April 28, 1942. R. T. LANG 2,281,293

APPARATUS FOR DELIVERING PAPER STOCK TO PAPER MAKING MACHINES

Filed Dec. 15, 1937 3 Sheets-Sheet 1

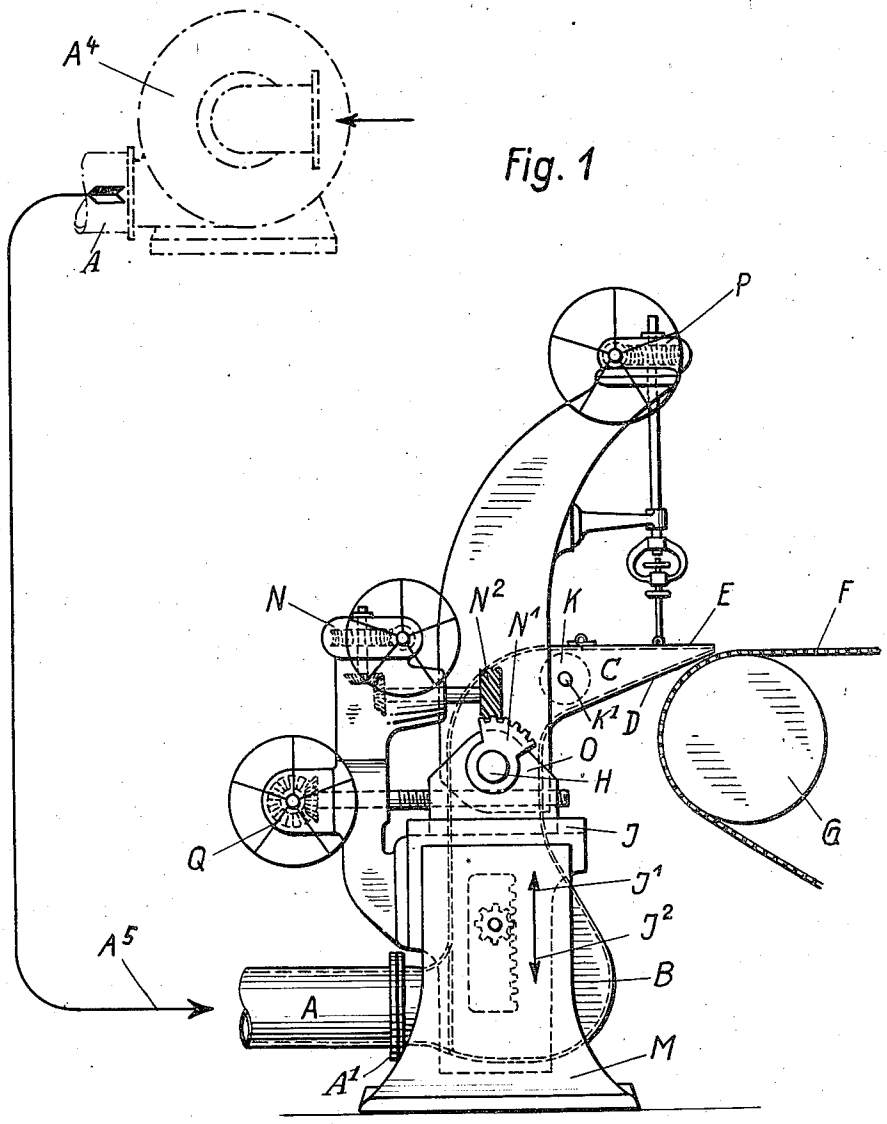


Fig. 1

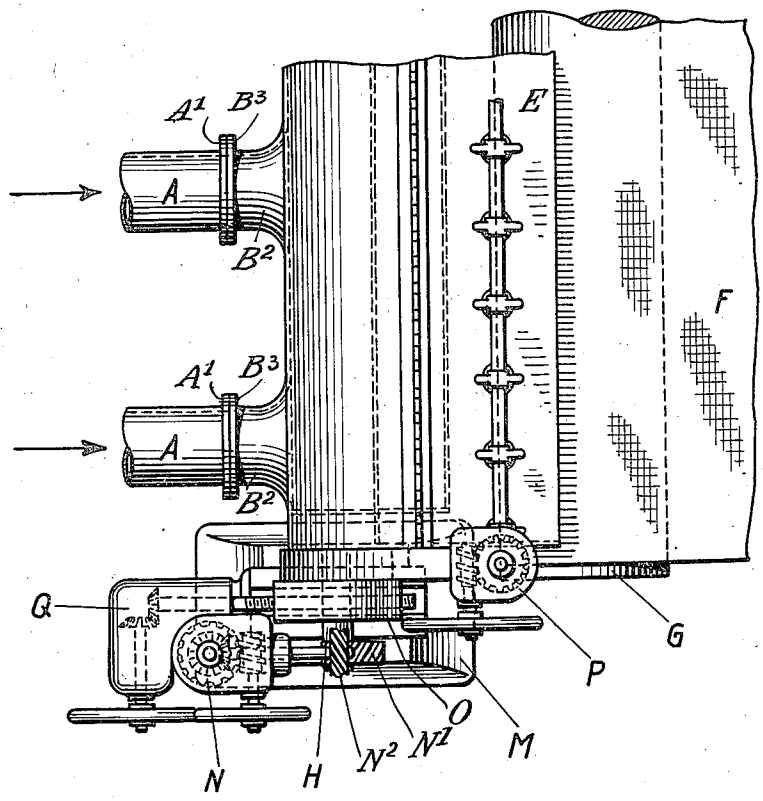
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Fig. 2



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Fig. 3

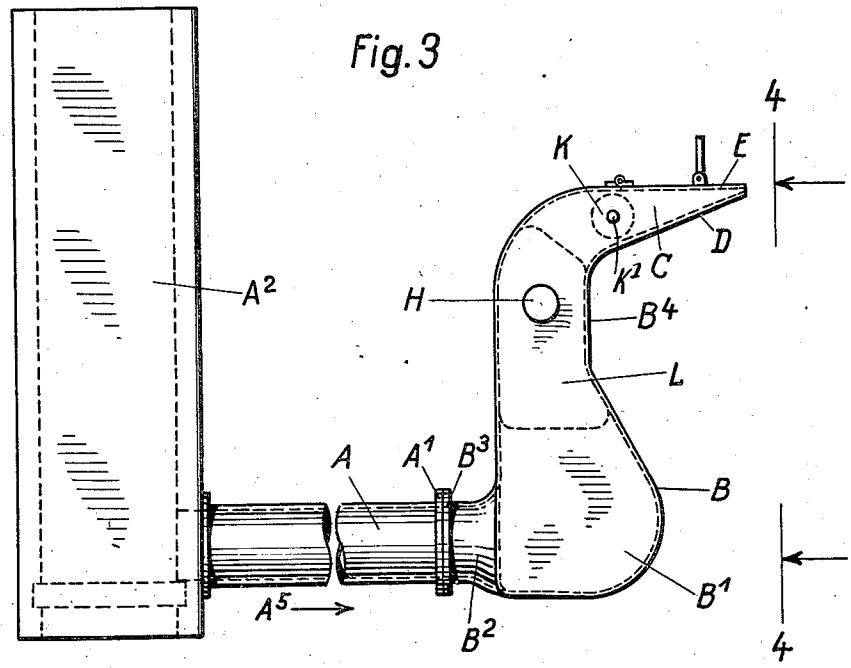
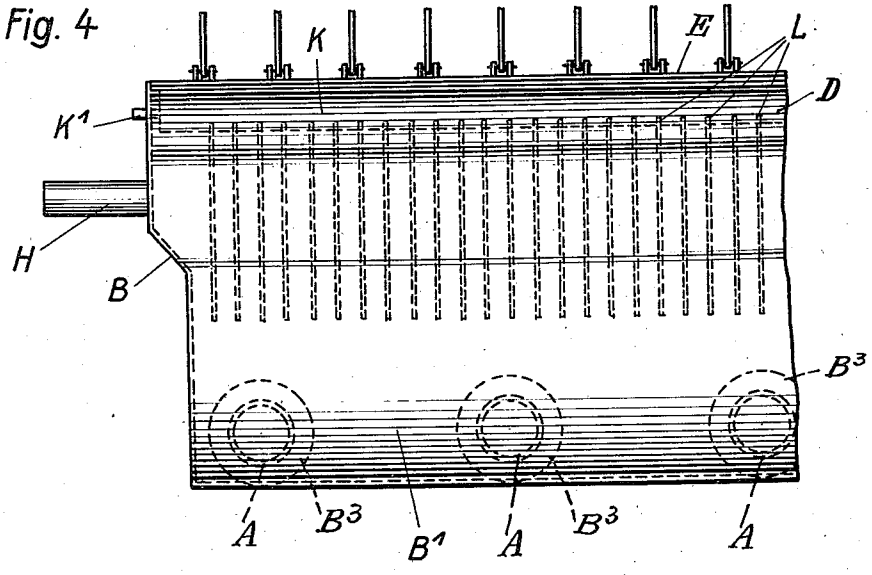


Fig. 4



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UNITED STATES PATENT OFFICE

2,281,293

APPARATUS FOR DELIVERING PAPER STOCK TO PAPER MAKING MACHINES

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5 Claims. (Cl. 92—44)

This invention relates to apparatus for delivering paper stock to paper making machines.

The object of the invention is to provide means to enable the stock discharging nozzle to be regulated in its position in respect to the paper making machine sieve or wire cloth, so as to be able to direct the stock stream to any desired direction of impingement upon the sieve, and also to select the point of impingement as desired and most efficient for the production of the pulp mash on the sieve.

In the use of larger or higher stock inlet boxes of the known kind, it is difficult to move the same, that is, to tilt them. Means to carry out such tilting are relatively complicated, and it is difficult to adjust them to the required desires. These difficulties are all the greater, the higher such stock inlet boxes are made, and these have been made increasingly higher on account of the increase of working speed of modern paper making machines. It is, however, very important to be able to regulate the direction of the stock stream upon the sieve, and also regulate the point of impact of the stock stream upon the sieve; and equally important to carry out these two regulations substantially at the same time.

The invention consists in the means of a stock delivery member which is independent of the stuff-chest, and which member has a delivery nozzle, itself regulatable, and is regulatable in vertical and horizontal directions, as also swingable about a horizontal axis perpendicular to the direction of the flow of the stock.

The invention also comprises a novel stock delivery member which is so shaped as to hold a certain quantity of stock and to distribute it, as also to enable it to be quieted prior to its discharge from the nozzle. More particularly, the delivery member has an enlargement to act in the nature of a reservoir for the stock.

Furthermore, the invention consists in the combination of such a novel member with the known stuff-chest, the novel cooperation being attributable to a flexible connection between the member and the stuff-chest, such flexible connection enabling the member to be raised or lowered, moved forward or backwards, or be tilted in any angular position within the sphere of operativeness of the cooperating parts described. To enable these objects to be attained and the means to be brought into being, a reconstruction of that part of paper making machines became necessary, which with other features of the invention will be shown in the form of embodiments of the invention in the drawings, will be more fully described hereinafter, and the invention will be finally pointed out in the claims.

In the accompanying drawings,

Figure 1 is a side view of a novel stock delivery mechanism, as applied to the sieve and roll of a paper making machine;

Figure 2 is a plan view of the mechanism shown in Figure 1;

Figure 3 is a side view of the stock delivery member, shown without the frame and regulating devices of Figure 1; and

Figure 4 is a partial front view of the member shown in Figure 3, seen in the direction of line 4—4 of Figure 3.

Similar characters of reference indicate corresponding parts throughout the various views.

Referring to the drawings, and more particularly to Figures 3 and 4, the reverse Z-shaped stock delivery member B has a goiter-like enlargement B^1, narrowing to a tubular portion B^2 forming the base of the reverse Z, provided with a flange B^3. From the enlargement B^1 the member narrows into a smaller shape B^4 as it ascends, and finally terminates in a beaklike nozzle portion C, which has a stationary under lip D and a movable upper lip E. Within the nozzle portion C, a roll K, which is well-known, is placed; The shaft K^1 may be rotated by known means. The interior of the member B may also be provided with the known partitions L. This roller K and partitions L serve to quiet the stock and to distribute it equally. Such devices are known and form no part of the present invention, and are referred to only for completeness sake.

Extending laterally from the hollow member B, are shafts H, which are suitably secured thereto, and which rest in bearings of the frame M of the stock feed mechanism.

The member B, being supportable by its trunnions or shafts H, the member may be vertically raised or lowered, horizontally moved forward or backwards, or may be tilted depending entirely upon the mechanism employed to carry out these movements. Such a variation of movements is possible, first because of the conception of such an independent stock delivery member, and secondly because of an elastic connection of this member with the stuff-chest A^2. The stuff-chest A^2 is suitably connected with an elastic or yieldable or flexible tube A, having a flange A^1 connected with flange B^3 of the member B.

Instead of using a stuff-chest A^2 as shown in Figure 3, a pump A^4 may be used as shown in Figure 1; the flow of the stock in any case is the

direction of the arrow A^5. The flow of the stock is under pressure.

Mechanism for moving the member B is shown in Figures 1 and 2. The frame M has guide slots, and in these an anvil J is guided, which anvil J can be raised or lowered in a vertical direction, as indicated by the double arrow J^1—J^2. Upon the anvil J a sled O is guided, and this sled O may be moved horizontally, forwards and rearwards, to and fro, by suitable means indicated generally by Q. Devices like this, both for horizontal and vertical movement, are placed at each side of the mechanism, or of the sieve, though only one side is shown in the drawings.

The sled O is provided with bearings which support the trunnions H of the member B. To one or both of the shafts H, a segment of a gear N^1 is secured, which meshes with a gear N^2, and which gear N^2 is driven by suitable mechanism, generally indicated by N. By rotating the gear N^2, the segment N^1 is moved, the shaft H rotated, and the member B tilted.

Finally, the upper lip E of the nozzle C is connected with means generally indicated by P to raise or lower the upper lip E, and thereby govern the amount of discharge of the stock.

All those generally indicated parts are within the skill of a mechanic, and naturally can be varied ad libitum, within the fundamental concept of the disclosed invention.

The relationship of the nozzle E to the sieve F and breast roll G is shown in Figure 1.

It has been seen that the stock delivery member B is independent of the stuff-chest. The member is movable vertically, horizontally or tiltable, either separately or simultaneously, in order to select the most favorable point, as well as direction of impact, of the stock stream upon the sieve F; variation in quantity entering also into these co-ordinates. Thereby it is possible to direct the stock stream beyond the curvature of the breast roll to any desired point or in any direction.

The embodiments described avoid the disadvantageous features of heavy stuff-boxes, with their heavy contents.

The member B with its enlargement, serves not alone as a guide nozzle considered in its entirety, but as a reservoir for the stock, to equally distribute it, and to make it quiescent prior to passing to the nozzle C.

Instead of the trunnions and the bearings therefor, other means may be used, as for instance, a ring around the member B, slidable in circular bearings, so arranged as to enable a universal joint action to take place. Similarly, changes can be made to raise or lower the member B, by suspension means on a monorail, or the like. Also, the upper lip can be moved by means on the member B, instead of those shown.

Such and other changes within the scope of the invention can be made, since the invention consists of the fundamental concept of the provision of a stock delivery member, independent of the stuff-chest, capable of being moved to any position to select the best direction of the stock stream and to select the best point of impact of the stock stream in respect to the plane of the sieve of a paper making machine. Other facets of the invention present the enlarged bowl of the member B, as also such others as are hereinbefore pointed out and hereinafter claimed.

It is obvious that various changes and modifications may be made in the details of construction and design of the above specifically described embodiments of this invention without departing from the spirit thereof, such changes and modifications being restricted only by the scope of the following claims:

I claim:

1. An apparatus for delivering stock to a high speed paper making machine, comprising a vertically disposed container having a lower and an upper portion, and having a stock inlet at said lower portion at the rear of the container and a stock outlet at its upper end, a stock supply pipe, for supplying stock to said inlet, a stock delivery nozzle for said outlet, said lower portion being formed with a curved wall, at the front of the container, disposed in line with and opposite to said inlet for deflecting the stock in an upward direction, and said upper portion having unimpeded communication with the lower portion and having substantially the same cross-sectional area throughout its length, said area being smaller than the cross-sectional area of the lower portion which varies with the curvature of said curved wall.

2. In a pressure head box like claim 1, in which the stock supply pipe is flexible, and means for adjusting the pressure head box as an entity to vary the position of the delivery nozzle in respect to the screen of the high speed paper making machine.

3. In an apparatus for delivering stock to a high speed paper making machine of the Fourdrinier type, having a vertically disposed container with an outlet nozzle extending along the width of the container at the upper front end thereof, and a plurality of stock supply pipe inlets at the rear lower end thereof, disposed in parallel relationship with the outlet nozzle, the combination of a first portion of the container of varying cross-sectional area adjacent the inlets and in direct communication therewith, the first portion having a curved wall forming an enlarged front of the container disposed in line with said inlets and concave and in the path of the flow of the stock entering the inlets, said enlarged portion acting as a reservoir for equally distributing the stock therein, with a second portion of the container of constant cross-sectional area adjacent the outlet nozzle, said second portion being vertically above the first portion and in communication therewith for receiving the stock therefrom and causing the stock to become quiescent prior to its passing to the outlet nozzle.

4. In an apparatus for delivering stock to a high speed paper making machine of the Fourdrinier type, having a pressure head box with an outlet nozzle extending along the width of the head box at the upper front end thereof, and a plurality of stock mixture supply pipe inlets at the rear lower end thereof, disposed in parallel relationship with the outlet nozzle, the combination of a first portion of the head box of varying horizontal cross-sectional area adjacent the inlets and in direct communication therewith, the first portion having a concave wall forming an enlarged front of the head box disposed in line with said inlets and in the path of the flow of the stock mixture for reversing the flow for equally distributing the fibers of the stock, and a second portion of the head box of substantially constant horizontal cross-sectional area adjacent the outlet nozzle, said second portion being vertically above the first portion and in communication therewith for receiving the stock therefrom as it rises in the head box, the

stock becoming quiescent for its passage to the outlet nozzle.

5. In an apparatus for delivering stock to a high speed paper making machine of the Fourdrinier type, having a pressure head box with an outlet nozzle extending along the width of the head box at the upper front end thereof, and a plurality of stock mixture supply pipe inlets at the rear lower end thereof, disposed in parallel relationship with the outlet nozzle, the combination of a first portion of the head box of varying horizontal cross-sectional area adjacent the inlets and in direct communication therewith, the first portion having a concave wall forming an enlarged front of the head box disposed in line with said inlets and in the path of the flow of the stock mixture entering the inlets for reversing the flow and for equally distributing the fibers of the stock therein, a second portion of the head box of substantially constant horizontal cross-sectional area adjacent the outlet nozzle, said second portion being vertically above the first portion and in communication therewith for receiving the stock therefrom, the stock becoming quiescent prior to its passing to the outlet nozzle, and means exterior of said head box for moving it as an entity for varying the position of its outlet nozzle in respect to the screen of such paper-making machine during its high speed operation, the variation in position of said head box being without changing the character of the stock in said head box.

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