

May 21, 1935.

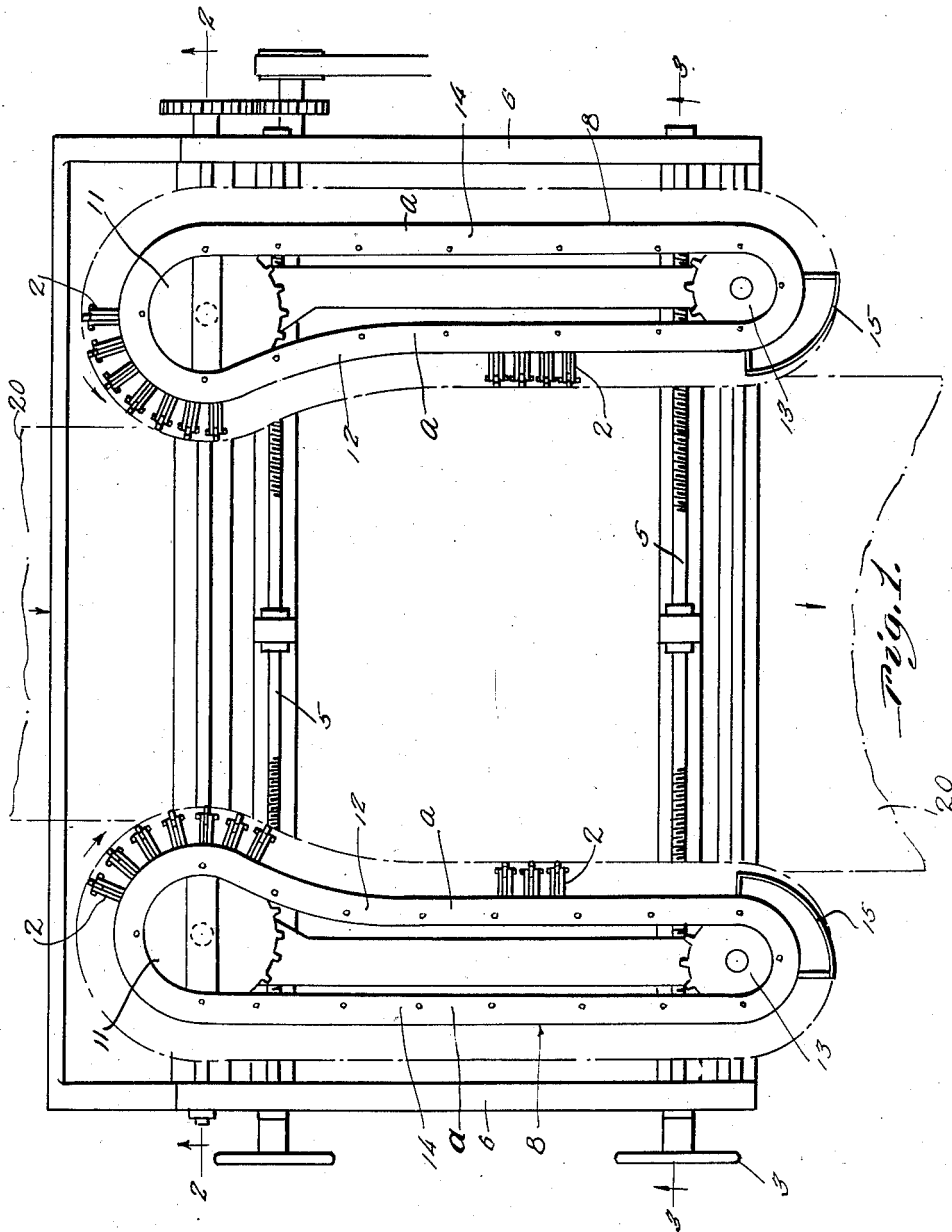
J. J. McCANN, JR

2,002,096

FABRIC EXPANDER FOR TEXTILE INDUSTRY

Filed Jan. 28, 1932

3 Sheets-Sheet 1



Inventor

John J. McCann, Jr.

By *Clarence A. O'Brien*
Attorney

May 21, 1935.

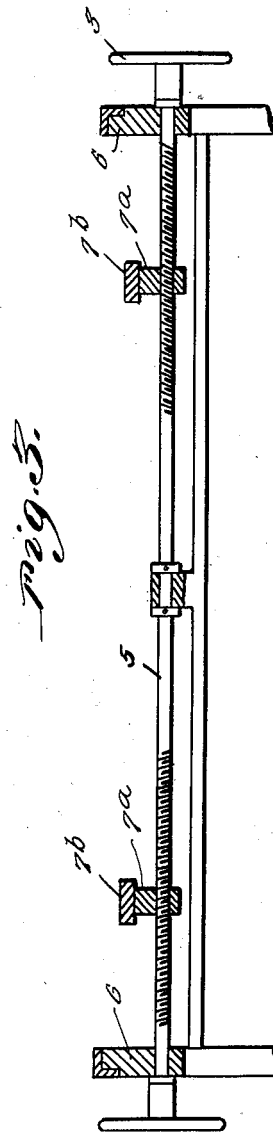
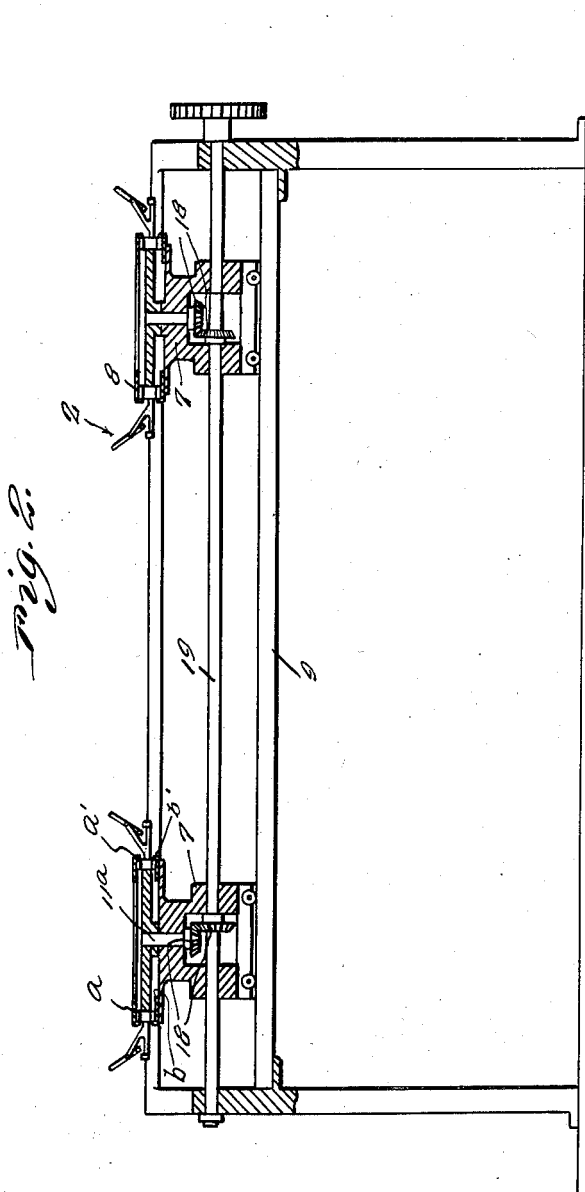
J. J. McCANN, JR

2,002,096

FABRIC EXPANDER FOR TEXTILE INDUSTRY

Filed Jan. 28, 1932

3 Sheets-Sheet 2



Inventor

John J. McCann, Jr.

By *Clarence*

Attorney

May 21, 1935.

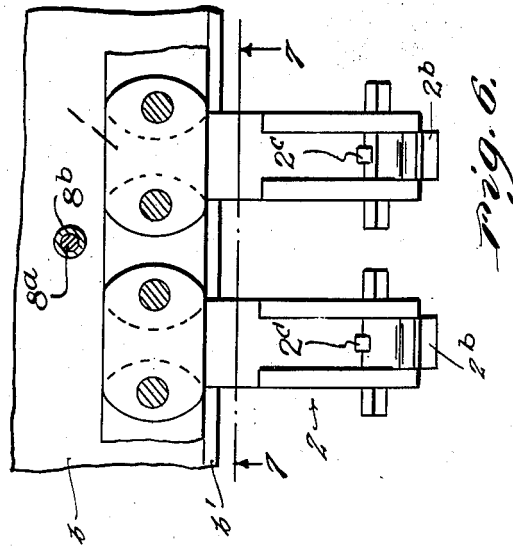
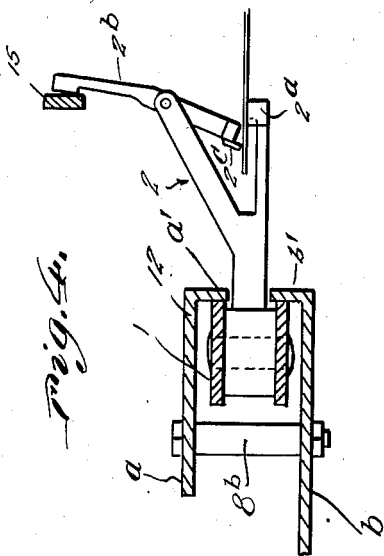
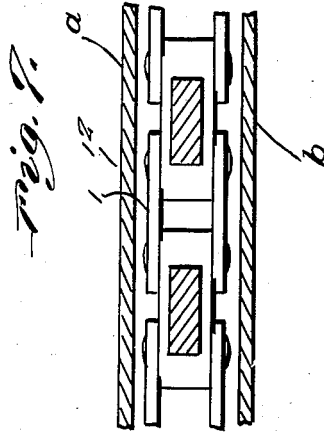
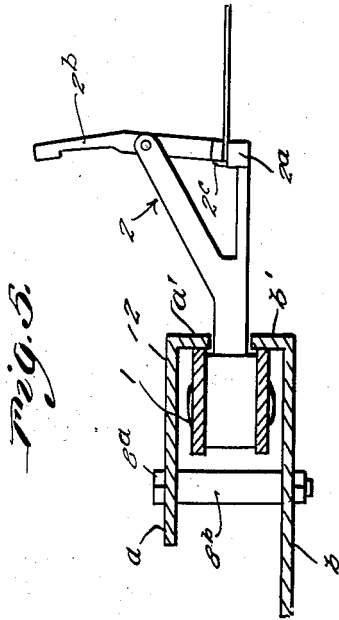
J. J. McCANN, JR

2,002,096

FABRIC EXPANDER FOR TEXTILE INDUSTRY

Filed Jan. 28, 1932

3 Sheets-Sheet 3



Inventor

John J. McCann, Jr.

By *Clarence A. O'Brien.*
Attorney

UNITED STATES PATENT OFFICE

2,002,096

FABRIC EXPANDER FOR TEXTILE INDUSTRY

John J. McCann, Jr., Lowell, Mass.

Application January 28, 1932, Serial No. 589,521

3 Claims. (Cl. 26-61)

This invention relates to certain new and useful improvements in the tentering of fabrics whereby to straighten the selvedge edges thereof and stretch the fabric widthwise, while at the same time permitting a decrease in length proportional to the increase in width. Such improved tentering treatment of the fabric provides a more balanced and equal tension on the warp and filling threads and produces a superior product, as more fully described hereinafter and in my copending application Serial No. 598,265. The object of the invention is the production of such an improved tentering treatment and an apparatus for carrying the same into practice.

These and other features of the invention will be best understood and appreciated from the following description of a preferred embodiment thereof, selected for purposes of illustration and shown in the accompanying drawings, in which

Figure 1 is a top plan view of an apparatus embodying the invention.

Figures 2 and 3 are transverse sectional elevational views therethrough taken substantially on the lines 2-2 and 3-3 respectively of Figure 1.

Figure 4 is a fragmentary detail sectional elevational view for more clearly showing the construction of my improved way or guide, and one of the clips forming part of the expander shown in an open position.

Figure 5 is a view similar to Figure 4 with the clip shown in a closed condition.

Figure 6 is a fragmentary horizontal sectional elevational view through the way.

Figure 7 is a sectional elevational view taken substantially on the line 7-7 of Figure 6.

Referring more in detail to the drawings, it will be apparent that my invention is susceptible to use with any and all well known types of tentering frames and for the sake of example, I have shown the invention as applied to that type of tentering frame which includes among other parts, a bench for supporting the working parts of the expander, which parts include pairs of opposed carriages 1 equipped with rollers rideable on rails 9. The bars 7b connecting the carriages of the respective pairs are provided with lugs 7a having threaded engagement with shaft 5 supported as at 6 and provided with hand wheels 3 for varying the distance between the conveyors or chains 1, which chains are trained over idler sprockets 13 and driven sprockets 11 that are suitably mounted and cause the chains to travel in the same direction and at the same speed. The parts herein above referred to are conventional to expander or tenter frame now in use,

and do not form the essence of the present invention.

As shown, each of the chains is provided with an endless series of fabric engaging clips 2 and while any preferred type of clip may be used, in the present instance, I have shown clips of the type described and claimed in my copending application Ser. No. 592,373, filed Feb. 11, 1932. The clips are illustrated as integral with certain links of the chain, and merely by way of explanation, it may be stated that each clip includes a substantially horizontally disposed fixed jaw 2a and a pivotally mounted jaw 2b cooperable with the jaw 2a and provided with a fabric engaging lug 2c.

In accordance with the present invention, and to provide for a relative decrease in the length of the fabric proportional to an increase in the width thereof, I provide for each chain 1 a novel guide or way 8, and each guide or way is substantially loop shaped at the ends, and accommodates within the confines thereof at relatively opposite ends, the sprockets 11 and 13, the sprockets 11 being larger than the sprockets 13 for a purpose hereinafter described.

Each guide 8 comprises upper and lower frames or plates a and b connected in spaced relation by studs 8b, and each guide comprises a straight outer side 14 and an inner side 12, the latter being straight and parallel with the side 14 for a considerable length thereof and having its end adjacent to the sprocket wheel 11 curved outwardly therefrom around this sprocket wheel. The chains 1 run in the guides between the plates a and b and at least the inner sides 12 of the plates are provided with chain engaging flanges a' and b' having their opposed edges in spaced relation for accommodating therebetween fabric engaging clips 2 carried by the chain links and extending outwardly therefrom past the flanges and toward the other chain 1. As shown in Fig. 1, the two guides are arranged with the said outwardly curved portions of the sides 12 extending toward each other at the entrance end of the fabric path, whereby this entrance end portion of the path is narrower than the portion between the straight and parallel sections of the sides 12.

The chains are driven in the direction of the arrows (Fig. 1) and it is apparent that they will travel in the course defined by the guides or ways 8 with the result that opposed clips 2 will be closer together at the entrance end of the device and the distance between opposed clips will gradually increase as they proceed toward the relatively opposite or outlet end of the device

and until their course becomes regulated by the straight portions of the sides 12 of the guides or ways whereupon such pairs of opposed clips will travel in spaced parallelism with the distance therebetween remaining constant until such clips have moved to the outlet end of the device. Such is thought apparent from a study of Figure 1.

At the outlet end of the space or path between the opposed portions of the chains, there is provided on each guide or way 8 a suitable abutment device 15 engageable with the free ends of the jaws 2b for opening said jaws to permit passage of the fabric from the expander and on to other suitable mechanism (not shown) whereby the fabric is subjected to a drying process or other step as may be next employed in the treatment of the fabric.

In actual practice, the web or cloth is fed to the tentering device at the inlet end of the latter, and the selvage edges of the cloth engage the lower jaws 2a of the clips 2 while the projections 2c of the jaws 2b engage the fabric in the manner suggested in Figure 4. As the chains 1 travel in the guides or ways in the direction of the arrows (Fig. 1), the jaws 2b, by reason of the engagement of the lugs 2c with the fabric, are gradually drawn into clamping relation with the jaws 2a so as to clamp the selvage edges of the cloth in the manner suggested in Figure 5. This engagement of the jaws serves automatically to pull the selvage edges of the cloth following into the line of succeeding fabric engaging clips, as will be apparent from an inspection of Fig. 1. As will also be noted from a study of Fig. 1, the distance between opposed clips 2 is at its minimum at the inlet end of the device. During operation, this distance between the clips gradually increases by reason of the curvature, about the wheels 11, in the sides 12 of the guides. When the distance between opposed clips reaches its maximum, this maximum distance preferably remains constant until the clips reach the outlet end of the device.

At said outlet end, the jaws 2b of the clips are engaged by the devices 15 and swung to the position shown in Figure 4 to release automatically the fabric, whereby the latter may then be withdrawn from the tentering mechanism, and then passed through a device forming the subject matter of my copending application Serial No. 589,522, which device, as clearly set forth in said application, provides for the efficient removal of water from the fabric.

Through the medium of my improved guides or ways for the tentering chains, a decrease in the length of the fabric being expanded in width is accomplished and this will be more apparent from the following: Where the cloth is fed into the tentering device, the clips 2 of each chain, traveling around its drive wheel or sprocket 11, are spaced at their maximum distance apart from each other. As the clips pass from that path, imposed thereon by the drive wheels 11, said clips move in a path defined therefor by the curved inner sides 12 of the guides or "ways", as clearly suggested in Figure 1. These curved portions cause the jaws to move gradually closer together as the chains travel therealong, since the curvature thereof is gradually reduced as said curved portions merge with the straight portions of the guides. Also, as the clips pass from this curved path into the straight path, the distance between opposed clips on the two chains increases, with the result that the fabric is expanded or stretched transversely in a manner increasing its width. Thus, as the clips pass through this zone

of curvature, the jaws thereof close upon the selvage edge of the fabric and increase the width of the web, and simultaneously therewith reduce the length thereof. The distance between the clips thereafter preferably remains constant until the outlet end of the device is reached. It will also be noted that the jaws 2 travel faster at the fabric-engaging portion of the path than at the portion adjacent to the straight sides 12 of the guides, and it will, therefore, be apparent that the relatively wider fabric is discharged from the device at a speed slower than the entrance of the fabric into the device. The fabric is indicated in Fig. 1 of the drawings by the reference character 20.

From the foregoing, it will be apparent that a tenter frame embodying the features of the present invention will provide for a decrease in the length of the fabric proportional to the increase in the width thereof and, consequently, when the fabric is thereafter subjected to any influence that would tend to change the relative tension of the threads thereof, for example, as by pressing, sponging, steaming or the like, there will be little or no possibility of the fabric shrinking because of its subjection to any of these influences.

The present invention will also insure a correction of any unevenness in the width of the cloth. For example, should a cloth not of uniform width be passed through the tentering device, the clips 2 will not close as quickly on relatively wide portions thereof as on the relatively narrow portions, it being understood that the jaws engage the cloth strip at its selvage edges, as shown in Fig. 5. Consequently, and as is thought apparent, a greater stretching operation will take place relative to a narrow portion of the cloth than will take place relative to a wider portion thereof, so that such narrow portion of the cloth will be stretched sufficiently to make it of a width corresponding to the width of the wide portion or portions. By so correcting unevenness in the width of the cloth, a smoother looking weave, a permanent reduction in cockled bunched places in the cloth or fabric, and a permanent, definite and uniform width to the cloth is assured.

While I have herein shown and described one preferred embodiment of the invention, it is to be understood that the same is susceptible of changes, modifications and improvements coming within the scope of the appended claims.

Having thus described my invention, what I claim as new is:

1. In a tentering device, a pair of endless conveyors having two sides thereof in opposed and relatively spaced relation and in substantially the same plane along a path therebetween, a plurality of elements carried by the conveyors for gripping the edges of a strip of fabric located in said path, means for driving the conveyors to move said opposed sides thereof from the fabric entering end to the exit end of the path, and means supporting and guiding the conveyors in ways causing the said two sides thereof to approach each other at said fabric entering end of the path and to diverge outwardly therefrom in curvilinear lines toward the exit end of the path, the said fabric gripping elements of each conveyor being in outwardly diverging relation to each other when at said curvilinear portion of the path and coming into closer relation as they leave such portion of the path whereby fabric gripped by the opposed elements is stretched widthwise by the said opposed sides of the con-

veyors at said outwardly diverging portion thereof and permitted by said approaching movement of the elements to reduce in length a proportional amount.

5 2. A continuous method of finishing fabric in strip form, consisting of feeding the fabric longitudinally along a predetermined path while holding the same gripped at its two side edges, and stretching the fabric to increase its width at a predetermined portion of said path and simultaneously therewith decreasing the longitudinal feeding speed of the fabric an amount allowing a longitudinal contraction of the fabric proportional to said increase in width.

10 3. In a tentering device, a pair of endless conveyors having opposed portions lying in the same plane and relatively spaced to provide a path therebetween, said opposed portions extending along lines leading inwardly toward each other to a point of closest approach adjacent to one end of the path and diverging from said point through

convexly curved portions and into straight and parallel portions, mechanism for driving the conveyors along said path in a direction away from said one end, a plurality of clips carried by each conveyor and extending from each of said portions toward the other portion, fabric engaging jaws on the free ends of the clips, and guides extending along and conducting said portions of the conveyor along said lines at the edges of the path, said clips on each conveyor being in outwardly diverging relation when located at said curved portions and being in relatively closer relation when located at said straight portions whereby fabric in said path gripped by said jaws at the curved portions is stretched widthwise by said opposed and diverging portions of the conveyors and permitted to reduce a proportional amount in length by the relative approaching movement of the clips as the fabric passes to said straight portions.

JOHN J. McCANN, JR.