Sept. 11, 1923. 1,467,867

J. L. MAUCH

DISTRIBUTION SYSTEM FOR FEEDING HOT LIQUID MATERIAL TO TRAVELING BELTS

Filed June 3, 1922 2 Sheets-Sheet 1

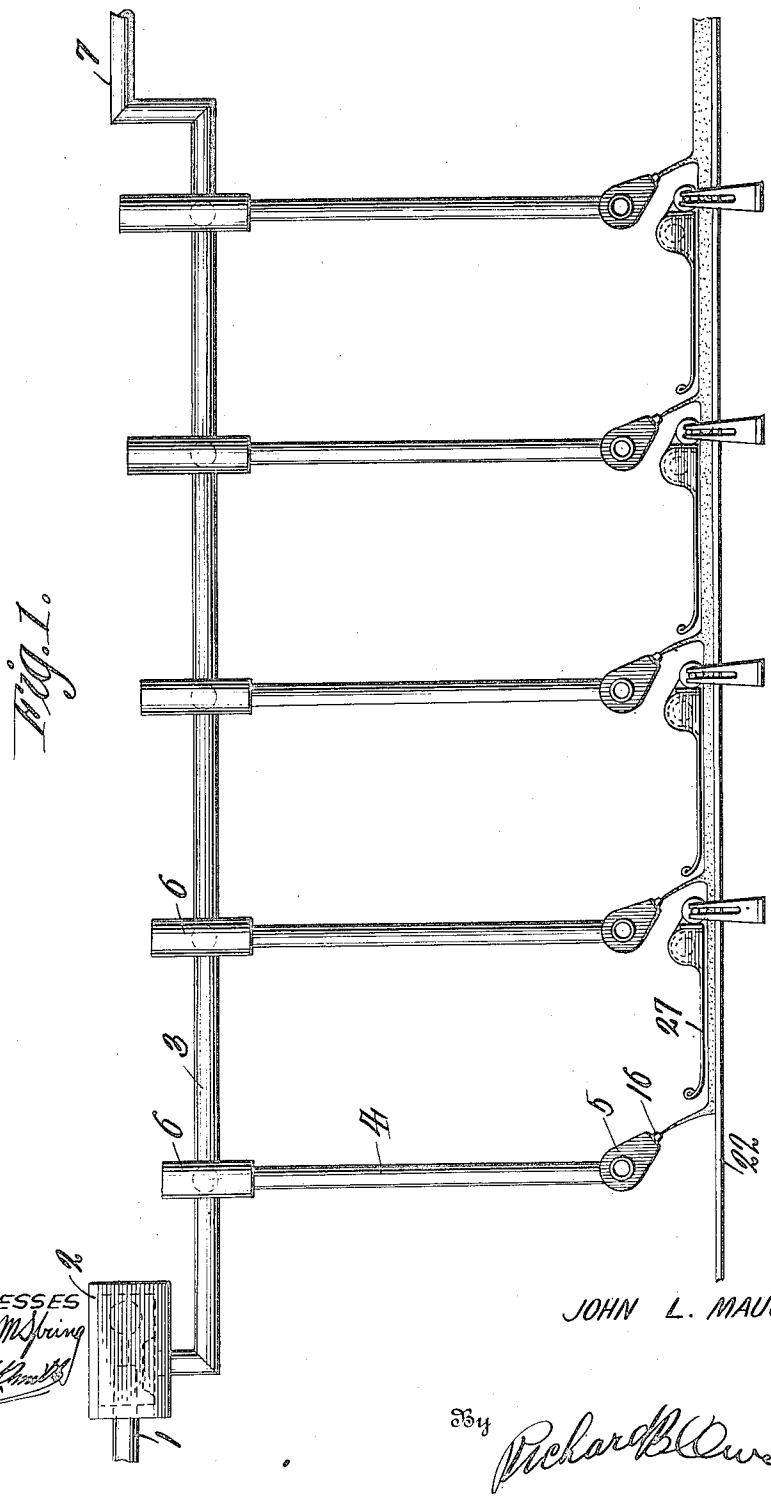


Fig. 1.

WITNESSES
Guy M. Spring
Chas. H. Ahrens

JOHN L. MAUCH Inventor

By Richard B. Owen Attorney

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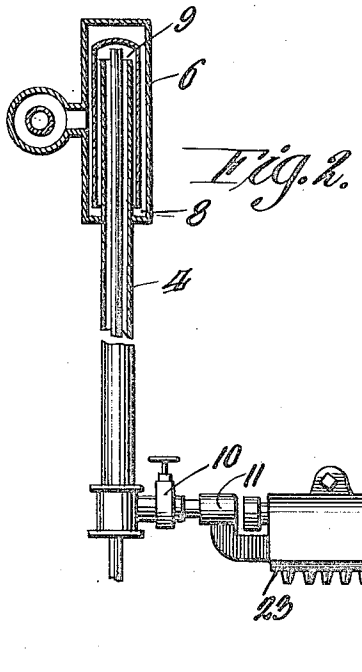


Fig. 2.

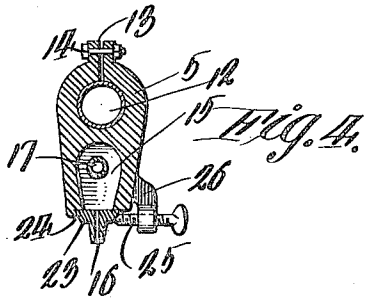


Fig. 4.

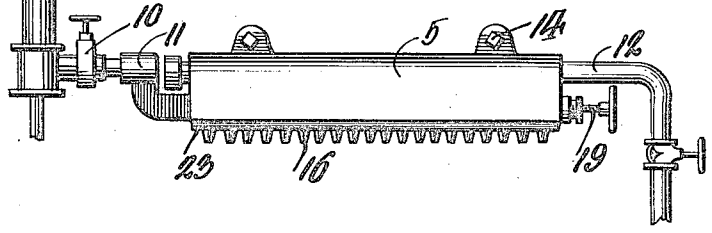
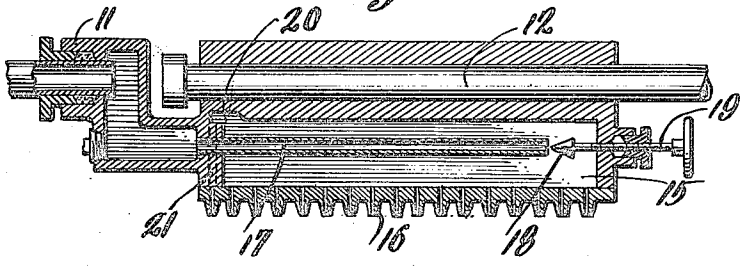


Fig. 3.



WITNESSES

Geo. M. Spring

Chas. H. Smith

Inventor

JOHN L. MAUCH

By Richard B. Owen, Attorney

Patented Sept. 11, 1923. 1,467,867

UNITED STATES PATENT OFFICE.

JOHN L. MAUCH, OF GULF, TEXAS.

DISTRIBUTION SYSTEM FOR FEEDING HOT LIQUID MATERIAL TO TRAVELING BELTS.

Application filed June 3, 1922. Serial No. 565,576.

To all whom it may concern:

Be it known that I, JOHN L. MAUCH, a citizen of the United States, residing at Gulf, in the county of Matagorda and State of Texas, have invented certain new and useful Improvements in Distribution Systems for Feeding Hot Liquid Material to Traveling Belts, of which the following is a specification.

The present invention relates to a distribution system for feeding a hot liquid material to a traveling belt being an improvement upon the apparatus disclosed in my pending application Serial Number 468,223 now Patent Numbered 1,417,542, filed May 10, 1921, for the handling of hot liquid materials and especially, although not exclusively, to the cooling and solidification of molten sulphur. In said application I disclosed a method and apparatus for building up a body of sulphur by superimposing a series of successive layers and it is the purpose of the present application to disclose an alternative distribution system for feeding the hot liquid material to the traveling belt.

With the above and numerous other objects in view the invention resides in certain novel features of construction, and the combination and arrangement of parts as will be hereinafter more fully described and claimed.

In the drawing.

Figure 1 is an elevation of the apparatus,

Figure 2 is a detail of one nozzle showing an overflow receptacle in vertical section,

Figure 3 is a longitudinal vertical section through one of the nozzles, and

Figure 4 is a vertical transverse section taken therethrough.

In this description I have for convenience assumed hot sulphur as the liquid considered. The hot sulphur supply is brought from some source through the heated pipe 1 and is delivered to the distribution system about to be described. The maximum amount to be delivered may be governed by a float valve or other automatic valve, which will cut off the supply whenever it is in excess of the delivering capacity of the nozzles in use. It is preferable to use an automatic valve of such type that the cutoff action will be quick when the critical point is reached. The float tank 2 which contains a float valve as is indicated in dotted lines in Figure 1 of any preferred construction, is to be heated, preferably with steam, to a point which will maintain the fluidity of the sulphur. The sulphur is taken from the automatic valve or rather from the valve float tank 2 into a pipe line 3 which distributes the sulphur to the various drops 4 that feed the nozzles indicated generally at 5.

In order to feed a greater or less number of such drops, as the available supply of sulphur varies, the various drops are connected to the pipe line by means of overflows 6 occurring at various levels such that, as the level of the sulphur rises, it will successively overflow into additional drops, and vice versa.

Should the automatic valve cease to function properly and too great an amount of sulphur be delivered, such excess would be removed through an emergency overflow 7, which would be somewhat higher than the highest overflow level of the drops.

In this manner, a greater or less number of nozzles will be brought into play, as necessary, at the same time maintaining practically a constant head on the nozzles in action, which it is very desirable to secure uniform discharge from the nozzles.

In order to prevent a dribbling overflow to the last drop of liquid, there is provided an accumulation pocket 8 and a siphon 9 near the top of each drop.

Sulphur will then collect in the pocket until siphoning commences, afterwards, the pocket will be emptied quickly into the drop line, thus securing the desirable pressure head for a time, instead of a possible continued low head. It is desirable to maintain a constant pressure head on the nozzles, in order to secure as near a definite rate of flow as possible, since a low velocity is desired yet sufficient to produce a continuous uniform layer. Too great a flow would produce too thick a layer for good cooling, and too meager a flow would not allow the jets to merge upon impact, which is not very desirable, thus forming a series of ridges. When the jets flow so as to cause a merging upon impact, surface tension is brought into play, causing flattening of the deposited sulphur and greater uniformity in thickness.

The siphon 9 and pocket 8, previously referred to, will not interfere with the continuous flow, when there is an ample supply of sulphur available to feed such drop.

At the lower end of each drop, a valve 10 is preferably situated for cutting off the sulphur supply to the nozzle header, to allow for its disconnection when such is desired. The nozzle header is to be connected to the drop line or valve by a stuffing box 11, which will allow of rotating the header for adjustment, inspection, or repairs. A steam heating pipe 12 having its axis coinciding with that of the stuffing box is used to carry the nozzle header, which latter may be split as at 13 to allow clamping thereon by means of bolts and nuts 14.

The sulphur is then led to the chamber 15 which directly supplies the jets 16 by means of a duct 17 having considerable resistance and extending longitudinally of the chamber, which will neutralize the pressure head of the drop to such an extent, as to leave only a small pressure head for causing the desirable rate of flow through the jets. Such resistance may be increased by adjusting the regulating valve 18 which is preferably conical shape and mounted on a threaded shank 19 at one end of the chamber 15 so as to be movable toward and away from the end of the duct 17. This valve may also be used for a stop valve when seated in the end of duct 17.

It will also be noted that an air collecting pocket 20 is provided in the chamber at one end which pocket is connected to one of the jets by means of a duct 21 indicated in dotted lines in Figure 3. Thus duct 21 will allow for the escape of air from the top of the chamber, thus allowing of the chamber being filled with sulphur, after which, such jets will discharge the sulphur. It is desirable to have the chamber filled with sulphur so as to obtain heat conduction as directly as possible from the steam pipe 12.

It is very desirable to have a low velocity of flow from the jets in order to produce a comparatively thin layer of sulphur when the traveling belt is operated at low speed. A low belt speed allows of closer spacing of nozzle heads and consequently produces a shorter casting machine for a greater thickness of solidified sulphur.

The nozzles are closely spaced in a direction transverse to the direction of the belt travel, the belt being shown at 22 in Figure 1, so that the various jets 16 will merge on impact with the wetted traveling belt 22 or the solidified layer of sulphur thereon.

The jets on the nozzle heads may be arranged in one or more rows on a plate 23 or be integral therewith. They may be staggered to gain more clearance between the jets. The jets may consist simply of holes in the plate 23, or such may terminate with projecting teats as is shown in the drawing, which is most desirable, since such projecting teats will concentrate dripping, instead of allowing wandering streamlets to form on the face of the plate.

The plates having the jets are readily removable from the nozzle header, for cleaning, repairs or replacement. These plates may be held in place as is shown in Figure 3 by having one longitudinal edge engaging with the beveled shoulder 24 while the other edge is engageable with a clamp screw or screws 25 threadedly mounted in the bracket 26. A few turns of these screw clamps will allow of the plates removal.

It is desirable that a screen, not shown, be placed in the system ahead of the jets to prevent foreign matter from clogging the same. It is also desirable that the exterior surface of the system be covered with a heat insulator, not shown, of any preferred material, to maintain a sufficiently high temperature to keep the sulphur liquid, without too great a consumption of steam for heating, and without making it necessary to complicate the heating arrangement.

In this system I also use cooling devices 27 which are disposed parallel and spaced above the moving belt 22 between the nozzle headers 5 as is shown to advantage in Figure 1. These cooling devices may be of any preferred construction and will not here be specifically described as I am filing an application upon their specific construction on even date with the present application.

It is thought that the construction and the operation of this distribution system for feeding the hot liquid material to the traveling belt will be readily understood from the above detailed description when taken in conjunction with my pending application bearing Serial Number 468,223 and that no further explanation is here necessary. The apparatus which I have disclosed presents merely the preferred construction and it is to be understood that numerous changes in form, in the details of construction, and in the combination and arrangement of parts may be resorted to without departing from the scope of the invention as hereinafter claimed.

Having thus described my invention what I claim as new is:—

1. An apparatus for casting a hot liquid material comprising a moving carrier, a plurality of devices arranged in series disposed parallel to the direction of movement of said carrier for depositing said material thereon in successive layers, drops leading to said devices, a line for feeding said drops, and overflow devices disposed between said line and said drops.

2. An apparatus for casting a hot liquid material comprising a moving carrier, a supply line, an automatic valve in the supply line, a feed line communicating with the automatic valve in the supply line, a plurality of overflow devices arranged at

varying levels in the feed line, drops depending from said overflow devices, nozzles on the ends of said drops, and an emergency overflow disposed at a higher level than any of said overflow devices arranged at the end of said feed line.

3. An apparatus for casting a hot liquid material comprising a supply line, an automatic valve in the supply line, a feed line leading from the automatic valve, an overflow device including a pocket and a siphon for preventing dribbling, a drop extending from said overflow device, and a nozzle on the lower end of said drop.

4. An apparatus for casting hot liquid material comprising a feed line, an overflow device in the feed line provided with a siphon and pocket for preventing a dribbling feed, and a nozzle communicating with said overflow device.

5. An apparatus for casting hot liquid material comprising a feed line, a plurality of overflowing devices arranged in said feed lines at varying levels, each overflow device provided with a siphon and pocket, and a nozzle communicating with each overflow device.

6. An apparatus for casting hot liquid material comprising a feed line, a plurality of overflowing devices arranged in said feed line at varying levels, each overflow device provided with a siphon and pocket, a nozzle communicating with each overflow device, and an emergency overflow in the end of the feed line at a higher level than any of said overflow devices.

7. An apparatus for casting hot liquid material comprising a feed line, a nozzle head communicating with said feed line, said head provided with a pipe receiving chamber and a sulphur receiving chamber, a steam heating pipe in said pipe receiving chamber, a resistance duct extending longitudinally of said sulphur receiving chamber and communicating with said feed line, said chamber provided with a plurality of jet apertures.

8. An apparatus for casting hot liquid material comprising a feed line, a nozzle head communicating with said feed line, said head provided with a pipe receiving chamber and a sulphur receiving chamber, a steam heating pipe in said pipe receiving chamber, a resistance duct extending longitudinally of said sulphur receiving chamber and communicating with said feed line, said chamber provided with a plurality of jet apertures, and a regulating valve associated with the end of said duct.

9. An apparatus for casting hot liquid material comprising a moving carrier, a plurality of nozzles arranged above the moving carrier in spaced relation to each other, a plurality of cooling devices disposed between the nozzles and means for delivering hot liquid material to the nozzles in the manner and for the purpose specified.

10. An apparatus for casting hot liquid material comprising a moving carrier, a plurality of nozzles disposed above said carrier in spaced relation to each other, a plurality of cooling devices disposed between the nozzles, a plurality of drops communicating with the nozzles, a feed line, a plurality of overflow devices each including a siphon and pocket disposed in the feed line communicating with the various drops, said overflow devices being disposed at varying levels and an emergency overflow disposed at the end of the feed line at a higher level than any of said overflow devices.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN L. MAUCH.

Witnesses:
ALBERT G. WOLF,
G. SEAMAN RISER.