

C. E. GEIGER.
PROCESS OF DESICCATING SLOP.
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1,057,142.

Patented Mar. 25, 1913.

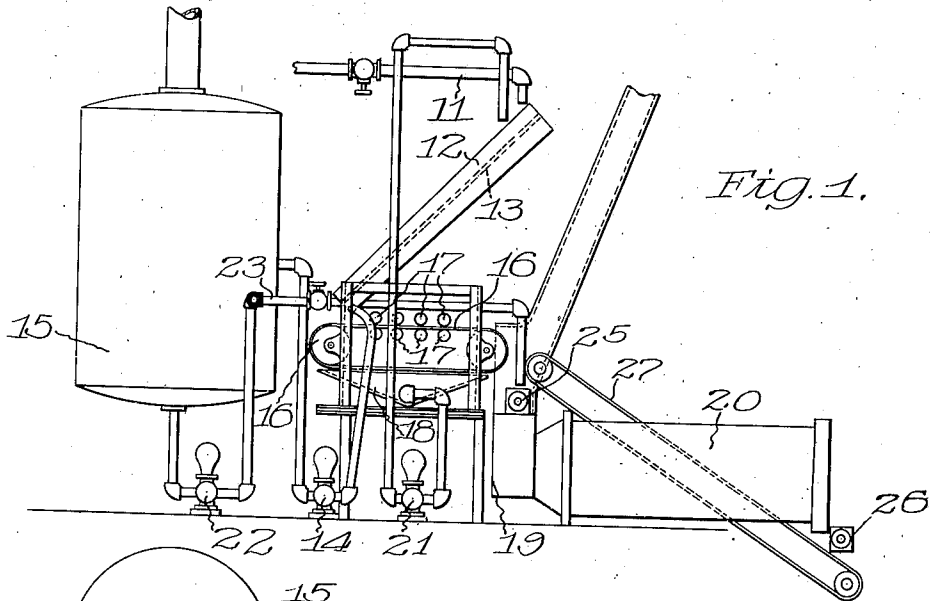


Fig. 1.

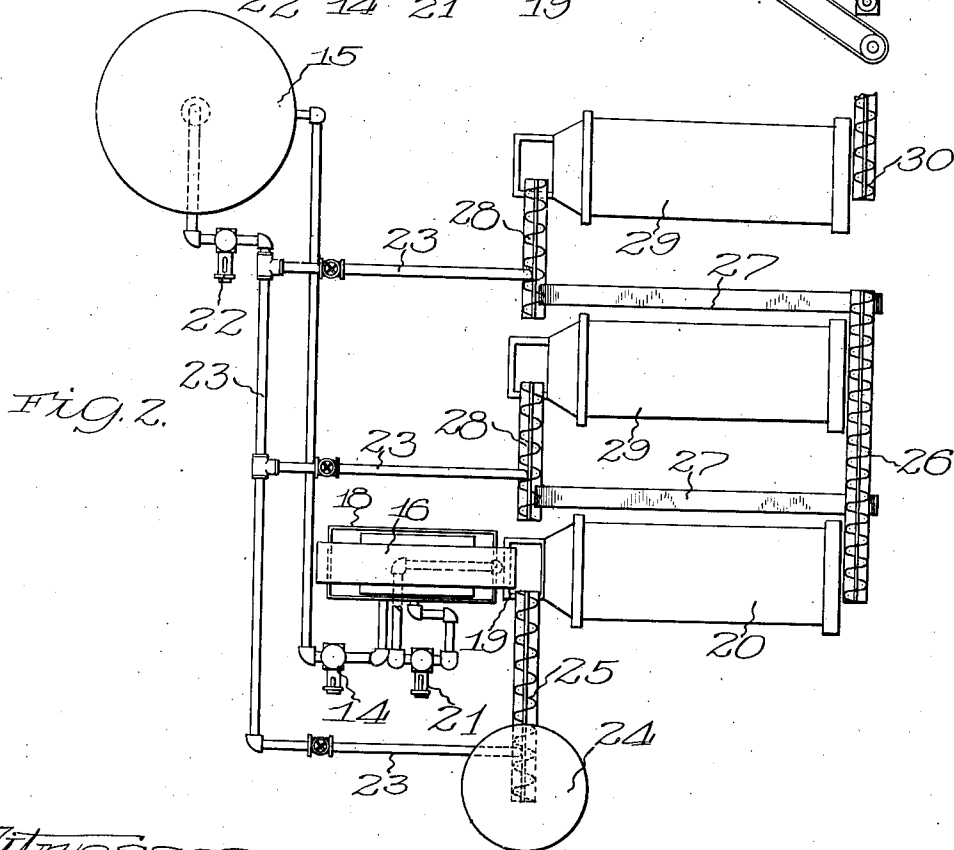


Fig. 2.

Witnesses:
G. W. Bonaruss Jr.
H. H. Bonnell

Inventor:
Charles E. Geiger
By Brown Hopkins
Attys

UNITED STATES PATENT OFFICE.

CHARLES E. GEIGER, OF LOUISVILLE, KENTUCKY, ASSIGNOR OF ONE-THIRD TO WILLIAM E. KOOP AND ONE-THIRD TO G. WALTER FISKE, BOTH OF LOUISVILLE, KENTUCKY.

PROCESS OF DESICCATING SLOP.

1,057,142.

Specification of Letters Patent.

Patented Mar. 25, 1913.

Application filed July 31, 1911. Serial No. 641,543.

To all whom it may concern:

Be it known that I, CHARLES E. GEIGER, a citizen of the United States, residing at Louisville, in the county of Jefferson and State of Kentucky, have invented certain new and useful Improvements in Processes of Desiccating Slop, of which the following is a specification.

This invention relates to a process for re-covering valuable products from slop, such as that obtained from distilleries and the like, and one of the principal objects of the invention is to provide a process in which slop of different consistencies may be successfully treated.

For the attainment of these ends and the accomplishment of other new and useful objects, as will appear, my invention consists in the process and the apparatus for effecting the operation of the process substantially as hereinafter described.

In the accompanying drawing Figure 1 is a view in elevation of an apparatus for effecting the carrying out of my process, and Fig. 2 is a plan view of the same.

It is found in treating mixtures containing spent grains and liquid such as is found in distillery slop and the like, that the mixture obtained from the different grains is not always of the same consistency. That is, in desiccating the more solid materials from a semi-solid mixture it is necessary to vary the process for mixtures in which the solid materials are of different proportions. Another difficulty encountered in drying the more solid materials is that in mixing a syrup with the materials as they are fed into a drier, the syrup causes the material to form in a gum-like mass.

The present invention is designed to obviate these difficulties, and to present a process in which slop of varied consistencies may be treated by the same desiccating apparatus.

In the process now to be described the slop is first fed into a separator, which may be, and preferably is, of an inclined type, and in which the more solid materials are caught by a screen, allowing the liquid to filter through the screen. The more solid material is then allowed to fall by gravity, or is discharged upon an endless belt or con-

veyer which carries the said material under a press wherein more of the liquid contained in the solid material is pressed therefrom and the material is discharged into a drier. The liquid first obtained from the separator is collected and discharged by suitable means into an evaporator by which the liquid is made into a syrup. The liquid obtained from the press is discharged at the top of the first named separator, where it is refiltered.

A receptacle is provided which contains a filler which may be of any desired or suitable material, such as meal or chopped feed, which may also be discharged into the drier. After the material issues from the drier it is conveyed to a mixer where it is mixed with syrup from the evaporator and the mixture thus formed is then discharged into another drier or driers, from which it is discharged in a form ready to be used.

It is evident that by using this process slop of any consistency may be desiccated, and that there is no danger of the more solid materials becoming gummed or sticking in the drier. Furthermore, if the materials about to be discharged into the drier at first are too thin or contain too much moisture, they may be mixed with a filling material which will give the mixture the necessary or required body. To effect the operation of this process I have shown and will now describe the preferred construction, combination and arrangement of an apparatus for carrying out the above-described process.

In the accompanying drawing the slop is discharged from a pipe 11 into an inclined separator 12, which is formed with a screen 13 and is adapted to permit the liquid part of the mixture to filter through the screen and to be carried down the bottom of the separator, from whence it is pumped by a pump 14 into an evaporator 15. The more solid materials slide down the screen by gravity or are conveyed from the separator to a moving belt or conveyer 16. This conveyer 16 passes through the pressing rolls 17 in such a manner that the liquid contained in the materials as they are discharged from the separator 12 is further removed and caught in a receptacle 18. From the conveyer 16 the dried materials

then pass into the hopper 19 of a drier 20. The liquid caught in the receptacle 18 is returned by means of a pump 21 to the top of the separator 12, where the liquid is again filtered with the slop as it comes from the discharge pipe 11. Connected with the evaporator 15 is a distributing pump 22, with distributing mains 23, for discharging the syrup formed in the evaporator.

Suitably located adjacent the drier 20 is a filler receptacle 24, which is adapted to contain meal or cut feed for supplying "body" to the materials to be dried in the drier. A conveyer 25 arranged beneath the receptacle 24 is adapted to discharge material therefrom into the hopper 19 of the drier, the syrup distributing mains having an outlet into the mixing conveyer 25, whereby the syrup may be mixed with material from the filler receptacle 24.

After the mixture emerges from the first drier 20 it is conveyed by means of the conveyers 26 and 27 to one of the conveyers 28. These conveyers 28 are provided with outlets from the syrup distributing mains 23, and are adapted to mix the materials delivered to them with the syrup and to discharge the mixture thus formed into one of the driers 29. This drying operation may be continued to any degree of refinement, the material finally being discharged from the drier into a conveyer 30.

From this description it is evident that the more solid material may be recovered from the slop simply by separating the liquid portions from the more solid portions and by drying the latter in the drier; or the more solid materials may be mixed with the liquid which is re-filtered with the incoming slop and the more solid portions thus obtained dried; or the more solid materials may be mixed with a syrup after the first drying process; or the more solid materials may be mixed with the filler in the first drier, the filler being formed with or without the syrup.

It is evident that these variations may all be made together with many others, without varying the construction or operation of the several parts, and it is further evident that others skilled in the arts to which this process and apparatus relate may make various changes without departing from the spirit and scope of my invention.

What I claim as new is:

1. The process of desiccating distillery slop, which consists in separating the more solid portions from the liquid; in evaporating the liquid obtained to a syrup; in pressing the solid matter to remove more of the liquid; in returning this liquid to be re-separated in the first named separating means; and in drying the more solid materials.

2. The process of desiccating distillery

slop, which consists in continuously directing the slop into a separator which separates the liquid from the more solid portions; in evaporating the liquid obtained therefrom to a syrup; in pressing the more solid portions to remove more of the liquid; in returning the liquid thus obtained to the first named separator; in drying the more solid portions; in mixing the syrup with the dried solid portions and in further drying the said mixture.

3. The process of desiccating distillery slop which consists in filtering the more solid portions from the slop; in pressing the said solids to remove more of the liquid; in evaporating the liquid first obtained to a syrup; in returning the liquid pressed out to the first named separator; in drying the solids; in mixing the syrup with the dried solids; and in further drying, mixing and drying the said mixture.

4. The process of desiccating distillery slop which consists in filtering the more solid portions from the slop; in pressing the said solids to remove more of the liquid; in evaporating the liquid first obtained to a syrup; in returning the liquid pressed out to the first named separator; in mixing a filler with the more solid materials; and in drying the said mixture.

5. The process of desiccating distillery slop which consists in filtering the more solid portions from the slop; in pressing the said solids to remove more of the liquid; in evaporating the liquid first obtained to a syrup; in returning the liquid pressed out to the first named separator; in mixing the syrup with a filler material; and in mixing and drying the said mixture and the more solid portions together.

6. The process of desiccating distillery slop which consists in filtering the more solid portions from the slop; in pressing the said solids to remove more of the liquid; in evaporating the liquid first obtained to a syrup; in returning the liquid pressed out to the first named separator; in mixing a filler material with the syrup; in combining the said mixture with the more solid portions and drying the mixture thus formed; and in further mixing the dried mixture with the syrup and again drying the mixture thus formed.

7. The process of desiccating distillery slop and the like which consists in discharging the slop into a separator which filters the more solid materials from the liquid; in subjecting the solids thus obtained to a pressure to remove more liquids; in pumping the liquid thus obtained into an evaporator which produces a syrup therefrom; in returning the liquid obtained from the press to the separator to be re-filtered with incoming slop; in mixing some of the syrup with a filler; in combining this mixture with the

more solid portions of the slop, and in sub-
jecting them into heat in a mixing drier; in
further mixing the product thus obtained
with more of the said syrup, and in drying
5 this latter mixture in another drier.

In testimony whereof I have signed my
name to this specification, in the presence

of two subscribing witnesses, on this 26 day
of July A. D. 1911.

CHARLES E. GEIGER.

Witnesses:

CHAS. L. KOOP,

CHAS. A. FISKE, Jr.