J. B. HOWE.

AUTOMATIC FEEDER.

APPLICATION FILED FEB. 14, 1918.

1,290,747.

Patented Jan. 7, 1919.

2 SHEETS—SHEET 1.

Fig. 1.

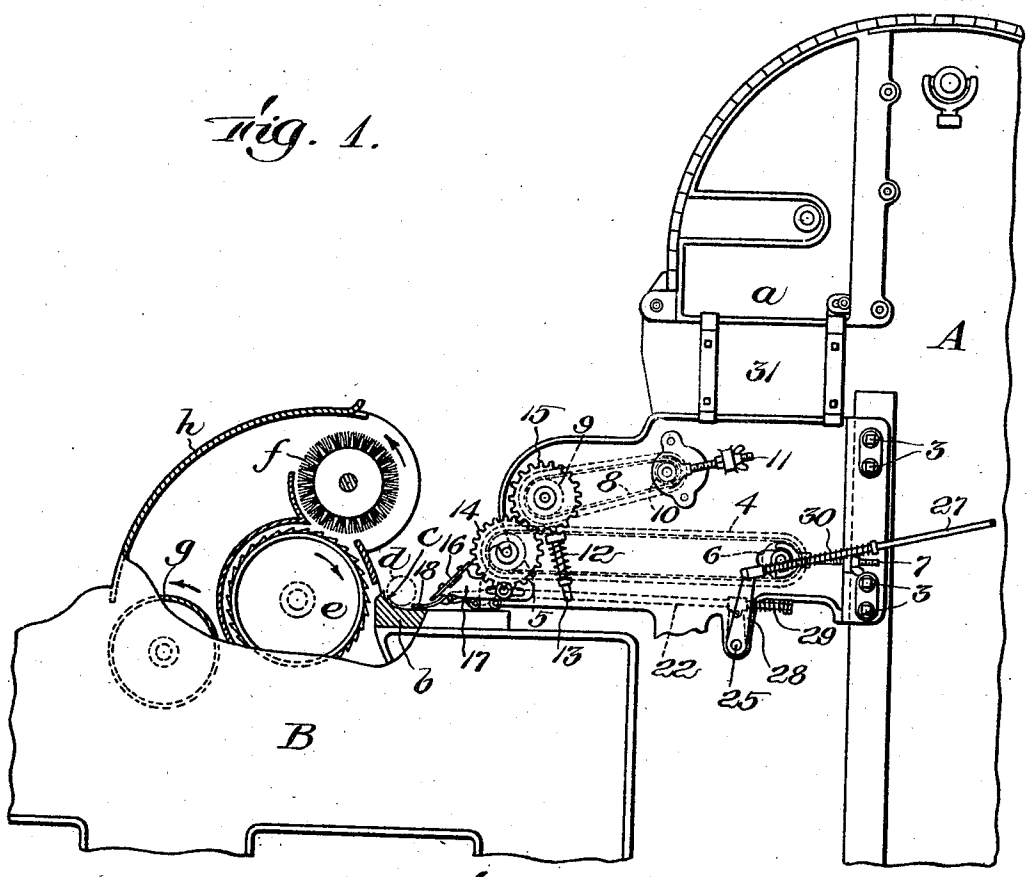
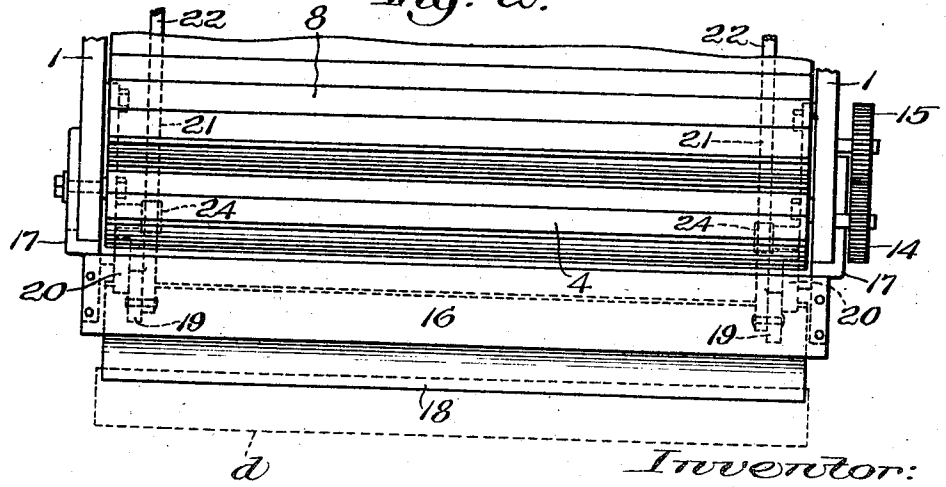


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

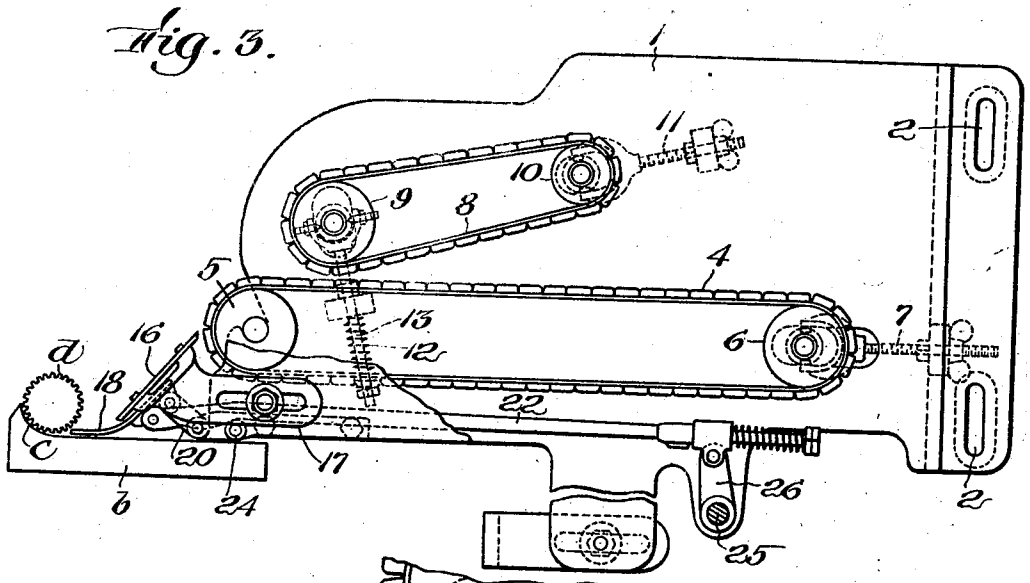


Fig. 4.

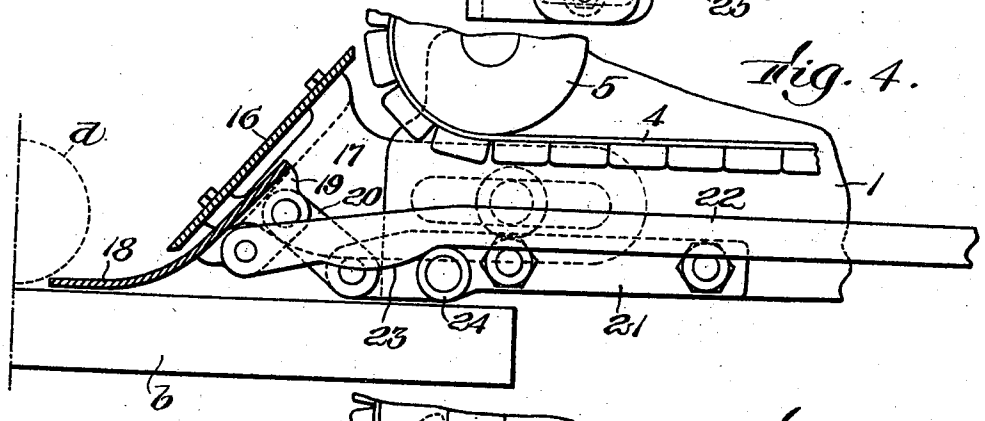
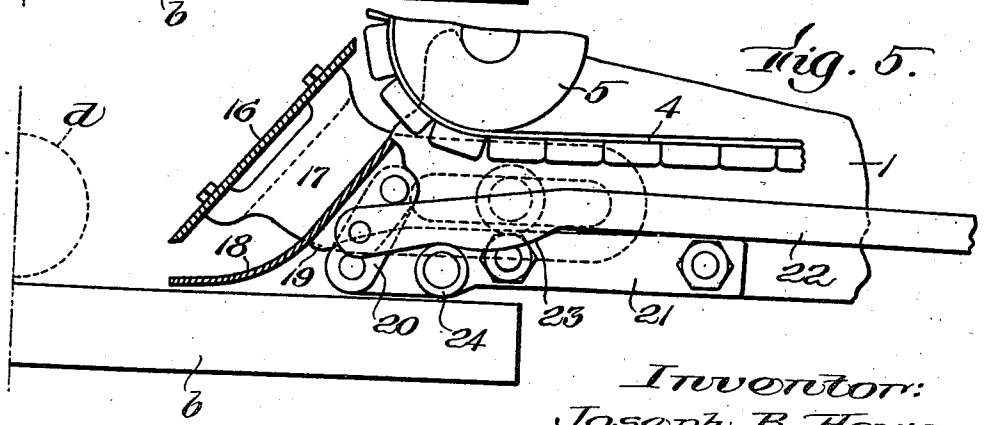


Fig. 5.



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UNITED STATES PATENT OFFICE.

JOSEPH B. HOWE, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO SYDNEY HARWOOD, OF NEWTON, MASSACHUSETTS, AND JOHN H. HARWOOD, OF BROOKLINE, MASSACHUSETTS, A COPARTNERSHIP DOING BUSINESS AS GEORGE S. HARWOOD & SON, OF BOSTON, MASSACHUSETTS.

AUTOMATIC FEEDER.

1,290,747. Specification of Letters Patent. Patented Jan. 7, 1919.

Application filed February 14, 1918. Serial No. 217,220.

To all whom it may concern:

Be it known that I, JOSEPH B. HOWE, a citizen of the United States, and resident of Worcester, in the county of Worcester and State of Massachusetts, have invented new and useful Improvements in Automatic Feeders, of which the following is a specification.

This invention relates to an automatic feeder for delivering fibrous materials to preparing machinery used in various textile industries. While the invention is not limited in its application to the handling of any particular kind of fiber, nor to the delivery of the fiber to any particular type of preparing machinery, it is nevertheless especially intended for the feeding and delivery of cotton waste and other cotton fiber to a cleaning machine, which removes foreign matter and leaves the cleaned fiber in condition for subsequent mill processes. The invention is also well adapted to be used as an adjunct to feeding machines of the type shown in Letters Patent of the United States to W. C. Bramwell, No. 216,373, dated June 10, 1879, comprising a casing in which the fibrous material is deposited, and a lifting belt, usually termed a "spike apron" in the casing, by which the fibers are elevated to the upper part of the casing and thence delivered upon a traveling apron which carries the material to the machine by which it is to be next treated.

The invention will therefore be illustrated as embodied in a feeder for delivering cotton fiber, such as low grade cotton or waste, from a machine of the general type shown in said Bramwell patent to a cleaning machine, but it will be understood that it is not limited to such particular environment or use.

In the accompanying drawings which illustrate a preferred embodiment of the invention,—

Figure 1 is a side view, partly in longitudinal section, showing the feeder, part of a cleaning machine, and part of the casing of a machine of the type of said Bramwell patent with which the feeder is associated;

Fig. 2 is a plan view of the forward end of the feeder on an enlarged scale;

Fig. 3 is a side elevation of the feeder on an enlarged scale; and

Figs. 4 and 5 are fragmentary views, partly in elevation and partly in section, on a still larger scale, illustrating two positions of the pusher hereinafter described.

A represents part of the casing of a machine of the type shown in said Bramwell patent, adapted to deliver the stock downward through an opening in the bottom of the overhanging part *a*. The details of this machine form no part of the present invention and need not be further described.

B represents part of a cleaning machine to which the stock is to be fed. This machine is provided at its intake end with a feed plate or table *b*, upwardly curved at its forward end as shown at *c*, and a feed roll *d* preferably fluted, arranged above the feed plate *b* and close to the curve *c*. The licker-in *e*, brush-roll *f*, condenser screen roll *g*, housing *h*, and other parts of the cleaning machine (not shown) form in themselves no part of the present invention and require no further description.

The automatic feeder between the casing A and the cleaning machine B, comprises the two side frames 1, secured to the sides of the casing A, one on each side. The frames 1 are provided with means for limited vertical adjustment consisting of the slots 2, and bolts 3. A conveyer belt or slat-apron 4 extends between suitable rollers 5 and 6 which are supported at their ends by journals on the side frames 1. The apron 4 is driven in any convenient manner, and its tension may be regulated by adjusting the roller 6, forward or backward by means of adjusting screws 7.

Above the slat-apron 4 is a presser belt or apron 8 stretched between rollers 9 and 10. The tension of apron 8 is regulated by adjusting screws 11 which are adapted to adjust the roller 10 toward and from roller 9. The apron 8 is arranged at an angle to apron 4, thus providing a space between the two belts which is wide at the entrance to re-

ceive the incoming stock, and converges toward the delivery end to press the stock into a comparatively thin flat mat. The bearings of roll 9 are movable on the side frames 1 toward and from the apron 4, and compression springs 12 acting through rods 13 normally press roller 9 and the corresponding end of apron 8 toward apron 4. The stock is passed under yielding pressure between the two aprons, while the apron 8 accommodates itself to any lumps or inequalities in the stock. The apron 8 is driven at the same speed as apron 4 through gears 14 and 15 fixed to rollers 5 and 9 respectively.

16 is an adjustable, inclined slide, extending from side to side of the feeder, and from a line close to the delivery end of the apron 4 downward toward, but terminating short of, the feed plate *b*. The slide 16 is supported by brackets 17, 17, one at each end, which are fastened by slot and bolt connections to the side frames 1, 1, thus providing means for adjusting the slide 16 toward and from the end of apron 4.

18 is a reciprocating pusher plate, preferably curved or scoop-like in form, so that the lower forward part extends approximately parallel to the feed plate *b*, while the upper part extends behind and approximately parallel to the slide 16. The pusher 18 has on its rear or under side a pair of ears 19, each pivotally connected by a link 20 to the forward end of an arm 21 bolted to one of the side frames 1. A pair of actuating rods 22 are pivotally connected to the ears 19 below the points at which the links 20 are pivoted.

On the under side of rods 22 are cam surfaces 23 which ride on rollers 24 journaled on the insides of arms 21. The cams 23 are so shaped that as the rods 22 are reciprocated endwise and the pusher 18 is swung on links 20 the forward edge of pusher plate 18 will be held close to, but clear of the feed plate *b* in all positions of the pusher, and will be guided in a path substantially parallel to the feed plate. The rods 22 are reciprocated by a rock shaft 25, journaled between frame 1, through arms 26 fast on the rock shaft and pivoted to rods 22. The rock shaft is in turn actuated by a rod 27 which is connected at one end to an arm 28 fast on the rock shaft and at the other end to a wheel or eccentric (not shown) on the outside of casing A. Yielding connections in the form of compression springs 29 and 30 are provided on rods 22 and 27 respectively so that the apparatus will not be damaged by any obstruction which might interfere with the free movement of the pusher 18 in either direction. The space through which the stock drops from the delivery end *a* of the casing A to the apron 4 of the feeder is inclosed by a housing 31 to prevent the escape of any of the stock, or of lint or dust as the stock falls into the feeder.

In operation the cotton waste or other fiber is delivered from the overhanging outlet end *a* of the casing A, falls through the housing 31 upon the traveling slat-apron 4, and is carried forward by said slat-apron and pressed and compacted by the yielding presser apron 8. From the end of apron 4 the stock passes down the slide 16 to the feed table *b*. The reciprocating pusher 18 moving in and out under the slide 16 forces, pushes, or tucks the fibrous material at a pressure determined by spring 30 under and into the nip of the flutted feed roll *d*, where it is nipped or seized by the revolving feed roll *d* and carried between the feed roll and the feed plate, and thence delivered by the feed roll into the cleaning machine.

A stream or lap of fibrous material, of little or no natural coherence, such as the picker or card wastes of inferior cottons, by the described means can be fed with certainty at the rate determined by the speed of roll *d*, without depending on the tensile continuity of the stream between the carrier 4 and the feed roll, the action of the pusher 18 insuring uniform and forcible operative contact of the material with the feed roll independently of the draft of the feed roll at a distance from its nip, and independently of movement of the material toward the roll by the delivering carrier or by gravity.

It will be noted that the side frames 1, slat-apron 4, presser apron 8, slide 16 and pusher 18, together with their immediately associated actuating mechanisms, constitute a unitary, self-contained feeding device, independent of either the feed casing A or the cleaning machine B, but capable of being readily applied to or removed from the casing A, and of being placed in coöperative relationship with both the casing A and the machine B.

I claim:—

1. In combination with the feed table and feed roll of a cleaning machine or other preparing machine, a carrier apron adapted to deliver a mass of fibrous material upon the feed table, a pusher above the feed table, a pair of pivotally mounted links on which the pusher is pivotally supported, a reciprocating rod pivotally connected to the pusher to swing the pusher forward and backward on said links, and means including a cam to impart vertical motion to said rod to guide the forward end of the pusher in a path substantially parallel to the feed table.

2. In combination with the feed table and feed roll of a cleaning machine or other preparing machine, a carrier apron adapt-

ed to deliver a mass of fibrous material upon the feed table, a pusher above the feed table, a pair of pivotally mounted links on which the pusher is pivotally supported, a reciprocating rod pivotally connected to the pusher to swing the pusher forward and backward on said links, a cam on the rod to impart vertical motion to said rod during its reciprocating motion to guide the forward end of the pusher in a path substantially parallel to the feed table, and a cam roller with which said cam coöperates.

3. In combination with the feed table and feed roll of a cleaning machine or other preparing machine, a carrier apron adapted to deliver a mass of fibrous material upon the feed table, an inclined slide leading from the delivery end of the carrier apron toward the feed table, and a reciprocating pusher between the lower edge of the slide and the feed table adapted to move the material delivered from the slide into position to be seized by the feed roll.

4. In combination with the feed table and feed roll of a cleaning machine or other preparing machine, a carrier apron adapted to deliver a mass of fibrous material upon the feed table, an inclined slide leading from the delivery end of the carrier apron toward the feed table, a pusher between the lower edge of the slide and the feed table, and means to reciprocate the pusher from a retracted position behind the path of the material moving from the slide to the feed table, to a forward position adapted to push the material into position to be seized by the feed roll.

5. In combination with the feed table and feed roll of a cleaning machine or other preparing machine, a carrier apron adapted to deliver a mass of fibrous material upon the feed table, an inclined slide leading from the delivery end of the carrier apron toward the feed table, a curved pusher, the lower part of which extends underneath the bottom edge of the slide and in proximity to the feed table and the upper part of which extends upward behind the slide, and means to reciprocate the pusher.

6. In combination with the feed table and feed roll of a cleaning machine or other preparing machine, a carrier apron adapted to deliver a mass of fibrous material upon the feed table, an inclined slide leading from the delivery end of the carrier apron toward the feed table, a curved pusher, the lower part of which extends underneath the bottom edge of the slide and in proximity to the feed table and the upper part of which extends upward behind the slide, a pair of pivotally mounted links on which the pusher is pivotally supported, and means to swing the pusher backward and forward on said links.

7. In combination with the feed table and feed roll of a cleaning machine or other preparing machine, a carrier apron adapted to deliver a mass of fibrous material upon the feed table, an inclined slide leading from the delivery end of the carrier apron toward the feed table, a curved pusher, the lower part of which extends underneath the bottom edge of the slide and in proximity to the feed table and the upper part of which extends upward behind the slide, a pair of pivotally mounted links on which the pusher is pivotally supported, means to swing the pusher backward and forward on said links underneath the slide, and means to guide the forward end of the pusher in a predetermined path above the feed table.

8. A feeding device of the character described comprising a carrier apron, an inclined slide leading from the delivery end of the carrier apron, a pusher adapted to reciprocate underneath the slide, and means coöperating with the carrier apron to press and compact the material before it is delivered to the slide and pusher.

9. A feeding device of the character described comprising a carrier apron, an inclined slide leading from the delivery end of the carrier apron, a pusher adapted to reciprocate underneath the slide, and a presser apron coöperating with the carrier apron to press and compact the material before it is delivered to the slide and pusher.

10. A feeding device of the character described comprising a carrier apron, an inclined slide leading from the delivery end of the carrier apron, a pusher adapted to reciprocate underneath the slide, and a presser apron, the intake end of which is spaced farther from the carrier apron than the delivery end, coöperating with the carrier apron to press and compact the material before it is delivered to the slide and pusher.

11. A feeding device of the character described comprising a carrier apron, an inclined slide leading from the delivery end of the carrier apron, a pusher adapted to reciprocate underneath the slide, and a yielding presser apron coöperating with the carrier apron to press and compact the material before it is delivered to the slide and pusher.

12. A feeding device of the character described comprising a pair of side frames, a carrier apron mounted between said frames, an inclined slide leading from the delivery end of the carrier apron and supported by the forward ends of said side frames, and a reciprocating pusher carried by said side frames, the whole constituting a self-contained mechanism adapted to be secured as a unit to the casing or frame of a machine.

13. A feeding device of the character described comprising a pair of side frames, a carrier apron mounted between said frames, a presser apron mounted between said side frames, an inclined slide leading from the delivery end of the carrier apron and supported by the forward ends of said side frames, a reciprocating pusher carried by said side frames, and means to actuate the pusher, the whole constituting a self-contained mechanism adapted to be secured as a unit to the casing or frame of a machine.

Signed by me at Boston, Massachusetts, this 9th day of February, 1918.

JOSEPH B. HOWE.