United States Patent

[11] 3,617,538

[72] Inventor **Ivan L. Bogert**
c/o Clinton Boget Ave. 2038 Center Ave., Fort Lee, N.J. 07024

[21] Appl. No. **16,295**
[22] Filed **Mar. 4, 1970**
[45] Patented **Nov. 2, 1971**
Continuation-in-part of application Ser. No. 612,522, Jan. 30, 1967, now abandoned.

[54] GREASE DIGESTING METHOD

2 Claims, 3 Drawing Figs.

[52] **U.S. Cl.** **210/12,** 210/66, 210/181
[51] **Int. Cl.** **C02c 1/14**
[50] **Field of Search** 210/12, 69, 66, 71, 175, 181

[56] **References Cited**

UNITED STATES PATENTS

829,954	9/1906	Edson	210/69 X
1,963,581	6/1934	Heukelekian	210/12 X

OTHER REFERENCES

Heukelekian, H., Basic Principles of Sludge Digestion, Article appearing in Biological Treatment of Sewage and Industrial Wastes, Vol. II, Anaerobic Digestion, etc., edited by McCabe, J. et al., 1958, Reinhold Publishing Corp., New York, pp. 25–32, 34, 35, 38–40, 42 and 43 relied on (P.O.S.L.)

Primary Examiner—Michael Rogers
Attorney—Norman N. Holland

ABSTRACT: The present invention relates to a mechanism and method for conditioning grease before it is deposited into a digester. The grease is heated by heating coils in order to melt it so that when the grease is deposited into the digester, the digester enzymes will digest all of the grease. Preferably the grease solids are separated from nongrease solids prior to the melting step and are maintained in a separated condition until such time as the grease is ready to be digested. The grease is maintained in the liquified condition while it is transported from the heating tank to the digesters. Agitating means comprising injection of compressed air into the heating tank is used to prevent the grease from insulating the heating coils during melting.

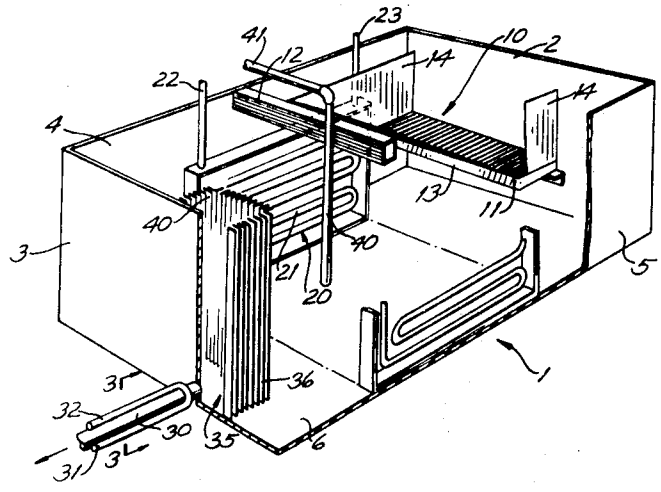


Fig. 1.

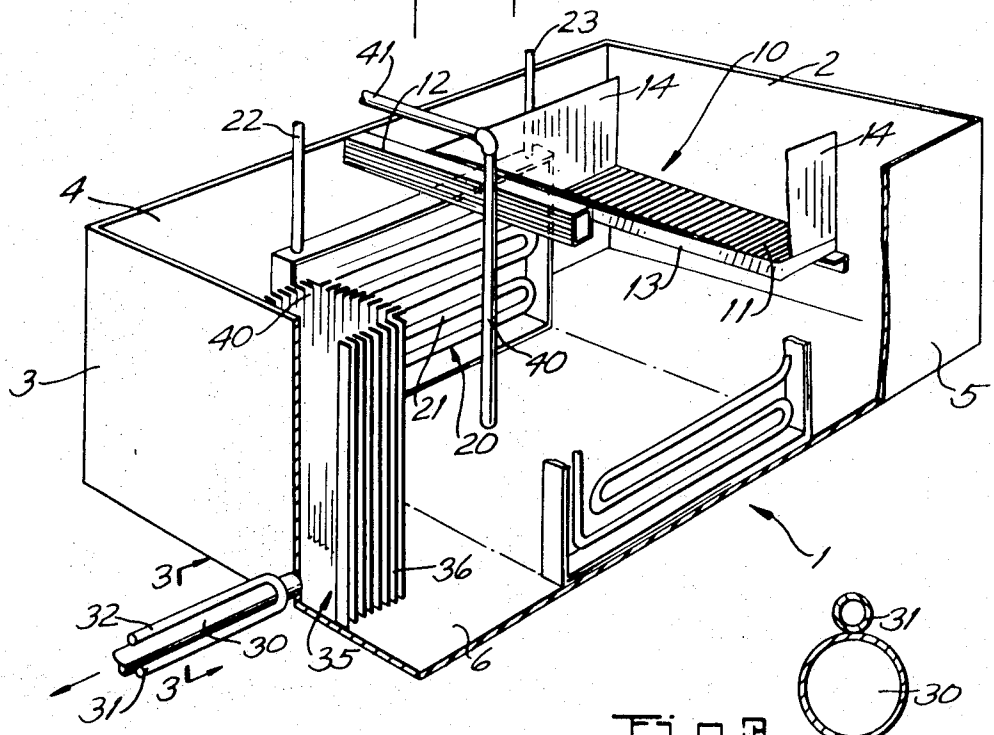
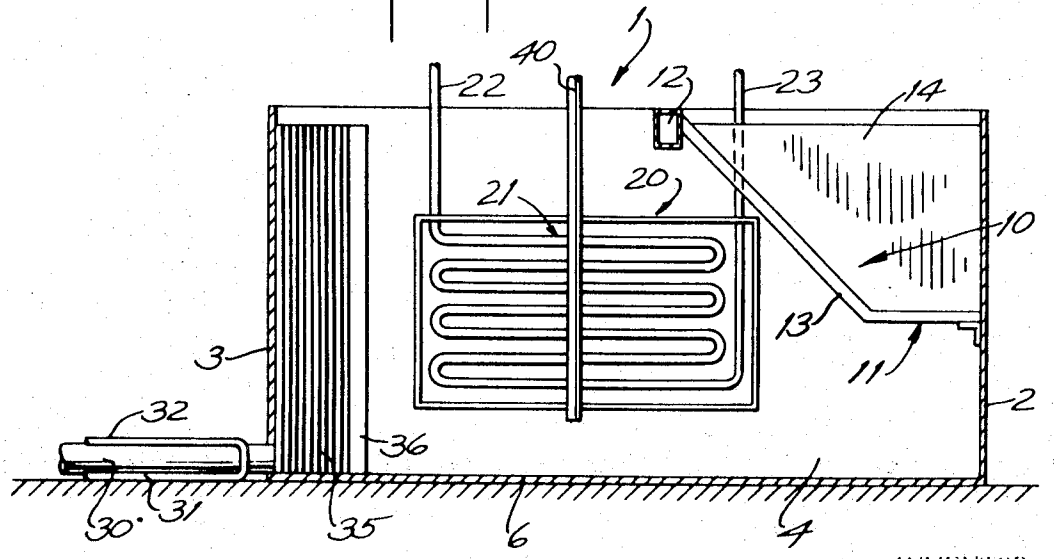


Fig. 3.

Fig. 2.



INVENTOR
IVAN L. BOGERT
BY
ATTORNEY

GREASE DIGESTING METHOD

CROSS REFERENCE

The present application is a continuation-in-part of applicant's copending U.S. S. application, Ser. No. 612,522 filed Jan. 30, 1967, now abandoned.

DESCRIPTION OF THE INVENTION

The present invention comprises an improved grease disposal system and more particularly an improved mechanism and method for facilitating the digestion of grease.

In waste water treatment plant operations grease and the like have presented a disposal problem. Heretofore, the grease has either been burned, buried or placed in digesters in solid form. Burying or burning of these waste products has posed a number of operation and maintenance problems. Thus, use of a digester to dispose of grease is a more desirable method.

However with present methods of digestion the grease is introduced to the digester in generally solidified form or in a form mixed with the nongrease solids. This makes digesting difficult and not effective because the grease tends to rise to the surface of the sludge to form a blanket or film and little or no digestion takes place.

The present invention overcomes these problems and has for one of its objects an improved mechanism and method for digesting grease and the like which is more efficient than prior methods.

Another object of the present invention is the provision of an improved method and mechanism of digesting grease and the like which permits the digesting components to more easily digest the grease.

Another object of the present invention is the provision of an improved method and mechanism of digesting grease which eliminates the problem of the grease rising to the top to form a blanket.

Other and further objects of the invention will be obvious upon an understanding of the illustrative embodiment about to be described, or will be indicated in the appended claims, and various advantages not referred to herein will occur to one skilled in the art upon employment of the invention in practice.

A preferred embodiment of the invention has been chosen for purposes of illustration and description and is shown in the accompanying drawings forming a part of the specification, wherein:

FIG. 1 is a perspective diagrammatic view of grease tank made in accordance with the present invention;

FIG. 2 is a side sectional view thereof; and

FIG. 3 is a sectional view taken along line 3—3 of FIG. 1.

In general, the present invention provides heating of the grease solids and the like after separation from nongrease solids in order to melt it before it is placed into digesters and to maintain it in liquid form and at the most efficient temperature for digesting to facilitate handling and accelerate the digesting thereof.

Referring more particularly to the drawings, the grease is collected from the surface of a settling tank (not shown) and placed into a heating tank 1 having front end wall 2 and rear end wall 3, sidewalls 4 and 5 and a bottom wall 6. Grease solids and the like are separated from nongrease solids prior to entry into heating tank. The grease passes through a bar rack 10 mounted on front end wall 2 and comprising a plurality of closely positioned bars 11 mounted on a bracket 12. The bar rack has a portion 13 mounted at an angle to the end wall 2 and has a pair of sidewalls 14. The bar rack 10 serves to remove any solid material, such as sticks, etc. from the grease.

The heating tank 1 is provided with a plurality of heating coils 20 which are adapted to melt the separated grease solids and the like in heating tank 1. The heating coils 20 are preferably a series of hot water coils 21 each of which has an inlet 22 and an outlet 23. The hot water may be supplied from plant heating boilers, digester sludge heat exchangers or any other suitable source. The hot water is circulated through the heating coils 20 so that a constant supply of heat is available in order to melt the grease and maintain it in a liquified state.

The melting of the grease preferably takes place at temperatures to about 160° F. so that all of the greases and like substances are melted before they are moved into the digester. However, higher or lower temperatures may also be used, if desired.

The melted grease is then pumped out of the heating tank 1 through a pipe 30 which is preferably provided with hot water tracing pipes 31 and 32 tracing the pipe 30 in order to keep the grease heated and in melted condition as it is being transported to the digesters. The same hot water may be used in the pipe tracings 31–32 as is used in the heating coils 20, e.g., one tracing pipe 31 may be a hot water supply pipe connected to inlet 22 pipe and the other tracing pipe 32 may be a return hot water pipe connected to outlet 23. Of course, if desired, the hot water tracing pipes can be supplied with hot water from any other suitable source.

Immediately in front of the outlet pipe 30 a rear bar rack 35 is provided and is removably mounted on end wall 3 to filter out any solid matter which may have entered into the heating tank 1. The rear bar rack 35 is provided with a plurality of closely positioned bars 36.

In order to prevent the grease from acting as insulation between the heating coils 20 which would inhibit melting, agitator means 40 are provided to agitate the grease and prevent it from attaching itself to the heating coils to insulate them. While any agitator means, such as mechanical stirrers, etc., may be used it has been found that by the introduction of air under pressure into a tank through a pipe 41 the grease is maintained in an agitated condition so as to prevent it from accumulating around the heating coils to insulate them.

The preferred method of the present invention comprises heating and melting of grease solids and the like after they have been separated from nongrease solids and keeping the melted grease at the most efficient temperature for melting at least until it has come in contact with a digesting medium with sufficient number of digesting organisms and at a temperature which gives the best digestion results. The melted grease may be combined with nongrease solids just prior to entering the digester, although preferably it is fed directly to the digester. Prior to entry into the digester, the nongrease solids are heated to a temperature of about 105° F.

When the grease in liquified form is placed into the digester, it mixes with the sludge and is digested along with the sludge. This not only provides for grease disposal but also increases the methane gas production in the digesters and, where gas produced in digesters is used as a fuel, the additional gas produced by digesting of grease provides greater economy.

It will thus be seen that the present invention provides an improved mechanism and method for digesting grease which is more efficient, which permits the digesting components to digest the grease and which eliminates the problem of the grease rising to the top to form a blanket.

As various changes may be made in the form, construction and arrangement of the parts herein without departing from the spirit and scope of the invention and without sacrificing any of its advantages, it is to be understood that all matter herein is to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention I claim:

1. A method of digesting a water sludge mixture of grease and nongrease solids comprising separating the grease solids from the nongrease solids, the nongrease solids being maintained separated from the grease solids until at least immediately before digestion, heating said grease solids to a temperature of about 160° F. to liquefy the same, feeding the liquified grease solids and the nongrease solids to a digesting medium while maintaining the grease at said temperature to keep the grease in melted condition at least until it comes into contact with said digesting medium, said digesting medium having a sufficient number of digesting organisms to effectively digest the grease, and maintaining the digesting medium at a temperature which gives best digestion results.

2. A method of digesting as claimed in claim 1, wherein said nongrease solids are heated to a temperature of about 105° F. before digestion.

* * * * *