May 17, 1927. 1,629,088

A. ALDRICH

MIXER FOR FOURDRINIER FLOW BOXES

Filed July 19, 1926

Fig. 1.

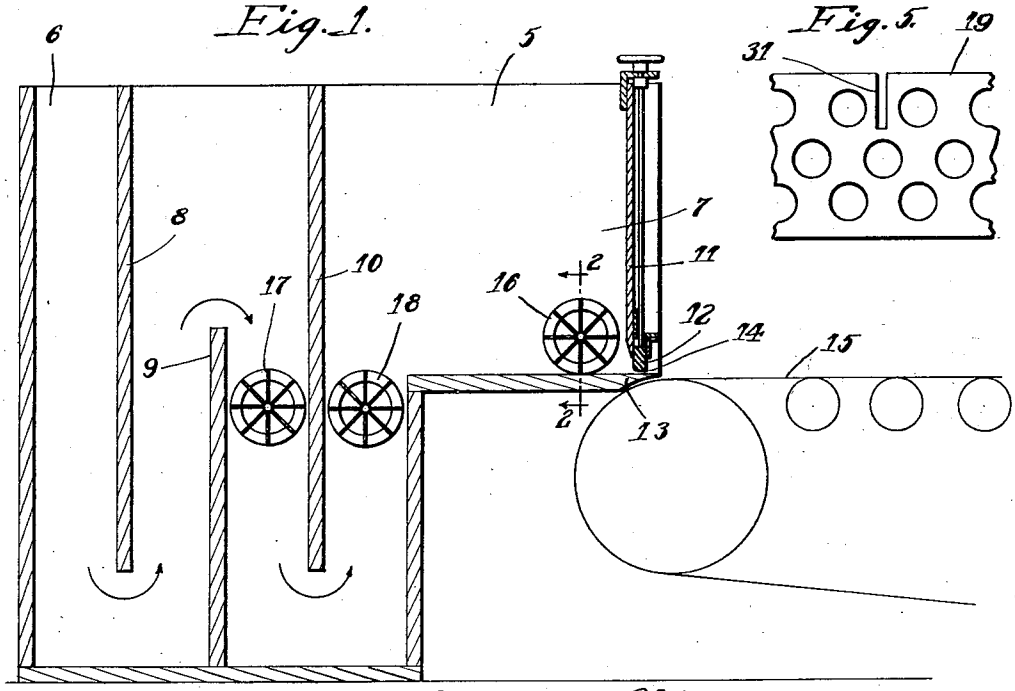


Fig. 5.

Fig. 2.

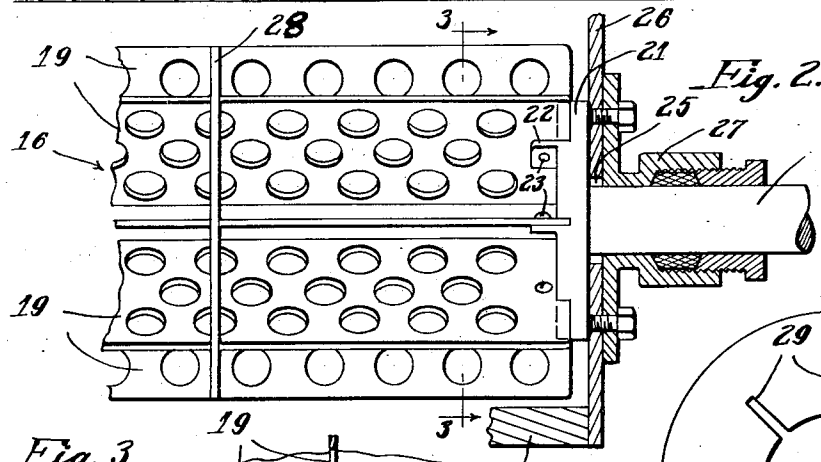


Fig. 4.

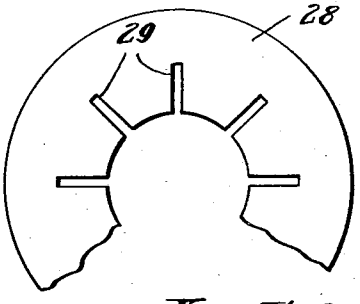
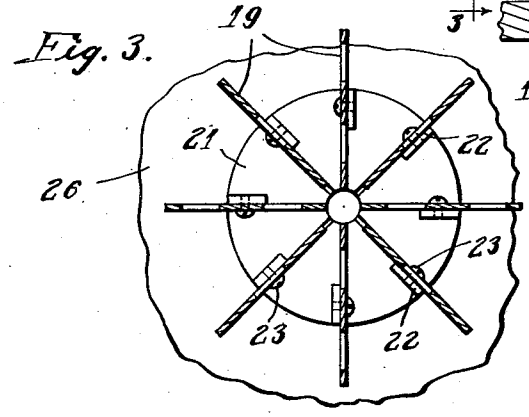


Fig. 3.



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UNITED STATES PATENT OFFICE.

ALONZO ALDRICH, OF BELOIT, WISCONSIN, ASSIGNOR TO BELOIT IRON WORKS, OF BELOIT, WISCONSIN, A CORPORATION OF WISCONSIN.

MIXER FOR FOURDRINIER FLOW BOXES.

Application filed July 19, 1926. Serial No. 123,281.

This invention relates to a mixer especially adapted for use in the flow box of a Fourdrinier paper making machine and has for its primary object to provide an improved mixer of this kind characterized by the provision of a plurality of perforated boards or plates mounted in circumferentially spaced and radial arrangement and adapted to be rotated. This mixer, as will be explained more fully hereinafter, has greater capacity and surface for mixing and agitating the stock or pulp than prior mixers used for this purpose. Another advantage is that it is self-cleaning and still another is that it will function very effectively in breaking up soft lumps of pulp and in maintaining a uniform consistency of the stock.

Another purpose of my invention is to provide a mixer of the character described so constructed that it may be produced economically and will serve in a practical and satisfactory manner the purposes intended.

Other objects and attendant advantages will be appreciated by those skilled in this art as the invention becomes better understood by reference to the following description when considered in connection with the accompanying drawing, in which—

Figure 1 is a vertical section through a flow box of a Fourdrinier paper making machine equipped with a mixer embodying my invention;

Fig. 2 is an enlarged vertical section taken substantially on the line 2—2 of Fig. 1 showing the mixer in elevation;

Fig. 3 is a section taken substantially on the line 3—3 of Fig. 2;

Fig. 4 is a detail view of one of the spiders; and

Fig. 5 is a detail view showing one of the spider slots in one of the mixer plates.

My improved mixer may be used in any flow box and it may be placed in any suitable or preferred position. As to the location and number of the mixers, I prefer that one shall be located just in advance and in close proximity to the discharge orifice at the delivery end, and others may be located in different channels or passages as shown in the present illustration or as in the application of Earl E. Berry, Serial No. 123,293. My invention is not, however, confined to these locations.

Referring more particularly to the drawing, the flow box designated generally by 5 is of conventional design having an inlet end 6 and delivery 7 and the series of baffles 8, 9, and 10, defining a circuitous channel through which the stock or pulp is adapted to flow. In this instance, an adjustable slice plate 11 is equipped at its lower end with a flexible and adjustable lip 12 which, with the apron 13, defines a discharge orifice 14 through which the stock is adapted to flow onto the traveling wire screen 15. This particular slice construction is claimed in the Berry application above mentioned.

As shown, a mixer, designated generally by 16, is located in close proximity to the mouth leading to the discharge orifice so as to intercept and mix the stock flowing thereto, and mixers 17 and 18 are located in the down and up flow channels, respectively, preceding the passage of the stock to the delivery end. Inasmuch as these mixers are similar in construction, a description of one will suffice.

Referring to Figs. 2, 3, and 4, it will be observed that the beater comprises a series of flat perforated boards or plates 19 circumferentially spaced and radially arranged. These mixer plates are secured at each end to a head 21, in this instance the head having a series of inwardly projecting lugs 22 to which the plates are secured by screws 23 and also having radial slots for the reception of the ends of the plates. Each head has an outwardly projecting trunnion 24 extending through an opening 25 in the adjacent side wall 26 of the flow box and journalled in a suitable bearing bracket 27 mounted on said side wall, the bearing bracket being provided with a suitable stuffing box. The trunnion 24 shown in Fig. 2 may serve as the drive shaft for rotating the mixer. One or more spiders 28 are provided for stiffening the mixing plates intermediate the heads or end plates 21. It will be observed that the spider is in the form of a ring plate the opening through which is of a diameter less than the width of any mixer plate. In order to assemble the mixer the plate 28 is notched at circumferentially spaced points 29, as shown in Fig. 4, to allow for successive insertion of the respective mixer plates and the latter are provided with complemental notches 31 which extend inwardly from the outer edge, as shown in

Fig. 5. After the mixer plates have been assembled in this fashion on the spiders the joints are closed as by soldering, thus securing the parts together and filling any openings or corners in which the paper fibres are apt to lodge and form into hard lumps. After assembling the mixer plates and spiders or stiffener plates, the end plates 21 may be attached.

It will be noted that, by reason of the numerous radial mixer plates, a comparatively large surface is provided for contact with the stock and that, by reason of the numerous perforations in said plates, the stock will be thoroughly mixed by the rotating action of the mixer. By reason of the many perforations the resistance to the flow of stock is minimized and by the flow of the stock through these perforations and through the center of the mixer the latter is kept free from accumulations of the stock fibre and is self-cleaning. A mixer of this kind is particularly advantageous in its location in close proximity to the discharge orifice at the delivery end of a flow box for the reason that it serves to effectively mix the stock and return it to a uniform consistency just before delivery to the wire. The mixer in this position also serves to a degree to reduce cross currents. The mixer functions, therefore, to overcome some of the common troubles in this art in that it breaks up lumps and makes for uniform consistency of the stock and aids in regulating and controlling the flow of stock just before its passage through the discharge orifice.

It is believed that the foregoing conveys a clear understanding of the objects prefaced above and, while I have illustrated but a single working embodiment, it should be understood that many changes might be made in details of construction and arrangement of the parts and devices without departing from the spirit and scope of the invention as expressed in the appended claims, in which—

I claim:

1. A pulp mixer for the flow box of a paper making machine comprising a series of perforated circumferentially spaced and radially arranged mixer plates, and means for rotating the mixer.

2. A pulp mixer for the flow box of a paper making machine comprising a series of perforated circumferentially spaced mixer plates mounted to leave an open center and adapted to be rotated as a unit.

3. A pulp mixer for the flow box of a paper making machine comprising a series of perforated circumferentially spaced and radially arranged mixer plates, end plates to which said mixer plates are attached, means for rotating the mixer, and one or more spiders uniting the mixer plates intermediate the end plates and leaving the center of the mixer open to allow for passage of the pulp.

4. A pulp mixer for the flow box of a paper making machine comprising a series of perforated mixer plates circumferentially spaced, mounted to rotate as a unit and positioned just in advance of the discharge orifice.

5. A pulp mixer for the flow box of a paper making machine comprising opposed end plates journalled on the opposite walls of the flow box, a series of mixer plates interposed between and secured at their ends to said end plates in circumferentially spaced and radial relation, and one or more spiders for stiffening the mixer plates intermediate the end plates, the mixer plates and spiders having complemental slots for interfitting connections.

In witness of the foregoing I affix my signature.

ALONZO ALDRICH.