E. B. CEDERSTROM.

METHOD OF MANIPULATING AND HANDLING ROLLS OF FABRIC.

APPLICATION FILED APR. 21, 1915.

1,210,902.

Patented Jan. 2, 1917.

3 SHEETS—SHEET 1.

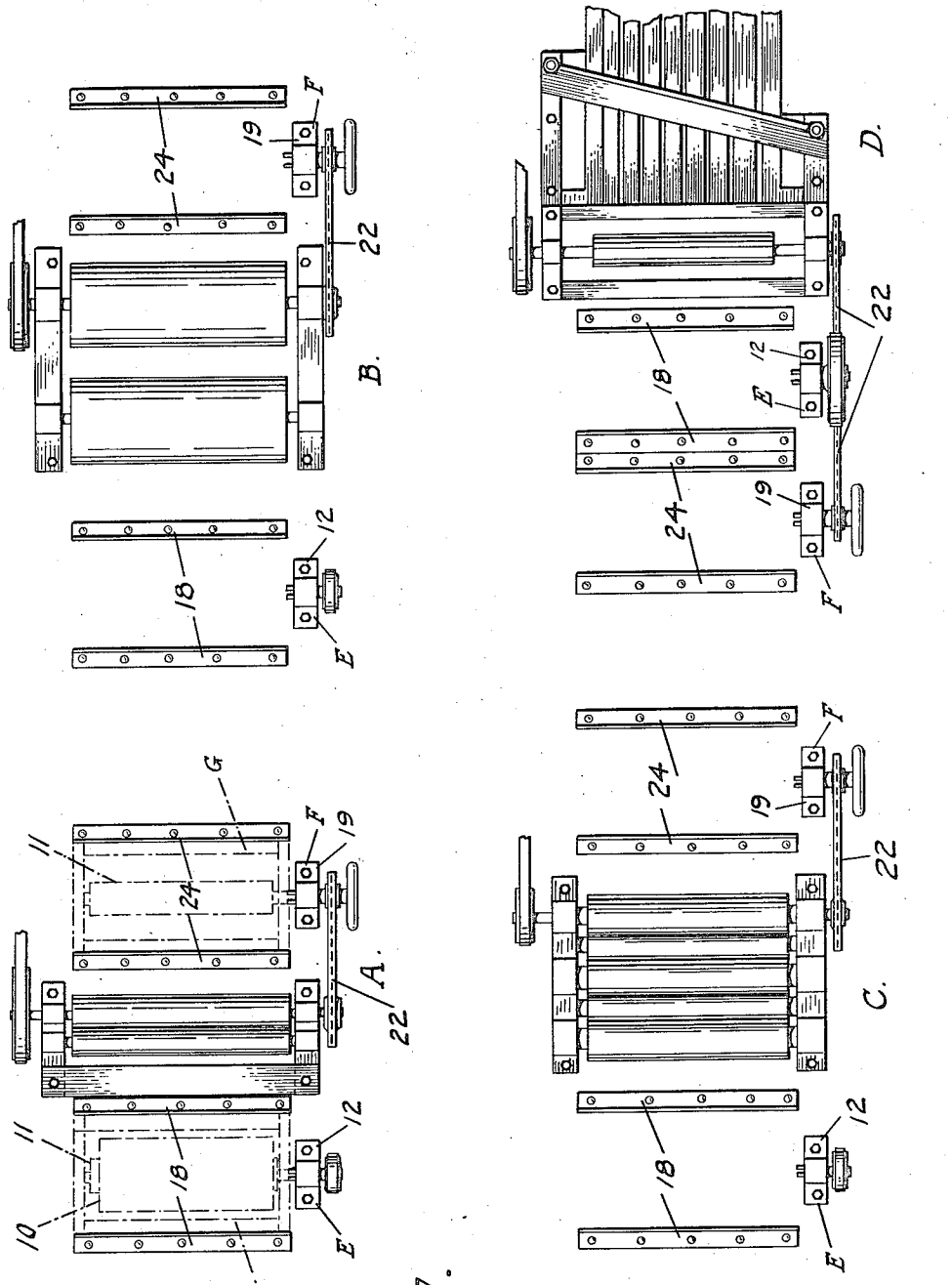


Fig. 1.

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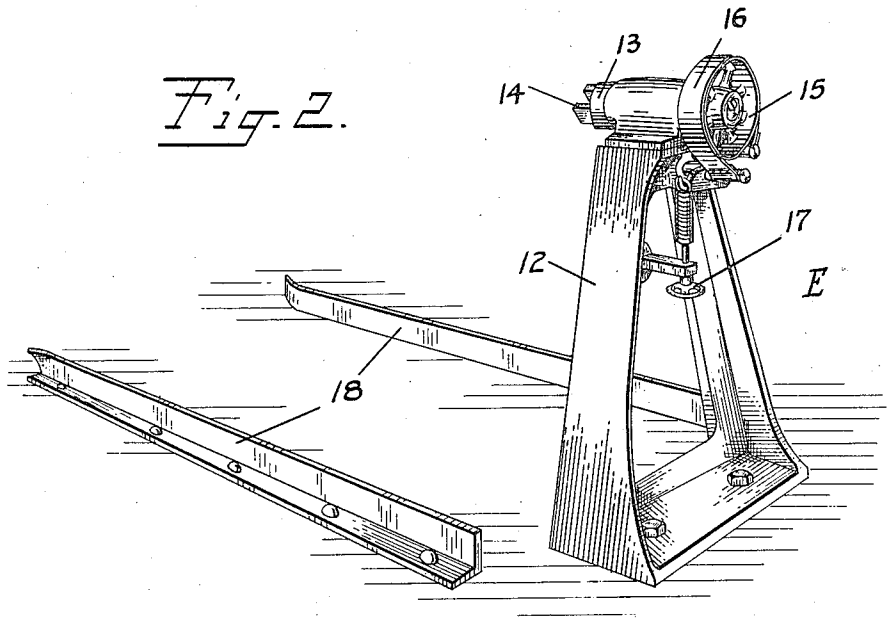
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3 SHEETS—SHEET 2.

Fig. 2.



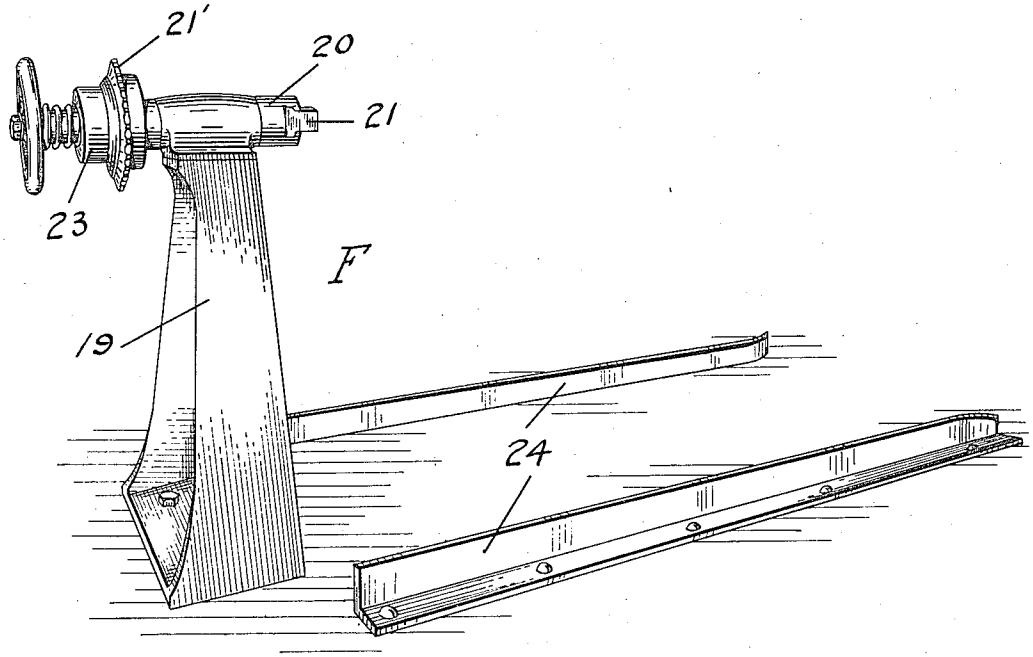


Fig. 3.

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3 SHEETS—SHEET 3.

Fig. 4.

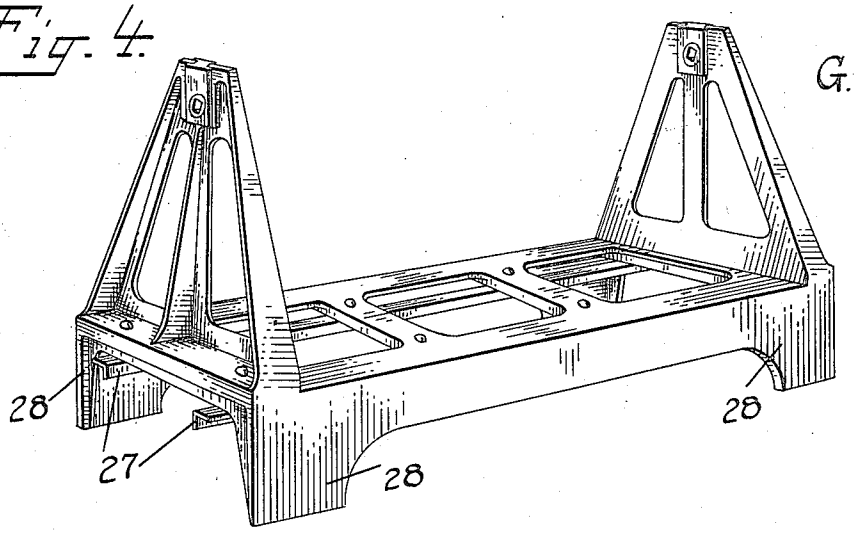


Fig. 5.

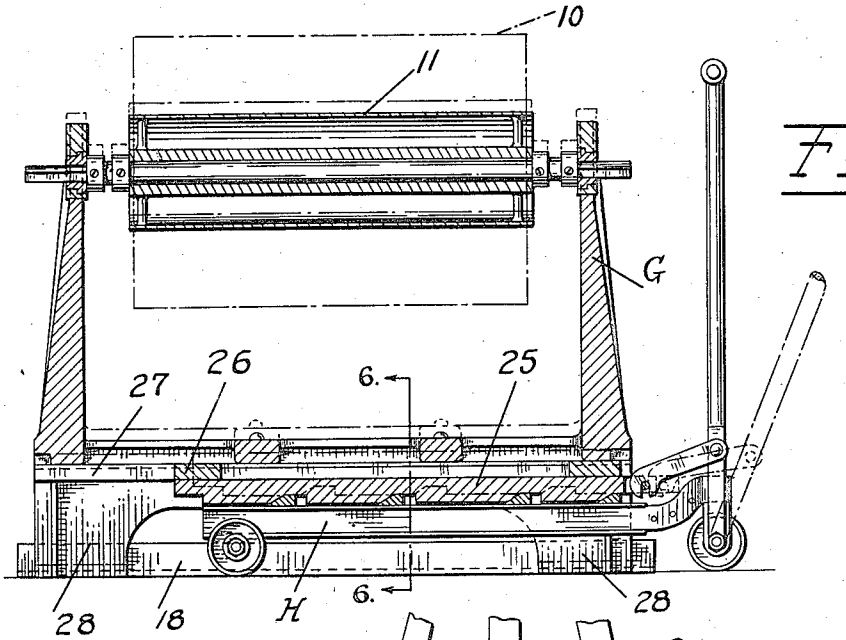
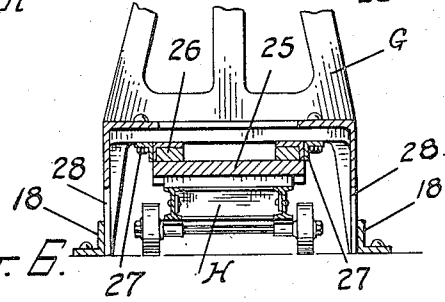


Fig. 6.



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METHOD OF MANIPULATING AND HANDLING ROLLS OF FABRIC.

1,210,902. Specification of Letters Patent. Patented Jan. 2, 1917.

Application filed April 21, 1915. Serial No. 22,887.

To all whom it may concern:

Be it known that I, EMIL B. CEDERSTROM, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented certain new and useful Improvements in Methods of Manipulating and Handling Rolls of Fabric, of which the following is a full, clear, and exact description.

This invention relates to means for effectively manipulating a roll of fabric during a course of treatment to fit it for use in building composite fabric and rubber articles, such as tires.

At present, during preparation of fabric for the construction of tires, it is customary to treat the fabric with rubber, and then cut the rubber-treated fabric into bias strips which go to make up the tire carcass. This fabric while undergoing treatment, is in the form of a roll and this roll generally contains from one hundred to one hundred twenty-five yards of fabric. In the present embodiment of my invention I contemplate the use of rolls containing approximately five hundred yards of fabric, more or less, and provide that a roll of this great size may be expeditiously manipulated during its course through the various machines which prepare it for use.

I attain the above ends by the provision of a permanent fabric feed installation at the feed end of each machine and a permanent fabric take-up installation at the discharge end of each machine, in combination with a frame which is interchangeable with both of these permanent installations and carries the roll of fabric, this frame being adapted to be readily applied and discharged from a truck by means of which the heavy roll of fabric is transferred from the take-up installation to the feed installation of consecutive machines through which the roll of fabric must pass while undergoing treatment.

The invention may be readily understood from the following description taken in connection with the accompanying drawing, in which:

Figure 1 is a diagrammatic plan view showing an apparatus suitable for carrying out the invention; Fig. 2 is a perspective view of the permanent installation situated at the feed end of each machine; Fig. 3 is a perspective view of the permanent installation at the delivery end of each machine; Fig. 4 is a perspective view of the roll carrying frame that is interchangeable with both of the installations shown in Figs. 2 and 3; Fig. 5 is a longitudinal sectional view through the frame with a fabric spindle thereon and mounted on a truck comprising part of the apparatus. Fig. 6 is a cross-sectional view taken on line 6—6, Fig. 5.

Briefly the apparatus used in carrying out the invention embodies a series of usual and well known machines used in the preparation of fabric for subsequent use in the manufacture of composite fabric and rubber articles such as tires. In the present embodiment I have shown diagrammatically a series of such machines arranged consecutively in accordance with consecutive operations to be performed upon the fabric during this preparatory treatment, these machines including a machine A for inspecting the fabric for imperfections, a machine B for thoroughly drying the fabric after inspection, a calender C for treating the fabric with rubber, and a cutting machine D whereby the fabric is cut into bias strips which are subsequently spliced terminally together to constitute what is commonly known as tire fabric. The invention, however, is not limited to the series of particular machines illustrated but is intended to include any system of machines by which fabric may be treated in steps to prepare it for subsequent use in the manufacture of composite products.

The invention requires that there be permanently installed at respective machines, two attachments which I shall subsequently term a feed installation E best shown in Fig. 2 and a take-up installation F, best shown in Fig. 3, these installations being situated at the feed and discharge ends of the machine respectively. A frame G is provided to be interchangeably received by each of the installations E and F, this frame being adapted to carry the heavy roll of fabric 10 upon its spindle 11.

The fabric feed installation E comprises a standard 12 which carries a spindle 13 that is provided at the inner end with an angular socket 14 to receive the similarly shaped end of the spindle 11 upon which the roll of fabric is spooled. The spindle 13 is equipped at the outer end with a wheel 15 upon which is mounted a band brake 16, the

tension of which is regulated by an adjusting device 17, so that the fabric may be maintained taut in passing to the corresponding machine. The installation further includes a track 18, the rails of which are spread apart a sufficient distance to receive therebetween the legs of the frame G and perform the dual function of anchoring the frame and properly positioning the frame to aline the fabric roll spindle 11 and spindle 13 when the frame is run into the track, as will be hereinafter more fully described.

The take-up installation F comprises a standard 19 which carries a spindle 20, also provided with an angular socket 21 to receive the similarly shaped end of the fabric roll spindle 11. The spindle is equipped with a drive-sprocket 21′ by means of which the spindle may be power-rotated from the corresponding machine, as for instance, by a chain-drive as shown at 22. The sprocket is controlled by a friction-brake 23 so that a certain amount of slip is provided for in order that the spindle will not have a tendency to wind up the fabric faster than it comes from the machine. The take-up installation also includes a track 24, the rails of which are a counterpart of the rails 18 of the feed installation, that is, they are spaced the same distance apart as said rails 18 and perform the same dual function as the latter, that is, upon receiving the frame G, they both anchor the frame in place and aline the spindle 11 of the fabric roll and drive spindle 20.

The invention further includes as part of the apparatus a truck H, the same having a vertically movable platform 25 which is provided on the top with a rack 26 which receives cleats 27 formed on the under face of frame G between the legs 28 thereof. The cleats 27 and rack 26 coact in positively anchoring the frame detachably to the truck platform. The truck is backed by the operator underneath the frame and then the platform is raised to lift the frame vertically so that its legs clear the floor, thus permitting of the operator transporting the frame with its heavy roll of fabric on the truck.

The operation is as follows: Suppose, as shown in Fig. 1, that the frame G with a roll of fabric thereon, is mounted in proper position upon the feed installation E at the feed end of the fabric inspection machine A, and also that a duplicate of the frame G with an empty spindle thereon is disposed in the take-up installation F at the delivery end of the fabric inspection machine. The free end of the web of fabric is trained through the machine in the usual manner and secured to the empty spindle in the frame of the take-up installation. The machine is now started and its operation is continued until the fabric is all wound upon the take-up spindle and wound off from the feed spindle. The operator now runs his truck underneath the full frame at the delivery end of the machine, raises the platform of the truck to lift the frame and then transports the frame to the feed end of the next succeeding machine, which in the present embodiment is the drying machine B. The frame with its empty spindle from which the fabric has been wound off is in like manner removed from the feed end of the fabric inspection machine and transported to the delivery end of the drying machine. The fabric is now passed through the drying machine, being wound off of the frame at the feed installation and onto the frame at the take-up installation as previously described. The operation is repeated until the roll of fabric has passed through all of the machines, the fabric acquiring a coat of rubber during its passage through the calender C, and at this machine there also being spooled with the roll of rubber treated fabric a liner strip to keep the convolutions of rubber treated fabric from sticking together. Before the roll of rubber treated fabric passes into the bias cutting machine D, this liner strip is removed, and for this purpose at the feed end of the bias cutting machine, a take-up installation F is also situated in addition to the feed-off installation E, as shown, the take-up installation being for the purpose of spooling the liner strip above referred to as the fabric comes off from the roll of the feed installation E and passes into the bias cutting machine.

It is obvious that the steps of treatment above referred to need not be consecutive, that is, need not follow each other immediately, but any interval of time may elapse between consecutive steps of the treatment, such as for instance, the fabric may be stored after any step of treatment when desired or necessary.

What is claimed is:

1. An apparatus for manipulating a roll of fabric during a course of treatment, comprising a series of machines each arranged to operate upon a fabric in the form of a traveling web, a feed installation and a take-up installation for the fabric, simultaneously operatable and permanently associated with the feed and discharge ends respectively of the machines, a pair of frames interchangeable with said permanent feed and take-up installations, means for carrying the roll of fabric on each frame, and a truck forming means for transporting as well as applying and removing said frames interchangeably throughout the series of said installations.

2. An apparatus for manipulating a roll of fabric including a series of machines for operating independently of each other upon

the fabric in the form of a traveling web, a feed installation and a take-up installation at the feed and discharge ends respectively of the machines, the feed installation embodying a track, and a braked spindle adapted to feed the fabric from the roll into the machine, and the take-up installation embodying a track and a driven spindle adapted to roll up the fabric from the machine, a pair of frames, axles on the frames for carrying the roll of fabric, said frames being interchangeably receivable by all of said tracks, said tracks serving to position said axles for reception by the respective spindles of said installations.

Signed at Detroit, Mich., April 14th, 1915.

EMIL B. CEDERSTROM.