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J. H. HAMILTON

1,754,099

TENTERING MACHINE

Filed May 6, 1929

Fig. 1.

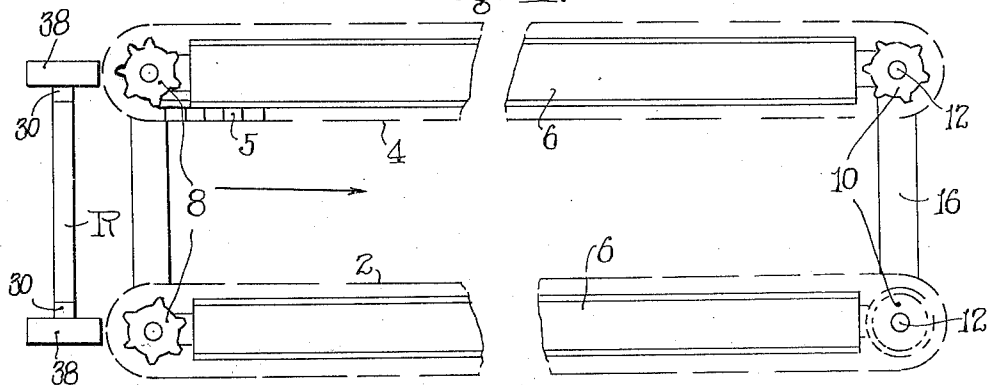


Fig. 2.

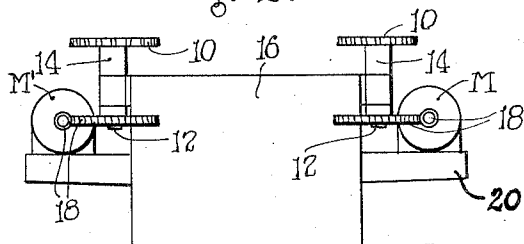


Fig. 4

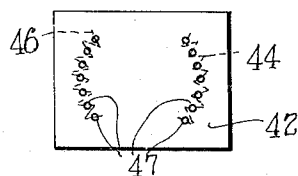


Fig. 3.

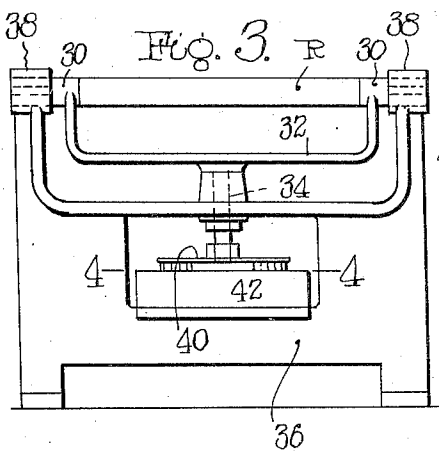


Fig. 6

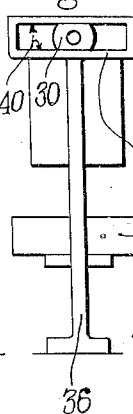
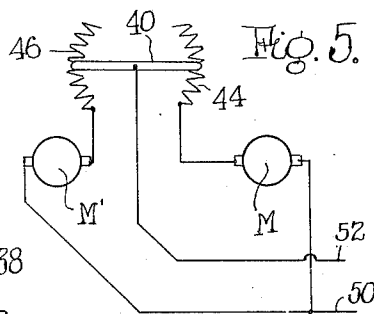


Fig. 5.



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UNITED STATES PATENT OFFICE

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TENTERING MACHINE

Application filed May 6, 1929. Serial No. 360,736.

This invention relates to improvements in tentering machines and is directed particularly to improvements in mechanism for operating the same.

As is well known a tentering machine consists essentially of a pair of endless chains formed by linked together gripping devices. The said chains are mounted for simultaneous movements so that the adjacent inner runs thereof may grip opposite side edges of a web of cloth or the like and carry the same forwardly through the machine.

For certain tentering operations it is essential that both edges of the web be moved forwardly at a uniform speed, a non-uniform speed being injurious to the web of material because one edge is moved relative to the other.

According to an application Serial No. 318,498, filed by me on November 10, 1928, then I showed and described driving apparatus for the chains which includes independent motor drive mechanisms for each chain.

The speed of electric motors varies for various reasons so that under such circumstances one chain moves relative to the other during their forward movement which results in the objection previously mentioned.

It is the principal object of this invention to provide an apparatus for operating the motors at a uniform speed so as to obtain uniform movements of the chains. This is accomplished by regulating or controlling the operation of the motors by the web in such a manner that a movement of one edge of the web relative to the other will in turn vary the speed of the motors to correct a non-uniform speed thereof. In other words should the speed of the motors vary with respect to one another even at the rate of one or two revolutions per minute and even for a very short space of time there would be an objectionable relative movement of opposite edges of the web. According to this invention any departure from the uniform speed desired is utilized as an actuating means for correcting the non-uniformity.

The novel features and advantages of the invention will be observed from the following description of the invention which for pur-

poses of disclosure is shown in the accompanying drawings in which:

Fig. 1 is a small scale diagrammatic plan view of a tentering machine.

Fig. 2 is an end elevational view of the same taken at the right hand end thereof.

Fig. 3 is a similar view taken at the opposite end thereof.

Fig. 4 is a plan view taken on the line 4—4 of Fig. 3.

Fig. 5 is a diagrammatic view showing the means for controlling the supply of electrical current to the motors, and

Fig. 6 is a side elevational view of the parts shown in Fig. 3.

The invention will now be described in detail with reference to the drawings.

Endless chains 2 and 4 are shown in Fig. 1 which are made up of linked together tenter clips 5 of usual form. The chains formed by the clips are suitably supported and guided by rails 6 in the usual way and are in engagement with sprockets 8 and 10 which are supported by the rails 6. The sprockets 10 are for driving the chains and are fixed to shafts 12 which are rotatable in bearings 14 of an end frame 16 (see Fig. 2).

The shafts at their lower ends are driven by means of suitable gears 18 from motors M and M' supported on brackets 20 fixed to the end frame 16.

A web of cloth or the like is delivered between the chains at the left end of the machine and is carried forwardly thereby in the direction of the arrow. Means (not shown) may be provided at the left end for closing the clips so that they will grip the web while other means also (not shown) may be provided at the opposite end for opening the clips and releasing the web. These form no part of the invention and need not be described more in detail.

According to this invention at the left end of the machine and what may be termed the entrance end I provide a web contacting member which may be in the form of a roll R. It is disposed transversely to the direction of travel of the web and in such a position that a web in passing into and between the chains will pass over or under said roll so that the

roll will be under the influence of the web. The roll may be termed a detector for detecting a non-uniformity or difference in speed of opposite side edges of the web.

5 The said roll is preferably pivoted in bearings 30 of a bracket 32. The bracket is pivoted by means of a shaft 34 in a frame 36 so that it may oscillate while the bearings 30 are slidable in guideway 40 at the upper
10 ends of oppositely disposed extensions 38 of the frame 36.

A contact member 40 in the form of a double ended arm is fixed to the lower end of shaft 34 and may be electrically insulated
15 therefrom. A current control device in the form of a rheostat 42 is supported by the frame as shown and preferably includes separate resistance units 44 and 46, one for each of the motors M and M'. Contacts 47 associated
20 therewith are arranged to be engaged by the ends of the arm 40 so that as the arm is oscillated the ends thereof will wipe over the contacts and vary the value of the resistance in the circuit in which it is included.

25 As in the wiring diagram shown in Fig. 5 each of the motors M and M' is connected to one common lead 50 of a power supplying pair the other of which is indicated at 52. The resistance units 44 are in series with the other
30 leads of the motors while the arm is connected to the supply lead 52. As will be seen, oscillating movements of the arm will simultaneously increase and decrease the resistance in the circuits to the motors to thereby
35 vary the current supply thereto. In that way the speed of one motor will be increased and the other decreased.

In operation a web is passed over or under the roll R and into and between the chains
40 so that its opposite edges are gripped thereby. The motors are operated to drive their respective chains and feed the web forwardly. In case the speed of the motor M decreases with respect to the other, the chain 2
45 will consequently be retarded with respect to the chain 4. Since the web contacts with the roll R and because its edge in chain 2 is retarded the roll will be swung on its pivot in a clockwise direction as viewed in Fig. 1.
50 This causes the arm to be swung so as to subtract resistance in the circuit of the motor M and add resistance to the other so that the motor M is accelerated in speed while the other is decelerated. In this way the chain
55 2 is caused to speed up until the roll R is swung to its normal position where it will remain until swung in one direction or the other by the web, the edges of which will
60 move forwardly at a uniform speed unless the motors become out of step.

It will be observed that I have provided means for regulating or controlling the speed of the driving mechanism for the tenter
65 chains and that as an actuating means there-

for I utilize the difference in speed thereof at such times as it occurs.

Having described my invention in its present preferred form, I desire to obtain and secure by Letters Patent of the United States
70 as broadly as the law allows the following.

What I claim is:

1. A tentering machine comprising in combination, a pair of endless chains for gripping opposite edges of a web, separate driving mechanisms for each chain, mechanism
75 for controlling the relative speed thereof and a detector engageable by a web as it is fed to said chains for actuating said control mechanism.

2. A tentering machine comprising in combination, a pair of endless chains for gripping opposite edges of a web, separate driving mechanisms for said chains each including an electric motor, a device having parts
80 in series with both motors for regulating current thereto and a detector engageable by said web and movable thereby adapted to actuate said device.

3. A tentering machine comprising in combination, a pair of endless chains for gripping opposite edges of a web, a member engageable by a web as it is led to said chains and movable thereby as one edge of said web
85 moves relative to the other, separate motor drives for each of said chains, circuits for said motor drives, separate current control device in said circuits and connections between said member and control devices whereby the latter is actuated by the former.
90

4. A tentering machine comprising in combination, a pair of endless chains for gripping opposite edges of a web, separate driving mechanisms for said chains each including an electric motor, a circuit for each motor,
95 a current regulating device including a resistance in each circuit and a movable member contacting with each resistance, a member engageable by a web as it enters said chains which is movable as opposite edges thereof
100 move relative to one another and connections between said member and movable member of the regulating device.

5. A tentering machine comprising in combination, a pair of chains for gripping opposite side edges of a web, separate driving mechanisms for said chains each including an electric motor, circuits to said motors including a separate resistance in each circuit, an arm contacting with said resistances and a
105 movable member engageable by a web as it is led to said chains which is operatively connected to said arm whereby the resistances are varied accordingly as the member is moved by the web.
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6. A tentering machine comprising in combination, a pair of endless chains movable in a certain direction for gripping opposite edges of a web, separate driving mechanisms for said chains, each including an electric mo-
115

tor, electric circuits for said motors including
a separate resistance in each circuit and an
arm for varying both resistances simulta-
neously, a roll engageable by a web as it is led
to said chains which is movable back and
forth in said certain direction accordingly as
one edge of said web varies with respect to
the other and connections between said roll
and arm whereby the former is actuated by
the latter.

7. The combination on a tentering machine
having a pair of chains for gripping opposite
edges of a web and separate motor drive
mechanisms for each chain with means for
regulating the speed of said motors compris-
ing, electric circuits for said motors including
a resistance in each circuit and an arm for
varying both resistances simultaneously, and
engageable by a web as it is lead to said
chains which is movable thereby accordingly
as one edge thereof moves relative to the
other and being operatively connected to
said arm.

In testimony whereof I affix my signature.

JOHN H. HAMILTON.