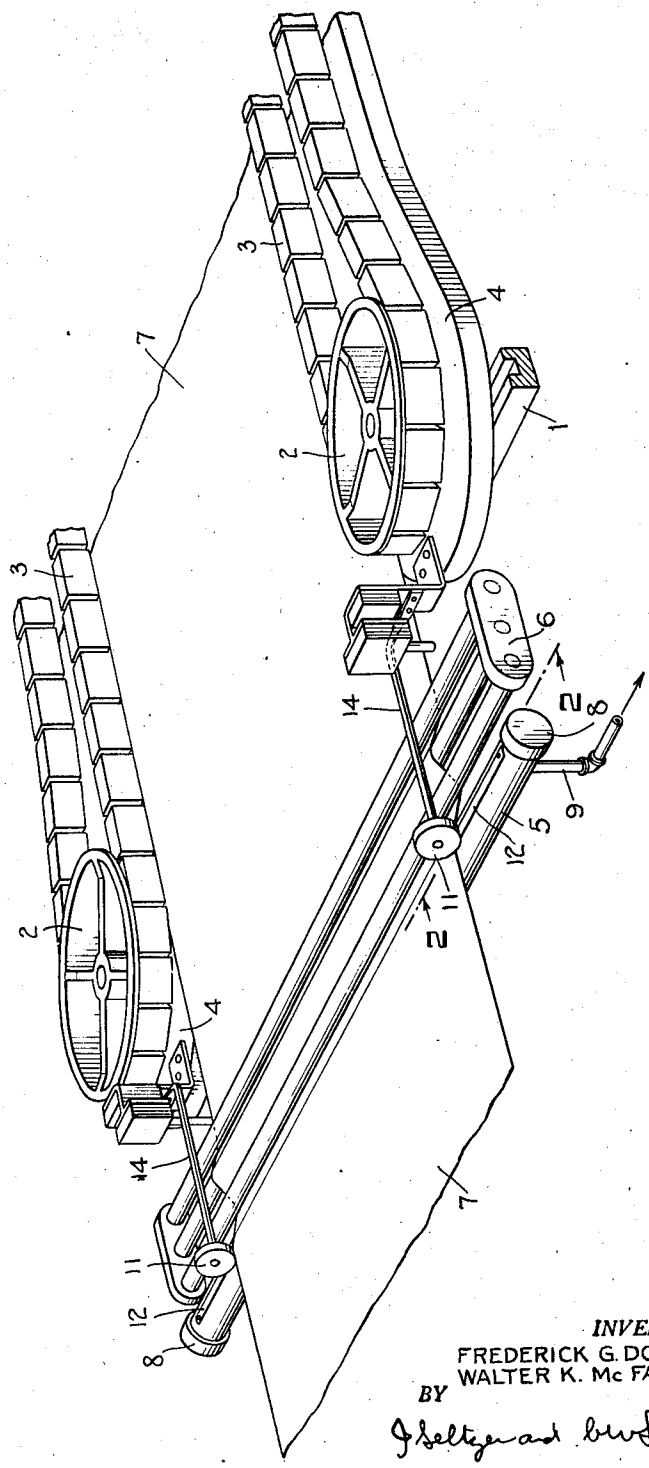
Jan. 4, 1944. F. G. DODGE ET AL 2,338,167

TENTERING MACHINE

Filed Nov. 19, 1942 2 Sheets-Sheet 1

Fig. 1.



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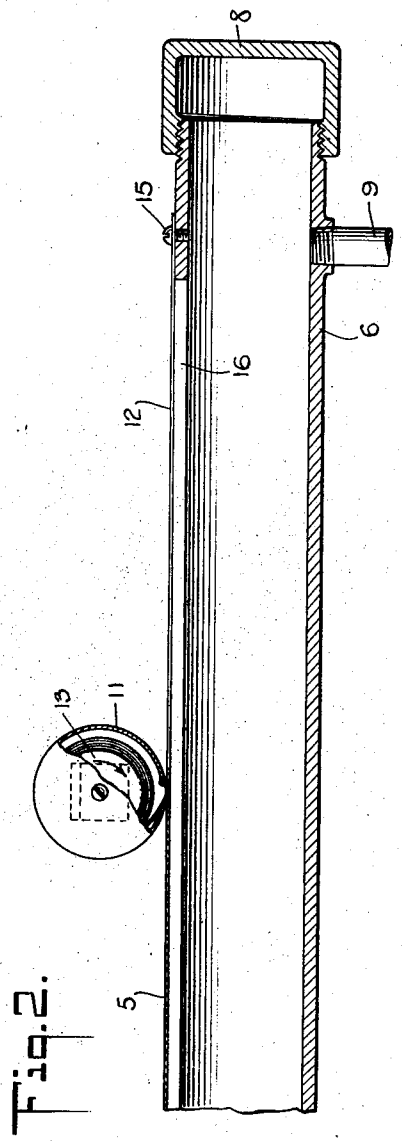

Fig. 2.

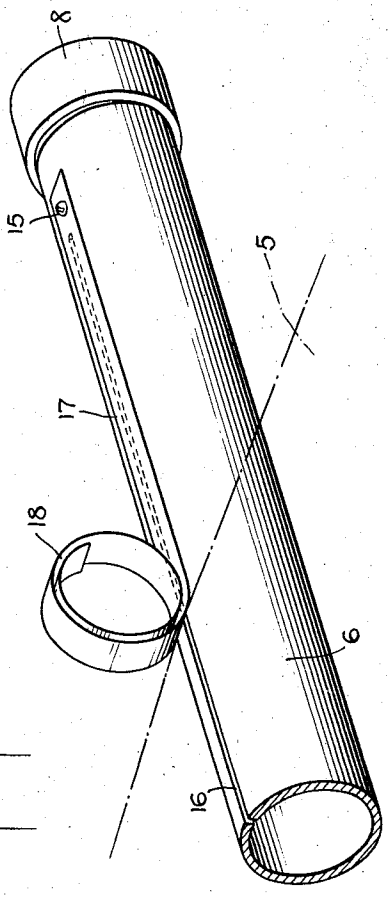

Fig. 3.

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2,338,167

TENTERING MACHINE

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Application November 19, 1942, Serial No. 466,204

8 Claims. (Cl. 26—60)

This invention relates to tentering machines and the like, and relates more particularly to improvements in vacuum extractors for extracting liquid from cloth or other web material being fed to a tentering or similar machine.

An object of this invention is the provision in a vacuum extractor of the slotted type for extracting liquid from cloth or other web material being fed to a tentering or similar machine of improved means for adjusting the effected area of the slot.

Another object of this invention is to provide in a vacuum extractor of the slotted type for extracting liquid from cloth or other web material being fed to a tentering machine, means responsive to the lateral movement of the tenter frames which carry the tenter chains for adjusting the effected length of the slot in the vacuum tube.

Other objects of this invention, together with certain details and combinations of parts, will appear from the following detailed description.

In the drawings:

Fig. 1 is a perspective view of the feed end of a tentering machine showing the relation of our invention thereto,

Fig. 2 is a cross-section view taken on line 2—2 of Fig. 1, and

Fig. 3 is a perspective view of another embodiment of our invention.

Like reference numerals indicate like parts throughout the several views of the drawings.

In running fabric through tentering machines, it has been general practice to pass the wet fabric over an opening or slot in a vacuum tube that extends across the feed end of the machine, which effects decided economics in speed, drying costs, uniformity of treatment, etc. The air being drawn through the wet fabric into the vacuum in the tube produces a shock effect similar to giving a water covered screen a sharp rap or blow, and a large percentage of the moisture is extracted.

It is generally agreed that a straight slot in the vacuum tube gives the maximum and most uniform extraction. The practice is to make the slot in the vacuum tube as long as the maximum width of the fabric. With variable widths and positions of the fabric, one or both ends of the slot may be uncovered, with the result that the amount of air passing through the interstices of the fabric is materially reduced, thereby affecting the efficiency of the vacuum tube. Devices have been designed to cover the portion of the slot not covered by the fabric, which devices have had the objection of contacting the face of the fabric, with the possibility of streaking or marking the same or they have required constant manual control. We have now designed a novel device for closing the unused portion of the slot. This device is adapted to contact the fabric at the marginal edges only of the selvedges and is fully automatic in adjustment to the width of the fabric.

Referring now to the drawings for a detailed description of our invention, the reference numeral 1 indicates a portion of the main frame of a tentering machine. As is well known, the tentering machine is provided on each side thereof with an endless chain mechanism adapted to be moved relative to each other to conform to the width of the fabric being treated. This endless chain mechanism, only a portion of which is shown in the drawing, comprises a pulley 2 and a driven pulley (not shown) around which a belt 3 is adapted to pass. The pulley and belt is shown mounted on a movable table 4. The belt 3 is normally equipped with pins, hooks, grippers or clips, or other attachments for grabbing the selvedge of the fabric and holding it stretched or smooth as it passes through the machine. Details of the belt and drawing mechanism therefor have not been shown as they do not form a part of this invention.

In accordance with our invention, the feed end of the tentering machine is provided with a slotted vacuum tube 5 at a point forward of a set of spreading rolls generally indicated by the reference numeral 6. The spreading rolls are provided for the purpose of smoothing out the fabric 7 prior to its passage on to tenter tables 4 where the fabrics are adapted to the tenter chain by the stable clips or other fastening means.

The vacuum tube 5 comprises a pipe of substantially the same length as spreading rolls 6 closed at each end by means of a cap 8. The tube is made of any suitable material which will withstand a vacuum of high degree without tending to collapse. A pipe 9 connects the vacuum tube 5 to a suitable suction apparatus. At each side of the tenter there is provided a metal casing 11 containing a tape 12 attached at its inner end to a spring rewinding means 13. The casing 11 is fastened to one end of bracket 14, the other end of which is fastened to the movable table 4 of the tenter. The tapes 12 are fastened by means of screws 15 tapped into the top of vacuum tube 2 to the ends of the slot 16 in said vacuum tube.

In operation the tapes 12 are adjusted so that when the fabric 7 is run into the tentering machine the unused or open portion of the slot 16 in the tube 5 is covered by the tapes 12 which, due to the pressure differential inside and outside the tube 5, are pressed tightly over the slot 16, thus completely sealing the unused portion against air leakage. As the fabric 7 varies in width the tables 4 move in or out to accommodate this variation. The tape cases 11 being bracketed to the tables 4 move with them, covering or uncovering the slot 16 as the case may be, and leaving the slot 16 open only under the fabric 7.

In Fig. 3 of the drawings there is shown another embodiment of our invention. This is constructed of a thin and narrow coil of tape 17 preferably of spring steel, one end of which is fastened to the tube 5 by means of a screw 15. Due to the pressure differential between the inside and the outside of the tube 5 the spring tape 17 is held tightly to the unused or open portion of the slot 16. Due to the pressure loss through the fabric 7 the pressure difference is not great enough to force the tape 17 over the fabric 7. As the width of the fabric 7 varies, the spring tape 17 rolls or unrolls, being held by the pressure differential exactly at the edge of the fabric 7 and being re-rolled by its own spring action.

Although this invention is described above with reference to the feeding of fabric to a tentering machine, it is also applicable to the vacuum extraction of liquid from a fabric as it is fed to a dryer, printing machine, weighting machine and the like. Its principal application, however, is on a tentering machine handling fine fabrics such as women's dress goods made of or containing continuous filament yarns where contact of the slot sealing means with the face of the wet fabric tends to produce streaks, moire effects, etc.

The strip or tape 12 may be of any suitable material capable of bridging the slot 16 under the pressure differential employed. We have found, however, that a spring steel tape is preferred. The strip or tape 17 may be made of any suitable material that has sufficient resiliency to re-roll itself into a coil as shown at 18. We have found that for this embodiment also a spring steel tape is preferred.

It is to be understood that the foregoing detailed description is given merely by way of illustration and that many variations may be made therein without departing from the spirit of our invention.

Having described our invention, what we desire to secure by Letters Patent is:

1. In a vacuum extractor wherein a slotted vacuum tube is employed for extracting liquid from wet fabric having a width less than the length of said slotted vacuum tube passing over said slotted vacuum tube, means comprising a self-coiling tape attached at one end of said tube for closing a portion of said slot, said tape automatically coiling and uncoiling over the slot of the vacuum tube responsive to the width of the fabric passing over said tube.

2. In a vacuum extractor wherein a slotted vacuum tube is employed for extracting liquid from wet fabric having a width less than the length of said slotted vacuum tube passing over said slotted vacuum tube, means comprising a self-coiling steel tape attached at one end of said tube for closing a portion of said slot, said tape automatically coiling and uncoiling over the slot of the vacuum tube responsive to the width of the fabric passing over said tube.

3. In a vacuum extractor wherein a slotted vacuum tube is employed for extracting liquid from wet fabric having a width less than the length of said slotted vacuum tube passing over said slotted vacuum tube, means comprising self-coiling steel tapes attached at each end of said tube for closing end of portions of said slot, said tape automatically coiling and uncoiling over said tube responsive to the width of said fabric passing over said tube.

4. In a tentering machine wherein a vacuum extractor comprising a slotted vacuum tube is employed for extracting liquid from wet fabric having a width less than the length of said slotted vacuum tube passing over said vacuum tube, means comprising a tape attached to one end of said tube for closing a portion of said slot, said means being responsive to the movement of a tenter table of said tentering machine.

5. In a tentering machine wherein a vacuum extractor comprising a slotted vacuum tube is employed for extracting liquid from wet fabric having a width less than the length of said slotted vacuum tube passing over said slotted vacuum tube, means comprising a tape attached at each end of said tube for closing portions of said slot, said means being responsive to the movement of a tenter table of said tentering machine.

6. In a tentering machine wherein a vacuum extractor comprising a slotted vacuum tube is employed for extracting liquid from wet fabric having a width less than the length of said slotted vacuum tube passing over said slotted vacuum tube, means comprising a tape attached at each end of said tube for closing portions of said slot, said means being attached to and movable with the tenter tables of said tentering machine.

7. In a tentering machine wherein a vacuum extractor comprising a slotted vacuum tube is employed for extracting liquid from wet fabric having a width less than the length of said slotted vacuum tube passing over said slotted vacuum tube, means comprising a tape attached by one end at the end of said tube, a rewind case supporting the other end of said tape, a bracket connecting said rewind case with the tenter table of said tentering machine in a manner to effect movement of said tape responsive to the movement of the tenter table.

8. In a tentering machine wherein a vacuum extractor comprising a slotted vacuum tube is employed for extracting liquid from wet fabric having a width less than the length of said slotted vacuum tube passing over said slotted vacuum tube, means comprising tapes each attached by one end to opposite ends of said tube, rewind cases supporting the other ends of said tapes, brackets connecting said rewind cases with the tenter tables of said tentering machine in a manner to effect movement of said tapes responsive to the movement of the tenter tables.

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