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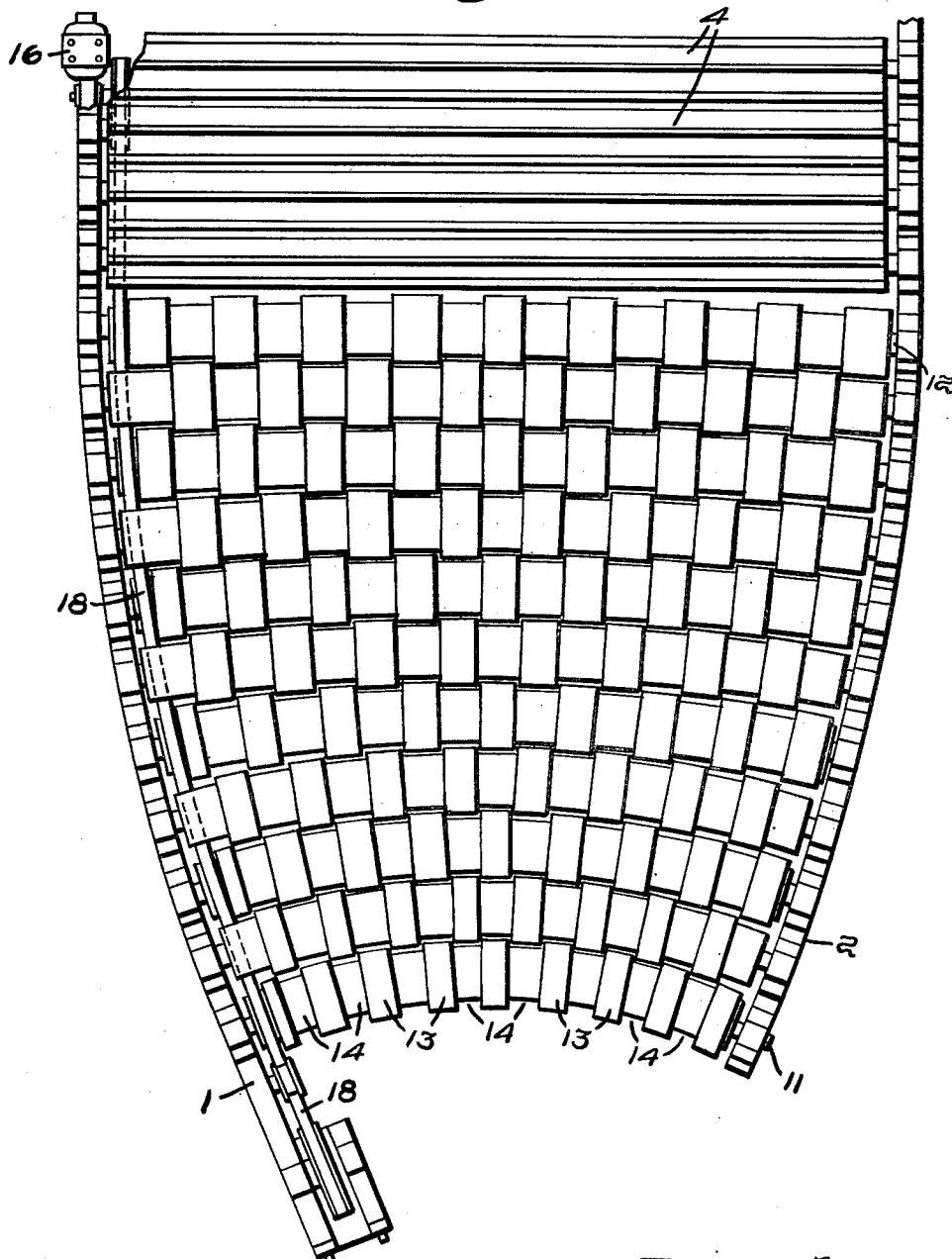
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CONVEYER FOR FEEDING AND SPREADING LOOSE FIBER INTO SHEET FORM

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2 SHEETS—SHEET 1

Fig. 1.



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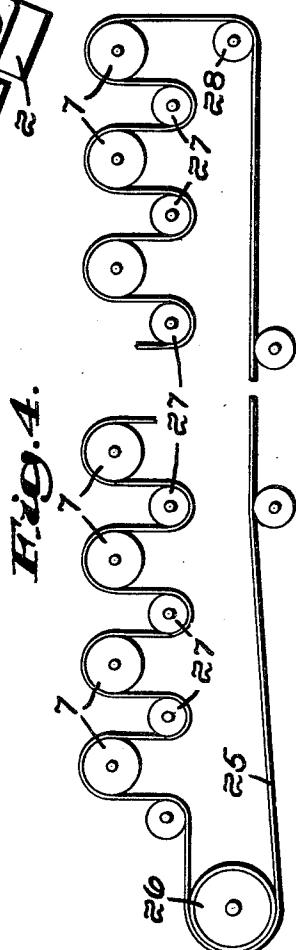
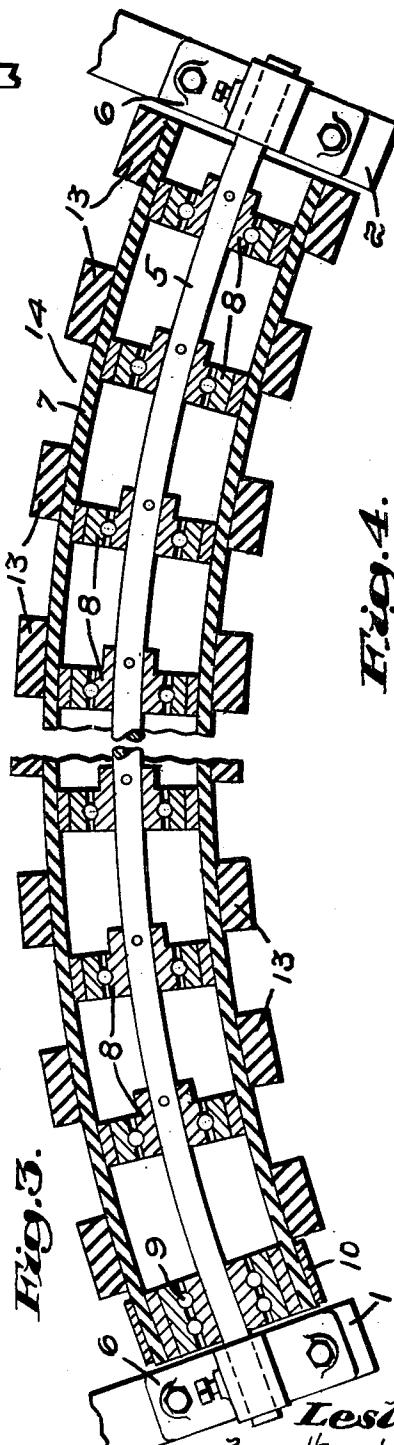
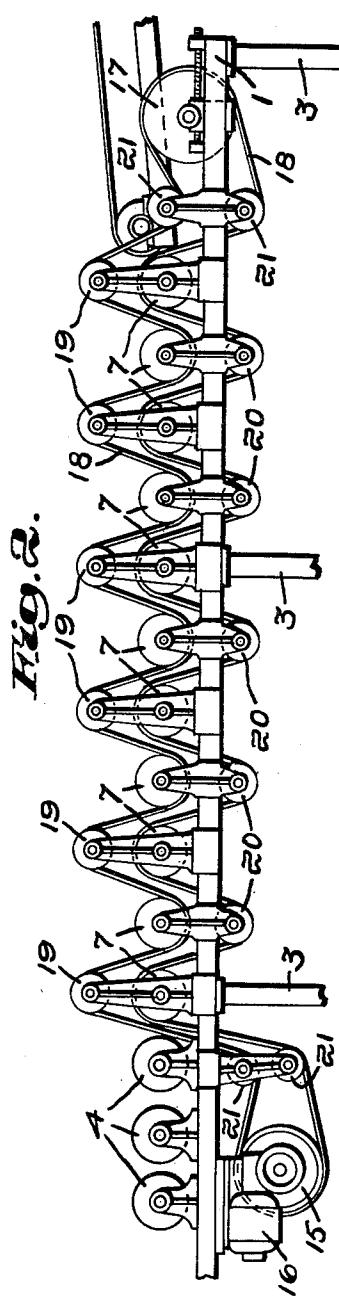
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2 SHEETS—SHEET 2



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UNITED STATES PATENT OFFICE

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CONVEYER FOR FEEDING AND SPREADING
LOOSE FIBER INTO SHEET FORM

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3 Claims. (Cl. 19—67)

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This invention relates to a conveyor for feeding and spreading loose fiber into sheet form, and while useful for various purposes is particularly designed to take loose fiber such as discharged from a picker and while feeding it forward, spread it out into a substantially sheet form and deliver it to a fiber blending apparatus.

The conveyor of this invention essentially comprises a series of arcuate closely spaced positively driven expander rolls, with these rolls lying in a substantially horizontal plane and of progressively increasing lengths and radii and functioning as hereinafter set forth. The nature and objects of the invention will appear more fully from the accompanying description and drawings and will be particularly pointed out in the claims.

In the drawings,

Fig. 1 is a top plan view of a preferred form of apparatus embodying the invention set up in connection with the admission end of a roller conveyor such as suitable for use in a fiber blending apparatus.

Fig. 2 is a side elevation of a construction such as shown in Fig. 1 to illustrate a positive driving mechanism for the rolls.

Fig. 3 is a view chiefly in horizontal cross section and partially broken away illustrating a preferred form of one of the rolls.

Fig. 4 is a diagrammatic side elevation partially broken away illustrating another form of driving mechanism.

In the operation of machines for handling fiber such, for example, as an apparatus for blending fiber, it is necessary that the loose fiber shall be brought into substantially sheet form, and the present invention is for the purpose of taking a mass of fiber, such for example as delivered by a picker, feeding it forward to the machine to which it is to be delivered and while so feeding it, spreading it out into substantially sheet form and preferably in a width substantially equal to the width of the conveyor of the fiber blending or other apparatus.

The present invention provides a conveyor embodying a series of expander rolls. Expander rolls of various types beginning with the well known Mycock expander of Patent No. 687,847, December 3, 1901, have long been known for use in the lateral stretching of cloth, and a roll of this general type, such as that illustrated in the patent to Voegeli, No. 1,599,257, September 7, 1926, is suitable for use in the present invention.

In the invention each roll consists of an arcuate shaft (by which is meant a shaft having its longitudinal axis arcuate) rigidly mounted with all the

shafts of the series lying in a substantially horizontal plane and at their center equally spaced from each other. Each roll comprises a flexible tubular shell, with all the shells of equal diameter, and with each shell mounted to rotate concentrically of its shaft and with all the shells positively rotated in the same direction. Furthermore the arcuate shells and consequently the arcuate shells rotarily mounted thereon progressively increase both in length and in radius of curvature from the beginning to the end of the conveyor and the end should be of a sufficiently flat arc readily to pass the spread out fiber to the machine to which it is to be delivered.

Since each element lengthwise of the shell of one of these rolls is rotating in the direction of the radius of the arc of curvature of its shaft, it will be seen that the action by reason of this fact is to spread the fiber toward the ends of the roll. It will also be seen that because at the beginning of the conveyor the radius of the arcuate shafts are shortest and gradually increase, the greatest spreading action due to the curvature takes place there and this is where the mass of loose fiber is deposited. It will also be seen that because the tubular shells of the rolls are necessarily flexible and contract on the inside of the arc and as they turn expand to the outside of the arc, that this expanding action of the shells in contact with and advancing the fiber has a further action to expand the fiber laterally.

The apparatus comprises a suitable frame having side members 1 and 2 suitably mounted as upon stands 3 and gradually curving away from each other from the admission end of the conveyor to the widest portion where in Figs. 1 and 2 they are shown merging into the side frame of a roller conveyor of such a machine as a fiber blending apparatus, a few rolls of a fiber blending conveyor being indicated at 4.

Each roll is of the same construction and involves essentially an arcuate shaft 5 rigidly secured at its ends in brackets 6 on the side members 1 and 2. On this shaft is rotarily and concentrically mounted a flexible tubular shell 7 made of a suitable material for that purpose such as rubber. Interposed between the shell and the shaft are suitable ball bearings 8 with one raceway secured to the shaft and the other engaging the shell. Since each shell is positively driven, suitable means must be provided for that purpose, and as herein illustrated the left hand end is provided with a special ball bearing 9 and a metal pulley 10 is secured to the shell exteriorly thereof over this ball bearing 9.

The arcuate shafts beginning at the entrance end of the conveyor with the shaft 5 shown at 11 and continuing to the discharge end with the shaft 12 progressively increase both in length and in radius. That is, at the beginning the shaft 11 is of relatively short length and small radius, while the final shaft 12 is of the greatest length and of the longest radius.

Preferably as illustrated in Figs. 1 and 3 the flexible tubular shells are also provided throughout their length with spaced annular projections 13 and these projections with the spaces 14 therebetween alternate with those of adjacent rolls as shown in Fig. 1 and this acts to maintain a close spacing of the series of rolls and maintain the fiber thereon as it is being spread and advanced.

Any suitable means may be employed for simultaneously and positively driving the rolls of the conveyor all in the same direction. There is one simple and preferred means that is illustrated, particularly in Fig. 1, viz. a pulley and belt drive at the side. At one end of the series of rolls, as illustrated the further or discharge end, there is mounted a pulley 15 driven by an electric motor 16, and at the other end of the series is mounted a second pulley. An endless belt 18 extends from the pulley 15 around the second pulley 17 and interposed between these is a plurality of idler pulleys mounted in position to direct the belt into forward driving engagement with each of the pulleys such as 10 of the shells. As illustrated there is an idler pulley 19 mounted above each alternate roll beginning with the one nearest the driving pulley and there is another idler pulley 20 mounted beneath each of the other rolls. The driving belt 18 passes from the driving pulley 15 up over the first idler roll 19, down under the second roll 7, thence over the next idler roll 19 and so on to the end of the series, thence around the second pulley 17, up around the adjacent roll 7, under the adjacent idler roll 20 and so on back over the roll 7 nearest the driving pulley back to the driving pulley. Since the driving pulley 15 and the second pulley 17 are preferably mounted well up close to the frame of the machine, small idler rolls 21 enable the driving and second pulleys to be maintained in this position.

An alternate form of a driving belt is diagrammatically indicated in Fig. 4 where a belt 25 extends from a driving pulley 26 over the first roll 7, under an idler roll 27 mounted beneath, thence over the next roll 7 and so on to the end of the series over the final roll 7, thence under an idler roll 28 beneath, back to the driving pulley.

The conveyor of this invention with the positively driven flexible shells, and preferably with the annular inter-locking projections thereon, with the shells progressively increasing both in radius of curvature and in length from the begin-

ning to the end of the conveyor very effectively acts continually to feed forward and spread out into substantially sheet form a mass of loose fiber fed to the conveyor and thus to present the fiber in a form suitable for use in a fiber blending or other machine.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is,

1. A conveyor for feeding and spreading loose fibre into sheet form comprising a series of centrally equi-spaced shafts having arcuate longitudinal axes and of progressively increasing lengths and radii of curvature fixedly mounted in a substantially horizontal plane, a corresponding series of flexible equal diameter tubular shells of lengths correspondingly increasing with those of the shafts rotatively and concentrically mounted on the shafts, and means for simultaneously 10 rotating the shells in the same direction to cause the series of shells to advance and spread laterally loose fibre fed on to the shells of the shortest length and radii.
2. A conveyor for feeding and spreading loose fibre into sheet form as defined in claim 1, in which the shells are provided longitudinally with spaced annular projections of the same diameter and with the said annular projections of each shell fitting the spaces between the annular 20 projections of each adjacent shell.
3. A conveyor for feeding and spreading loose fibre into sheet form comprising the construction defined in claim 1, in which the means for rotating the shells comprises a driven pulley 25 mounted adjacent one end of the series, a second pulley mounted adjacent the other end of the series, an endless belt extending around said driven and second pulleys, and a plurality of idler 30 pulleys mounted and positioned to direct the belt into forward driving engagement with each of the shells.

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