FEEDING DEVICES FOR FIBER TREATING MACHINES
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ABSTRACT OF THE DISCLOSURE

This disclosure relates to devices for the feeding of fiber treating machines, e.g. carding-machines, in which there is a plurality of filling-shafts for feeding the material to the treating machines.

Description of the prior art

Devices for feeding carding-machines are relatively well known. On the one hand cotton or other similar fibrous material is pneumatically transported through corresponding air-channels and is fed into various feeding shafts which are placed in communication with the carding or other type machines through switch points in these air-channels. On the other hand apparatus is known whereby a row of feeding shafts is provided with a conveyor, e.g. a conveyor belt which extends along the feeding shafts and carries the particular fibrous material which is to be treated.

With most of these conventional feeding devices there exists the disadvantage that the material which is fed in the conventional manner is not depleted by the row of feeding shafts. In most such devices a constant quantity of material is delivered to the feeding shafts even though the demands employed upon the feeding shafts by the fiber-treating machines may vary. If the machine demand is slight too much material will be present at the end of the feed conveyor and this material must be in some way brought back to the input end of the feed conveyor for recirculation. In accordance with this invention, however, the material undergoes a double treatment which results in a loosening or separation of the fibrous material and an attended variation in the specific weight of the material delivered to the treating machines. Consequently the individual feeding shafts are fed at different times and rates with fibrous material of varying consistency.

Summary of the invention

Therefore, the primary object of the invention is to provide a fiber-treating device in which feeding means is provided to regulate the flow of material to the demands of a number of feeding shafts and to make it possible for any superfluous material to be conveyed immediately to a primary input feeding shaft.

The invention is directed primarily to a feeding device for a number of feeding shafts which includes a conveyor device extending along the feeding shafts, and in which the material is blown from the conveyor device into the feeding shafts by means of air-jets, a further conveyor device being provided as a collecting device for moving the material in an opposite direction to that of the first direction of the conveyor device and material is provided at the end of the conveyor devices for transferring the material from one conveyor device to the other to achieve continuous material circulation.

It is a further object of this invention to provide a feeder device incorporated shortly before the end of a second conveyor device by means of which the direction of material to a first conveyor can be shut off in order that only stored material reaches the feeding shafts.

In order to increase the regularity of the material supplied each feeding shaft is provided with several feeler-flaps or feeler devices with each of which is associated an air-jet. In this way each feeding shaft is regularly loaded over its width whereby regular distribution of the material across the width of the feeding shaft can be achieved.

Furthermore, the conveyor of this invention is capable of having its speed regulated in dependence upon the number of feeder-flaps or similar sensing devices and feeding shaft, and the number of feeding shafts. The speed of the feeding conveyor can therefore be exactly calculated according to the demand from the number of feeder-flaps which indicate a demand for additional material. In this way it is possible to keep the amount of superfluous material at the end of the feeding conveyor at a minimum, or in given cases superfluous material can even be eliminated.

The invention is described in more detail by means of the embodiments shown in the accompanying drawings, in which:

FIG. 1 is a diagrammatic side elevational view, and illustrates a feeding device constructed in accordance with this invention;
FIG. 2 is a plan view of the feeding device shown in FIG. 1;
FIG. 3 is a diagrammatic end view of the feeding device;
FIGS. 4 and 5 are respective side and end diagrammatic views and illustrate a third embodiment of the subject of the invention; and
FIGS. 6 and 7 are respective side and end diagrammatic views and illustrate a third embodiment of the invention; and
FIG. 8 is an enlarged sectional view taken along line VIII—VIII of FIG. 6, and illustrates a portion of the conveyor belt of the feeding device of FIGS. 6 and 7.

The feeding shafts 2a, 2b, 2c, 2d, etc. (FIGS. 1—3) are attached to a number of fiber processing devices, e.g. carding machines, 1, 1b, 1c, 1d, etc. A common conveyor device, e.g. a conveyor belt 3 leads to the feeding shafts 2a, 2b, etc., and the conveyor belt is fed at an input end with material from a main feeder 4. The material is brought to the main feeder 4 at an input point 5. Each feeding shaft 2a, 2b, 2c, etc. is provided with at least one sensing device or feeder-flap 7, 8, 9, and 10, respectively, but as illustrated there are three feeder-flaps associated with each feeding shaft, as best illustrated by the three feeder-flaps 7 in FIG. 1. A corresponding number of air-jets 11, 12, 13 and 14 are operatively connected for response to the sensing of the feeder-flaps 7, 8, 9, 10, respectively. The material is blown from the conveyor belt 3 by means of the air-jets 11—14 into the corresponding feeding shafts 2a, 2b, 2c, 2d. The feeder-flaps 7—10 are arranged along the width of the feeding shafts, as are the air-jets 11—14. Each air-jet is controlled by a corresponding feeder-flap so that material is only blown into the feeding shaft where across the width of the feeding shaft there is a demand for the material. In this way an exact distribution of the material over the width of each feeding shaft is made possible.

A further conveyor belt 15 (FIG. 2) is provided which is parallel to the feeding conveyor 3, and runs in the opposite direction to it. Conveyor belt 15 serves as a storage belt. The ends of the conveyor belt 15 are each provided with an air-jet 16 and 17. Superfluous material is blown by the air-jet 16 onto the belt 15 from the belt 3. Further, material arriving at the end of conveyor belt 15 can be transferred by the air-jet 17 onto the belt 3 in front of the main feeder 4. The transfer of the material from one belt to the other takes place through ports or passages 18 and 19. Conveyor belt 15 also runs at a considerably slower speed than conveyor belt 3 so that the mate-
The feeding of the material onto the belt 15 is regulated by a feeder device 20, e.g., a conventional sensing switch arm near the end of belt 15. As soon as the device 20 is actuated the machine is stopped automatically by a conventional electric circuit (not shown) and no material is brought to the belt 3 from the main feeder 4. Instead, the material present on the storage belt 15 is transferred onto the belt 3 by the air-jet 17, during which time the storage belt 15 can be driven at the same speed as belt 3. The stored material is thus directly led to processing, i.e., to the feeding shafts, without any further reverse feeding or double treatment. As soon as the storage belt 15 is empty, the feeding of belt 3 from feeder 4 begins again, and the storage belt 15 is switched to a slow speed again.

In the embodiment of the invention illustrated in FIGS. 4 and 5 a further conveyor device or belt 23 is provided below the conveyor belt 3, the former belt running in the opposite direction to the latter. At the end of the belt 3 the superfluous material is thrown off upon a projecting end portion of the belt 23. Return of the superfluous material is effected directly into a box feeder 25 by air-jets 24. In the box feeder 25 the material is immediately transported to the belt 3 by a conveyor belt 26. In this method of return conveyor belt 23 does not run slower than conveyor belt 3. A quicker return is of advantage, so that the material can be returned to circulation without delay.

In the embodiment shown in FIGS. 6 to 8, the same conveyor belt 3 serves for both feeding and return of the material. The material is brought to the feeding shafts 2a . . . 2d by means of the upper run 3a of the belt 3. Air-jets 27 situated at the end of the belt 3 blow any superfluous material into a chute 28 from which it automatically slides onto a lower run 3b of the belt 3. It is returned on the lower run 3b to the box feeder 25, and transferred onto it by air-jets 29. The material is immediately taken by conveyor 26 from the feeder to the upper belt run 3a. In this way a quick and continuous circulation relative to the return of any superfluous material is made possible.

It is of advantage that in the case of the employment of separate conveyor devices the feeding conveyor 26 be driven at a regulated speed. There should be as many degrees of speed as there are feeder-flaps present, or in action, for all feeding shafts. In the example illustrated, four feeding shafts are provided with three feeder-flaps each, so that there are twelve degrees of speed for the conveyor 26. The belt 26 rotates at its highest speed when all the feeder-flaps indicate a demand for material. The fewer the feeder-flaps showing a demand, the slower the degree of speed selected. Thus, it can be arranged that the amount of material fed to the shafts corresponds to the requirements indicated by the feeder-flaps. This means that the material returning in the storage belt stays at a minimum, or is completely eliminated.

The number of feeding shafts or carding machines can be optional. Also, the number of feeder-flaps and the corresponding air-jets for each feeding shaft can be freely selected. Care should be taken, however, to ensure that the feeding of the feeding shaft is effected with safety over its whole width. Both belts 3 and 15 should be surrounded by a housing 21 or 22.

What is claimed is:
1. A feeding device for fibrous material comprising a plurality of feeding shafts, first conveyor means extending along the feeding shafts, means for transferring material from said first conveyor means to said feeding shafts, second conveyor means functioning as a storage device for fibrous material, means placing said first and second conveyor means in fluid communication for the transfer of fibrous material therebetween, said first and second conveyor means being movable in opposite directions of travel, said conveyor means being operable at different speeds, and means provided for regulating the speed of said second conveyor in response to the demands of said feeding shafts as indicated by sensing means associated with said feeding shafts.

2. The feeding device as defined in claim 1 wherein said first and second conveyor means lies in a common plane, and said transferring means effects the transfer of fibrous material in said common plane.

3. The feeding device as defined in claim 1 wherein said first and second conveyor means are located in different horizontal planes, and said transferring means effects the transfer of fibrous material between said planes.

4. A feeding device as in claim 1 wherein the means for transferring the material from the first named conveyor includes at least one pneumatic blower.

5. A feeding device as in claim 1 wherein a trough receives the excess material on the second conveyor means for return to the first named conveyor means.

6. A feeding device as in claim 1 wherein a box is provided for the supply of fibrous material that receives the excess material returned by the second conveyor means.

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