

July 25, 1933.

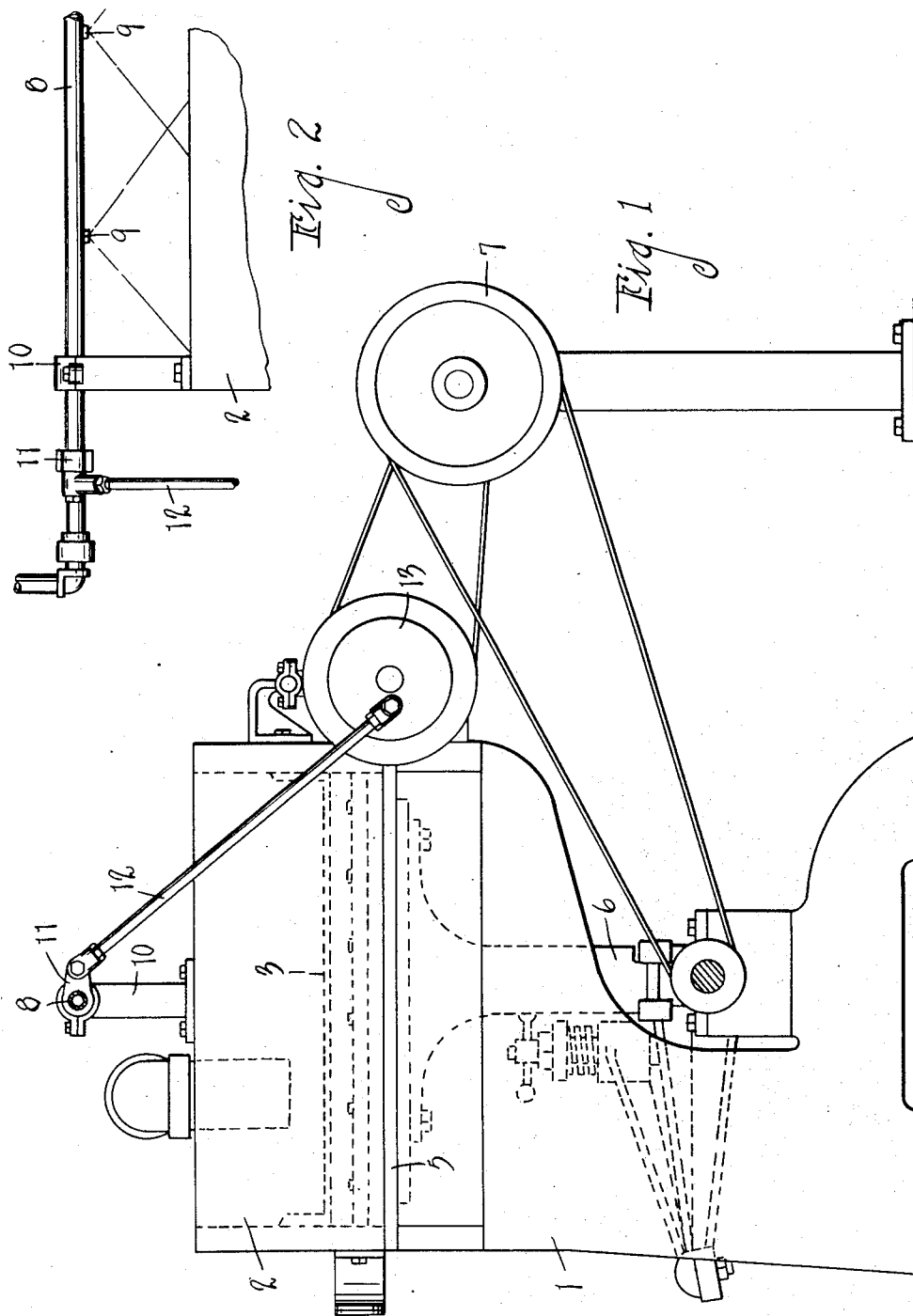
W. B. CLEMENTS ET AL

1,919,201

SCREEN FOR PAPER STOCK AND THE LIKE

Filed March 24, 1932

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

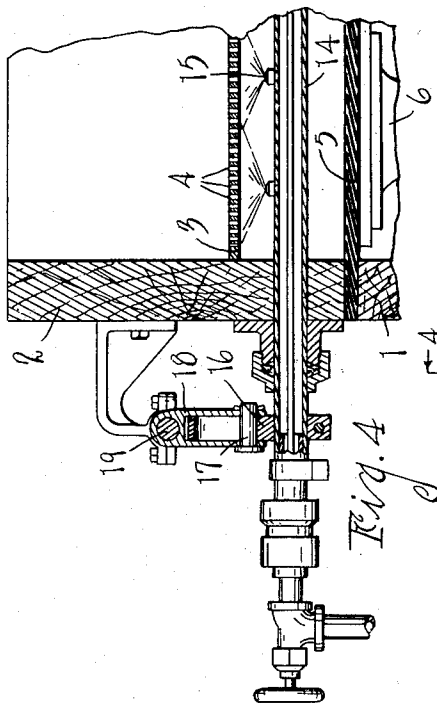


Fig. 4

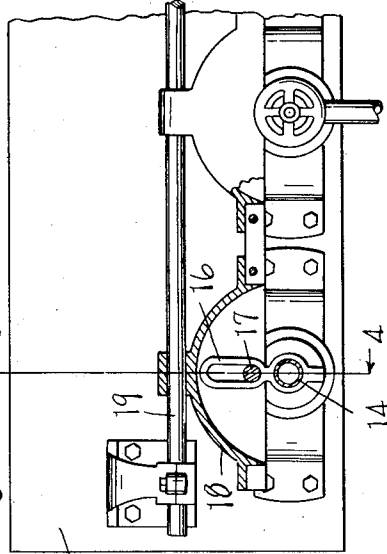


Fig. 5

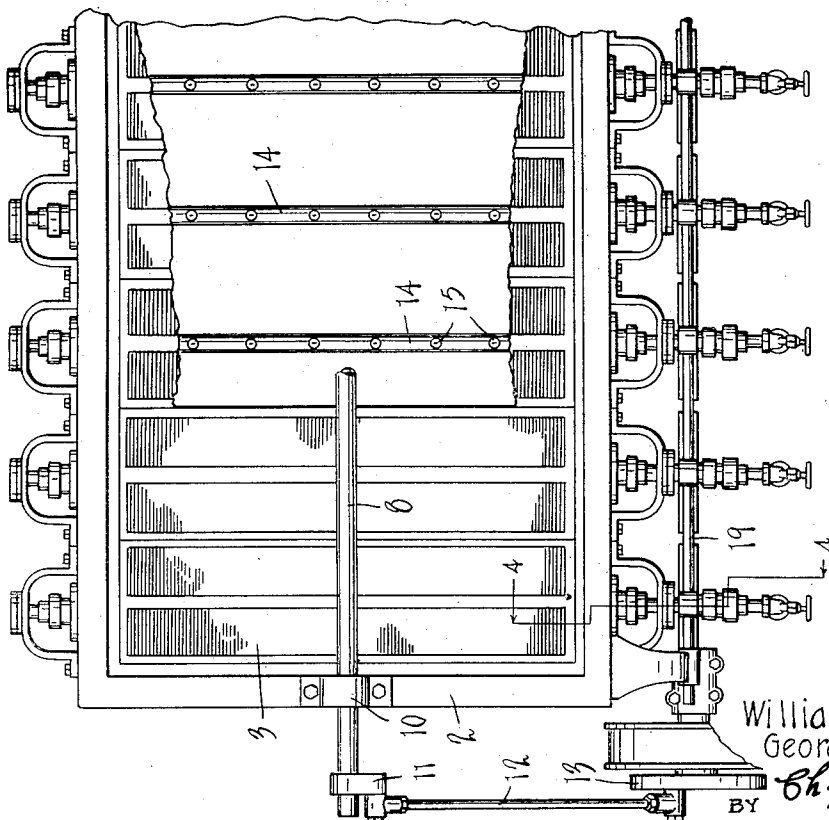


Fig. 3

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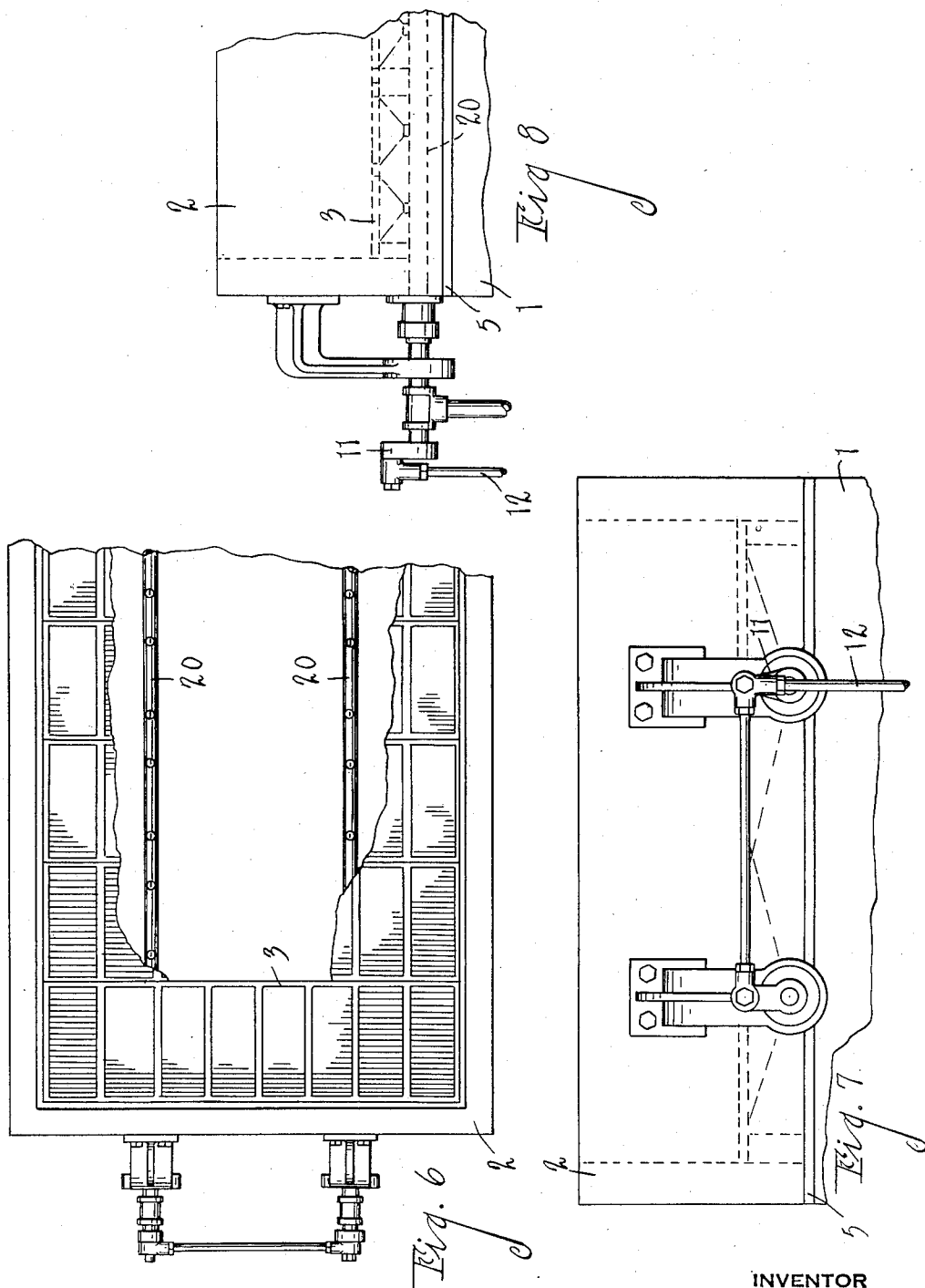
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SCREEN FOR PAPER STOCK AND THE LIKE

Application filed March 24, 1932. Serial No. 600,968.

The main objects of this invention are:

First, to provide a screen for paper stock in which clogging is substantially eliminated, and further, one in which the formation of lumps or strings of fiber is eliminated.

Second, to provide a screen for paper stock and the like which reduces "foaming" to a minimum.

Third, to provide a screen for paper stock and the like having the above advantages which is of large capacity.

Objects relating to details and economies of our invention will appear from the description to follow. The invention is defined and pointed out in the claims.

A structure which is a preferred embodiment of our invention is illustrated in the accompanying drawings, in which:

Fig. 1 is an end elevation of a screen for paper stock embodying our invention, certain parts being shown in conventional form, the upper spray pipe being sectioned.

Fig. 2 is a fragmentary side elevation looking from the right of Fig. 1.

Fig. 3 is a fragmentary plan view.

Fig. 4 is an enlarged fragmentary section on a line corresponding to line 4—4 of Figs. 3 and 5.

Fig. 5 is a fragmentary view looking from the left of Fig. 4, partially in elevation and partially in section.

Fig. 6 is a fragmentary plan view of a modified form or embodiment of our invention.

Fig. 7 is a fragmentary end elevation looking from the left of Fig. 6.

Fig. 8 is an enlarged fragmentary view looking from the right of Fig. 7.

In the embodiment illustrated, 1 represents a supporting pedestal and 2 a flow or screening trough mounted thereon. This trough is provided with a plurality of screen plates or elements 3 having slit-like apertures 4 which, in the embodiment shown in Figs. 1 to 4, are disposed longitudinally of the trough. The stock is introduced at one end of the trough and flows across the bottom of the trough, the trough having, in practice, a slight pitch.

Below the screens is a flexible diaphragm

5 actuated by a vibrating or shaker mechanism designated generally by the numeral 6 and driven from the pulley 7. As the details of this vibrating means form no part of this invention, they are not described herein, it being sufficient to say that a suitable mechanism is provided to vibrate the diaphragm which facilitates the passage of the stock through the screen.

In screens of this type as commonly used, there is, however, a tendency for fiber to collect in strings, or to form small lumps on the underside of the screen which finally become detached and pass to the paper making machine as lumps or clusters of fibers, thereby resulting in objectionable lumps or spots in the paper, or slime may collect in the same manner and form objectionable spots.

To prevent the formation of such collections of fiber or other material, and to increase the capacity of the machine and prevent clogging thereof, we arrange a spray pipe 8 longitudinally above and preferably centrally of the trough, this spray pipe having a plurality of downwardly directed nozzles 9 adapted to deliver fan-like sprays or jets, these sprays being positioned so that they overlap as indicated in Fig. 2.

This spray pipe 8 is mounted for oscillating movement, it being rotatably supported in bearings, one of which is indicated at 10 and provided with an arm 11 connected by the pitman 12 to the crank disk 13, so that the spray pipe is rocked, the rocking being such that the sprays sweep entirely across the screen bottom of the trough, effectively preventing clogging and, in effect, forcing the material through the mesh or openings of the screen, and further, preventing objectionable foaming or frothing.

In the embodiment illustrated in Figs. 1 to 5 inclusive, we also provide under spray pipes 14 which are arranged transversely of the trough below the screen element and provided with jets 15 adapted to deliver fan-like sprays. These spray pipes are rotatably mounted and provided with slotted rocker arms 16 engaged by pins 17 on the slides 18 which are designed to constitute housings for the arms, these being carried by the rod 19, 100

so that all the under spray pipes are simultaneously oscillated. These under spray pipes sweep across the under side of the screens and cooperate with the upper spray pipe in preventing the collection of fibers or foreign materials into lumps or strings.

In the embodiment shown in Figs. 6, 7 and 8, a pair of longitudinally disposed spray pipes 20 are mounted below the screens for oscillating movement, these also being provided with nozzles adapted to deliver a fan-shaped spray and being oscillated so that the sprays sweep across the underside of the screen. The operating connections for these spray pipes are not fully illustrated.

Stock screens embodying our improvements are highly efficient and effective in preventing the forming of lumps or aggregates of foreign materials, thereby resulting in a superior product and greatly reducing waste in the manufacture of paper.

We have illustrated certain practical embodiments or adaptations of our improvements, but we have not attempted to illustrate certain other embodiments or adaptations which we contemplate as it is believed that this disclosure will enable those skilled in the art to embody or adapt our improvements as may be desired.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent, is:

1. In a screen for paper stock and the like, the combination with a trough provided with a foraminate bottom consisting of a plurality of slitted screen elements disposed transversely of the trough and with their slits longitudinally of the trough, of an upper longitudinal spray pipe rotatably supported centrally above said trough and provided with a plurality of nozzles delivering fan-shaped sprays longitudinally of the spray pipe and arranged so that the sprays of adjacent nozzles overlap, means for oscillating said upper spray pipe so that the sprays discharged therefrom sweep across the foraminate bottom of the trough at right angles to the slits, a plurality of under spray pipes rotatably supported transversely below said trough and centrally relative to said screen elements and each provided with a plurality of nozzles discharging fan-shaped sprays longitudinally thereof against the under sides of the screen elements, and means for oscillating said under spray pipes so that the sprays therefrom sweep across the under sides of the screen elements in the direction of the slits.

2. In a screen for paper stock and the like, the combination with a trough provided with a foraminate bottom consisting of a plurality of slitted screen elements disposed transversely of the trough and with their slits longitudinally of the trough, of a longitudinal spray pipe rotatably supported centrally above said trough and provided with a plu-

rality of nozzles delivering fan-shaped sprays longitudinally of the spray pipe and arranged so that the sprays of adjacent nozzles overlap, and means for oscillating said spray pipe so that the sprays discharged therefrom sweep across the foraminate bottom of the trough at right angles to the slits.

3. In a screen for paper stock and the like, the combination with a trough provided with a foraminate bottom consisting of a plurality of slitted screen elements disposed transversely of the trough and with their slits longitudinally of the trough, of a plurality of under spray pipes rotatably supported transversely below said trough and centrally relative to said screen elements and each provided with a plurality of nozzles discharging fan-shaped sprays longitudinally thereof against the under sides of the screen elements, and means for oscillating said under spray pipes so that the sprays therefrom sweep across the under sides of the screen elements in the direction of the slits.

4. In a screen for paper stock and the like, the combination with a trough provided with a foraminate bottom, the apertures being slit-like and disposed longitudinally of the trough, of an upper spray pipe rotatably supported above said trough and provided with a plurality of nozzles delivering fan-shaped sprays longitudinally of the spray pipe, means for oscillating said upper spray pipe so that the sprays discharged therefrom sweep across the foraminate bottom of the trough, a plurality of under spray pipes rotatably supported transversely below said trough and each provided with a plurality of nozzles discharging fan-shaped sprays longitudinally thereof against the under side of the foraminate bottom, and means for oscillating said under spray pipes.

5. In a screen for paper stock and the like, the combination with a trough provided with a foraminate bottom, the apertures being slit-like and disposed longitudinally of the trough, of a spray pipe rotatably supported above said trough and provided with a plurality of nozzles delivering fan-shaped sprays longitudinally of the spray pipe, and means for oscillating said spray pipe so that the sprays discharged therefrom sweep across the foraminate bottom of the trough at right angles to the slits.

6. In a screen for paper stock and the like, the combination with a trough provided with a foraminate bottom, the apertures being slit-like and disposed longitudinally of the trough, a plurality of under spray pipes rotatably supported transversely below said trough and each provided with a plurality of nozzles discharging fan-shaped sprays longitudinally thereof against the under side of the foraminate bottom in the direction of the slits, and means for oscillating said under spray pipes.

7. In a screen for paper stock and the like, the combination with a trough provided with a foraminate bottom having the slits arranged longitudinally thereof, of an upper spray pipe rotatably supported above said trough and provided with a plurality of nozzles delivering fan-shaped sprays longitudinally of the spray pipe, means for oscillating said upper spray pipe so that the sprays discharged therefrom sweep across the foraminate bottom of the trough, a plurality of under spray pipes rotatably supported transversely below said trough and each provided with a plurality of nozzles discharging fan-shaped sprays longitudinally thereof against the under side of the foraminate bottom, and means for oscillating said under spray pipes.

8. In a screen for paper stock and the like, the combination with a trough provided with a foraminate bottom having longitudinally arranged slits, of a spray pipe rotatably supported above said trough for rotation about its longitudinal axis and provided with a plurality of nozzles delivering fan-shaped sprays longitudinally of the spray pipe, and means for oscillating said spray pipe so that the sprays discharged therefrom sweep across the foraminate bottom of the trough.

9. In a screen for paper stock and the like, the combination with a trough provided with a foraminate bottom having longitudinal slits, a plurality of under spray pipes rotatably supported transversely below said trough for individual rotation about their longitudinal axis and each provided with a plurality of nozzles discharging fan-shaped sprays longitudinally thereof against the under side of the foraminate bottom, and means for oscillating said under spray pipes.

10. In a screen for paper stock and the like, the combination with a trough provided with a foraminate bottom having longitudinal openings, of an upper spray pipe supported above said trough for oscillating movement so that the water discharged therefrom sweeps across the foraminate bottom of the trough, and under spray pipes supported below said trough for oscillating movement to discharge against the under side of the foraminate bottom and so that the water is discharged with a sweeping movement as the under spray pipes are oscillated.

11. In a screen for paper stock and the like, the combination with a trough provided with a foraminate bottom having longitudinally arranged slit-like apertures, of a longitudinal spray pipe supported above said trough for

oscillating movement so that the water discharged therefrom sweeps across the foraminate bottom of the trough at right angles to the slit-like apertures.

12. In a screen for paper stock and the like, the combination with a trough provided with a foraminate bottom having longitudinally arranged slit-like apertures, of a transverse under spray pipes supported below said trough for oscillating movement to discharge against the under side of the foraminate bottom and so that the water is discharged with a sweeping movement in the direction of the slit-like apertures as the under spray pipes are oscillated.

13. In a screen for paper stock and the like, the combination with a trough provided with a foraminate bottom having longitudinally arranged slit-like apertures, of a transverse spray pipe mounted for oscillating movement about its longitudinal axis and provided with a plurality of nozzles delivering fan-shaped sprays longitudinally of the spray pipe and arranged so that the sprays of adjacent nozzles overlap and so that the water discharged therefrom sweeps across the foraminate bottom as the pipe is oscillated.

14. In a screen for paper stock and the like, the combination with a trough provided with a foraminate bottom having longitudinally arranged slits, of a spray pipe mounted for oscillating movement about its longitudinal axis and having lateral wall ports arranged so that the water discharged therefrom sweeps across the foraminate bottom as the pipe is oscillated.

15. A paper stock screening device comprising in combination a trough having slit-like apertures in the bottom thereof extending in the same general direction, an upper spray pipe mounted above said trough for rotation about its longitudinal axis and extending in same direction as the slit-like apertures, whereby when the pipe is oscillated the spray sweeps across the slit-like apertures at right angles thereto, a lower spray pipe mounted below said trough for rotation about its longitudinal axis and extending at right angles to the direction of the slit-like apertures, whereby when the pipe is oscillated the spray sweeps through the slit-like apertures in the same direction as they extend, and means for oscillating said pipes simultaneously, whereby their sprays coact to break up lumps in the stock above the slit-like apertures.

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