No. 654,470.

Patented July 24, 1900.

W. MATHER.

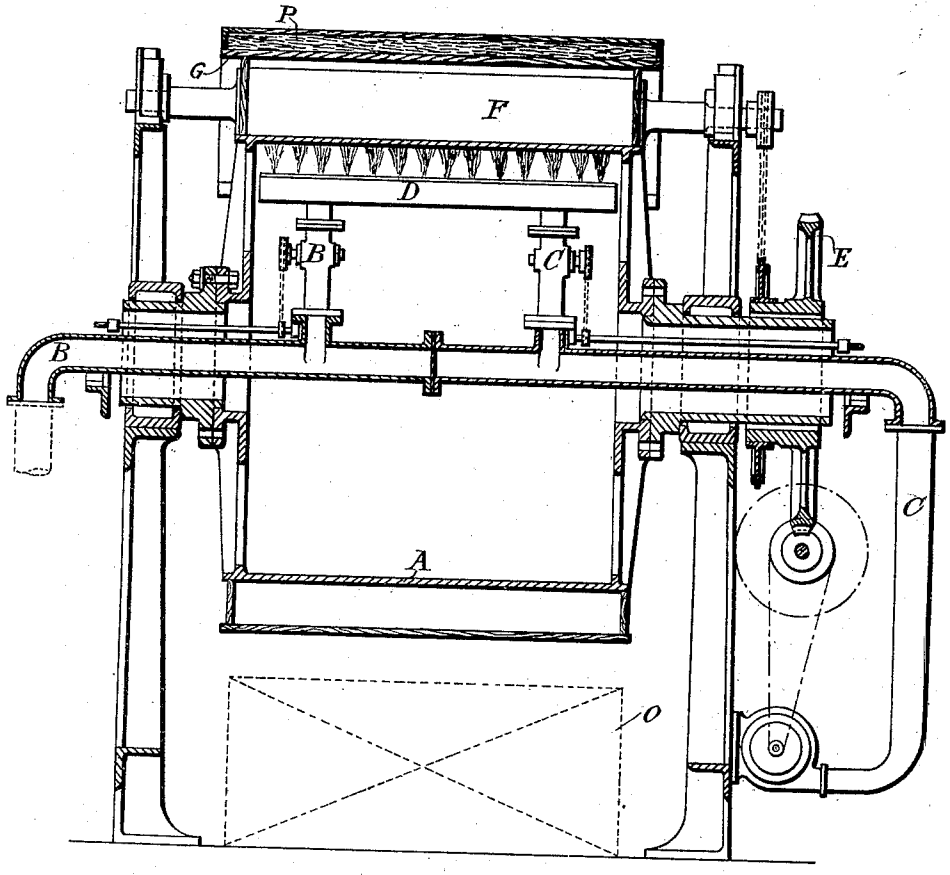
EVAPORATING APPARATUS

(Application filed July 10, 1899.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.



WITNESSES

J. G. Hinkel

Arthur A. Fisher

INVENTOR

William Mather

by Foster & Freeman

Attorneys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 654,470. Patented July 24. 1900.

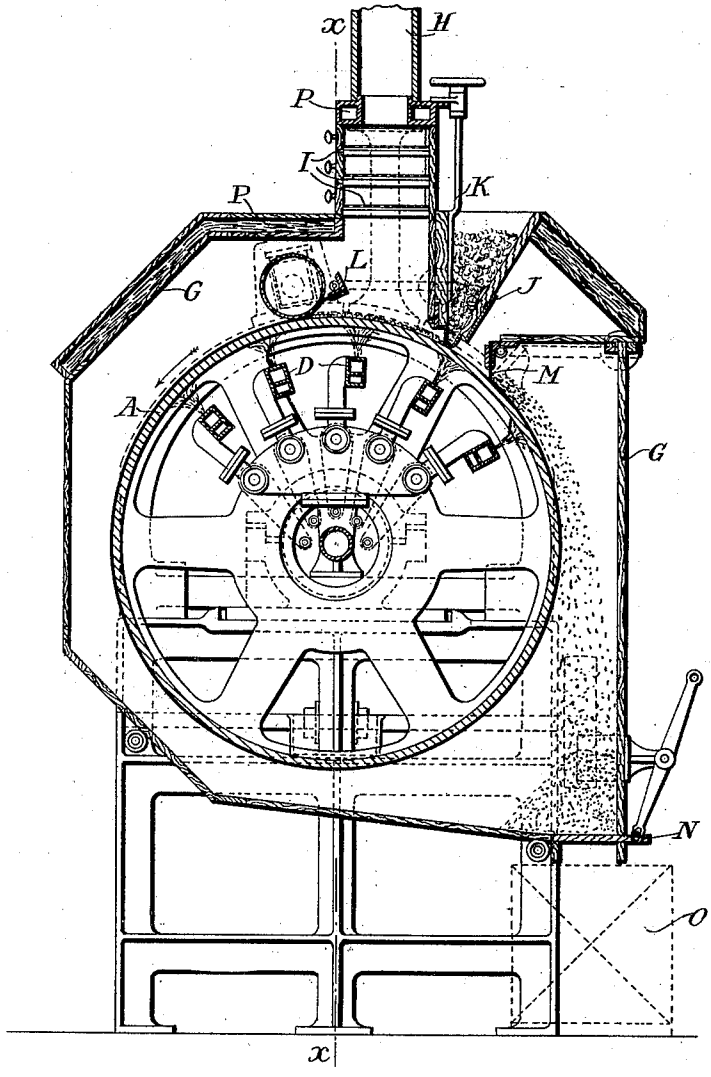
W. MATHER.

EVAPORATING APPARATUS.

(Application filed July 10, 1899.)

(No Model.) 2 Sheets—Sheet 2.

Fig.2.



WITNESSES

J. G. Hinkel

Arthur A. Fisher

INVENTOR

by William Mather

Baker & Freeman

Attorneys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

WILLIAM MATHER, OF MANCHESTER, ENGLAND.

EVAPORATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 654,470, dated July 24, 1900.

Application filed July 10, 1899. Serial No. 723,314. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM MATHER, engineer, a subject of the Queen of Great Britain, residing at Salford Iron Works, Manchester, England, have invented certain new and useful Improved Means for Evaporating Substances and Reducing Them to an Anhydrous Condition, of which the following is a specification.

In another application for Letters Patent I have described how a liquid solution may be evaporated or concentrated by means of heated rotating cylinders which take up a film of the solution, and from this film the water is rapidly driven off and the film returns to the bath in a much more concentrated condition.

According to the present invention it is proposed to evaporate or reduce to a practically anhydrous condition such substances as are capable of being spread in the form of a film upon a heated cylinder in a liquid or semiliquid state. Many of such substances are normally solid, but on application of heat become liquid, and subsequently as their contained water is driven off return to the solid state. Among such materials may be mentioned borax, cyanide of potassium, and similar materials.

To clearly explain one form in which my invention may be carried out, reference is made to the accompanying drawings, in which—

Figure 1 is a sectional elevation taken on line *x x* of Fig. 2, which is an end elevation, the frame and some other parts being omitted.

In said drawings, A represents a gas-heated cylinder, the gas and air being admitted thereto by pipes B C and passing to burners D. The cylinder is caused to revolve by gear E, which also drives the spreading-roll F. The cylinder is surrounded by a casing G, from which opens the vapor-outlet H, which may be provided with removable sieves I to catch any of the material which may become finely pulverized. The feed-hopper J is provided with a slide K, so that the quantity of material fed may be regulated. The spreading-roller F is provided with a scraper or "doctor" L, which will throw down any particles of the material which might adhere to the roller F, and a second scraper or doctor M is provided for the heated cylinder A. To enable the material treated to be withdrawn, a slide-door N may be provided, opening over a packing box or drum O.

The material may be fed to the hopper in a liquid or semiliquid state, or it may be melted therein or as it passes from the hopper to the cylinder, and such melting may be effected either by independently heating the feed end of the hopper—as, for example, by means of a gas-burner S—or by permitting it to come in contact with the heated cylinder. In either case the liquid or semiliquid material passes onto the heated cylinder and under the spreading-roll, which reduces it to a film of uniform thickness and expresses any bubbles or gases it may contain, while the heat of course rapidly removes the contained water, and the material is removed from cylinder A by stripping-doctor M in a practically anhydrous condition. The casing G and vapor-outlet H may be provided with a steam or other jacket P, so as to prevent any condensation of the water or escaping gases prior to their leaving the machine.

It will be obvious that different forms of heating and casing may be employed and that more than one spreading-roll may be used and the position and construction of the parts varied without departing from the scope of the invention.

What is claimed is—

1. The improved apparatus for depriving solid or semisolid substances of their contained moisture, consisting of a combined melting and feeding vessel adapted to melt and feed a regulated quantity of the liquid or semiliquid substance in the form of a film, a heated cylinder for receiving such film, a spreading-roller for distributing and compressing such film, a doctor working against such compressing-roll, and a stripping-doctor for removing the anhydrous material from the cylinder.

2. The improved apparatus for depriving solid or semisolid substances of their contained moisture, consisting of a combined melting and feeding vessel adapted to melt and feed a regulated quantity of the liquid or semiliquid substance in the form of a film, a heated cylinder for receiving such film, a spreading-roller for distributing and compressing such film, a doctor working against

such compressing-roll, a stripping-doctor for removing the anhydrous material from the cylinder, and a surrounding casing, as and for the purpose described.

3. The improved apparatus for depriving solid or semisolid substances of their contained moisture, consisting of a combined melting and feeding vessel, means whereby the delivery end of such vessel is maintained at a temperature which will cause the solid or semisolid substances to become or remain in a liquid condition, means for regulating the feed from such vessel direct to a cylinder, means for heating the cylinder, a spreading-roller for distributing and compressing the film delivered to it and a stripping-doctor for removing the anhydrous material from the cylinder and clear of the feeding vessel, substantially as set forth.

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

WILLIAM MATHER.

Witnesses:
EDMUND BRITTON,
JAMES WILLIAM BRITTON.