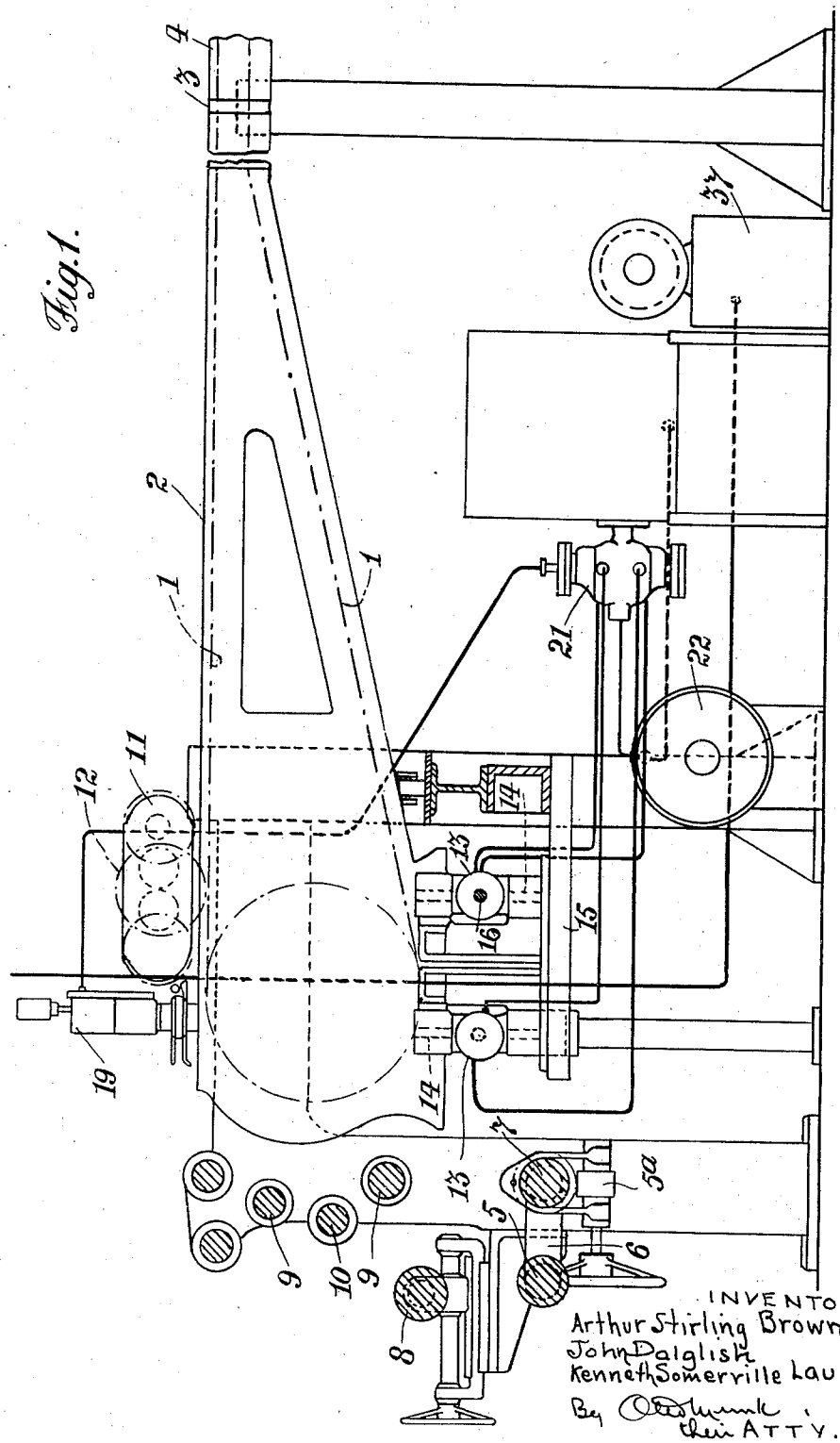
Aug. 19, 1941. A. S. BROWN ET AL 2,252,832

MACHINE FOR HANDLING MATERIALS IN WEB FORM, ESPECIALLY STENTERING MACHINES

Filed Oct. 14, 1939 5 Sheets-Sheet 1

Fig. 1.



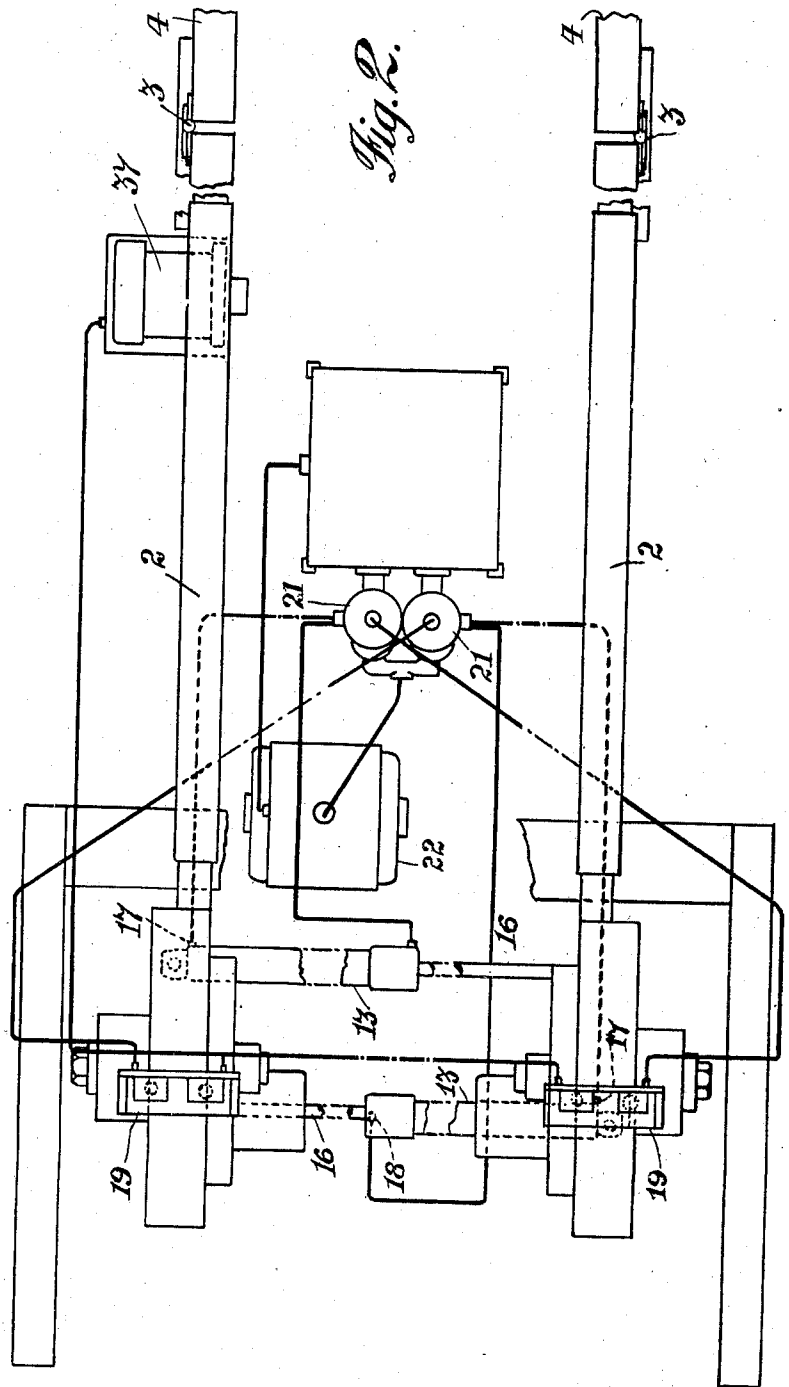
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MACHINE FOR HANDLING MATERIALS IN WEB FORM, ESPECIALLY STENTERING MACHINES

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Fig. 2.



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MACHINE FOR HANDLING MATERIALS IN WEB FORM, ESPECIALLY STENTERING MACHINES

Filed Oct. 14, 1939 5 Sheets-Sheet 3

Fig. 7.

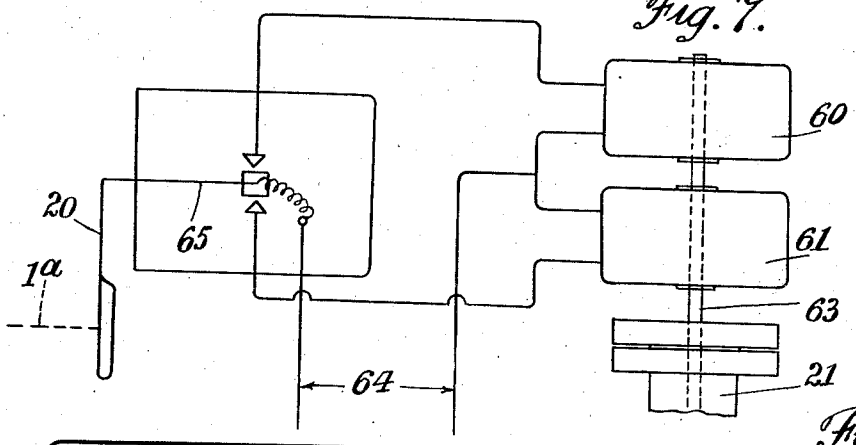
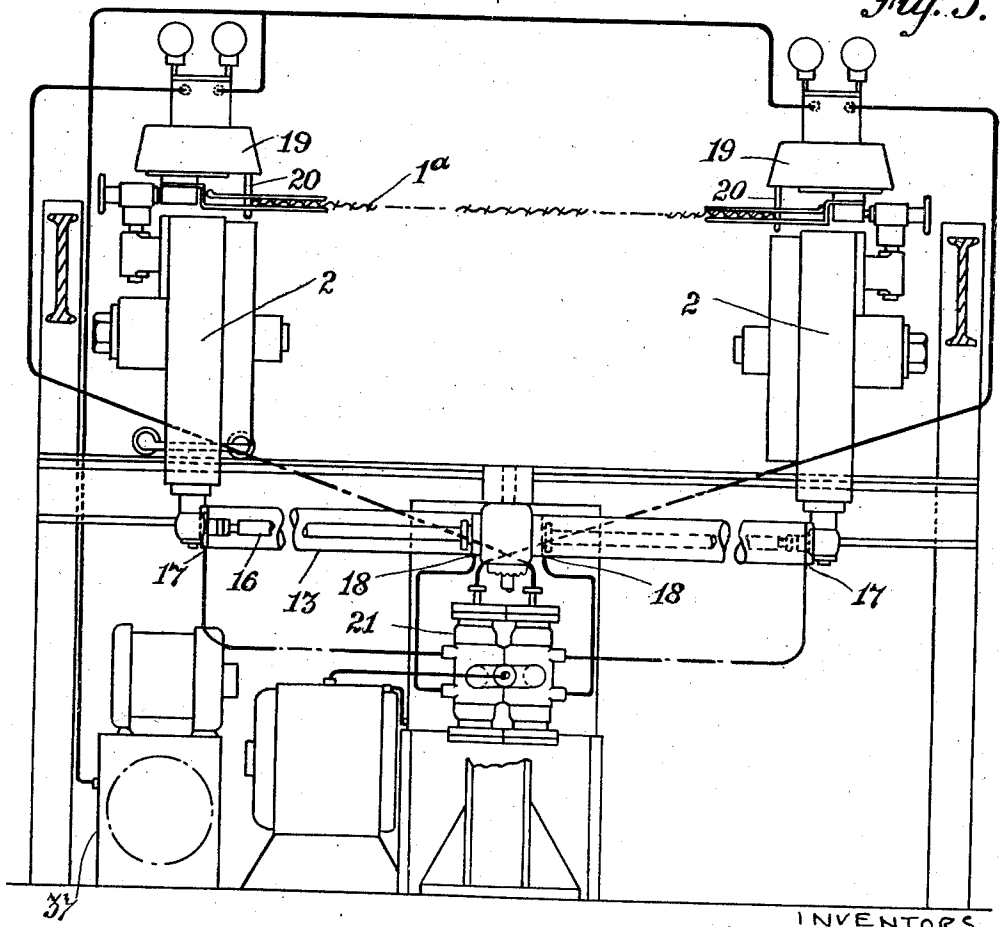


Fig. 3.



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MACHINE FOR HANDLING MATERIALS IN WEB FORM, ESPECIALLY STENTERING MACHINES

Filed Oct. 14, 1939 5 Sheets-Sheet 4.

Fig. 5

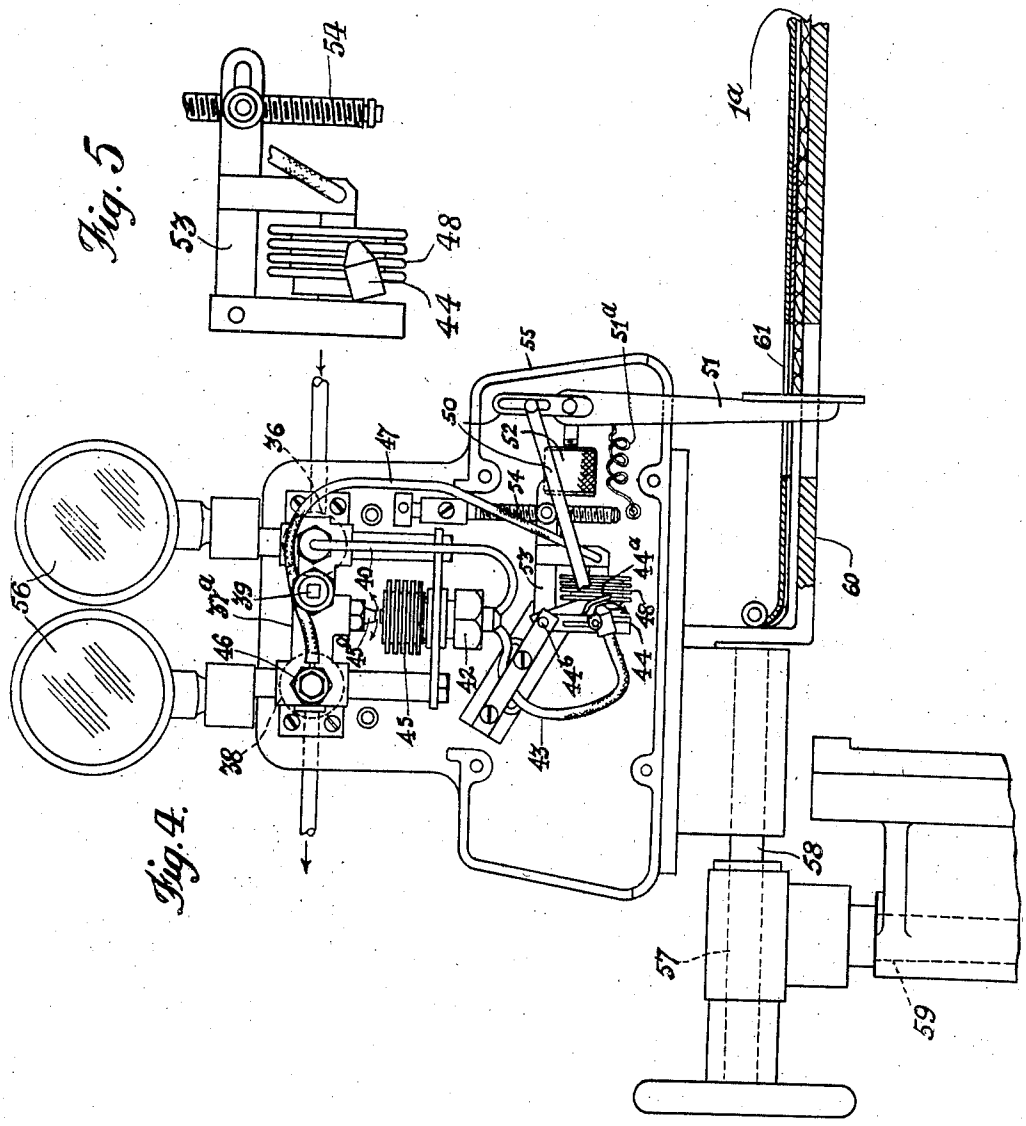


Fig. 4.

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MACHINE FOR HANDLING MATERIALS IN WEB FORM, ESPECIALLY STENTERING MACHINES

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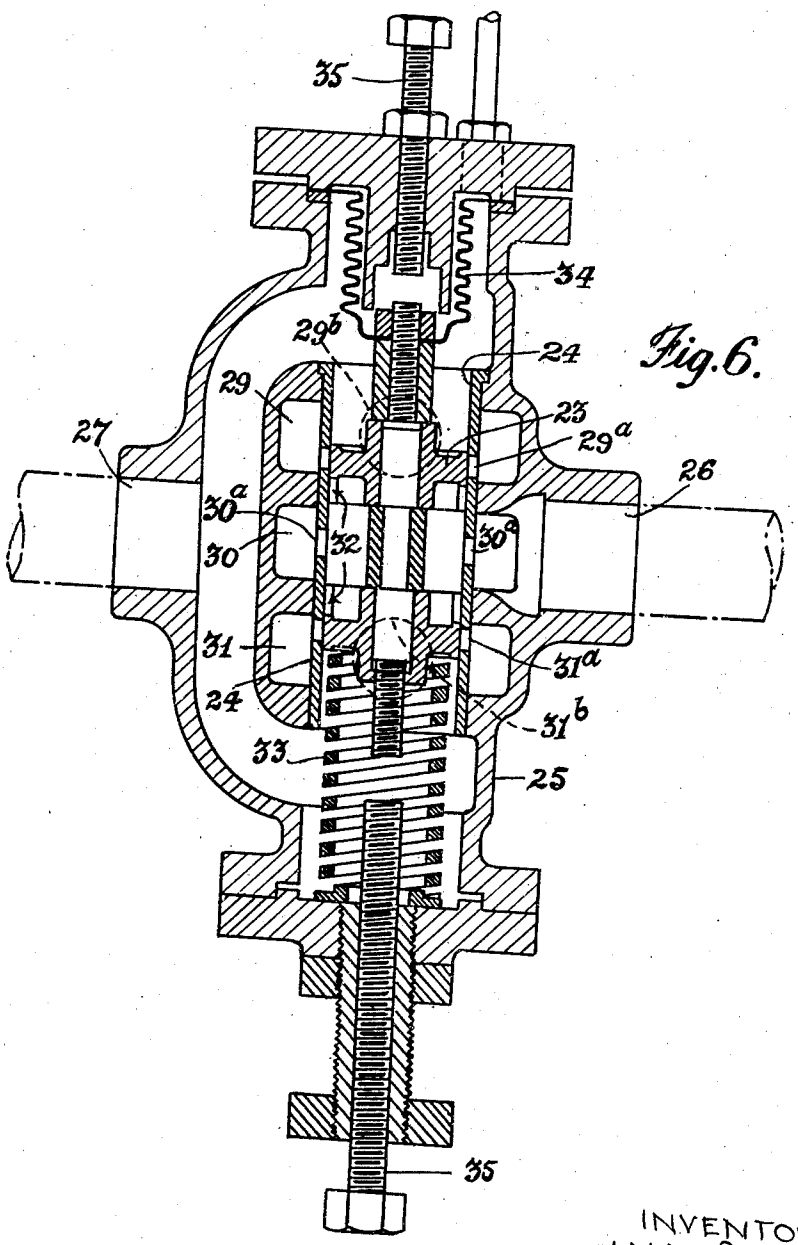


Fig. 6.

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UNITED STATES PATENT OFFICE

2,252,832

MACHINE FOR HANDLING MATERIALS IN WEB FORM, ESPECIALLY STENTERING MACHINES

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Application October 14, 1939, Serial No. 299,432

21 Claims. (Cl. 26—57)

This invention relates to machines for handling material in web form. It is concerned particularly, though not exclusively, with stentering machines for fabrics, that is to say, machines which comprise two lines of travelling retaining elements adapted to engage the edges of a strip of fabric so as to cause the latter to travel along therewith.

Machines of this kind are commonly used in the treatment of cloth when it is desired that the fabric should be maintained under a desired transverse tension, or subjected to a varying and possibly gradually reduced tension, the tension being determined by the distance between the lines of elements, which may or may not vary at different points along the length of the lines.

In stentering machines it is most desirable that the retaining elements, which may be in the form, for example, of pins or of grippers, should engage the fabric accurately at the selvedge; on the other hand, the selvedge may not always be so perfectly straight, or so exactly aligned, that the fabric will feed into the machine with its edges in exact register with the retaining elements. In that event the latter would sometimes fail altogether to engage. On the other hand, they might engage at points undesirably far from the selvedge, thus resulting in noticeable marking or perforation of, or damage to the fabric and leaving the marginal part of the fabric free of the stentering action. In order to meet this difficulty it has already been proposed to support the retaining elements at the entry end of the machine on guide rails one at either side, which can be pivoted laterally, the movement of each guide rail being controlled by an automatic control which operates in conjunction with the corresponding selvedge so that upon misalignment of a selvedge with respect to the retaining elements to which it is being fed, the control tends to cause adjustment of the guide rail to bring the retaining elements to an aligned position.

It will be realised that, to be of commercial value, the means employed for correcting the alignment of the retaining elements with the selvedges should be not only accurate and sensitive, but also rapid in operation—that is, there should be as little time lag as possible between the detection of a misalignment and the actual correction. These requirements, since they determine the permissible speed of the fabric, must be satisfied in all stentering machines to a greater or less extent depending on the designed speed of the fabric therethrough, and a particularly high degree of perfection is required in the case of pin or of spring clip stenters (employing respectively pins and spring clips as retaining elements) since the permissible margin of error in such machines is smaller than in machines employing retaining elements of the gripper type. In arrangements hitherto proposed for adjusting the guide rails, however, difficulty has been experienced in preventing "hunting" and in obtaining the required adjustment accurately and with a sufficiently small time lag. Thus, we have found, upon investigating the possibility of adjusting the guide rails by means of pneumatically operated pistons directly connected thereto, that possibly owing to the cushioning effect due to the compressibility of the air there is a liability to over-swinging, giving rise to hunting, as well as initial inaccuracy of the setting. Furthermore, even if such a system succeeds in giving a rapid response on the first lateral variation of the selvedge, we have found that it is not easy for it to respond properly to a rapid sequence of different lateral variations or misalignments, whilst if a dash pot is employed to prevent hunting and over-swinging the system is rendered unsuitable for high speed operation. On the other hand in the case of mechanically or electrically driven adjusting screws connected to the guides there is liable to be considerable inertia involved in starting, stopping and reversing of moving parts, as well wear on the various parts. These objections apply of course, even if the mechanical drive is controlled by a pneumatic control operating in conjunction with the fabric edge. In the case of electrical elements the frequency with which it is necessary to make and break contacts or to vary the speed is liable to result in a short life for the electric apparatus. Consequently, whilst these possible arrangements are satisfactory up to a point, they generally cause a comparatively low limit of speed to be imposed on the operation of the apparatus as a whole, especially in the case of pin stenters and spring clip stenters.

Although the invention is particularly applicable to cloth stentering machines, certain aspects thereof are believed to be novel and useful in other machines for handling materials in general, including paper, in web form, for example drying machines, mangles, or printing machines, in which the problem of alignment of the web arises. In some of these cases the adjustment of the alignment may be obtained by shifting a web-carrying feeding-on roller.

An aim of the present invention is, in general, to obviate or mitigate the above stated disadvantages, and to provide an improved apparatus

for correcting misalignment of a material edge in a machine for handling materials in web form, and especially with respect to the retaining elements in stentering machines in general, and pin and spring clip stenters in particular; more specifically, further aims of the invention are to enable web handling machines to be run at a relatively high speed whilst obtaining a rapid response of considerable accuracy and avoiding, at least to a considerable degree, the possibility of hunting.

Accordingly, one object of the invention is a stentering machine having the lines of travelling retaining elements each displaceable laterally of the other for the alignment with the corresponding fabric edge, and hydraulic means by the power of which said lines of elements are displaced, the said hydraulic means being controlled automatically by that edge of the fabric corresponding to the line of elements to be displaced thereby, and in accordance with the position of such edge as it moves into the machine. Thus, each line of retaining elements may be displaceable by means of a corresponding hydraulic ram controlled from the fabric edge.

A further object of the invention is a stentering machine having the features just stated, wherein the automatic control gear for said hydraulic means is pneumatically operated; for example by compressed air, the supply of which is controlled by feelers, one co-operating with each selvedge of the fabric.

Another object of the invention is a machine for handling travelling fabric in web form and having means for adjusting the relative alignment of the web and a part of the machine, for example a stentering machine, having a pneumatic control system for the alignment adjusting means, whether or not the latter is hydraulic, in which the control is derived from variations in the pressure of air supplied continuously under pressure above atmospheric, said variations being achieved by varying the magnitude of an air-release in said supply in accordance with the position of the fabric edge. The variations in pressure may be utilised, for example, to influence the expansion or contraction of a resilient bellows operating the supply valve of hydraulic mechanism.

Preferably, in the case of a web-handling machine having hydraulic means for adjusting the relative alignment of the web and a part of the machine, the supply of liquid to such hydraulic means is controlled from a pair of coaxial connected double acting piston valves coupled in common to a supply of hydraulic operating liquid under pressure so as to be balanced thereby when in the inoperative position, and which are displaced, so as to admit the pressure liquid to pressure chambers for operating the hydraulic mechanism in one direction or the other, under the influence of control gear, for example the pneumatic control just referred to, operating in conjunction with the edge of the fabric.

According to still a further object of the invention, in order to allow for the fact that when the retaining elements of a stentering machine are supported on pivoted guide rails the latter swing through an arcuate path during adjustment, and also to allow the longitudinal expansion and contraction of the guide rails, the hydraulic mechanism comprises hydraulic rams, each having one part pivotally mounted on the fixed frame of the machine, and the other part pivotally connected to one of said guide rails.

Another object of the invention is a web handling machine, having a control for adjusting the relative alignment of the web and a part of the machine which is adapted to impart a rate as well as a magnitude of lateral displacement approximating closely to the magnitude and rate of lateral variation of the fabric edge. Thus, in the case of hydraulically operating mechanism as mentioned above, the edge-operated control and the control of the hydraulic mechanism may be constructed to vary the rate of supply of hydraulic liquid at least approximately in proportion to the rate of lateral variation of the edge, and thus of the control.

Another feature of the invention relates to the provision, in a web-handling machine, of a control gear operated by the fabric edge for adjusting the relative alignment of the web and a part of the machine, which will greatly assist in eliminating hunting when used in conjunction with a suitable operating mechanism such as the hydraulic rams referred to above, and in rendering the displacement reasonably accurate. For this purpose the control gear, for example the pneumatic control already referred to, may be provided with means, operative upon actuation of the control, to effect adjustment of said control in a sense opposite to that in which the control is acting and tending to return the control to a neutral position; in this way the possibility is reduced of the control operating too strongly in one sense, thus causing too large a displacement and setting up hunting. In the case of the air-leak system already referred to such anti-hunting device may be employed to adjust the air-leak in a sense opposite to that induced by the variation of the fabric edge.

In order that the invention may be clearly understood and readily carried into effect reference will now be made to the example of construction illustrated in the accompanying drawings in which the invention is shown as applied to typical form of stentering machine, and in which—

Figure 1 is a longitudinal section of the feeding end of the stentering machine;

Figure 2 is a plan view of Figure 1;

Figure 3 is an end elevation of Figure 1 but with the feed rollers removed;

Figure 4 is a face view of an automatic pneumatic control operating in conjunction with one of the selvedges;

Figure 5 is a view of a detail of Figure 4;

Figure 6 is a sectional elevation of a supply valve for supplying fluid to the hydraulic apparatus and automatically controlled by the pneumatic control illustrated in Figure 4; and

Figure 7 is a diagrammatic illustration of an automatic electric control operating in conjunction with one of the selvedges.

Referring more particularly to Figures 1 to 3 of the drawings, the stentering machine there illustrated is of the type in which the fabric retaining elements (not shown) are formed by pins carried by a continuous chain 1. The two runs of the chain 1 lie in the same vertical plane and are guided along the length of the machine by guide rails, the end portions 2 of which at the entry end of the machine are pivotally connected at 3 to the normally fixed portions 4 thereof to permit adjustment of the alignment of the retaining elements and the fabric 1^a, in addition to being bodily adjustable with the said fixed portions 4 in the usual way to vary the normal width of the machine as required either to accommodate fabrics of different width or to

vary the convergence or divergence of the guide rails. The fabric is supplied by way of feed controlling rollers comprising a lower roller 5 carried by a pivoted arm 6 swingable by means of worm gear 5a about the fixed axis of a second roller 7, an aligning roller 8 adapted to have its axis of rotation angularly adjusted in a horizontal plane to vary its alignment with the machine, a pair of rubber covered rollers 10 arranged one below and one above a fluted roller 9 which serves to spread the fabric laterally and assist in removing creases. From the upper of the rubber rollers 9 the fabric is fed to the retaining elements, being drawn along by the rollers of an over-feed device 11, which also incorporates a dabbing brush 12 for applying the fabric properly to the pins of the retaining elements.

The parts of the machine briefly described above follow known practice so that no further details thereof will be given. Moreover, for the sake of simplicity details of the machine such as the drive of the various rollers will not be described as not being concerned in the present invention.

According to one of the features of the present invention the lateral pivotal displacement of the guide rails is effected by means of hydraulic rams, one to each rail, each comprising a cylinder 13 pivotally mounted at 14 upon a fixed part 15 of the machine and having its piston rod 16 connected to the lower part of the corresponding guide rail 2. The hydraulic rams are provided with inlets and outlets 17 and 18 on opposite sides of their pistons 16 so that by admitting liquid to one side or other of the required piston the corresponding rail 2 can be pivoted, thereby bringing the pins of the retaining elements into a different position. As has already been pointed out, the operation is required to be such that the pins will always engage as accurately as possible with the selvedge of the fabric 1a and for this purpose the operation of the hydraulic rams is controlled from corresponding automatic pneumatic controls 19, one mounted on each guide rail part 2, each of which controls 19 is actuated by a feeler 20 engaging one selvedge of the fabric 1a, and adjusts one of a pair of hydraulic valves 21 controlling the supply of liquid under pressure to the respective ram cylinders 13 from a continuously operating pump 22.

Each hydraulic valve 21, in a preferred construction, comprises a double acting double piston 23 operating in a fixed sleeve 24 fitted in a main body portion 25 provided with an oil inlet 26 and oil exhaust 27, as well as with a passage 28 connecting the open ends of the piston sleeve 24 and the oil exhaust 27. The sleeve 24 (which for convenience will be regarded as being vertical) is surrounded by three annular passages 29, 30, 31 each of which communicates with the interior of the sleeve 24 by means of suitable ports 29a, 30a, 31a; in addition the upper and lower annular passages 29, 31 have outlets 29b, 31b communicating with opposite sides of one of the hydraulic rams. The middle set of ports 30a in the sleeve 24 serves to provide constant communication between the oil inlet 26 to the casing and the space between the two members of the piston 23 so that the latter, in the absence of any disturbing force, will be balanced. The ports 29a, 31a, between the piston sleeve 24 and the upper and lower annular passages 29, 31 are made square and controlled by the respective piston member 23, the arrangement being such that both the piston members 23 close their corresponding ports simultaneously. The pistons are provided at their inner ends with skirts formed with slots at 32 adapted to register with the corresponding square ports 29a, 31a, so as to open the latter in one direction of piston movement. Due to the slots 32 the extent of the port opening, and thus the rate of flow of liquid, varies substantially according to a linear law. The piston 23 is normally held in a balanced position by means of a spring 33 at its lower end acting against a metal bellows 34 at the other end, the said bellows 34 being in communication with a source of compressed air controlled by one of the automatic pneumatic controls 19 (described fully below). Adjusting screws 35 are provided at the upper and lower ends of the casing 25 for limiting the permissible movement of the piston 23. It will be seen that if the piston is moved from a neutral position in which both upper and lower sets of ports are closed, for example in an upward direction, there will be a flow of oil from the intermediate chamber 30 the upper annular chamber 29, and thence by way of the outlet 29b therefrom to one side of the corresponding hydraulic ram. At the same time the lower annular chamber 31 is placed in communication with the exhaust 27 through the open end of the sleeve 24, so that fluid on the other side of the said ram may be returned to the pump 22.

A preferred construction of the pneumatic controls 19 for actuating the pistons 23 of the two hydraulic valves 21 just described is as follows: Each said control (see Figure 4) has an inlet 36 connected to a convenient source of compressed air such as an independently operating pump 37 (see Figures 1–3) which supplies air by way of a main passage 37a to a supply 38 connected to the bellows 34 of one of the hydraulic valves 21. The supply of air can be throttled by means of an adjustable throttle control 39 provided for the purpose. From a point in the main passage 37a on the inlet side of the throttle is provided a capillary pipe 40 which leads to a junction member 42 and thence by way of a flexible connection 43 to a primary leak valve 44 carried by a metal bellows 48. The capillary pipe 40 also communicates through the junction member 42 with a further metal bellows 45 adapted to control a secondary leakage nozzle 45a on the bellows 34 supply side of the throttle valve 39. Beyond the secondary leakage nozzle 45a is provided a small bore outlet 46 having a flexible by-pass connection 47 to the metal bellows 48 on which the primary leak valve 44 is mounted. The outlet of air from the primary leak valve 44 is controlled by means of an obturating finger 44a mounted on a spindle 44b and coupled thereto by a spring so as to be rotatable relatively thereto. The said finger 44a is operated through the medium of lever and link mechanism 50 from a feeler 51 which, in use, is arranged to co-operate with the selvedge of the fabric 1a being treated, the said feeler 51 being balanced by a counter-weight 52 so that its lower end tends to swing towards the fabric, and having an earthing wire 51a to prevent the accumulation thereon of an electric charge due to friction.

The bellows 48 on which the primary leak valve 44 is mounted are adjustably supported by means of a pivoted frame 53, the setting of which is controlled by a manually operable screw

54 so that the position of the bellows 48 and consequently of the valve 44 can be varied relatively to the obturating finger 44a of the valve. In addition, the various links connected to the feeler may also be adjustable.

Although primary and secondary leakage nozzles 44, 45a have been described, the latter may be dispensed with if the primary leak is made of sufficient magnitude.

The operation of the pneumatic control is as follows: The lever and link mechanism 50 and the bellows 48 carrying the primary leak valve 44 are set so that for a given width of material, with all parts in proper alignment, the primary leak valve 44 will be just open so that there will be a continual but not a maximum leakage of air therefrom, the magnitude of the leak being such that the bellows 45 controlling the secondary leak valve 45a will occupy a normal position in which the secondary leakage nozzle 45a is just open so that there will be a leakage, but not the maximum leakage here also, the sum total of these leakages being adjusted by suitable manipulation of the throttle 39 so as to provide a pressure in the bellows 34 of the hydraulic control valve 21 such as will just balance the opposing spring 33 and maintain the piston 23 of the valve in its neutral position. Supposing now that the feeler 51 is allowed to move inwardly due to misalignment of the fabric or a defect in the selvedge, then the obturating finger 44a will fully close the primary leakage valve 44 and thus cause the bellows 45 controlling the secondary leak to be expanded. This in turn closes the secondary leakage nozzle 45a and causes an excess of compressed air to be supplied to the corresponding hydraulic control valve 21. In this way the piston 23 of the said valve is caused to move downwardly so as to supply liquid to the appropriate side of the corresponding hydraulic ram. Simultaneously compressed air is supplied by way of the flexible by-pass 47 to the bellows 48 which carries the primary leakage valve 44 and thus tends to move the latter to a position in which it is again opened, so resisting any tendency to hunting. As the corresponding rail part 2 and retaining elements move, the feeler 51 returns to its original position relative thereto and the primary leakage valve 44 is again opened to allow the leakage of compressed air to take place so that the secondary bellows 45 in turn opens the secondary leakage nozzle 45a and the supply of air to the bellows 34 of the hydraulic control valve 21 falls to the normal amount required to maintain the valve balanced.

In the event of the feeler 51 moving outwardly the converse sequence of operations takes place; that is to say the primary leakage valve 44 is completely opened so that there is a reduction in pressure in the secondary bellows 45 and also in the bellows of the hydraulic valve 21; thus the latter valve on this occasion moves upwardly to permit the entry of liquid to the other side of the hydraulic ram. The reduction in pressure also takes effect in the bellows 48 carrying the primary leakage valve 44 and thus tends to bring the latter again to the closed position.

Since the magnitude of the air pressure in the bellows 34, and thus the resulting movement of the piston 23, is at least to some extent a function of the rate of lateral variation of the fabric selvedge (for a given amount of selvedge variation the pressure tends to vary more when the rate of selvedge variation is higher), and since the piston 23 controls the hydraulic supply substantially according to a linear law, the rate of supply of fluid to the hydraulic rams, and therefore the rate of adjustment of the stenter guides, is substantially proportional to the rate of lateral variation of the selvedge.

The parts of each pneumatic control 19 are conveniently assembled in a common casing 55 carrying pressure gauges 56 to indicate the inlet and outlet pressure and said casing is preferably slidably adjustable, under the control of a screw 57, on guides 58 extending transversely with respect to the machine, the said guides 58 being supported for pivoting about a vertical axis at 59 to allow angular adjustment of the control. The casing 55 also carries a fabric guide for supporting the fabric 1a in proper relation to the feeler 51, said guide comprising a rigid horizontal plate 60 slotted for the passage of the feeler 51, and a superposed hinged plate 61, spring pressed to bear upon the upper surface of the fabric.

Although the invention has been described as applied to a case in which the cylinders of the hydraulic rams are pivotally mounted on fixed supports, it will be understood that the arrangement could be inverted and the cylinders connected to the displaceable rails. Moreover, instead of employing hydraulic rams with one part mounted on a fixed pivot, the rams may be carried rigidly or pivotally upon slide members which have a screw adjustment by which they can be set to occupy different positions transversely of the machine. Further, separate single-acting rams could be used instead of double acting rams.

Although the pneumatic control above described possesses definite advantages in respect of cleanliness, sensitiveness, and accuracy, an electric or hydraulic control may be substituted therefor. In Figure 7 an electric control is illustrated in which a pair of solenoids 60, 61 are employed to move in opposite directions a rod 63 connected, for example, to the piston of a valve 21 of the form illustrated in Figure 6. The solenoids 60, 61 are alternatively connected to supply mains 64 by a contact arm 65 moving with a feeler arm 20 contacting the selvedge of the fabric 1a. The weight of the moving parts of the solenoids 60, 61 and valve 21 would be balanced by the spring 33 as before. The contact arm 65 could operate the solenoids 60, 61 indirectly through relays.

In another form, not illustrated, the pneumatic control illustrated in Figure 4 could operate electric relays instead of the valve 21.

By making the various pipes and orifices in the pneumatic control illustrated in Figure 4 sufficiently large to accommodate the flow of oil instead of air as the controlling fluid, the apparatus can be rendered completely hydraulic.

We claim:

1. A stentering machine having the lines of travelling retaining elements each displaceable laterally independently of the other for alignment with the corresponding fabric edge, hydraulic means by the power of which said lines of elements are displaced, and a pneumatic control system to which air is supplied continuously under pressure above atmospheric and variations in the pressure in which control said hydraulic means for the displacement of each line of elements, said system having therein a variable air-release operated to vary the release of air, and thus the controlling pressure, automatically in accordance with the position of that fabric

edge to which the system corresponds, as the said edge moves into the machine.

2. A stentering machine having the lines of travelling retaining elements each displaceable laterally independently of the other for alignment with the corresponding fabric edge, hydraulic means by the power of which said lines of elements are displaced, and means controlling the supply of operating liquid to said hydraulic means for the displacement of each line of elements, said controlling means comprising the combination of valve means adapted to vary the rate of said supply in accordance with the extent of the valve movement, and a valve-operating control system operated by the fabric edge corresponding to the line of elements concerned as said edge enters the machine, the magnitude of the valve-operating response of which system varies with the rate of lateral variation of said fabric edge, thus varying the extent of the valve movement and consequently the rate of displacement of the retaining elements.

3. A stentering machine having the lines of travelling retaining elements each displaceable laterally independently of the other for alignment with the corresponding fabric edge, hydraulic means by the power of which said lines of elements are displaced, and a control system by which said hydraulic means are controlled for the displacement of each line of elements, said control system acting automatically in accordance with the position of the fabric edge corresponding to the line of elements concerned as said edge moves into the machine, and including means operative, upon operation of the control system, to effect adjustment of said system in a sense opposite to that in which the system is acting and tending to return said control system to a neutral setting.

4. A stentering machine having the lines of travelling retaining elements each displaceable laterally independently of the other for alignment with the corresponding fabric edge, hydraulic means corresponding to the respective lines of elements and by the power of which said lines of elements are displaced, and pneumatic systems controlling the supply of operating liquid to the respective hydraulic means, each pneumatic control system being operated by that edge of the fabric corresponding to the line of elements to be displaced by the corresponding hydraulic means, and in accordance with the position of such edge as it moves into the machine.

5. A machine for handling travelling fabric in web form, having hydraulic means for adjusting the relative alignment of the web and a part of the machine; means, including a pair of coaxial connected double acting piston valves coupled in common to a supply of hydraulic operating liquid under pressure so as to be balanced thereby when in the inoperative position, each controlling the supply of said liquid to a pressure chamber for operating said hydraulic means in one direction; and a control, operating automatically in conjunction with the edge of the fabric, for actuating said valve for the supply of liquid to one or other of said pressure chambers of the hydraulic means for opposite actuation thereof.

6. A machine for handling travelling fabric in web form, having hydraulic means for adjusting the relative alignment of the web and a part of the machine; valve means adapted to vary the rate of supply of liquid to said hydraulic means; and a control for said valve operating automatically in conjunction with the edge of the fabric being treated and acting to adjust said valve means to vary the rate of supply of operating liquid to the hydraulic mechanism according to the rate of lateral variation of the fabric edge, thereby to vary the rate of supply of liquid, and also the rate of adjustment of the said relative alignment, in accordance with said rate of lateral variation of the fabric edge.

7. A machine for handling travelling fabric in web form, having a control system acting automatically in conjunction with an edge of the web for adjusting the relative alignment of the web and a part of the machine; said control system including means operative, upon operation of the system, to effect adjustment of said system in a sense opposite to that in which the system is acting and tending to return said control system to a neutral position.

8. A stentering machine having the lines of retaining elements each displaceable laterally independently of the other for alignment with the corresponding fabric edge, hydraulic means by the power of which said lines of elements are displaced, and electrical control systems each operating automatically in conjunction with an edge of the fabric being treated and controlling the operation of the hydraulic displacing means corresponding to said edge.

9. A stentering machine having the lines of retaining elements each displaceable laterally independently of the other for alignment with the corresponding fabric edge, hydraulic means by the power of which said lines of elements are displaced, and combined fluid and electrical control systems each operating automatically in conjunction with an edge of the fabric being treated and controlling the operation of the hydraulic displacing means corresponding to said edge.

10. A stentering machine having lines of travelling retaining elements carried by guide rails, said guides rails having at the entry end of the machine laterally pivotal sections to permit adjustment of the alignment each line of elements independently of the other with respect to the fabric at said entry end, hydraulic rams, corresponding to the respective pivotal sections, to effect pivoting thereof, and automatic control means for controlling said rams, said control means operating in conjunction with the selvedges of the fabric being treated; one part of each hydraulic ram being mounted for pivoting about a vertical axis and the other part being pivotally connected to the corresponding guide rail.

11. A machine as claimed in claim 5, wherein the piston valve comprises a cylinder; and a pair of rigidly connected spaced piston elements slidable in said cylinder; said cylinder having intermediate ports for the supply of liquid to between said elements, and piston-controlled ports for the discharge liquid to opposite sides of the corresponding hydraulic means, said piston-controlled ports being placed alternatively in communication with the supply and discharge of the hydraulic liquid, according to the direction of movement of the piston.

12. A machine for handling travelling fabric in web form, having hydraulic means for adjusting the relative alignment of the web and a part of the machine; means, including a double acting piston valve coupled to a supply of liquid under pressure, for controlling the supply of liquid to said hydraulic means; said piston valve controlling ports communicating with the hydraulic means of such form that the extent of the open-

ing thereof with movement of the piston varies according to a linear law; and a control, operating automatically in conjunction with the edge of the fabric, for actuating said valve for the supply of liquid to one or other side of the hydraulic means.

13. A machine as claimed in claim 5, wherein the piston valve comprises a cylinder; and a pair of rigidly connected spaced piston elements slidable in said cylinder; said cylinder having intermediate ports for the supply of liquid to between said elements, and piston-controlled ports for the discharge of liquid to opposite sides of the corresponding hydraulic means, said piston-controlled ports being placed alternatively in communication with the supply and discharge of the hydraulic liquid, according to the direction of movement of the piston, and being of such form that the extent of the opening thereof with movement of the piston varies according to a linear law.

14. A machine for handling travelling fabric in web form, having hydraulic means for adjusting the relative alignment of the web and a part of the machine; means, including a double acting piston valve coupled to supply of liquid under pressure for controlling the supply of liquid to said hydraulic means, said piston valve having slots therein co-operating with rectangular ports communicating with the hydraulic means so that the extent of the opening of the parts with movement of the piston varies according to a linear law; and a control, operating automatically in conjunction with the edge of the fabric, for actuating said valve for the supply of liquid to one or other side of the hydraulic means.

15. A machine for handling travelling fabric in web form, having hydraulic means for adjusting the relative alignment of the web and a part of the machine; means, including a double acting piston valve coupled to a supply of liquid under pressure for controlling the supply of fluid to said hydraulic means, a liquid-pressure-responsive diaphragm operatively connected to said piston so as to adjust the latter upon variation of the pressure on the diaphragm; a fluid control system acting to vary the pressure on said diaphragm in accordance with the position of the fabric edge; and means for balancing said valve in a neutral position when said fluid pressure has a predetermined value.

16. A machine for handling travelling fabric in web form, having means for adjusting the relative alignment of the web and a part of the machine; and an automatic fluid control system for actuating said adjusting means, said control system comprising a first pressure responsive means adapted upon variations of pressure thereon to initiate operation of the alignment-adjusting means, means for the provision of a constant supply to said pressure responsive means of fluid under pressure, a leakage nozzle connected to said supply, a feeler element adapted to co-operate with the fabric edge and operatively connected to said nozzle for the opening and closing thereof according to the position of the fabric edge, and further pressure responsive means, subject to the pressure of fluid supplied to said first pressure responsive means, and operatively connected to said nozzle for varying the degree of opening thereof in a sense opposite to that of the variation induced by the first pressure responsive means, so as to resist a tendency to hunting.

17. A machine as claimed in claim 16, wherein said further pressure responsive means is a diaphragm subjected to the pressure of the fluid supplied to said first pressure responsive means, and the leakage nozzle is mounted on said diaphragm so as to move therewith upon variation of the pressure thereon and to vary the degree of opening of the nozzle in a sense opposite to that of the variation induced by said feeler element.

18. A machine for handling travelling fabric in web form having means for adjusting the relative alignment of the web and parts of the machine; a fluid control system for controlling said alignment adjusting means including means for maintaining fluid under pressure therein, said system being connected to said adjusting means so as to operate the latter upon variation of the pressure in the system and comprising a pressure responsive means controlling actuation of the alignment adjusting means; means for the provision of a constant supply thereto of fluid under pressure; a primary and a secondary leakage nozzle connected to said supply; a feeler element adapted to co-operate with the fabric edge and operatively connected to said primary nozzle for the opening and closing thereof; a second pressure responsive means connected in parallel with said primary nozzle, said means controlling said secondary leakage nozzle so that opening and closing thereof takes place in the same sense and at the same time as opening and closing of the primary nozzle; the pressure in the system thereby being varied in accordance with the position of the fabric edge.

19. A machine for handling travelling fabric in web form having means for adjusting the relative alignment of the web and parts of the machine; a fluid control system for controlling said alignment adjusting means including means for maintaining fluid under pressure therein, said system being connected to said adjusting means so as to operate the latter upon variation of the pressure in the system and comprising a pressure responsive means controlling actuation of the alignment adjusting means; means for the provision of a constant supply thereto of fluid under pressure; throttle means for adjusting said supply; a primary leakage nozzle connected at the supply side of said throttle; a feeler element adapted to co-operate with the fabric edge and operatively connected to said primary nozzle for the opening and closing thereof; a secondary leakage nozzle connected at the discharge side of said throttle, and a second pressure responsive means connected in parallel with said primary nozzle, said means controlling said secondary leakage nozzle so that opening and closing thereof takes place in the same sense and at the same time as opening and closing of the primary nozzle; the pressure in the system thereby being varied in accordance with the position of the fabric edge.

20. A stentering machine having the lines of travelling retaining elements each displaceable laterally independently of the other for alignment with the corresponding fabric edge, hydraulic ram mechanism connected to each line of elements and having two pressure chambers by the alternate use of which the line can be displaced in either of two directions, means controlling the supply of liquid to and its discharge from said pressure chambers, said means being controlled automatically by the edge of the fabric corresponding to the ram mechanism so that, when the supply to either of the chambers commences, discharge therefrom is prevented whilst supply

to the other chamber is prevented and discharge therefrom can take place, and so as to operate the ram mechanism in accordance with the position of the fabric edge as it moves into the machine.

21. A stentering machine having the lines of travelling retaining elements each displaceable laterally independently of the other for alignment with the corresponding fabric edge, and hydraulic rams by the power of which said lines of elements are displaced, each ram having associated with it means to control the supply thereto and discharge therefrom of liquid, said means being controlled automatically by the edge of the fabric corresponding to that ram so as to provide for the supply of liquid when the ram is to displace the corresponding line of elements in one direction, and for the discharge of liquid when the line of elements is moved in the other direction against said ram, and so as to operate the ram in accordance with the position of the fabric edge as it moves into the machine.

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