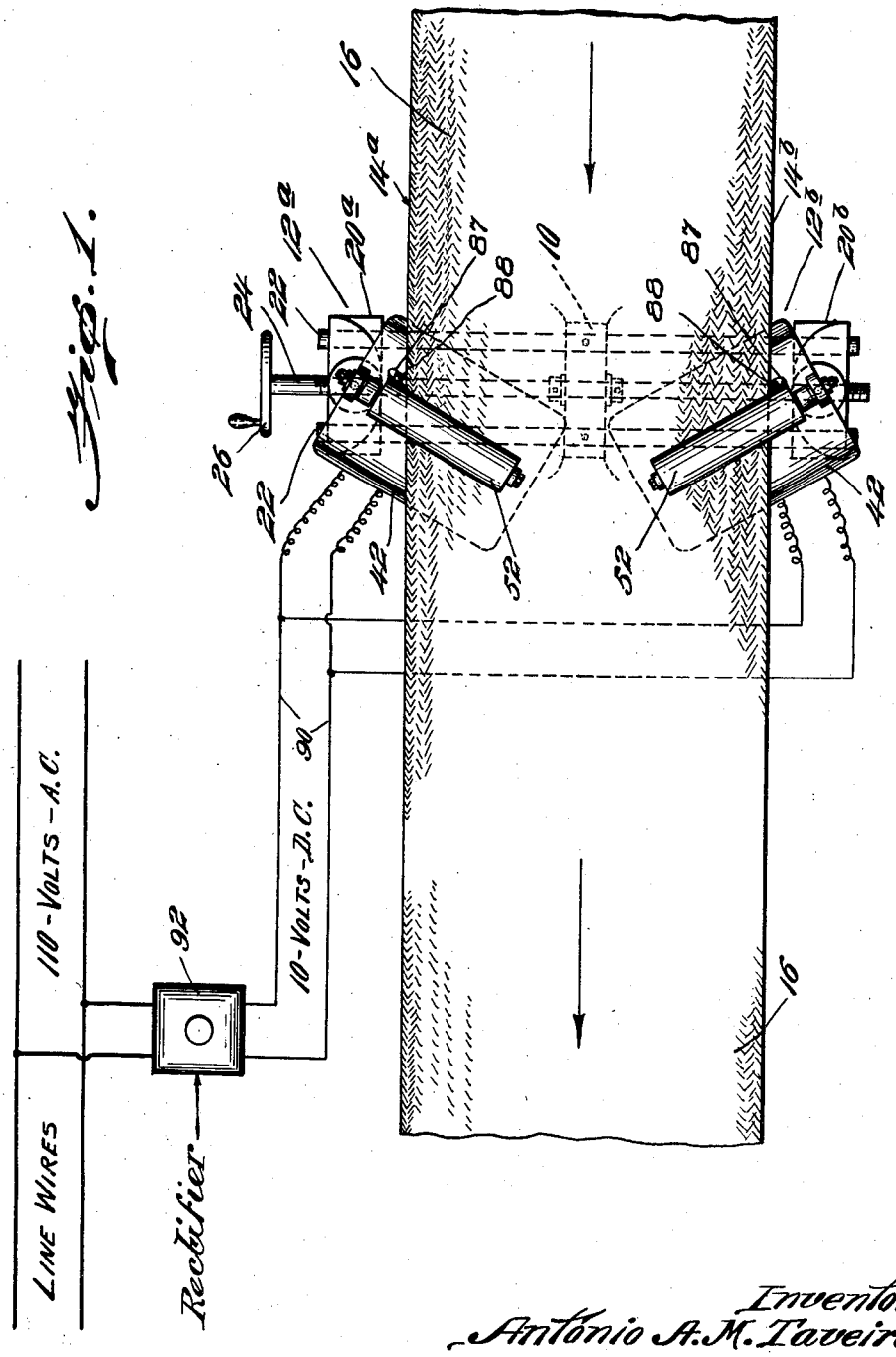
April 1, 1930. A. A. M. TAVEIRA 1,753,033

AUTOMATIC STRETCHING AND GUIDING APPARATUS

Filed Sept. 15, 1928 4 Sheets-Sheet 1

Fig. 1.



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AUTOMATIC STRETCHING AND GUIDING APPARATUS

Filed Sept. 15, 1928 4 Sheets-Sheet 2

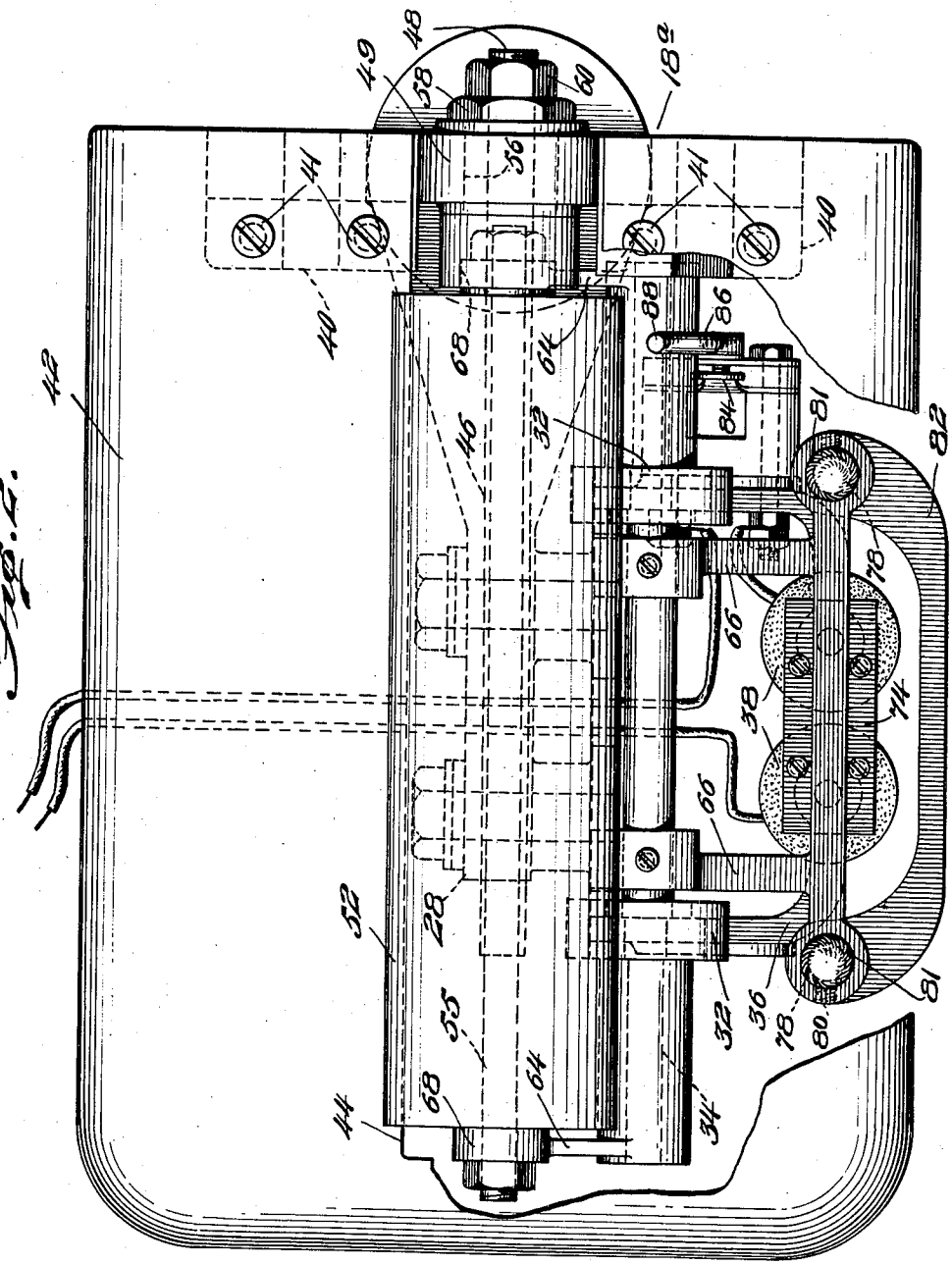


Fig. 2.

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AUTOMATIC STRETCHING AND GUIDING APPARATUS

Filed Sept. 15, 1928 4 Sheets-Sheet 3

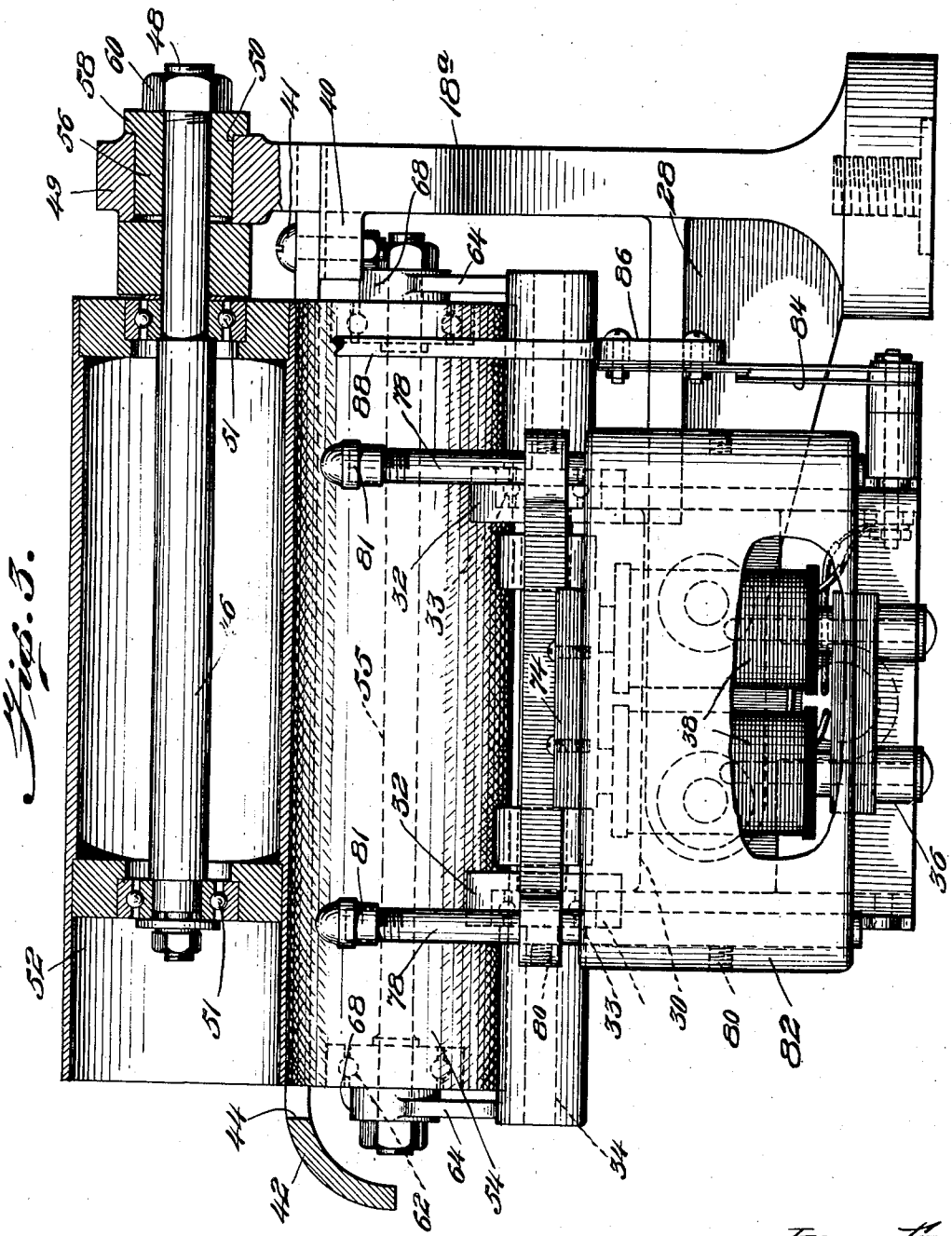


Fig. 3.

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AUTOMATIC STRETCHING AND GUIDING APPARATUS

Filed Sept. 15, 1928 4 Sheets-Sheet 4

Fig. 4.

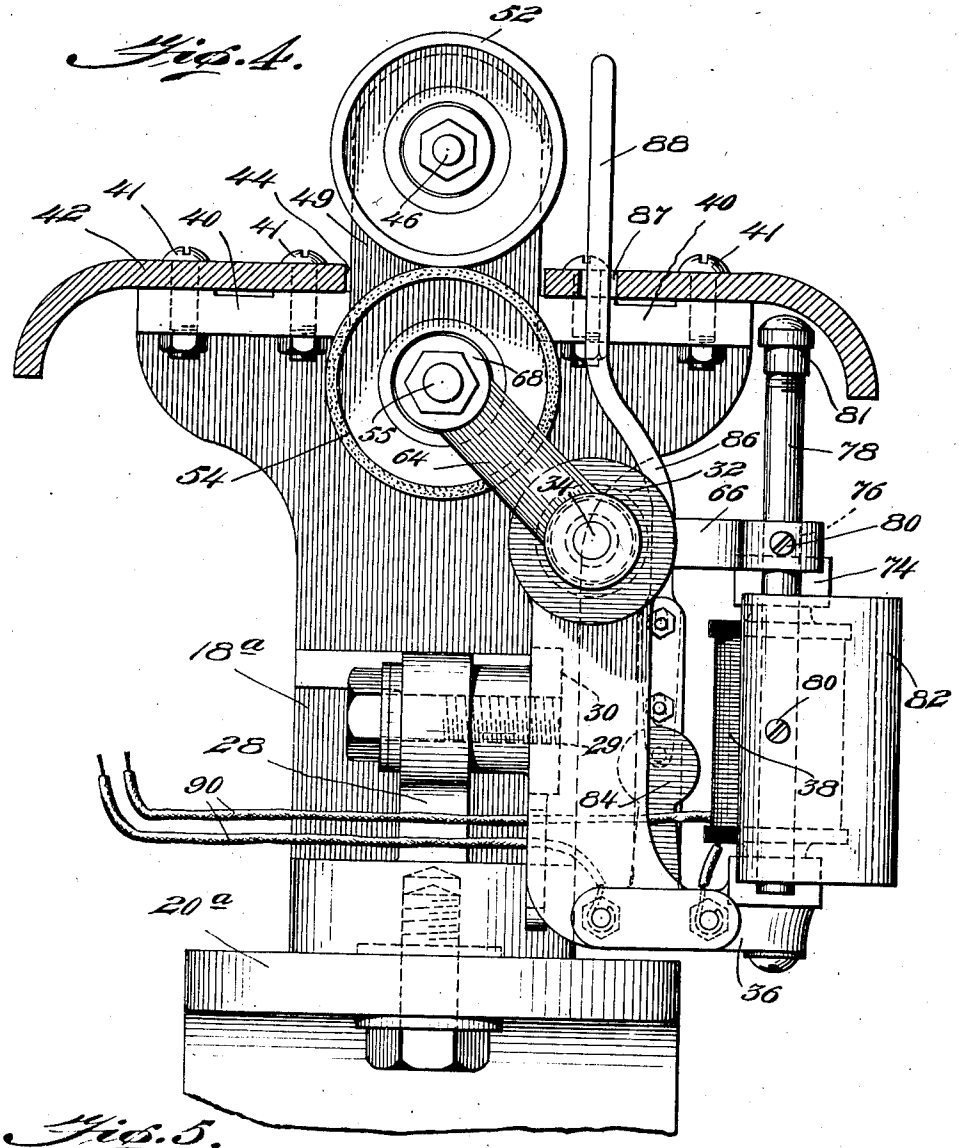
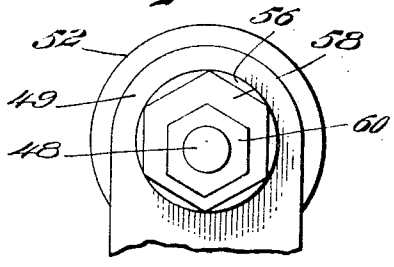


Fig. 5.



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Patented Apr. 1, 1930 1,753,033

UNITED STATES PATENT OFFICE

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AUTOMATIC STRETCHING AND GUIDING APPARATUS

Application filed September 15, 1928. Serial No. 306,107.

My invention relates to an automatic stretching and guiding apparatus for web material in open form, particularly adapted for use for guiding cloth and opening and straightening the same as it is delivered to machines of various kinds, notably, calendering machines, mangles, beetles, stenters and the like, though it may be used for the same purpose for paper machinery or for use with other types of web material in open form.

My invention includes a pair of cooperating upper and lower guide roll units placed obliquely to the travel of the material in its direction of travel and normally adapted to nip each selvage edge of the cloth to open it out and stretch it. Said device is normally provided with suitable types of means adapted when the cloth or other material swings nearer to one edge than normal to release the pressure between the rolls to permit the opposite guide roll unit to draw the cloth towards the center to realign it. When the cloth is realigned said guide roll unit will again automatically nip the cloth between the upper and lower guide rolls thereof. I am aware that others have provided pneumatically controlled devices for this purpose and I am aware that others have endeavored to provide electrically controlled devices. So far as I am aware, however, none of these electrically controlled guide roll units have proved practical.

An object of my invention is to provide an electrically controlled apparatus for this purpose which may be operated with safety and with a minimum amount of electric current to be able to energize the electromagnets sufficiently to raise the lower guide roll to nipping position and to permit the lower guide roll to drop by gravity when the electro-magnet is deenergized. So far as I am aware in other devices of this description the lower guide roll has not been substantially balanced by the armature or other device to permit a relatively small current to energize the electromagnet to raise it to operative position.

A further object of my invention largely made possible by the balanced lower guide roll is that I am able to employ a direct current of relative low voltage to energize the magnet so that if any short circuit occurs there is no danger of burning the material or harming the operative. To this end I normally employ the usual source of high voltage alternating current and I insert a rectifier-transformer unit of the type commonly used in radio reception though preferably slightly larger between the electromagnets and the source of alternating current to transform the high voltage alternating current to a low voltage direct current before entry into the electromagnets and operating portions of the machine.

A further feature of my invention relates to the means I employ to adjust the pressure on the material including an eccentric bearing and lock nut to raise the upper guide roll desired predetermined amounts away from the lower guide roll.

A further feature of the specific construction of my invention resides in the fact that the electromagnet itself is substantially not enclosed as normally, to prevent an excessive amount of heat to cause a fire or short circuit therein as often caused by the normal closure employed therefor. For partial protection of the electromagnet, however, and to assist in balancing the work arm of said lever system weighted by the lower guide roll I preferably attach a weighted balancing electromagnet casing on the power arm of the lever system exterior of said electromagnet to partially protect the electromagnet.

A further feature of my invention relates to the means I preferably employ to regulate the drop of the lower guide roll. To assist in guiding the cloth or other web material between each set of guide rolls, I preferably provide each set with a guider plate adapted to underlie the fabric and provide it with a central slot therein for the nip between the two rolls. In my preferred embodiment the means to limit the drop of the lower guide roll consists of vertically adjustable rods mounted on the power arm of said lever system adapted to abut the underside of the guider plate for said purposes.

These and such other objects of my invention as may hereinafter appear will be best

understood from a description of the accompanying drawings, which illustrate an embodiment thereof.

In the drawings, Fig. 1 is a diagrammatic plan view of my invention illustrating the material in web form passing through the opposite obliquely disposed sets of upper and lower guide roll units and the electric circuits for controlling said units including a rectifier-transformer unit.

Fig. 2 is a plan view partially broken away of a single guide roll unit.

Fig. 3 is a side elevation of said unit with the upper guide roll shown in section.

Fig. 4 is an end elevation of said guide roll unit with the guider plate shown in section.

Figure 5 is a fragmental end elevation of the eccentric adjustment of the fixed roll.

In the drawings, wherein like characters of reference indicate like parts throughout, 10 generally indicates a suitable frame for supporting the opposite guide roll units 12^a and 12^b thereon near each side of each respective selvage edge 14^a and 14^b of the web material 16 passing in open form between the upper and lower guide rolls thereof. The frame 10 extends transversely of the travel of said material 16. While any means may be provided for suitably mounting the guide roll units 12^a and 12^b on opposite sides of said frame I preferably employ the standards 18^a and 18^b for mounting each respective guide roll unit 12^a and 12^b thereon.

I also provide manually operable means to adjustably space said standards 18^a and 18^b and hence guide roll units 12^a and 12^b on the frame. While any suitable means may be provided for this purpose I preferably provide the bases 20^a and 20^b of said standards with the transverse parallel holes, the outer two of which are adapted to contain the transversely extending guide shafts 22 and the center of which is respectively reversely threaded at each end thereof to receive the threaded shaft 24 each end of which is respectively oppositely threaded and which is provided with the turning handle 26. Thus manipulation of the handle 26 moves the shaft 24 to mutually expand said bases 20^a and 20^b and hence standards 18^a and 18^b or to contract them.

I also provide means to adjust the angularity of said standards 18^a and 18^b from the perpendicular from the direction of material travel obliquely towards said direction of travel. In my preferred embodiment for this purpose I preferably adjustably threadedly mount the standards 18^a and 18^b on the bases 20^a and 20^b.

Inasmuch as each guide roll unit is similar in its operation and function though obliquely oppositely disposed I will now describe in detail the single unit 12^a. The standard 18^a is preferably constructed as a flat plate and is provided with the fin 28 projecting laterally from near the base thereof on which is mounted the vertically extending frame 30 by means of the bolts 29. Said frame 30 is split at its upper end into the bearings 32 for mounting the pivoted fulcrum shaft 34 thereon and projects rearwardly at its lower end as at 36 for mounting of the electromagnets 38 thereon. The lugs 40 project inwardly from the upper end of the standard 18^a and have mounted thereon the guider plate 42 by means of the bolts 41. The upper guide roll is suitably mounted in the bearing 50 in the projecting upper end 49 of the flat standard 18^a. The upper guide roll shaft 46 has its outer end 48 nonrotatably mounted in said bearing 50. Said shaft 46 has mounted thereon the spaced ball bearings 51 on which the upper guide roll 52 is mounted. In practice the upper guide roll shaft and upper guide roll are thus rigidly mounted on the upper end 49 of each standard 18 and are adapted to extend towards the center line of the material 16 over said material.

In my preferred embodiment I provide means to adjustably raise the upper guide roll 52 from the pivoted lower guide roll 54, if desired for any purpose from its normal position in nipping contact with the lower guide roll 54 or to adjust for varying thicknesses of material. While any suitable type of means may be provided for this purpose I preferably interpose the eccentric bushing 56 in the bearing 50 in the upper end 49 of the standard 18^a provided with the outer hexagonally headed flange 58. The outer end of the extension 48 of the upper guide roll shaft is preferably threaded and is provided with a suitable lock nut 60. Thus if desired to raise the upper guide roll for any purpose it is merely necessary to unscrew the lock nut 60 and manually turn the eccentric bushing 56 by means of the hexagonal head 58 thereof until the portion thereof of greater depth abuts the lower edge of the bearing 50 to cause said shaft 46 and attached upper guide roll 52 to be raised up.

As stated hitherto, I pivotally mount the lower guide roll 54 in slightly underbalanced relationship so as to normally permit it to drop to inoperative position out of contact with the upper guide roll 52. The lower guide roll 54 is preferably mounted on the fulcrum shaft 34 which is suitably mounted on the ball bearings 33 mounted on the bearing extensions 32 of the vertical frame 30 parallel to the upper guide roll 52 and offset from the vertical plane thereof. Said fulcrum shaft 34 has mounted thereon the forwardly projecting lever arms 64 and the rearwardly projecting lever arms 66. It is thus obvious that the forwardly projecting lever arms 64 which terminate in the bearings 68 for mounting of the lower guide roll 54 thereon form the work arm of the balancing lever and that the rearwardly projecting lever arms

66 with their attachments to be described form the power arm of said lever suitably fulcrumed by the shaft 34. The lower guide roll 54 is preferably solid and is constructed for weighting purposes of a relatively heavy solid metal and covered with the rubber covering 70. The bearings 68 are provided with suitable ball bearings 62 on which the lower guide roll shaft 55 and lower guide roll 54 are mounted. The forwardly projecting lever arms 64 are preferably of such a length that the lower guide roll 54 is mounted substantially parallel with and in the same vertical plane of mounting as the upper guide roll 52. The lower guide roll 54 is adapted to extend underneath the material being treated and to nip when raised to nipping position the material 16 against said upper guide roll 52. The armature 74 is mounted on the rearwardly projecting arms 66 and thus extends directly over the electromagnets 38. The guider plate 42 is provided with the central slot 44 to permit nipping engagement of the upper guide roll 52 with the lower guide roll 54.

As stated, I preferably counterbalance the power arm of said lever system so as to slightly underbalance the weighted lower guide roll 54. While said weighted lower guide roll 54 may be counterbalanced in any suitable fashion, I preferably provide the lever arms 66 with the holes 76 through which are mounted means adapted to abut the lower edge of the guider plate to limit the drop of the lower guide roll. While any suitable means may be provided for this purpose I preferably provide two rods 78 adjustably mounted within said holes 76 by means of the set screws 80 and having the upper ends 81 adapted to abut the lower side of the guider plate 42. To further counterbalance the lower guide roll 54 and to provide a partial covering for the electromagnets 38 I additionally suitably mount on said rods 78 the balancing weighting electromagnet protective casing 82 adapted to extend on the outside of said electromagnets 38. If desired, however, said casing 82 may be attached directly to the lever arms 66 other than through the medium of the adjustable guider plate abutting rods 78 as shown. It is obvious that I have thus constructed a lever system so that it is substantially balanced, the weighted lower guide roll being thus slightly underbalanced to normally drop from the rigid upper roll 52 and the lever system being so evenly balanced that it will only require a slight amount of current to sufficiently energize the electromagnets 38 to attract the armature 74 and raise the lower guide roll 54 into nipping engagement with the upper guide roll 52.

The electromagnets 38 are connected to a suitable source of current and to control the pivoting of the lever system I provide a suitable electric contact switch connected to the electromagnets 38. Said switch includes the fixed contact 84 suitably mounted on said standard 18^a and resilient contact member having a rigid feeler finger 86 mounted thereon and having the upper end 88 thereof projecting through the slot 87 in the guider plate 42 near the outer end of each standard adapted when the selvage edge of said material is temporarily withdrawn from its normal course to abut it and move the movable contact against the inherent resiliency of its stock to break the switch connection, deenergize the electromagnets 38, and permit the oppositely expanding guide roll unit 18^b to align the material 16 and thus draw the material 16 away from said feeler finger 88 to permit the contact carrying it to spring back to again close the switch to complete the circuit to energize the magnets 38 to attract the armature 74 to again raise the lower guide roll 54 of the guide roll unit 18^a in nipping position with the upper guide roll 82 to normally expand and guide the cloth.

While I preferably employ the guider plate, it is obvious that it may be omitted if desired. It is also obvious that one or more electromagnets 38 and one or more adjustable rods may be employed without departing from the spirit and scope of my invention and that the various elements of the guide roll unit may be mounted on the standard 18^a in any suitable manner other than shown.

A further feature of my invention resides in the fact that I preferably employ a low voltage direct current to actuate the electromagnets 38 with its attendant advantages for even if a short circuit should occur (and there is less likelihood of one occurring with a low voltage direct current than with a high voltage alternating current) it will not be of sufficient intensity to burn or damage the material or to harm the operative. It is thus apparent that as I have substantially counterbalanced the lower guide roll 54 that a very small current will be sufficient to properly energize the electromagnets 38 thereby saving a larger amount of electricity than when a greater current is used to energize the electromagnets sufficiently to raise weight of the lower guide roll 54. In practice, the wires 90 are suitably split to be connected through the medium of the switches to the electromagnets of each respective guide roll unit 18^a and 18^b. It is thus apparent that by this specific construction of electric apparatus that I am able to provide an electric control for guide roll units of this description, which is simple to construct, relatively safe and cheap to operate.

It is understood that my invention is not limited to the specific embodiments shown and that various deviations may be employed without departing from the spirit and scope of the appended claims.

What I claim is:

1. An automatic stretching and guiding apparatus for web material in open form, comprising a frame extending transversely of the travel of said material, a pair of guide roll standards mounted on said frame to be near each edge of said material, manually operable means to adjustably space said standards from each other on said frame, means to adjust the angularity of said standards from the perpendicular to the direction of material travel obliquely towards said direction of travel, an upper guide roll rigidly mounted on ball bearings on the upper end of each standard adapted to extend towards the center line of material travel over said material, means to raise each upper guide roll from normal position including an eccentric bushing attached to each roll shaft and a lock nut for securing each eccentric bushing in set position, a shaft pivotally mounted on ball bearings on each standard parallel to each upper guide roll and offset from the plane thereof having sets of lever arms projecting forwardly and rearwardly from each side thereof, a lower rubber covered weighted guide roll mounted on ball bearings on each set of forwardly projecting lever arms in substantially the plane of mounting of each upper guide roll and adapted to extend under said material, an armature mounted on each set of rearwardly projecting lever arms, an electromagnet rigidly mounted on each standard below said armature, a guider plate mounted on each standard parallel to the direction of material travel having a central slot therein for the nip of the upper and lower guide rolls, a balancing weighted electromagnet protective casing also mounted on each set of rearwardly projecting lever arms, means attached to each set of rearwardly projecting lever arms adapted to abut the lower edge of the guider plate to limit the drop of the lower guide roll comprising a plurality of rods adjustably mounted on said lever arms, each set of rearwardly projecting lever arms and attachments being slightly less in weight than each forwardly projecting set of lever arms and lower weighted guide rolls to normally permit each lower guide roll to drop to a position out of contact with the upper guide roll, a source of high voltage alternating current, a rectifier-transformer unit connected to said source of high voltage alternating current and to each respective electromagnet to transform said current into a low voltage direct current, an electric contact switch connected to said rectifier transformer unit and to each electromagnet, including a fixed contact and a resilient contact member having a feeler finger mounted on the outer end thereof adapted on contact of the web material therewith to break the switch connection to de-energize the respective electromagnet to permit said opposite expanding guide roll unit to align the material and draw the material away from said feeler finger to permit it to spring back to again close the switch to complete the circuit to energize the electromagnet to again raise the lower guide roll in nipping position to expand the cloth.

2. An automatic stretching and guiding apparatus for web material in open form, comprising a frame extending transversely of the travel of said material, a pair of guide roll standards mounted on said frame to be near each edge of said material, manually operable means to adjustably space said standards from each other on said frame, means to adjust the angularity of said standards from the perpendicular to the direction of material travel obliquely towards said direction of travel, an upper guide roll rigidly mounted on the upper end of each standard adapted to extend towards the center line of material travel over said material, a shaft pivotally mounted on each standard parallel to each upper guide roll and offset from the plane thereof having sets of lever arms projecting forwardly and rearwardly from each side thereof, a lower rubber covered weighted guide roll mounted on each set of forwardly projecting lever arms in substantially the plane of mounting of each upper guide roll and adapted to extend under said material, an armature mounted on each set of rearwardly projecting lever arms, an electromagnet rigidly mounted on each standard below said armature, a guider plate mounted on each standard parallel to the direction of material travel having a central slot therein for the nip of the upper and lower guide rolls, a balancing weighted electromagnet protective casing also mounted on each set of rearwardly projecting lever arms, means attached to each set of rearwardly projecting lever arms adapted to abut the lower guide roll, each set of rearwardly projecting lever arms and attachments being slightly less in weight than each forwardly projecting set of lever arms and lower weighted guide rolls to normally permit each lower guide roll to drop to a position out of contact with the upper guide roll, a source of high voltage alternating current, a rectifier-transformer unit connected to said source of high voltage alternating current and to each respective electromagnet to transform said current into a low voltage direct current, an electric contact switch connected to said rectifier-transformer unit and to each electromagnet, including a fixed contact and a resilient contact member having a feeler finger mounted on the outer end thereof adapted on contact of the web material therewith to break the switch connection to deenergize the respective electro-magnet to permit said opposite expanding guide roll

unit to align the material and draw the material away from said feeler finger to permit it to spring back to again close the switch to complete the circuit to energize the electromagnet to again raise the lower guide roll in nipping position to expand the cloth.

3. An automatic stretching and guiding apparatus for web material in open form, comprising a frame extending transversely of the travel of said material, a pair of guide roll standards mounted on said frame to be near each edge of said material, an upper guide roll rigidly mounted on the upper end of each standard adapted to extend towards the center line of material travel over said material, a shaft pivotally mounted on each standard parallel to each upper guide roll and offset from the plane thereof having sets of lever arms projecting forwardly and rearwardly from each side thereof, a lower weighted guide roll mounted on each set of forwardly projecting lever arms in substantially the plane of mounting of each upper guide roll and adapted to extend under said material, an armature mounted on each set of rearwardly projecting lever arms, an electromagnet rigidly mounted on each standard below said armature, each set of rearwardly projecting lever arms and attachments being slightly less in weight than each forwardly projecting set of lever arms and lower weighted guide rolls to normally permit each lower guide roll to drop to a position out of contact with the upper guide roll, an electric contact switch connected to each electromagnet including a fixed contact and a resilient contact member having a feeler finger mounted on the outer end thereof adapted on contact of the web material therewith to break the switch connection to deenergize the respective electromagnet to permit said opposite expanding guide roll unit to align the material and draw the material away from said feeler finger to permit it to spring back to again close the switch to complete the circuit to energize the electromagnet to again raise the lower guide roll in nipping position to expand the cloth.

4. An automatic stretching and guiding apparatus for web material in open form, comprising a frame extending transversely of the travel of said material, a pair of guide roll standards mounted on said frame to be near each edge of said material, an upper guide roll rigidly mounted on the upper end of each standard adapted to extend towards the center line of material travel over said material, means to raise each upper guide roll from normal position including an eccentric bushing attached to each roll shaft and a lock nut for securing each eccentric bushing in set position, a shaft pivotally mounted on each standard parallel to each upper guide roll and offset from the plane thereof, having sets of lever arms projecting forwardly and rearwardly from each side thereof, a lower weighted guide roll mounted on each set of forwardly projecting lever arms in substantially the plane of mounting of each upper guide roll and adapted to extend under said material, an armature mounted on each set of rearwardly projecting lever arms, an electromagnet rigidly mounted on each standard below said armature, each set of rearwardly projecting lever arms and attachments being slightly less in weight than each forwardly projecting set of lever arms and lower weighted guide rolls to normally permit each lower guide roll to drop to a position out of contact with the upper guide roll, an electric contact switch connected to each electromagnet, including a fixed contact and a resilient contact member having a feeler finger mounted on the outer end thereof adapted on contact of the web material therewith to break the switch connection to de-energive the respective electromagnet to permit said opposite expanding guide roll unit to align the material and draw the material away from said feeler finger to permit it to energize the electromagnet to again raise the lower guide roll in nipping position to expand the cloth.

5. An automatic stretching and guiding apparatus for web material in open form, comprising a frame extending transversely of the travel of said material, a pair of guide roll standards mounted on said frame to be near each edge of said material, an upper guide roll rigidly mounted on the upper end of each standard adapted to extend towards the center line of material travel over said material, a shaft pivotally mounted on each standard parallel to each upper guide roll and offset from the plane thereof, having sets of lever arms projecting forwardly and rearwardly from each side thereof, a lower weighted guide roll mounted on each set of forwardly projecting lever arms in substantially the plane of mounting of each upper guide roll and adapted to extend under said material, an armature mounted on each set of rearwardly projecting lever arms, an electromagnet rigidly mounted on each standard below said armature, a guider plate mounted on each standard parallel to the direction of material travel having a central slot therein for the nip of the upper and lower guide rolls, each set of rearwardly projecting lever arms and attachments being slightly less in weight than each forwardly projecting set of lever arms and lower weighted guide rolls to normally permit each lower guide roll to drop to a position out of contact with the upper guide roll, an electric contact switch connected to each electromagnet, including a fixed contact and a resilient contact member having a feeler finger mounted on the outer end thereof adapted on contact of the web material therewith to break the switch

connection to de-energize the respective electromagnet to permit said opposite expanding guide roll unit to align the material and draw the material away from said feeler finger to permit it to spring back to again close the switch to complete the circuit to energize the electromagnet to again raise the lower guide roll in nipping position to expand the cloth.

6. An automatic stretching and guiding apparatus for web material in open form, comprising a frame extending transversely of the travel of said material, a pair of guide roll standards mounted on said frame to be near each edge of said material, an upper guide roll rigidly mounted on the upper end of each standard adapted to extend towards the center line of material travel over said material, a shaft pivotally mounted on each standard parallel to each upper guide roll and offset from the plane thereof, having sets of lever arms projecting forwardly and rearwardly from each side thereof, a lower weighted guide roll mounted on each set of forwardly projecting lever arms in substantially the plane of mounting of each upper guide roll and adapted to extend under said material, an armature mounted on each set of rearwardly projecting lever arms, an electromagnet rigidly mounted on each standard below said armature, a balancing weighted electromagnet protective casing also mounted on each set of rearwardly projecting lever arms, each set of rearwardly projecting lever arms and attachments being slightly less in weight than each forwardly projecting set of lever arms and lower weighted guide rolls to normally permit each lower guide roll to drop to a position out of contact with the upper guide roll, an electric contact switch connected to each electromagnet, including a fixed contact and a resilient contact member having a feeler finger mounted on the outer end thereof adapted on contact of the web material therewith to break the switch connection to deenergize the respective electromagnet to permit said opposite expanding guide roll unit to align the material and draw the material away from said feeler finger to permit it to spring back to again close the switch to complete the circuit to energize the electromagnet to again raise the lower guide roll in nipping position to expand the cloth.

7. An automatic stretching and guiding apparatus for web material in open form, comprising a frame extending transversely of the travel of said material, a pair of guide roll standards mounted on said frame to be near each edge of said material, an upper guide roll rigidly mounted on the upper end of each standard adapted to extend towards the center line of material travel over said material, a shaft pivotally mounted on each standard parallel to each upper guide roll and offset from the plane thereof having sets of lever arms projecting forwardly and rearwardly from each side thereof, a lower weighted guide roll mounted on each set of forwardly projecting lever arms in substantially the plane of mounting of each upper guide roll and adapted to extend under said material, an armature mounted on each set of rearwardly projecting lever arms, an electromagnet rigidly mounted on each standard below said armature, a guider plate mounted on each standard parallel to the direction of material travel having a central slot therein for the nip of the upper and lower guide rolls, means attached to each set of rearwardly projecting lever arms adapted to abut the lower edge of the guider plate to limit the drop of the lower guide roll, each set of rearwardly projecting lever arms and attachments being slightly less in weight than each forwardly projecting set of lever arms and lower weighted guide rolls to normally permit each lower guide roll to drop to a position out of contact with the upper guide roll, an electric contact switch connected to each electromagnet, including a fixed contact and a resilient contact member having a feeler finger mounted on the outer end thereof adapted on contact of the web material therewith to break the switch connection to deenergize the respective electromagnet to permit said opposite expanding guide roll unit to align the material and draw the material away from said feeler finger to permit it to spring back to again close the switch to complete the circuit to energize the electromagnet to again raise the lower guide roll in nipping position to expand the cloth.

8. An automatic stretching and guiding apparatus for web material in open form, comprising a frame extending transversely of the travel of said material, a pair of guide roll standards mounted on said frame to be near each edge of said material, an upper guide roll rigidly mounted on the upper end of each standard adapted to extend towards the center line of material travel over said material, a shaft pivotally mounted on each standard parallel to each upper guide roll and offset from the plane thereof, having sets of lever arms projecting forwardly and rearwardly from each side thereof, a lower weighted guide roll mounted on each set of forwardly projecting lever arms in substantially the plane of mounting of each upper guide roll and adapted to extend under said material, an armature mounted on each set of rearwardly projecting lever arms, an electromagnet rigidly mounted on each standard below said armature, each set of rearwardly projecting lever arms and attachments being slightly less in weight than each forwardly projecting set of lever arms and lower weighted guide rolls to normally permit each lower guide roll to drop to a position out of contact with the upper guide roll, a source of high voltage

alternating current, a rectifier-transformer unit connected to said source of high voltage alternating current and to each respective electromagnet to transform said current into a low voltage direct current, an electric contact switch connected to said rectifier-transformer unit and to each electromagnet, including a fixed contact and a resilient contact member having a feeler finger mounted on the outer end thereof adapted on contact of the web material therewith to break the switch connection to deenergize the respective electromagnet to permit said opposite expanding guide roll unit to align the material and draw the material away from said feeler finger to permit it to spring back to again close the switch to complete the circuit to energize the electromagnet to again raise the lower guide roll in nipping position to expand the cloth.

9. An automatic stretching and guiding apparatus for web material in open form, comprising a frame, a pair of expanding guide roll units mounted on said frame to be near each edge of said material and adapted to nip each edge of the material obliquely towards its direction of travel, each comprising an upper guide roll rigidly mounted on said frame, an electromagnet mounted on said frame in offset parallel relationship to said upper guide roll, a guider plate mounted on said frame so as to extend parallel to the direction of material travel having a central slot therein for the nip of the upper and lower guide rolls and a substantially balanced lower guide roll unit consisting of a fulcrum shaft offset from said upper guide roll, a weighted lower guide roll mounted on the work arm thereof in the plane of said upper guide roll and an armature mounted on the power arm thereof in the plane of said electromagnet, said power arm also having a balancing weighted electromagnet casing and adjustable means adapted to abut the lower edge of said guider plate to limit the drop of said lower guide roll attached thereto, the power arm of said lever and its attachments being of slightly less weight than said work arm and weighted lower guide roll to normally permit the lower guide roll to drop to a position out of contact with the upper guide roll, an electric contact switch connected to the electromagnet consisting of a fixed contact, and a resilient contact member having a feeler finger mounted thereon just beyond the normal position of the material edge, a source of high voltage alternating current, and means connected through each magnet to each switch to transform said high voltage alternating current into a low voltage direct current.

10. An automatic stretching and guiding apparatus for web material in open form, comprising a frame, a pair of expanding guide roll units mounted on said frame to be near each edge of said material and adapted to nip each edge of the material obliquely towards its direction of travel, each comprising an upper guide roll rigidly mounted on said frame, an electromagnet mounted on said frame in offset parallel relationship to said upper guide roll, and a substantially balanced lower guide roll unit consisting of a fulcrum shaft offset from said upper guide roll, a weighted lower guide roll mounted on the work arm thereof in the plane of said upper guide roll and an armature mounted on the power arm thereof in the plane of said magnet, the power arm of said lever being of slightly less weight than said work arm and weighted lower guide roll to normally permit the lower guide roll to drop to a position out of contact with the upper guide roll, an electric contact switch connected to the electromagnet consisting of a fixed contact, and a resilient contact member having a feeler finger mounted thereon located just beyond the normal position of the material edge.

11. An automatic stretching and guiding apparatus for web material in open form, comprising a frame, a pair of expanding guide roll units mounted on said frame to be near each edge of said material and adapted to nip each edge of the material obliquely towards its direction of travel, each comprising an upper guide roll rigidly mounted on said frame, an electromagnet mounted on said frame in offset parallel relationship to said upper guide roll, a guider plate mounted on said frame so as to extend parallel to the direction of material travel having a central slot therein for the nip of the upper and lower guide rolls and a substantially balanced lower guide roll unit consisting of a fulcrum shaft offset from said upper guide roll, a weighted lower guide roll mounted on the work arm thereof in the plane of said upper guide roll and an armature mounted on the power arm thereof in the plane of said electromagnet, said power arm also having adjustable means adapted to abut the lower edge of said guider plate to limit the drop of said lower guide roll attached thereto, the power arm of said lever and its attachments being of slightly less weight than said work arm and weighted lower guide roll to normally permit the lower guide roll to drop to a position out of contact with the upper guide roll, an electric switch connected to the electromagnet consisting of a fixed contact, and a resilient contact member, feeler finger mounted on said resilient contact member and located just beyond the normal position of the material edge.

12. An automatic stretching and guiding apparatus for web material in open form, comprising a frame, a pair of expanding guide roll units mounted on said frame to be near each edge of said material and adapted to nip each edge of the material obliquely towards its direction of travel, each comprising an upper guide roll rigidly mounted on said

frame, an electromagnet mounted on said frame in offset parallel relationship to said upper guide roll, and a substantially balanced lower guide roll unit consisting of a fulcrum shaft offset from said upper guide roll, a weighted lower guide roll mounted on the work arm thereof in the plane of said upper guide roll and an armature mounted on the power arm thereof in the plane of said electromagnet, the power arm of said lever being of slightly less weight than said work arm and weighted lower guide roll to normally permit the lower guide roll to drop to a position out of contact with the upper guide roll, an electric contact switch connected to the electromagnet consisting of a fixed contact, and a resilient contact member, feeler finger mounted on said resilient contact member and located just beyond the normal position of the material edge, a source of high voltage alternating current, and means connected through each magnet to each switch to transform said high voltage alternating circuit into a low voltage direct current.

13. In a web guiding and stretching device, a plurality of units on opposite edges of the web, each comprising a web guiding plate having a slot therein, a fixed roller mounted on the web engaging side of the plate opposite said slot, the web engaging surface of said plate and roller being tangent, a pivot pin back of said plate, an arm pivoted intermediate its ends on said pin, a movable roller supported by said arm at one side of said pin to be moved thru said slot towards the fixed roll, the arm at the other side of said pin carrying an armature and a counterweight assisting to balance the weight of the movable roll about said pivot pin, adjustable means for limiting the movement of said arms and roll about said pin, and electromagnet positioned to move said armature, swing said arms and cause engagement of said rolls when energized, means for energizing said electromagnet including a direct circuit of low voltage, a switch in said circuit and a feeler member for operating said switch having a fixed contact, and a movable contact mounted upon a strip having inherent resiliency tending to move said contacts into engagement, and a feeler arm also mounted on said strip to be engaged by the edge of the web and bodily moved thereby to separate said contacts upon excessive movement of the web in one direction.

14. In a web guiding and stretching device, a plurality of units on opposite edges of the web, each comprising a web guiding plate having a slot therein, a fixed roller mounted on the web engaging side of the plate opposite said slot, a pivot pin back of said plate, an arm pivoted intermediate its ends on said pin, a movable roller supported by said arm at one side of said pin to be moved thru said slot towards the fixed roller, the arm at the other side of the pin carrying an armature and a counterweight assisting to balance the weight of the movable roll about said pivot pin, adjustable means for limiting the movement of said arm and roll about said pin, an electromagnet positioned to move said armature, swing said arms and cause engagement of said rolls when energized, means for energizing said electromagnet including a direct current circuit of low voltage, a switch in said circuit having a fixed contact and a movable contact mounted upon a strip having inherent resiliency tending to move said contacts into engagement, and a feeler arm also mounted on said strip to be engaged by the edge of the cloth and bodily moved thereby to separate said contacts upon excessive movement of the web in one direction.

15. A stretching and guiding apparatus for web material in open form, comprising a frame, a pair of guide roll units mounted on said frame adjacent each edge of the web material for nipping said material obliquely with reference to its direction of travel, each unit comprising a pair of rolls, means for pivotally mounting one of said rolls to move away from the other roll under the influence of gravity, electromagnetic means for moving said gravity influenced roll toward the other roll in the opposite direction, and counterbalancing means covering said electromagnetic means to oppose to a predetermined extent the effect of said gravity on the movable roll.

16. A stretching and guiding apparatus for web material in open form, comprising a frame, a pair of guide roll units mounted on said frame adjacent each edge of the web material for nipping said material obliquely with reference to its direction of travel, each unit comprising a fixed roll, a movable roll cooperating therewith, means tending to move said movable roll away from said fixed roll, electromagnetic means for moving said movable roll towards said fixed roll including an electric circuit, a switch in said circuit having a fixed contact and a movable contact, and a feeler arm connected to and movable with said movable contact to and from contacting position and positioned to be engaged by the edge of the web upon excessive movement of the web in one direction to separate said contacts whereby separation of the rolls is permitted.

17. A stretching and guiding apparatus for web material in open form, comprising a frame, a pair of guide roll units mounted on said frame adjacent each edge of the web material for nipping said material obliquely with reference to its direction of travel, each unit comprising a fixed roll, a movable roll cooperating therewith and mounted to move from said fixed roll under the influence of gravity, electromagnetic means for moving said movable roll towards said fixed roll including an electric circuit, a switch in said

circuit having a fixed contact member, a movable feeler arm including a contact member having a resilient portion tending to move said contacts into engagement, said arm being positioned to be engaged by the edge of the cloth upon excessive movement in one direction to separate said contacts whereby separation of the rolls is permitted.

18. A stretching and guiding apparatus for web material in open form, comprising a frame, a pair of guide roll units mounted on said frame adjacent each edge of the web material for nipping said material obliquely with reference to its direction of travel, each unit comprising a fixed roll, a movable roll cooperating therewith and mounted to move away from said fixed roll, electromagnetic means for moving said movable roll towards said fixed roll including an electric circuit, a switch in said circuit comprising a fixed contact member, a movable contact mounted upon a strip of metal having an inherent resiliency tending to move said contacts into engagements, and a feeler arm also mounted on said strip of metal to be engaged by the edge of the web and bodily moved thereby, whereby said contacts are separated upon excessive movement of the web in one direction.

19. In a web guiding and stretching device, a guide plate having a slot, a pair of rolls, one of said rolls being relatively fixed in position on one side of the plate, the other of said rolls being pivotally mounted on the other side of the plate and movable toward and away from the relatively fixed roll through the slot, electromagnetic means for moving said movable roll towards the other roll, and eccentric mounting means for the fixed roll for adjusting the position of said relatively fixed roll with respect to said plate.

In testimony whereof I affix my signature.

ANTONIO A. M. TAVEIRA.