

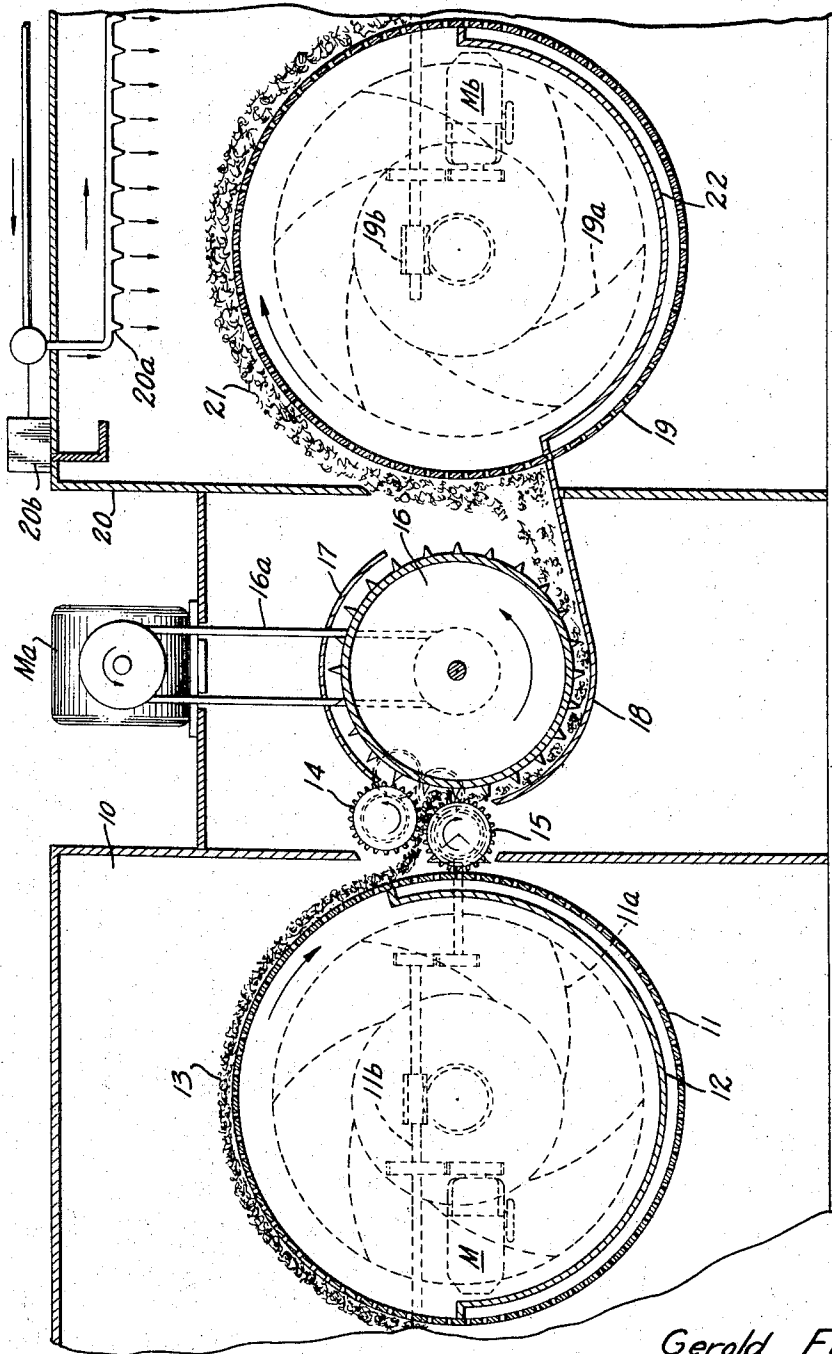
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WILLOW DRIER FOR LOOSE FIBROUS MATERIAL

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WILLOW DRIER FOR LOOSE FIBROUS MATERIAL

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2 Claims. (Cl. 34-60)

The present invention relates to a willow or sieve drum drier for drying loose fibrous material in which such material adheres to the perforated drying drums by suction.

The invention is concerned with improving the known types of such driers which consist of a preliminary drum drier, an intermediate willower or fiber opener following the preliminary drier, and a final drier following the willower which is likewise provided with perforated suction drums or an air-conditioning apparatus which is followed by a fine willower. The purpose of the air conditioner is to give the fibrous material the desired final moisture content.

The intermediate willowers of these known driers are so-called wet willowers consisting of a coarse needle drum to which the fibrous material is fed from the last drum of the preliminary drier by means of a lath belt. The needle drum then throws the fibrous material upon another lath belt which carries the material to the perforated drum of the final drier or to the air conditioner. One disadvantage of a lath belt is that it causes the fibrous bat or fleece which is subsequently produced to be uneven and of irregular thickness. Furthermore such lath belts, even though very solidly made and provided with metal cross bars and guided at both sides by roller chains, are easily the cause of serious difficulties and breakdowns which may, for example, be due to the fact that the roller chains are insufficiently lubricated. On the other hand, such lubricant can only be very sparingly applied since otherwise it may be transferred upon the fibrous material and ruin the same. It also occurs very frequently that the cross bars of a lath belt become bent if due to various causes larger lumps of fibers come between the lower feed roller and the lath belt. Great losses in material and considerable damage to the drier frequently result herefrom, particularly in driers for staple fibers which are preceded by large machine units.

It is the principal object of the present invention to provide a drier for loose fibrous material which avoids such losses and is not subject to such damages, and which is more reliable and efficient in its operation and more inexpensive in its manufacture and operation than similar driers previously known.

According to the present invention, the feed rollers of the intermediate willower or fiber opener receive and take over the fiber bat immediately from the last perforated drum of the preliminary drier, and this intermediate willower then throws the fibers directly upon the peripheral surface of the perforated drum of the final drier or air conditioner. The new drying system therefore entirely omits the lath belts of the intermediate willower with the result that the entire machine has a much shorter length and that the difficulties which are due to the use of lath belts are avoided. Furthermore, the fibrous bat which is picked off the last drum of the preliminary drier enters uniformly between the feed rollers of the intermediate willower and does not contain such irregularities as are caused by a lath belt. After the fiber bat is disintegrated by the needle drum of the willower, the fibers are also thrown directly and uniformly upon the perforated drum of the final drier or air conditioner and

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are drawn thereto and held thereon by the internal suction of the drum so that the newly formed bat will be very uniform. The entire machine is therefore considerably less expensive but also operates more reliably and economically than the previous machines.

According to another feature of the invention, the intermediate willower between the preliminary drier and the final drier or air conditioner is also designed to act as a fine-willower. This has the advantage that the bat passing through the air conditioner will be very uniform and voluminous, that the bat when finally discharged from the drier will have a very uniform moisture content, and that this will be attained within a minimum of time.

According to the invention it is also possible to use a fine-willower which instead of having a single needle drum has two or more needle drums. In any case, the fine-willower which was previously required after the air conditioner is no longer required since the fibrous material issuing from the air conditioner is already so finely distributed that a further disintegration will not be required.

Further objects, features, and advantages of the present invention will be apparent from the following detailed description thereof, particularly when read with reference to the accompanying diagrammatic drawing of one preferred embodiment of the invention.

In this drawing, the preliminary drier 10 is only indicated by showing the last perforated drum 11 thereof which is maintained under internal suction by means of fan 11a and is rotated by gear train 11b driven by motor M. The fan holds the fiber bat by such suction on the upper half of its peripheral perforated wall, while the lower half is covered from the inside by a cover plate 12. The fiber bat 13 which is relatively dense is removed from drum 11 at the end of the preliminary drier 10 by means of a pair of feed rollers 14 and 15 driven from gear train 11b and immediately behind these feed rollers subjected to the action of a needle drum 16 driven from motor Ma by belt 16a and which is provided with a very large number of needles so as to act as a fine-willower. This fine-willower 16 is enclosed by cover plates 17 and 18. The lower cover plate 18 extends tangentially away from needle drum 16 and leads directly to the perforated drum 19 of a final drier or air conditioner 20. Fan 19a provides an internal suction within drum 19 and the drum is rotated by motor Mb through gear train 19b. Air conditioner 20 contains a water spray 20a controlled by a humidity regulator 20b. The finely distributed fibrous material which has been thrown off by the tangential momentum of the fine-willower 16 is sucked toward and upon drum 19, and a very voluminous and uniform bat 21 is thus formed on drum 19. The lower half of the peripheral wall of this drum is likewise covered by a cover plate 22. Since the fibers are finely disintegrated in bat 21 and are no longer bunched together, the bat will be given a very uniform moisture content in the air conditioner. It may then either be passed from drum 19 over a further perforated drum or be immediately discharged from the machine for further use without requiring an additional fine-willower after the air conditioner as previously needed. The fine disintegration of the fibers before being air conditioned has the great advantage that in this finely dispersed condition the individual fibers will take up the proper final moisture content much more quickly and uniformly than if the air conditioning is carried out before the fine-willower as in the previous methods. Thus, such additional fine-willower is no longer required, the entire machine is of considerably shorter length, and considerably less expensive than the previous machines.

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Although my invention has been illustrated and described with reference to the preferred embodiments thereof, I wish to have it understood that it is in no way limited to the details of such embodiment, but is capable of numerous modifications within the scope of the appended claims.

Having thus fully disclosed my invention, what I claim is:

1. A willow drier for drying a bat of loose fibrous material comprising a preliminary drier, an intermediate willower following said preliminary drier, and a final drier following said intermediate willower, each of said driers consisting of at least one perforated suction drum, means for producing suction within each drum, a pair of feed rollers between the preliminary drier suction drum and said willower and disposed closely adjacent said preliminary drier suction drum, means for rotating each suction drum, willower and feed rollers for picking up

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partially dried fiber bat directly from said preliminary drier suction drum and feeding the same to said willower, and said willower being disposed relative to said final drier so its tangential momentum throws the fibers partially dried by said preliminary drier suction drum directly upon the peripheral perforated surface of the final drier drum to form a voluminous and uniform bat of material thereon.

2. A willow drier as in claim 1, further comprising air conditioning means for said final drier to give the fiber bat a uniform moisture content before leaving said final drier.

References Cited in the file of this patent
UNITED STATES PATENTS

116,032	Dick	June 20, 1871
2,192,823	Aycock	Mar. 5, 1940
2,755,513	Fleissner	July 24, 1956