1, 1947

Fig. 1.

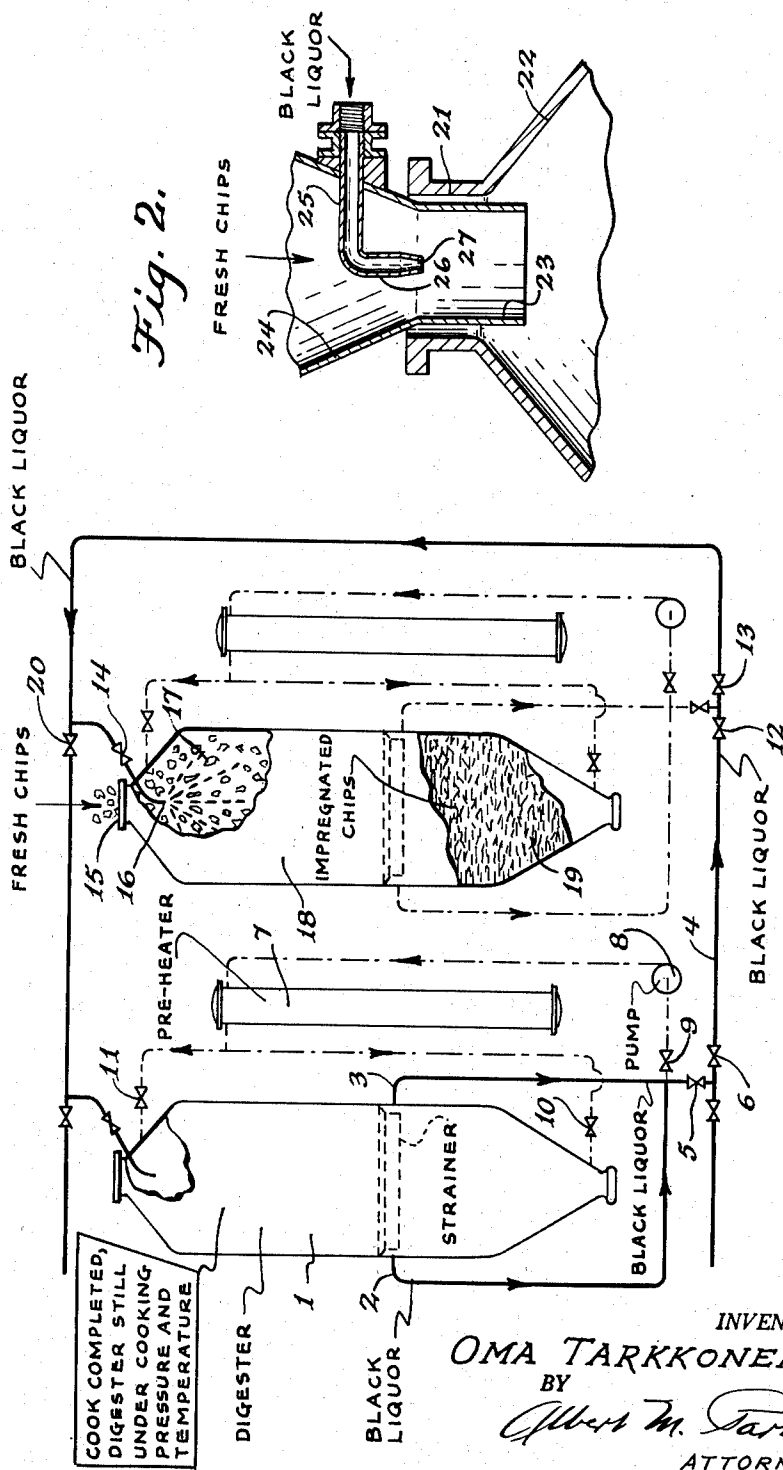
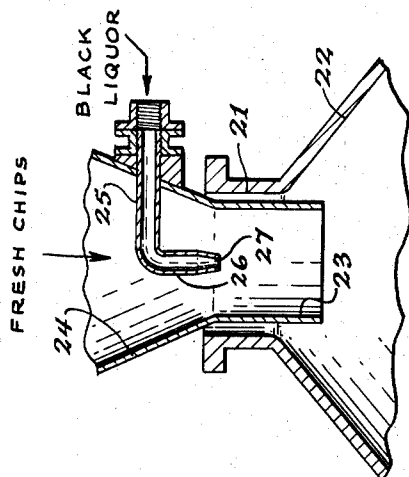


Fig. 2.



INVENTOR.
OMA TARKKONEN
BY
Albert M. Tarkka
ATTORNEY.

UNITED STATES PATENT OFFICE

2,614,923

DIGESTER FILLING IN SULFATE PULPING

Oma Tarkkonen, Sunila, Finland, assignor of one-half to Sunila Osakeyhtio, Sunila, Finland, a corporation of Finland

Application February 1, 1947, Serial No. 725,963
In Finland April 17, 1946

2 Claims. (Cl. 92—7)

1

The invention here presented concerns the method of procedure in the production of sulfate pulp and intends a saving of steam needed for digestion as well as a reduction of the digestion time by utilizing the heat of the black liquor from digesters in which the cook has been completed.

This invention has for its object the utilization of the heat contained in the quantity of black liquor to be used in the charge of a digester, which black liquor is obtained from a preceding completed sulfate cook and is under substantially the pressure and temperature conditions of a finished digestion, by the introduction of the quantity of black liquor to be used as a diluent for the cooking liquor into the digester to be charged before adding the white liquor and simultaneously and together with the chips causing practically the whole charge of the chips to be soaked in black liquor during the process of charging.

Another object of this invention is to utilize substantially the entire heat content and pressure of the aforementioned black liquor with the amount of black liquor so employed practically corresponding to the total amount of black liquor desired as a diluent for the cook.

Still another object of the invention is the utilization of the pressure under which the hot black liquor is introduced and the steam generated when this pressure is released, in the act of introduction, to pack the chips in the digester being filled.

According to this invention a quantity of black liquor is transferred under digester pressure from a digester in which the cook is completed into another digester in the process of being filled with chips. This quantity of black liquor is to be used as, or constitutes a portion of an amount to be used as a diluent of the cooking liquor in the second digester, its amount being measured in transference by timing by the clock, by a glass measuring gauge on the side of the digester, or by means of some other measuring device. The black liquor thus transferred is most suitably introduced into the digester together with and substantially in the same direction as the entering stream of chips, that is to say at the upper end of the digester. The pressure under which the hot black liquor is introduced and the steam generated when this pressure is released in the act of introduction are utilized to pack the chips in the digester being filled. Since it has proved that using this procedure the chips are wetted completely by the black liquor, the inflow of the

2

liquor is regulated to make the time necessary for introduction into the digester of the entire amount of liquor in question at least approximately equal to the time needed for filling the digester with chips. Such even wetting of the chips with black liquor is, of course, partly instrumental in promoting even results in the cook, and a particularly favorable result in this respect is achieved if the hot black liquor under pressure intended to be introduced into the digester to be used as the power medium in a chip distributor of any suitable design operating with pressure. In this case also the inflow of black liquor should be regulated to make the time needed to transfer into the digester the whole intended amount of black liquor correspond as nearly as possible to that needed for filling the digester with chips. When the digester is filled with chips and the intended amount of black liquor has been simultaneously introduced, the necessary amount of white liquor is added and the cook is carried out in the known manner.

Figure 1 is a diagrammatic showing of the coupling of the two digesters for the carrying out of the method of the invention, and

Figure 2 is an enlarged fragmentary diagrammatic showing of the entrant portion of a digester with a chip distributor applied thereto.

In the diagrammatic showing of Figure 1, the digester 1 is illustrative of a digester in which a sulfate cook has been completed. It has side relief lines at 2 and 3 from which black liquor may be taken off and run into the line 4 through suitable valves 5 and 6. This digester would normally have a pre-heater such as 7, and a recirculating pump such as 8, for recirculating liquor into the digester itself, as controlled by the valves 9, 10 and 11.

According to the instant invention, however, the black liquor from the digester 1 is piped right through the line 4, past the valves 12 and 13 and through the valve 14 into the upper end 15 of the digester being charged. The black liquor is discharged out of a nozzle, as shown at 16. Up until this point the black liquor has been brought substantially directly from the digester 1 and has been maintained under substantially the same temperature and pressure which it had on leaving the digester 1 at the completion of the cook in that digester. Thus, when the black liquor emerges at 16 the pressure is released and it serves to pack the chips, as shown at 17, in the digester 18. As already pointed out, the black liquor and the chips are introduced in the same direction and together with each other at the

3

upper end of the digester. Packing is effected by the introduction of the hot black liquor and the steam generated when the pressure on the liquor is released in the act of introduction. The time for introducing the liquor is equal to the time needed for filling the digester with chips. In this manner, the chips are evenly wetted and impregnated with the black liquor as they are packed in the digester, as shown at 19.

Once the introduction of black liquor and chips is completed with the quantity of black liquor being substantially what is needed for the impregnation of the chips, the supply of black liquor is shut off and a valve, such as 20, is opened for the introduction of fresh cooking liquor.

In the enlarged showing of Figure 2, the mouth 21 of a digester 22 is shown as equipped with a suitable chip distributor having a tubular portion 23 extending into the mouth from a conical portion 24 above the same. Black liquor is introduced into the distributor through the nozzle 25 having a downturned end 26 exhausting at 27 and the black liquor serves as the pressure medium for operating the distributor to distribute the chips as well as packing and impregnating them.

From the foregoing and from the accompanying drawing, it will be clearly apparent that the black liquor to be used as a diluent for the cooking liquor is taken under pressure from a completed sulfate cook in another digester and introduced into the digester to be charged without any material loss of pressure. At the same time, the heat content in the black liquor is substantially completely utilized. Thus, the pressure and temperature conditions of a finished digestion are taken advantage of and the chips are caused to be soaked in black liquor during the process of charging.

The invention achieves its results by the simultaneous introduction of the black liquor and the chips and the taking up of substantially all of the black liquor by the impregnation of the chips, so that free black liquor to be engaged by fresh cooking liquor is kept to a minimum. Furthermore, economy is enhanced by utilizing the black liquor under substantially the temperature and pressure that it had when leaving the

4

previous digester for the introducing and packing of the chips.

What I claim as my invention is:

1. The process of manufacturing sulphate pulp which comprises the following steps, simultaneously charging a digester with chips and with black liquor under pressure, which black liquor has been obtained from a previous completed sulfate cook, and thereby packing the chips into the digester with said black liquor, said black liquor being substantially under the same temperature and pressure that it had when withdrawn from said previous cook, said black liquor in said charging operation being in sufficient amount to practically impregnate the whole of said charge of chips with black liquor and, after said impregnated chips are packed in said digester, then adding the requisite amount of white liquor to said digester to digest said impregnated chips.

2. A process as in claim 1 and including utilizing a chip distributor for the packing of the chips into the digester and operating said chip distributor by the introduction of said black liquor under pressure from a completed cook.

OMA TARKKONEN.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,609,832	Rinman	Dec. 7, 1926
1,657,048	Tomlinson	Jan. 24, 1928
1,694,139	Olsson	Dec. 4, 1928
1,697,032	Tomlinson	Jan. 1, 1929
1,889,158	Spencer	Nov. 29, 1932

FOREIGN PATENTS

Number	Country	Date
82,050	Sweden	Nov. 20, 1934

OTHER REFERENCES

Manufacture of Pulp and Paper, Third Edition, volume III, section 5, page 5 (1937), published by McGraw-Hill Book Co., Inc., New York.