Aug. 31, 1954 H. S. MESSING 2,687,816

FEEDING DEVICE FOR PULP MAKING MACHINERY

Filed Aug. 16, 1951

2 Sheets-Sheet 1

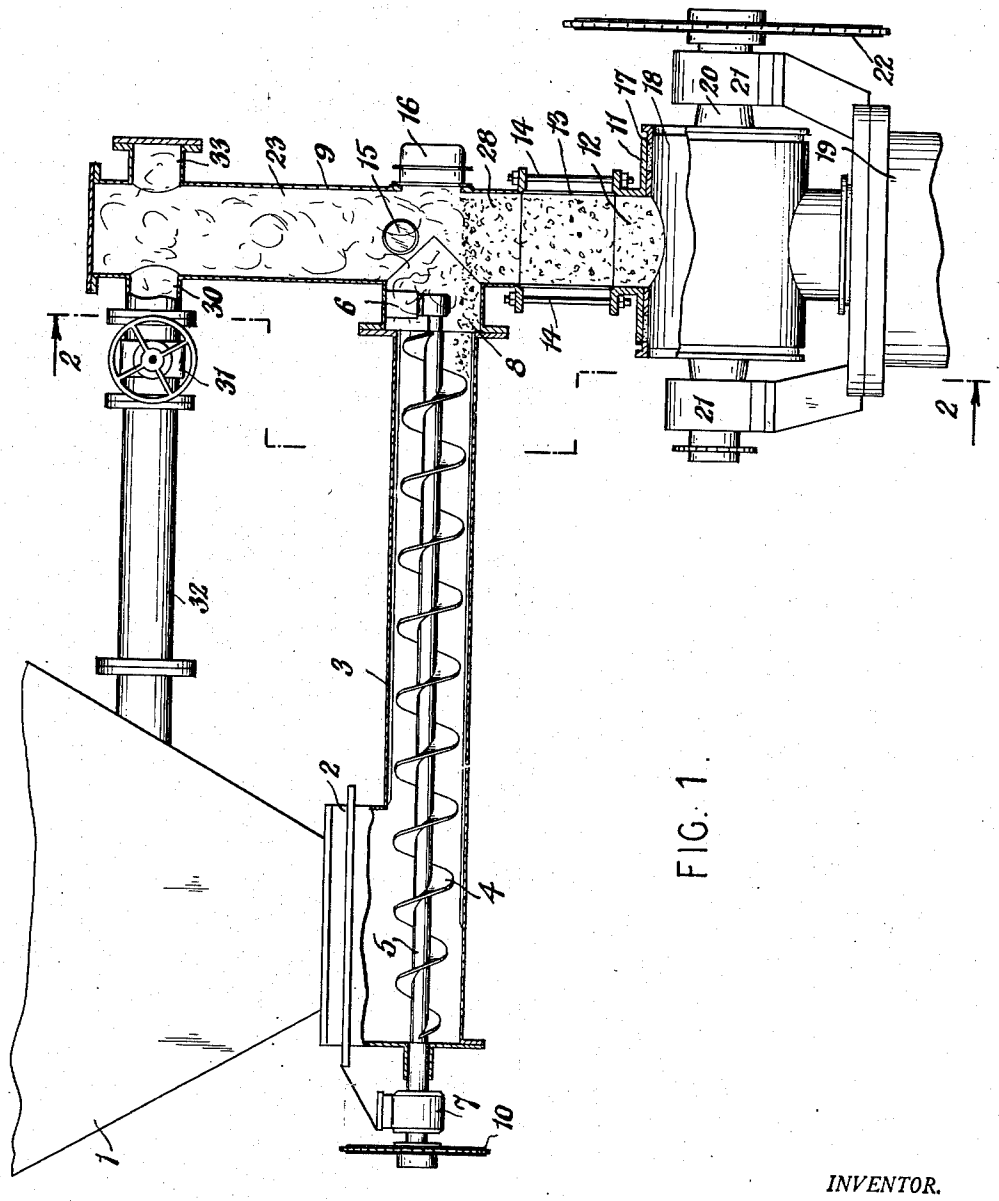


FIG. 1.

INVENTOR.
Hjalmar S. Messing
BY Eric Y. Munson
ATTORNEY.

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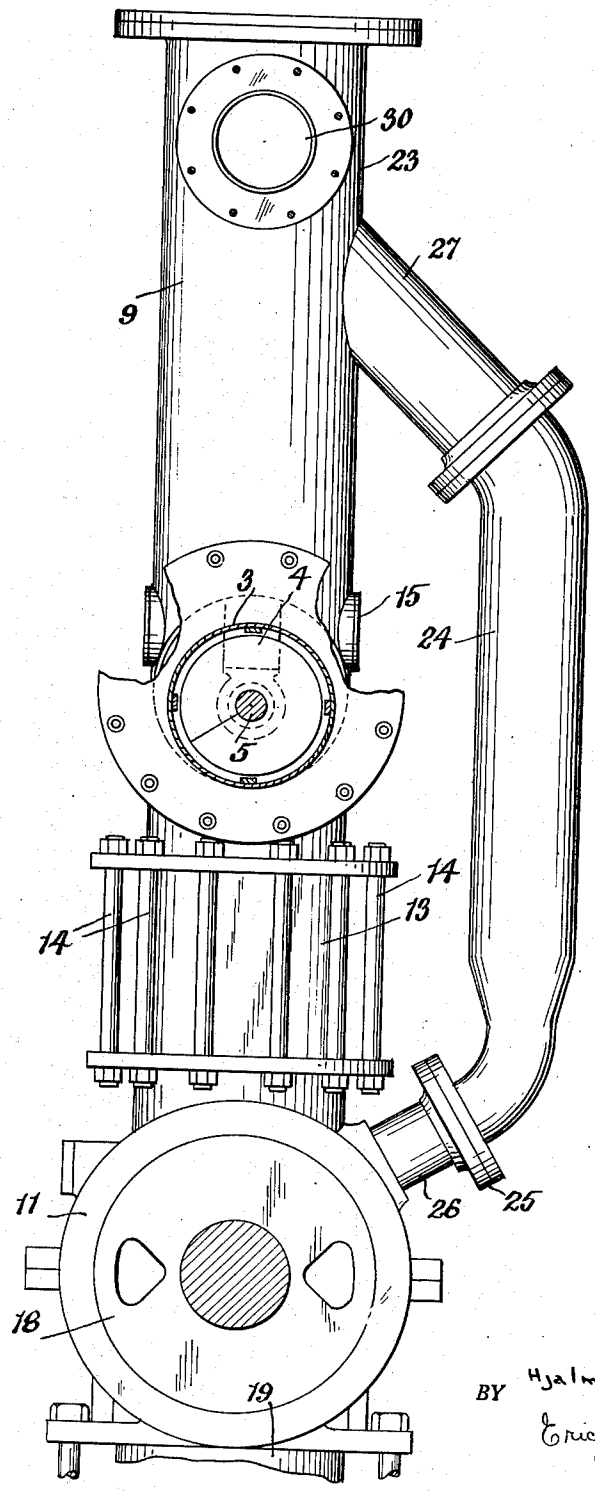


FIG. 2.

INVENTOR.
BY Hjalmar S. Messing
Eric J. Munson
ATTORNEY.

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UNITED STATES PATENT OFFICE

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FEEDING DEVICE FOR PULP MAKING MACHINERY

Hjalmar S. Messing, New York, N. Y., assignor to American Defibrator Inc., New York, N. Y., a corporation of New York

Application August 16, 1951, Serial No. 242,157

6 Claims. (Cl. 214—17)

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This invention relates to an apparatus of the type employed in paper manufacture and by means of which wood chips or similar materials are defibrated. One of the objects of the invention is to provide, in a feeding device in which the chips are heated and softened by steam and fed to the defibrator, means which will prevent a form of back-pressure often found in structures of this character and tending to cause the chips to ascend or rise in the hopper in a manner to interfere with the feeding of the chips from the hopper to the rotary feeding device.

In certain devices of the character to which the present invention relates, the hopper from which the wood chips are fed to a rotary feeder is located directly above the feeder with the result that escaping steam under pressure from the pockets of the rotary feeder, causes a back pressure or rising action of the chips in the hopper, that materially interferes with the feeding of the chips. It has been suggested, as shown in my co-pending application Serial No. 88,733, filed April 21, 1949, now Patent No. 2,652,935, that the employment of a by-pass conduit extending from the rotary feeder to the interior of the hopper will tend to remedy the above deficiency but I have found that the use of a by-pass leading into the top of a feed stack above the rotary feeder is more effective in preventing back pressure or "spitting" action of the chips and that it also prevents collection of air in the pocket of the feeder likely to retard the entry of chips therein to thus interfere with the feeding. Steam constantly supplied to the stack and the preheater chamber will expel air from the chip charge before the charge enters the stack.

It is therefore an object of the invention to provide means by which steam pressure will be by-passed from the rotary feeder to the top of a feed stack and above the point of entry of the chips into the stack whereby such pressure will exhibit a tendency to force the chips downwardly through the stack and into the feeder and avoid the "spitting" action herein described.

With these and other objects to be hereinafter set forth, I have devised the particular arrangement of parts to be described and more particularly pointed out in the claims appended hereto.

In the accompanying drawings, forming a part hereof, and in which an illustrative embodiment of the invention is shown, Fig. 1 is a front elevation, with parts in section of an apparatus constructed according to the invention; and

Fig. 2 is a sectional view, taken substantially on the line 2—2 of Fig. 1, looking in the direction of the arrows.

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Referring to the drawings, 1 indicates a hopper in which the wood chips to be defibrated are dumped and from which the same are conveyed to feeding and heat-softening means which delivers the chips to a defibrator, which may be of the Asplund type. The hopper has its outlet leading into the housing 2 having an elongated, horizontally-disposed cylindrical pre-heating chamber 3 containing a spiral feeder 4 on rotary shaft 5.

The shaft 5, extending for the length of the chamber 3, has its ends mounted in the bearings 6 and 7, the bearing 7 being located externally of chamber 3 and the bearing 6 being mounted in the entrance opening 8 of the feed stack 9. A sprocket 10 is secured on the end of the shaft 5 that is located externally of the chamber 3, said sprocket being driven by a chain from a motor or other source of power.

As the chips descend from the hopper 1, the same fall down into the chamber 3 where they are heated and softened by steam in the chamber 3 and are moved toward the right, as viewed in Fig. 1 to pass through the entrance opening 8 of the stack 9 to then descend into the rotary feeder generally indicated at 11.

The portion of the stack 9 that is disposed between the entrance opening 8 and the entrance 12 to the feeder 11 may include a glass or other transparent section 13 to permit the chips passing through the same to be visible for inspection. The bolts 14 are employed to clampingly maintain this transparent section 13 in position to form a part of the stack. The stack may also be provided with one or more inspection windows, such as indicated at 15, and may also be provided with a pressure-indicator or relief device of known type such as shown at 16.

The rotary feeder generally indicated at 11 includes a housing 17 within which a rotor 18 is rotated, said rotor being shown in detail in my co-pending application, Serial No. 88,733 filed April 21, 1949, and as shown therein is provided with pockets or recesses which receive the chips at the top of the feeder and carry the same to the inlet 19 of the defibrator. The rotor 18 is mounted on shaft 20 supported in bearings 21, said shaft carrying the sprocket 22 driven from a motor or other power source.

The feed stack 9 is provided with an upper portion 23 arising above the inlet opening 8 and a by-pass conduit 24, seen in Fig. 2 which has its lower end connected at 25 to a nipple 26 extending from the rotary feeder housing 17. The upper end of the by-pass conduit 24 is connected to the extension 27 projecting from the upper portion

23 of the stack 9. This arrangement is such that any steam pressure forced out of the pockets of the rotary feeder during the rotation of the same will be forced upwardly through the by-pass conduit to enter into the top portion of the stack above the entering chips, which pressure will tend to force the chips downwardly toward the feeder 11. This action might also be augmented by a cyclone placed in the top end of the stack and cooperating with the by-pass 24 in forcing the steam downwardly and back into the chamber 3, this keeping air from entering into the vertical stack and into the rotary feeder.

The stack 9 is shown as being provided with an outlet pipe 30, connected through the valve 31 to a pipe 32 which connects into the upper portion of the hopper 1 so that, if desired, excess steam pressure may be conveyed from the upper portion of the stack 9 into the upper portion of the hopper 1 for preheating the chips therein. Another extension 33 of the upper portion of the stack 23, and shown as being capped in Fig. 1, may, if desired, be connected to a separate container to use excess steam for preheating chips therein.

Having described one embodiment of the invention, it is obvious that the same is not to be restricted thereto, but is broad enough to cover all structures coming within the scope of the annexed claims.

What I claim is:

1. In an apparatus of the character described, a hopper provided with an outlet, a feed chamber extending horizontally from the outlet of the hopper and receiving material from the hopper, a feed screw rotative in the feed chamber, a feed stack connected to the outlet end of the feed chamber and receiving material from the feed screw, a rotary feeder connected to the lower end of the feed stack below the connection of the feed chamber to the stack, and a by-pass conduit connected at one end into the housing of the rotary feeder and having its other end connected into the feed stack above the connection of the feed chamber to said stack.

2. In an apparatus of the character described, a rotary feeder having a housing, a feed stack connected at the top of the housing and rising upwardly therefrom, a hopper to one side of the housing, said hopper having an outlet, feed means connected to said outlet and communicating with the interior of the feed stack at a point above the rotary feeder, and a by-pass conduit having one end connected to the housing and its other end connected to the feed stack adjacent to the upper end of the same.

3. In an apparatus of the character described, a rotary feeder having a housing, a feed stack connected to the top of the housing and extending upwardly therefrom, a hopper to one side of the rotary feeder, a horizontal feed chamber extending from the outlet of the hopper to the feed stack whereby material is delivered through the feed chamber to the feed stack at a point therein above the connection of the stack to the housing, and a by-pass conduit having a lower end connected into the rotary feeder housing and having its upper end connected into the feed stack at

a point above the connection of the feed chamber to the feed stack, whereby steam pressure forced through said by-pass conduit will enter the upper portion of the feed stack to force material in said stack toward the rotary feeder.

4. In an apparatus of the character described, a hopper provided with an outlet, a feed chamber connected to the outlet and extending horizontally therefrom, a feed screw rotative in said feed chamber, a feed stack connected to one end of the feed chamber at a point remote from the hopper, a rotary feeder having a housing provided at the top with an inlet opening, a feed stack disposed vertically above the rotary feeder and having its lower end connected to the inlet of the rotary feeder housing, the stack being closed at the top, a by-pass conduit having one end connected into the housing of the rotary feeder and having its upper end connected into the feed stack adjacent to the closed upper end of the same whereby steam pressure forced through said by-pass conduit will enter the upper portion of the feed stack above the entering point of material into the stack and will force the material in said stack downwardly and toward the rotary feeder.

5. In an apparatus of the character described, a rotary feeder having a housing, a feed stack connected at the top of the same and extending upwardly therefrom, a feed chamber leading into the lower portion of the feed stack, a by-pass extending between the upper portion of said stack and the housing of the rotary feeder, a hopper arranged to one side of the rotary feeder, a horizontal feed chamber connecting the outlet of the hopper and the lower portion of the feed stack at a point between the connection of the by-pass conduit to the housing and its connection into the feed stack.

6. In an apparatus of the character described, a hopper provided with an outlet at its lower end, a horizontally-arranged feed chamber connected at one end to the outlet of the hopper, a rotary feeder located remotely from the hopper, a vertically-extending feed stack having its lower end connected to the top of the rotary feeder, a by-pass conduit having one end connected into the housing of the rotary feeder and its second end connected into the feed stack adjacent to the upper end of the same, the second end of the feed chamber being connected into the feed stack adjacent to the lower end of the same, and a steam pressure pipe connected at one end into the feed stack near the upper end of said stack, said pipe having its other end connected into the hopper adjacent to the upper end of said hopper.

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