

April 8, 1930.

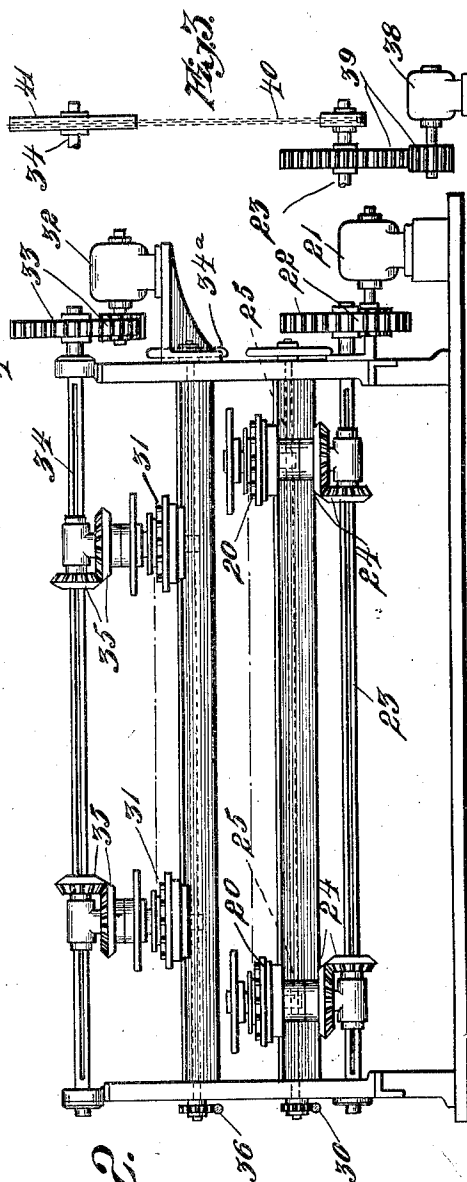
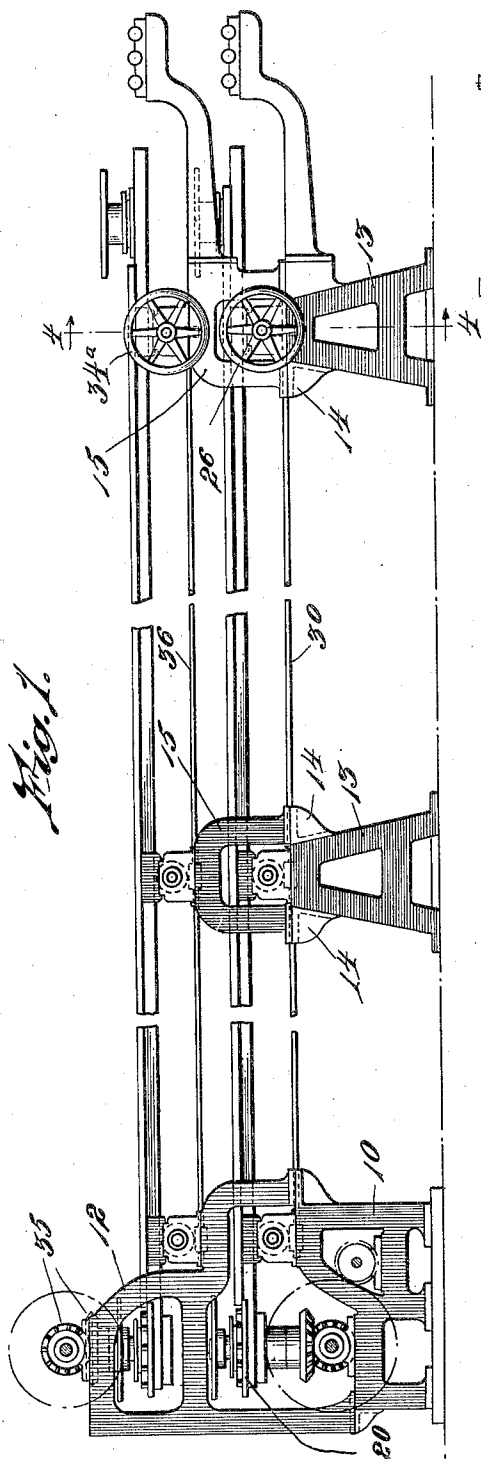
T. W. FRANCE

1,754,089

TENTERING MACHINE

Filed Feb. 14, 1929

2 Sheets-Sheet 1



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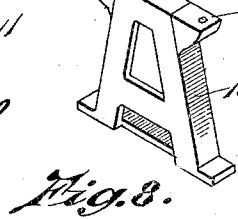
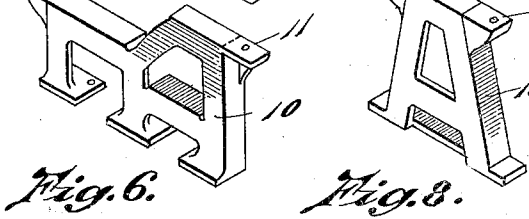
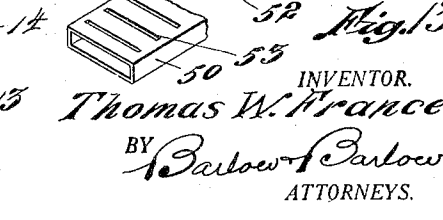
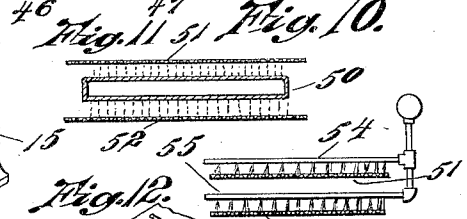
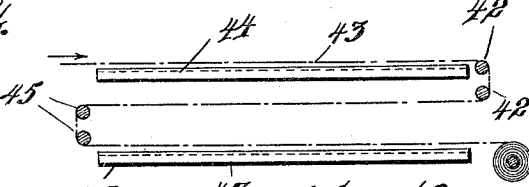
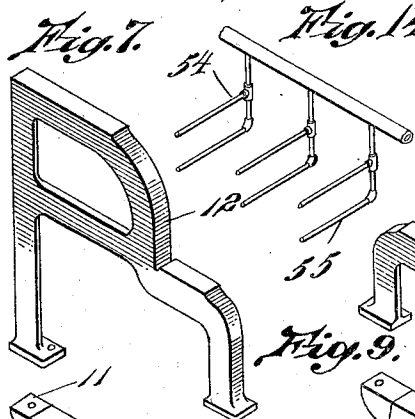
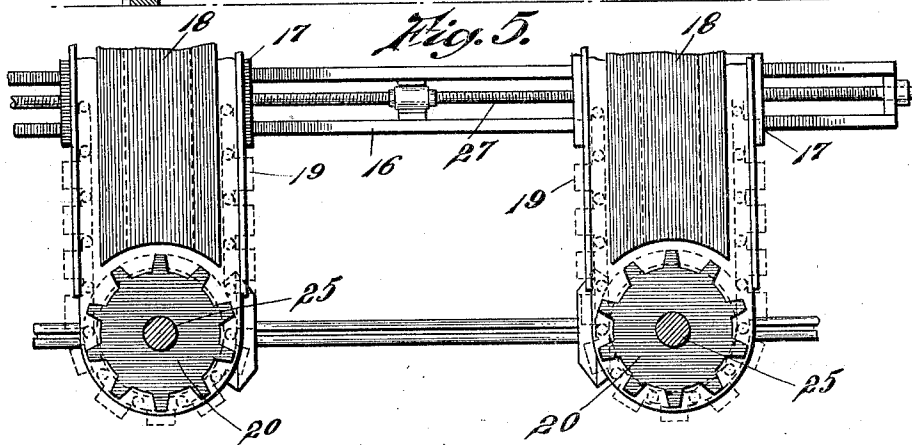
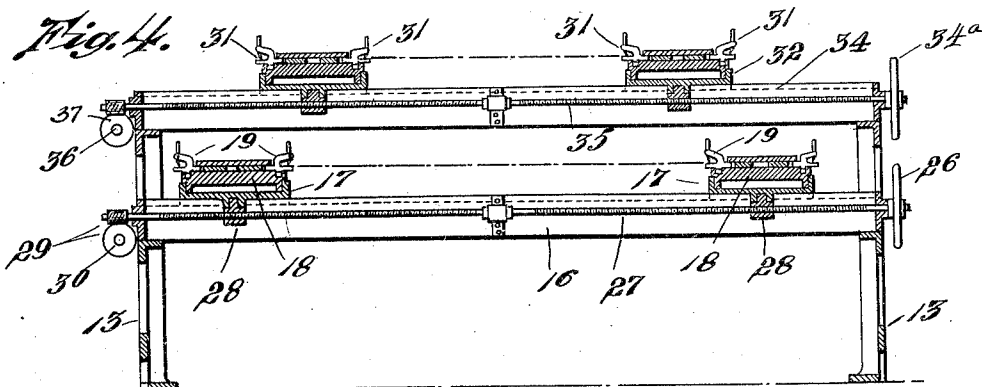
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2 Sheets-Sheet 2



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TENTERING MACHINE

Application filed February 14, 1929. Serial No. 339,988.

This invention relates to improvements in tentering machines; and has for its object to provide means whereby a plurality of sets of tentering mechanisms may be mounted in superimposed relation, so that the work of two or more tentering machines may be done in substantially the floor space usually occupied by one machine.

A further object of the invention is to construct the frame of the lower set of mechanisms that it is adapted to support the frame of the upper set thereon.

The invention further consists in the provision of means for spacing the webs being treated a substantial distance apart so that the faces of both webs may be observed by the attendant to make sure that both are being properly acted upon.

A still further object of the invention is to provide means whereby the two sets of mechanisms may be operated from a single source or operated independently of each other if desired.

The invention further consists in the arrangement of two sets of web carrying chains one being located above the other, and the provision of means for conducting the web through the machine by one set of chains and after leaving the discharge end of the set to be conducted through the other set, whereby the web may be acted upon by both sets of chains before being finally discharged from the machine.

A further object of the invention is to extend the hot air conducting pipe along between the two spaced webs to dry both webs simultaneously by a single drying system.

With these and other objects in view, the invention consists of certain novel features of construction, as will be more fully described, and particularly pointed out in the appended claims.

In the accompanying drawings:

Fig. 1 is a side elevation of my improved tentering machine.

Fig. 2 is an end view of the machine showing the separate drives for each of the tentering mechanisms.

Fig. 3 is a detail illustrating both of the

tentering mechanisms as driven from a single motor.

Fig. 4 is a section on line 4—4 of Fig. 1 showing the manually operable means for adjusting each set of the chains independently of each other.

Fig. 5 is a plan view showing the rails with chains mounted thereon and engaged by the driving sprocket wheels.

Fig. 6 is a perspective view showing the lower frame at the drive end of the machine provided with extension portions for receiving the upper frame member.

Fig. 7 is a perspective view showing the upper frame member arranged to fit upon and be supported on the lower frame member at the drive end of the machine.

Fig. 8 shows one of the A shaped frames for supporting the upper frame thereon.

Fig. 9 is a perspective view showing one of the upper frames arranged to be supported upon the lower frame for carrying the upper tentering mechanism.

Fig. 10 is a diagrammatic view illustrating two spaced sets of chain rails located one above the other with the web to be treated as being conducted by the upper chain to its discharge end and then around and back to the receiving end of the lower chain to be again conducted through the machine before being finally discharged therefrom.

Fig. 11 is an end view of the two spaced webs, showing the hot air conducting pipe for drying as located between the webs.

Fig. 12 is a perspective view of a fragmental portion of the hot air pipe removed.

Fig. 13 is an end view of the two spaced webs, showing the hot water conducting pipes locating in position to wash both of the webs.

Fig. 14 is a perspective view showing one arrangement of the hot water distributing pipes.

Tentering machines as is well known are very expensive to construct and are very large and heavy, weighing many tons, and are 20 ft. to 120 ft. in length and therefore some may take up a great deal of valuable floor space and often a separate room is built for each machine which is provided with an expensive drying system and also in some cases

a web washing apparatus, and it is found to be of great advantage in many instances to be able to provide means whereby two or more of the web manipulating portions of these machines may be mounted one above the other permitting the whole to be operated in the same room and treated by the same drying and washing apparatus and also operated by the same attendant, thus it is also often found that in order to obtain practical results from such a superimposed arrangement of tentering mechanisms that the web chains must be spaced a substantial distance apart or such a distance that the usual hot water spray pipes in washing the mercerized goods and the hot air conducting pipes for drying the starched goods may extend along between the webs, the space also being such as to enable the attendant to observe the upper surface of both webs as they pass through the machine to ascertain whether or not both webs are properly nipped by the tentering clips and are being properly acted upon by the washing or by the drying apparatus, also it is found of advantage to so form the frame and lower tentering mechanism that it is adapted to support the lower mechanism independently of the upper mechanism and also adapted to support the upper frames for the superimposed sets of tentering mechanisms when desired to be installed whether installed at the time the lower mechanism is installed or subsequently thereto. It is also found of advantage to provide means whereby each set of mechanism may be operated independently of the other set if desired so that two webs of different widths and characters may be running at the same time, if desired.

Also it is found of advantage in some instances where it is impossible to install a tentering machine of the required length to so arrange these superimposed parts that the web may be passed first through one set and then conducted around and also passed through the second tentering set before being finally discharged from the machine, thus enabling the machine to produce the same amount of tentering effect on a single web as in a machine of twice its length; and the following is a detailed description of the present embodiment of my invention and showing the preferred means by which these advantageous results may be accomplished.

With reference to the drawings, 10 designates the lower side frames at the drive end of the machine, which frames are provided with extensions 11 for the support of the upper R-shaped frames 12, which upper frames are arranged to carry the upper driving mechanism presently described.

The intermediate A-frames 13 are also arranged to support the lower tentering mechanism and are provided with extensions 14 for the support of the upper side frames 15 which may be bolted thereto. Thus the lower frames

are called upon to support not only the lower tentering mechanism but also the upper tentering mechanism. On the lower frames are supported the cross rails 16 and on which are mounted the slide saddles 17 carrying the rails 18 and these rails in turn carry the chains 19 which are driven by the sprockets 20 from the motor 21 through gears 22, cross shaft 23, beveled gears 24, short upright shaft 25. These rail carrying saddles 17 may be adjusted laterally relatively toward and from each other by operating the hand wheel 26, through screw shafts 27 and nuts 28. On the end of this screw shaft 27 is mounted the worm and gear 29 to rotate the worm shaft 30 to simultaneously operate the screws 27 which are spaced along the machine for lateral adjustment of the rails.

A similarly constructed mechanism is arranged to operate the upper parts of the tentering mechanism wherein the sprockets 31 are operated from the motor 32 through gears 33, shaft 34 and gears 35 to impart a traverse motion to the chain 31. Rail carrying saddles 32 are mounted on the cross rails 33 and are moved laterally toward and from each other by manipulation of the hand wheel 34* through the screw shaft 35 which like the lower set imparts its motion through the worm and gear 37 to longitudinal shaft 36 to operate the different screw shafts 35 spaced along the machine.

In some instances instead of having separate drives for the separate superimposed tentering mechanisms, I may provide a single motor 38 (see Fig. 3) which may drive through gears 39 to operate the lower tentering mechanism and through the sprocket chain 40 and sprocket wheel 41 to operate the upper mechanism or any other suitable arrangement of drive may be employed.

In still other instances, I may, as illustrated in Fig. 10, arrange at the discharge end of one of the sets of mechanisms, a pair of lead rolls 42 for conducting the web 43 back, from the discharge end of the upper chain rails 44, over conducting rolls 45 to the entering end 46 of the lower chain rails 47 to be again passed through the machine before being finally discharged therefrom. In this way a machine of one-half the length of that usually required may be employed for twice acting upon the web before being finally discharged therefrom.

When my improved machine is used for the drying of the starch in the goods, I may employ a single pipe 50, see Figs. 11 and 12, to extend along the length of the machine between the webs 51 and 52, the air being forced through the slits 53 through the top and bottom of the pipe at spaced intervals to impinge against the under face of the web 51 and against the upper face of the web 52 for drying both simultaneously thus employing a single drying system for both webs; when

the machine is constructed with the webs running back and forth, as illustrated in Fig. 10, by my improved method of heating which is that of acting on both the upper and lower webs at the same time, the running speed of this web may be greatly increased.

Then again, when it is desired to use the mercerizing or wet process in which the goods have been first subjected to the caustic and then passed through the machine, I may employ a set of pipes for conducting hot water for washing both of these webs, the upper set of pipes 54 being above the web 51, see Fig. 13, while the lower set of pipes 55 is placed between the upper web 51 and the lower web 52, whereby the washing water which is applied to the upper web percolates through the cloth and falls upon the lower web thus obtaining an additional washing effect on the lower web, and when this system or arrangement of webs, as illustrated in Fig. 10, wherein the water on the upper web percolates through to the next lower web the washing is much more effective as the water which is discharged onto the upper web also acts on the other two traveling parts below the same web.

It is desired that the chains of these tentering mechanisms shall be spaced sufficiently apart so that hot water conducting pipes (not shown) may extend along between the webs, also hot air discharging pipes may extend along between the webs and also these should be so spaced that the operator may readily observe the condition of both upper and lower webs as they pass through the machine as it is important that this should be done in order to obtain the best results from the operation of the machine.

By running a strip of cloth through two sets of tenters, as illustrated in Fig. 10, the cloth is gripped and stretched twice by the tenters, whereby should a tenter clip in the first set be faulty and fail to properly grip and stretch the cloth, the next set would properly grip and stretch it to remedy any defect which might otherwise occur to cause the work to be classified as a "second," thus by separately gripping and stretching the cloth with different sets of tenters this additional advantage to those above enumerated is secured.

By the use of my improved tentering machine in which tentering mechanisms are superimposed or mounted one upon the other, valuable floor space is conserved and the stretching, drying and washing means which are ordinarily arranged to operate upon a single web may operate upon both webs simultaneously, also the attendant usually employed for the single web may also care for both webs thus practically doubling the capacity of this machine over the old style single web machine without additional floor

space and with but little additional cost of operation.

The foregoing description is directed solely towards the construction illustrated, but I desire it to be understood that I reserve the privilege of resorting to all the mechanical changes to which the device is susceptible, the invention being defined and limited only by the terms of the appended claims.

I claim:

1. In a tentering machine, a frame for supporting a lower set of web tentering mechanism, a frame for supporting an upper set of web tentering mechanism above the lower set, means on the lower frame for supporting the frame for the upper set, means for independently adjusting each set, and means for driving both sets.

2. In a tentering machine, a frame for supporting a lower set of web tentering mechanism, a frame for supporting an upper set of web tentering mechanism above the lower set, extension members on the lower frames for receiving and supporting the frame for the upper set, and means for manipulating said sets independently of each other.

3. In a tentering machine two sets of web carrying chains operatively mounted one above the other, and means at the discharge end of one set and at the receiving end of the other set for conducting the web released from one set into operative engagement with the other set, whereby the web may be acted upon by both chain sets independently before being finally discharged from the machine.

4. In a tentering machine, two sets of chain rails one mounted above the other, tentering chains operatively mounted on said sets of rails, the working portions of both chain sets being driven in synchronism to run in the same direction, and means for leading the web from the delivery end of one set back to the receiving end of the other set to be again acted upon by said second set before being delivered from the machine.

5. In a tentering machine, a plurality of separate sets of web stretching tentering chains, means for operatively mounting said sets one above the other, means for manipulating said sets independently of each other, means for driving said sets in synchronism and means for discharging web-treating fluid positioned between the webs and having a plurality of discharge outlets.

6. In a tentering machine, a plurality of separate sets of web stretching tentering chains, means for operatively mounting said sets one above the other, means for manipulating said sets independently of each other, means for driving said sets in synchronism and hot air discharge means positioned between the webs and having upper and lower discharge openings for drying both webs simultaneously.

7. In a tentering machine, a framework, comprising superimposed frame elements, chain rail supports on said superimposed frame elements, two sets of movable chain rails mounted on said chain rail supports in spaced superimposed relation, a set of web stretching chains operatively mounted on each set of rails, means for driving each set of chains, and means for adjusting the lateral spacing of the rails of each rail set.
8. In a tentering machine, a framework, comprising superimposed frame elements, chain rail supports on said superimposed frame elements, two sets of movable chain rails mounted on said chain rail supports in spaced superimposed relation, a set of web stretching chains operatively mounted on each set of rails, means for driving the two sets of chains in synchronism, and means for adjusting the lateral spacing of the rails of each rail set.

In testimony whereof I affix my signature.
THOMAS W. FRANCE.

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