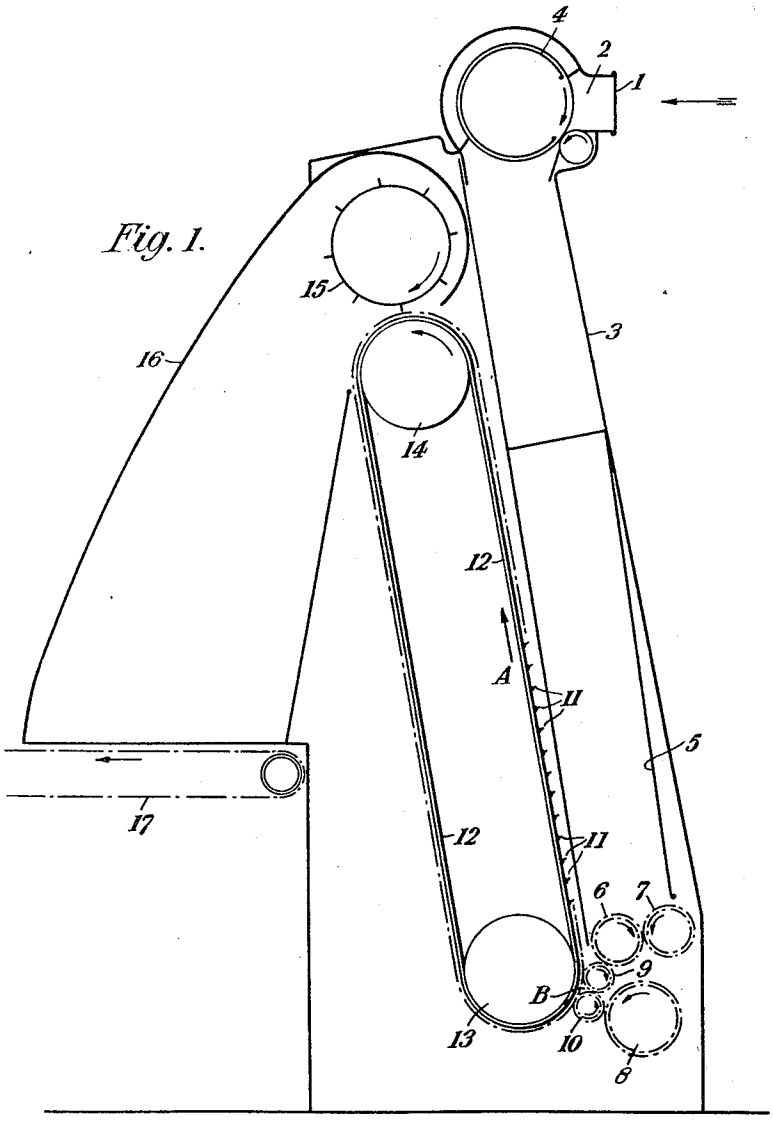
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APPARATUS FOR USE IN CONVEYING AND OPENING TEXTILE FIBROUS MATERIALS

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Fig. 1.



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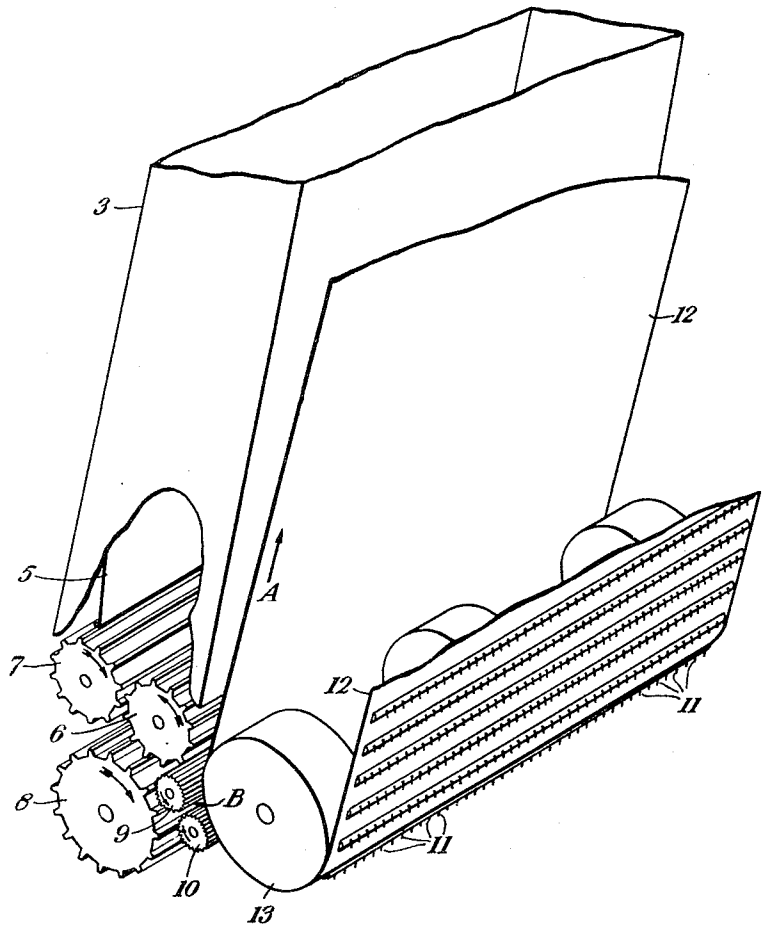


Fig. 2.

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Filed Oct. 28, 1950 3 Sheets-Sheet 3

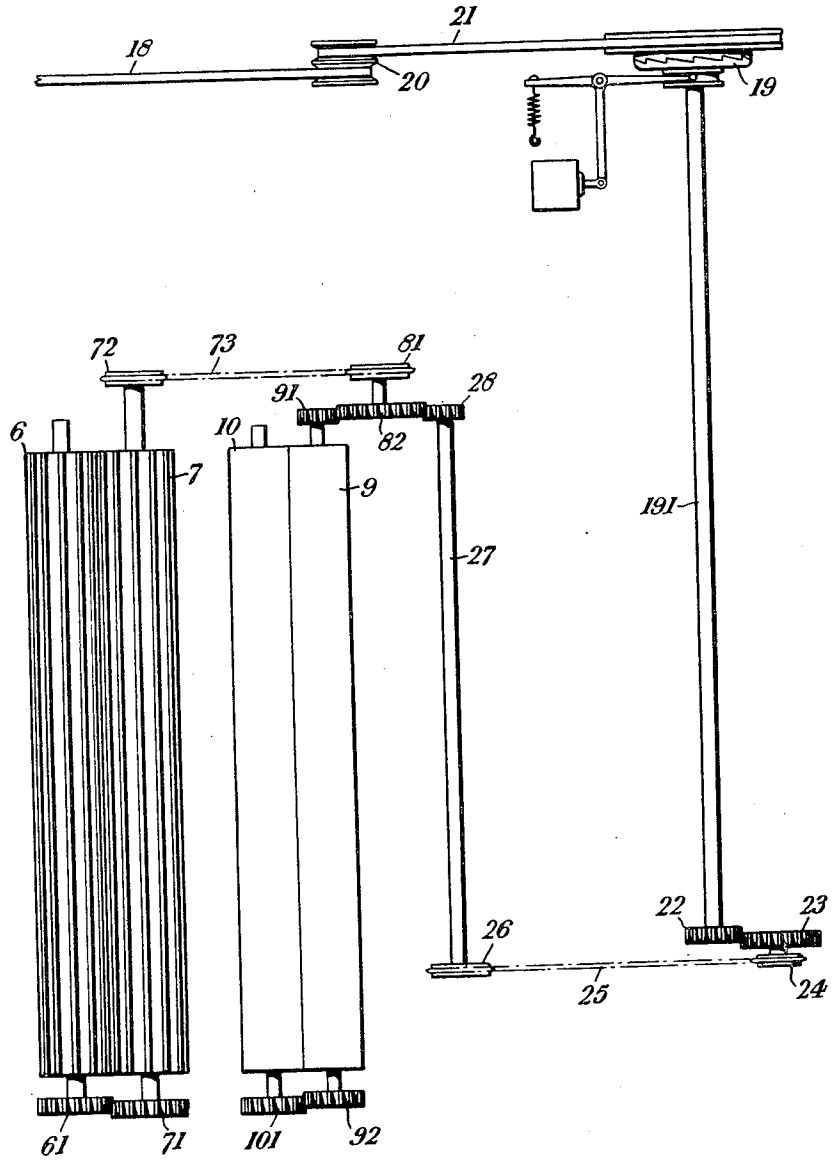


Fig. 3.

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Patented Jan. 26, 1954 2,666,956

UNITED STATES PATENT OFFICE

2,666,956

APPARATUS FOR USE IN CONVEYING AND OPENING TEXTILE FIBROUS MATERIALS

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Application October 28, 1950, Serial No. 192,654

3 Claims. (Cl. 19—78)

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The hopper feeder apparatus hitherto used for delivering cotton, stapled synthetic fibres, wool and other textile fibres, to the opening and cleaning machines have depended for their conveying functions upon an endless travelling lattice bearing spikes which gather the material from the hopper bin, the material passing forward coming under the controlling action of an "evener roller" which is set in such a position relatively to the spikes of the lattice as to prevent any unduly large matted masses from being fed forward to the delivery box or chute. In such machines the thickness of the mass of material so delivered by the lattice depends upon the following variable factors, viz. the inclination of the lattice, the length of the spikes and their inclination to the path of the lattice, the amount of material contained in the hopper bin, the condition of the material under treatment, and the setting of the evener roller towards or away from the lattice spikes.

The apparatus is intended to have the effect of reducing any unduly large matted masses of fibres and returning them to the bin until their size is rendered sufficiently small by the combined action of the spiked lattice and the evener roller to pass forward beneath the latter towards the delivery box. It is however found in practice that there is a tendency for the material, particularly when it is of long staple, to be converted into a flocked condition due to the rolling action within the bin, and the relatively dense compacted bodies of fibre composing the flocks impose a considerable additional duty upon the subsequent opening machinery, particularly in the carding process.

With the object of avoiding this disadvantage, the invention proposes a hopper feeder wherein the material is presented to a spiked travelling lattice by a pair of cooperating feed rollers located in such close proximity to the lattice spikes that said spikes execute a positive combing action on the fibres whilst they are still under the restraining influence of said feed rollers.

One form of hopper feeder embodying this invention is illustrated by way of example in the accompanying diagrammatic drawings, reference to which is made in the ensuing description of the manner in which the invention may be carried into effect. In said drawings, Fig. 1 is an elevation of the machine as though seen with the side casing removed, Fig. 2 is a fragmentary perspective view showing the relationship of the feed rollers to the intake end of the spiked lattice, and Fig 3 is a schematic representation of the gearing between the several elements of the machine.

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In the illustrated machine, the unopened fibrous material is conveyed by a pneumatic trunk, of which the delivery end is indicated by the reference numeral 1, to the inlet 2 of a feed trunk 3, the entrance to which is controlled by a cage condenser 4 of conventional type. At the foot of the feed trunk 3 the material is guided by the plate 5 (which may be adjustable) between a pair of longitudinally ribbed rollers 6, 7 which rotate in the directions indicated to deliver the material at any predetermined rate of delivery in the form of a partially compacted sheet which is received upon the surface of the third ribbed roller 8, which latter serves to deflect the sheet of fibres into the nip of the two feed rollers 9, 10. Said feed rollers 9, 10 rotate in opposite directions so as to present the fibres to the spikes 11 of the endless lattice 12 which is carried on rollers 13, 14, and which travels in the direction of the arrows A.

The said feed rollers 9, 10 are so closely located to the tips of the lattice spikes 11 that the latter enter the fringe of the fibrous sheet in their upward travel at the point B and thereby perform an intensive combing action upon the fibres whilst these are still under the restraining influence of said rollers 9, 10.

The lattice spikes 11 may be shorter than has been customary in the lattices of known hopper feeders, and they should be sufficiently stout and rigid to withstand the heavier load imposed on them by the resistance offered by the sheet of fibres to the combing action. They should also be disposed over the lattice surface in a uniformly staggered formation, so as not to have a tracking action.

As shown in Fig. 3, the ribbed rollers 6, 7 are geared together by meshing spur wheels 61, 71, respectively fixed thereon. A sprocket 72 fixed to the roller 7 is connected by a chain (indicated conventionally at 73) to a sprocket 81 which is fixed to the shaft of the third ribbed roller 8. From a gear-wheel 82 on said shaft a pinion 91 on the upper feed roller 9 receives driving motion, and the rollers 9 and 10 are geared together by meshing spur wheels 92, 101, respectively. All said rollers are driven through gearing from the lattice drive, a belt 18 passing over a pulley (not shown) on the shaft of the lattice roller 14, to drive a solenoid-controlled clutch 19 through the medium of a Croft's variable speed unit 20 and a second belt 21. The output shaft 191 of the clutch 19 is connected by the gear

wheels 22 and 23 and the chain and sprocket gearing 24, 25 and 26 to a counter-shaft 27 which bears a pinion 28 meshing with the said spur wheel 82. By these means it is possible to regulate the speed of the feed rollers 9, 10 in relation to the constant linear speed of the lattice spikes 11, and therefore to control the charge of the material to the lattice and to ensure that it will be deposited over the sheet of spikes in an even condition. As a result, the evener roller which is conventionally employed in conjunction with the lattice of a hopper feeder, has no duty to perform in the present machine and can therefore be omitted

A further advantage to be derived from the facility for adjustment of the speed of the feed rollers 9, 10 in the manner hereinbefore described, is that it becomes possible to deal in the same machine with fibrous materials varying in staple length, density and other general characteristics over a wide range, and to present such material to the subsequent opening machinery at the correct weight.

The material is stripped from the lattice spikes 11 by a saw-toothed or other suitable stripping roller 15 in the well-known manner, and the fibres so removed, being in a condition of unusually light density, are deposited in a chute 16 for delivery to the ensuing opening machinery by a conveyor 17. The use of a delivery chute 16 of large cross-sectional area assists in maintaining the uniformly open condition and homogeneity of the material.

What we claim as our invention and desire to secure by Letters Patent is:

1. In a hopper feeder apparatus for textile fibrous material which has at its inlet a cage condenser and a gravity feed trunk leading downward therefrom, in combination, a pair of ribbed rollers situated at the exit from the trunk for conveying the fibers from the trunk in a controlled manner and forming them into a compressed sheet of substantially uniform cross-section, means for feeding the so-formed sheet

including a second pair of feed rollers, and a spiked driving lattice traveling in such close proximity to the latter feed rollers that the spikes of the lattice are caused to execute a positive combing action on the fibers of the sheet while the compressed sheet is still held under the restraining influence of the latter feed rollers.

2. The combination as claimed in claim 1 which further includes means for regulating the speed of the said second pair of feed rollers relative to the lattice speed.

3. In a hopper feeder apparatus for textile fibrous material which has at its inlet a cage condenser and a gravity feed trunk leading downward therefrom, in combination, a pair of cooperating feed elements situated at the exit from the trunk for conveying the fibres from the trunk in a controlled manner and forming them into a compressed sheet of substantially uniform cross section, means for feeding the so formed sheet including a second pair of cooperating feed elements, and a spiked lattice travelling in such close proximity to the second pair of feed elements that the spikes of the lattice are caused to execute a positive combing action on the fibres of the sheet while the compressed sheet is still held under the restraining influence of the second feed elements.

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