Sept. 3, 1935. M. M. KASANOF 2,013,632

FABRIC TREATING MACHINE

Filed May 13, 1933 3 Sheets-Sheet 1

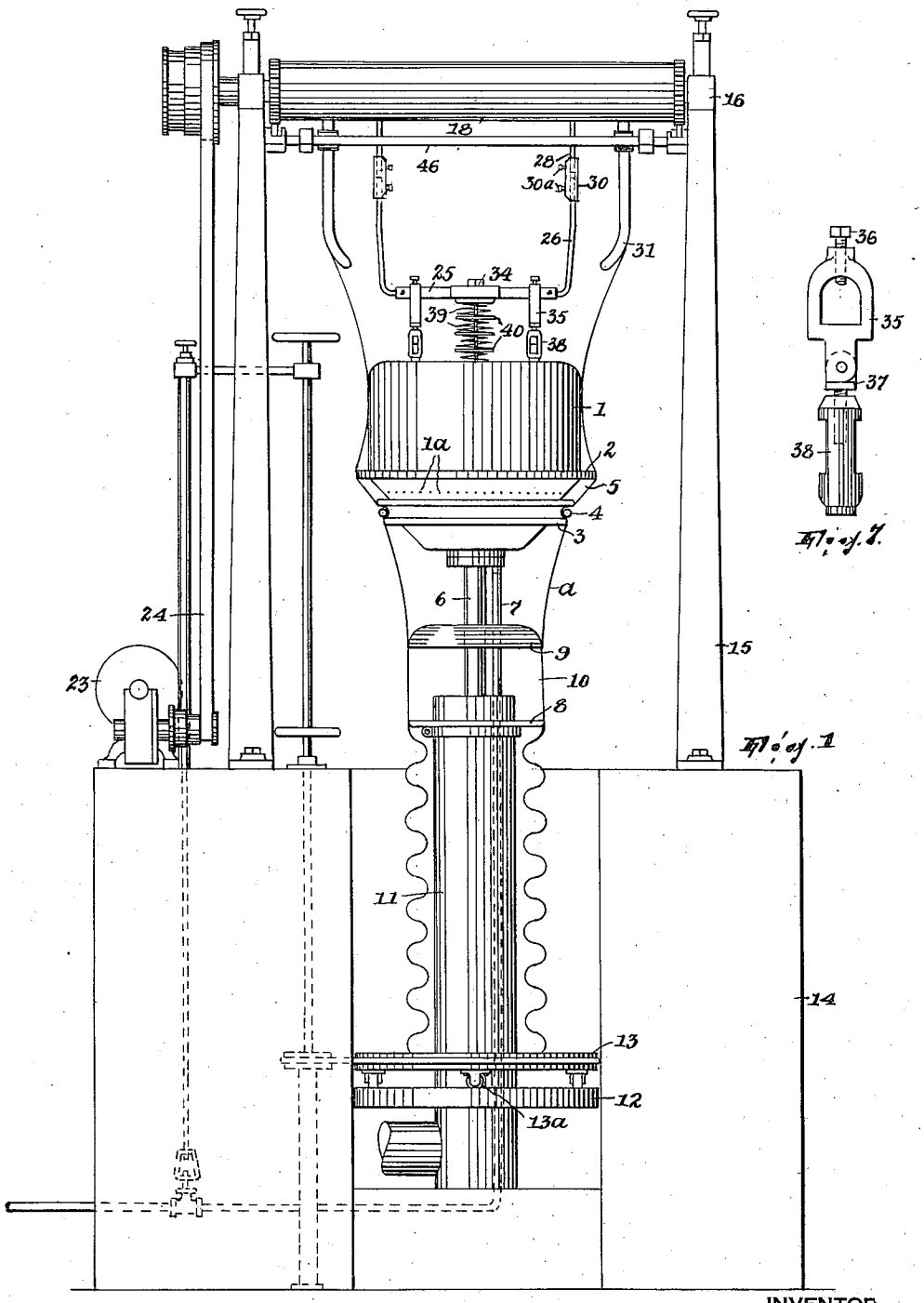


Fig. 2.

Fig. 1

INVENTOR,
Maurice M. Kasanof
BY
ATTORNEY

Sept. 3, 1935. M. M. KASANOF 2,013,632

FABRIC TREATING MACHINE

Filed May 13, 1933 3 Sheets-Sheet 2

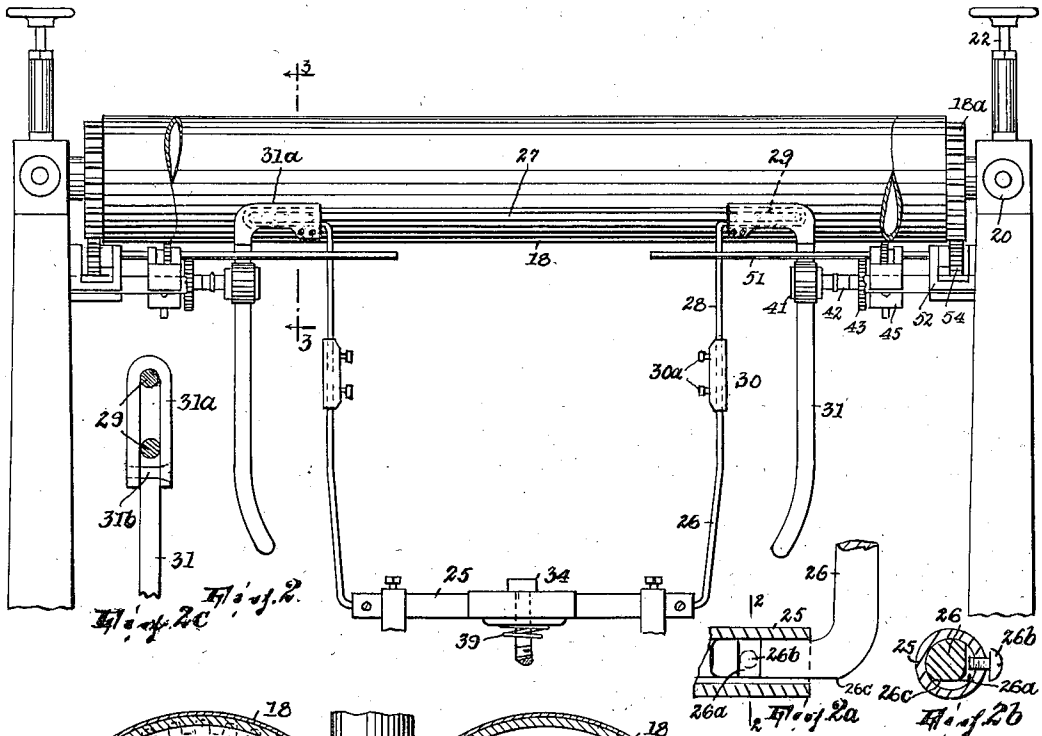


Fig. 2c Fig. 2. Fig. 2a Fig. 2b

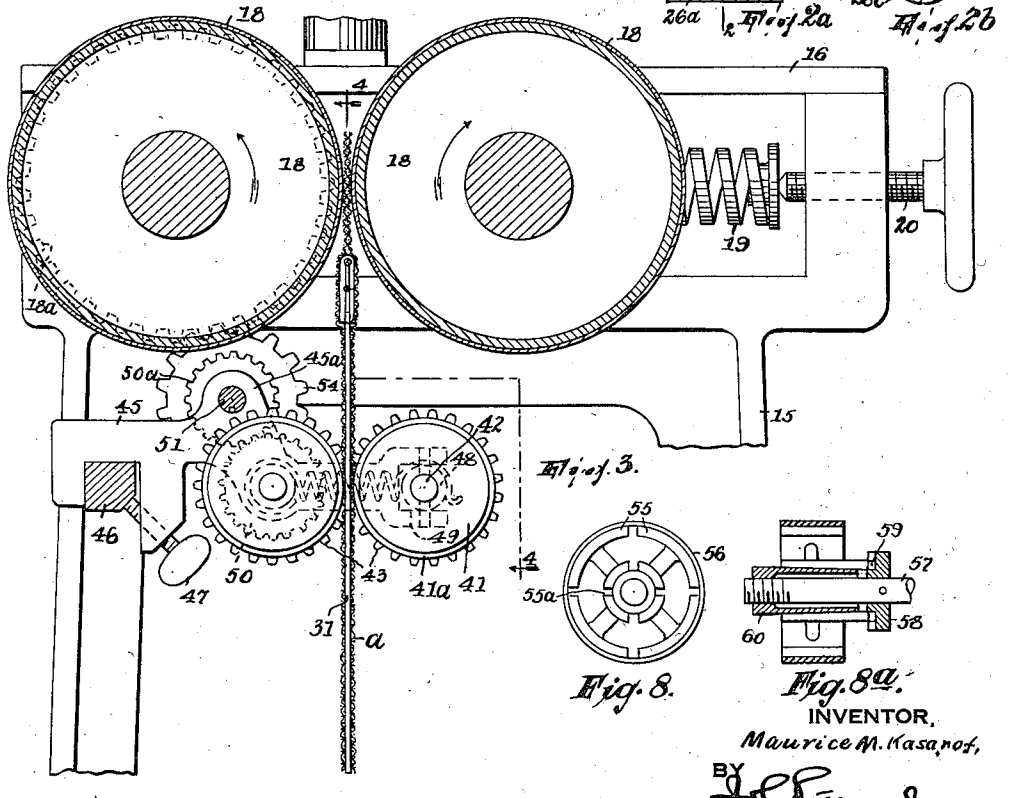


Fig. 3.

Fig. 8.

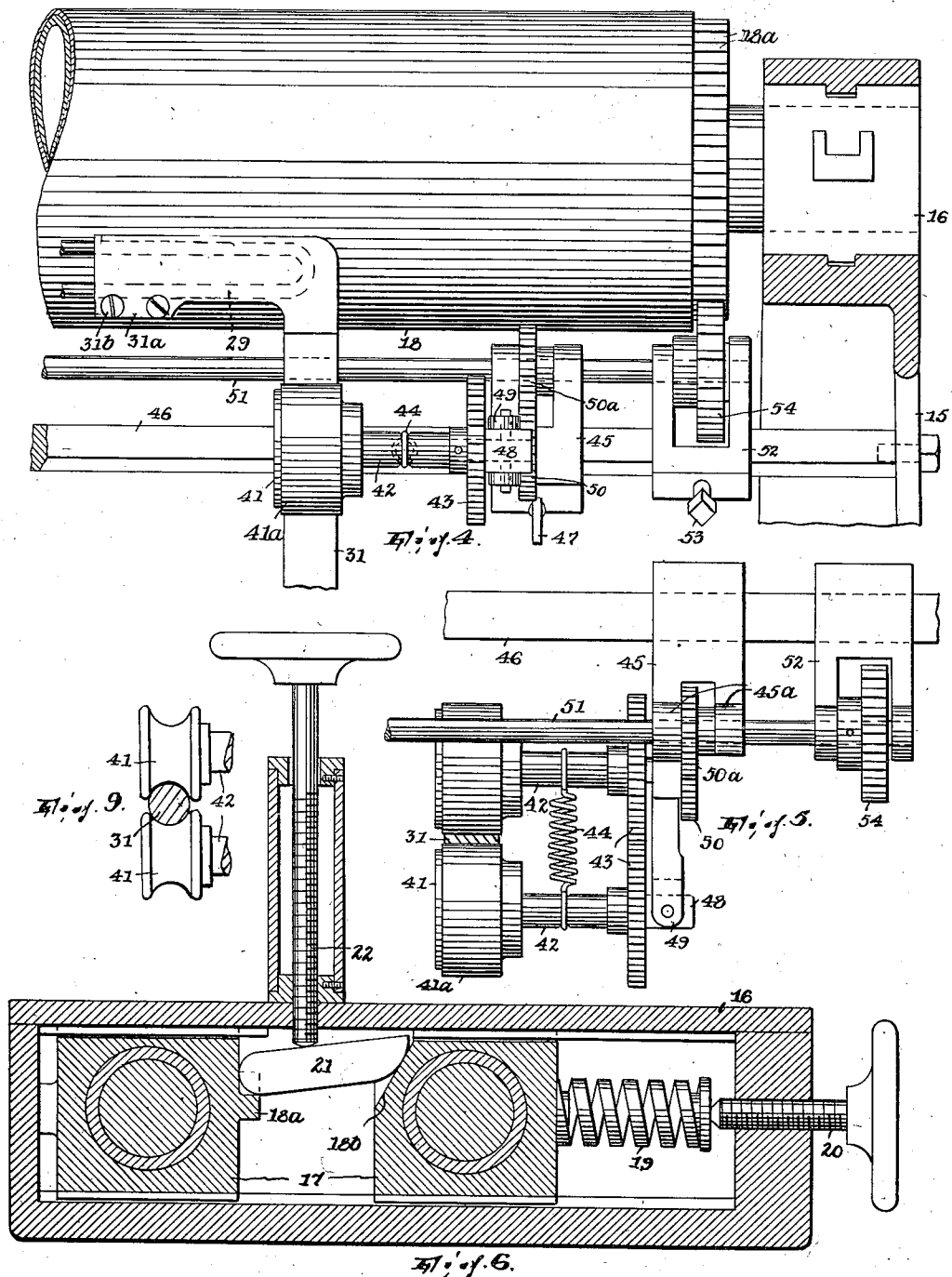
Fig. 8a.

INVENTOR,
Maurice M. Kasanof,
BY
ATTORNEY

Sept. 3, 1935. M. M. KASANOF 2,013,632

FABRIC TREATING MACHINE

Filed May 13, 1933 3 Sheets-Sheet 3



INVENTOR,
Maurice M. Kasanof
BY
John Stewart
ATTORNEY

Patented Sept. 3, 1935

2,013,632

UNITED STATES PATENT OFFICE

2,013,632

FABRIC TREATING MACHINE

Maurice M. Kasanof, Bronx, N. Y.; David R. Kasanof and Abraham Kriegel, both of New York, N. Y., executors of said Maurice M. Kasanof, deceased

Application May 13, 1933, Serial No. 670,889

11 Claims. (Cl. 26—55)

In patents heretofore granted to me (for example, No. 1,711,094) I have disclosed apparatus whereby tubular fabrics, as tubular knit goods, may be progressively subjected to certain treatments, as steaming and drying, with the use of a structure designed to stretch or tenter the fabric as the same is drawn over and encloses said structure and after passing the latter, and so no longer subject to its action to expand it in substantially all radial directions, is subjected to means enclosed thereby which spreads it to flat-tubular form preparatory to its encountering draft means, as a pair of rollers, by which it is drawn or advanced.

The improvements herein set forth relate to the said draft means and to the means for flat-spreading and control of the fabric after it has passed the mentioned structure, which is usually a steam-heated dome, their objects being, generally stated, to provide for adjustment of the draft means, to facilitate the initial entering of the fabric to the draft means, and to avoid the fabric being in certain respects distorted. These objects will be elaborated in more detail hereinafter.

In the drawings,

Fig. 1 is a front elevation of the improved apparatus;

Fig. 2 a rear elevation of the upper part thereof, with the rear draft roller broken away;

Fig. 2*a* shows the joint between parts **25** and **26**, the former in longitudinal section;

Fig. 2*b* is a section on line **2—2**, Fig. 2*a*;

Fig. 2*c* is an inside elevation of the upper part of one of the members **31**;

Fig. 3 is a sectional view, on approximately line **3—3**, Fig. 2, of said part of the apparatus on a larger scale;

Fig. 4 is a fragmentary section on line **4—4**, Fig. 3;

Fig. 5 is a plan of one of the fabric control means;

Fig. 6 is a longitudinal vertical section of the bearing means for the draft rollers and the head of one of the standards containing said bearing means;

Fig. 7 shows a detail of the spreader;

Figs. 8 and 8*a* are, respectively a side elevation and sectional view of one of the control rollers in modified form; and

Fig. 9 shows another modification affecting such rollers and the spreader.

1 is a hollow dome having an annular series of fluid outlets 1*a* above and below which, respectively, are the flanges **2** and **3**,—the latter being channeled and containing an endless helical spring **4**,—which coact to form with the tubular fabric *a* a fluid chamber **5**. **6** is the pipe by which fluid, as steam, is admitted to the dome and **7** is the condensation eduction pipe. **8** is an annular flange or wall which, with a similar but inverted dished wall **9** above it, may form between them and with the fabric another fluid chamber **10** to which heated air or other fluid is admitted by the pipe **11** partially enclosing pipes **6** and **7** and carrying wall **8**. **12** is a platform on which may be rotatively adjusted a carriage or fabric-support **13** having anti-friction means **13***a* to travel on the platform.

The fabric to be treated, having preferably first removed the dome for the purpose, is passed over pipe **11** and placed on the platform whereupon, the dome being replaced, the fabric is drawn up past the walls **8** and **9**, extended between the flange **3** and collar **4** and past the flange **2** and the dome and brought into the grip of the draft means as will be described. When the fabric is being treated, as it is drawn upwardly by the draft means, it undergoes diametric stretching or tentering or at least distending by the flange **2** and may be steamed by the steam in chamber **5** and dried by the superadjacent part of the dome, or if it comes to the apparatus in wet or damp condition it may undergo a preliminary drying by warm air admitted to chamber **10** from pipe **11**; other treatments are of course possible, depending on the fluids used, the presence or absence of heat, and other conditions, and so far as my present invention is concerned all that is actually essential as to the apparatus so far described is that there should be some structure, as the flanged dome, which shall at least distend radially the encompassing and axially moving tubular fabric. While usually the fabric will actually be stretched by the flanged dome, so that any given area thereof would be expanded to greater dimensions than it had prior to the treatment, I do not wish to exclude the mere distension of the fabric to open tubular as distinct from flat tubular form, and by distension I here mean so that any given area would not be expanded to appreciably greater dimensions than it had before treatment.

Fixed supporting structure is afforded by work platform **14** which carries a pair of standards **15** whose heads form housings **16** containing bearings **17** for the cylinders **18** which afford the mentioned draft means, and to that end grip the fabric more or less between them and are driven in the directions of the arrows in Fig. 3. One bearing in each pair is yieldingly urged toward the other by a spring **19** interposed between one such

bearing and a hand-screw 20 tapped into the end of the housing. By means of a cam-block 21 resting on a projection 18a of one bearing and engaging with a cam-face 18b on the other and a screw 22, tapped in the housing above and bearing upon the cam-block, the bearings can be spaced apart so as to space the cylinders according to the requirements as to the particular fabric to be treated. One of the cylinders is driven from a motor 23 through a belt-and-pulley transmission 24.

Upon the fabric under draft leaving the dome and preparatory to its entering between the cylinders it should undergo change from open-tubular to flat-tubular form. This I have heretofore accomplished by what I have termed a "stretcher" or herein a "spreader", to wit, a flat frame upstanding above the dome and of such width as at least to distend the fabric, which encloses it, to the flat-tubular form. But due to certain conditions it is found that longitudinal zonal portions of the fabric do not travel at the same rate; for instance, on account of the frictional resistance offered by the spreader, particularly in the side folds, the sides of the flattened fabric tend to lag behind its intermediate longitudinal portion, so that the wales of the fabric become curved or bent or not straight across as they should be (such curve being in this instance convex toward the direction, as upward, in which the fabric is moving) and the fabric leaves the cylinders undesirably distorted in this respect and in fact set more or less in that condition. I therefore provide controlling means which will offset the resistance responsible for this condition and, where the distortion is incident to the spreader, devise the spreader so as to coact with such means, as follows:

The spreader here comprises a horizontal tube 25 forming the base member thereof and these parts forming the spreader proper: stiff wire portions 26 upstanding from the ends of the tube, a stiff wire bent to form a horizontal mid-portion 27 and depending end portions 28 joined to mid-portion 27 by loops 29, couplings 30 receiving the free ends of the portions 26 and 28 and forming therewith telescopic side members of the frame and equipped with screws 30a for clamping them and so that the frame formed by parts 25 to 30 may be adjusted vertically or lengthwise of itself, and blade members 31 projecting downwardly from the loops and outwardly flanking said frame. Members 31 may be adjusted rectilineally toward or from each other, to vary the width of the spreader, and for this purpose have channeled heads 31a (Fig. 2c) receiving the loops 29 and adapted to be clamped thereto by screws 31b. The portions 26 are preferably connected to the tube so as not only to swing down but be detachable therefrom, as shown by Figs. 2a and 2b where the inturned end or trunnion of each has a notch 26a to receive the end of a screw 26b in the tube, said trunnion being flattened at 26c.

To assemble the trunnions with the tube, said portions are forced apart and the spreader proper brought to approximately horizontal position so that the flats 26c will permit said trunnions to enter the tube without interference by the screws, whereupon said spreader proper is raised to elevated or normal position thereby bringing the notches into position to receive the screws and thus retain the trunnions in the ends of the tube. In other words, the described (bayonet-joint) connections are such that whereas the structure comprising the mentioned frame and members 31 may, when depressed far enough, be detached from the tube 25, it is adapted to be swung down somewhat for a purpose to appear without the trunnions being detached from the tube.

The tube 25 is penetrated by a bolt 34 upstanding from the top of the dome. When the spreader is in operative position it stands with its upper end reaching into the crotch between the cylinders (Fig. 3) supported by the devices shown in Fig. 7 which form folding props resting on the top of the dome and holding the tube 25 against the head of the bolt; each of these devices comprises a loop 35 clamped to the tube by a set-screw 36 and a leg formed in two sections, the upper section 37 being pivoted to the loop and having a threaded stem onto which the lower section or foot 38 is screwed. Springs 39 and alternating disks 40 are interposed between the spreader and dome which tend to support the former yieldingly; in other words, the tube and springs form spring-including means, between the spreader and the dome as a fixed support, normally holding the spreader projecting into the crotch between the cylinders.

The construction with reference to the spreader is such that when the tubular fabric is to be entered between the cylinders, having first shifted the props to inactive position and then depressed the spreader against the tension of springs 39 so that the spreader proper will clear the rear cylinder and drawn the upper end of the fabric up so as to enclose the spreader, said upper end of the fabric is smoothed above the spreader and the latter returned to its vertical position and then allowed to rise so as to place said upper end of the fabric in the nip of the cylinders.

So far as I am aware the construction of the spreader is novel, especially in these respects, to wit: That it is normally held spring-pressed upwardly and so as to project between the cylinders 18 but comprises a base member 25 and a spreader proper pivoted to the base member to swing downwardly upon depressing the spreader against the tension of the spring sufficiently for the spreader proper to clear one cylinder; and that the spreader proper is generally inverted U-shaped in form and has, as in Figs. 2a and 2b, oppositely projecting trunnions at its extremities pivoted in and forming bayonet-joint connections with the supporting structure of the machine.

Each member 31 extends between two rolls 41 carried by horizontal shafts 42 having intermeshing gears 43 and connected by a spring 44 so that the rolls will act as presser members or press against the portion of the fabric containing said member 31, the rolls having rubber or equivalent peripheries 41a which will obtain a certain degree of grip on the fabric. For the support of each shaft 42 there is a bracket 45 carried by a cross-bar 46 connecting the two standards 15, each bracket being secured to the cross-bar, so as to permit adjustment of the rolls toward or from each other according to the width of the spreader, by a set-screw 47. The cross-bar or shaft 46 is square in cross-section and the bracket has a square socket receiving and fairly closely fitting the same so that, in effect, even though the screw 47 be fully retracted, the bracket is splined to the shaft. One shaft is journaled directly in the bracket, but the other is journaled in a bearing 48 (Fig. 3) pivoted in a fork 49 of the bracket. On the shaft of that gear in each presser member comprising parts

41—42—43 which is the nearer to the cross bar 46 is another gear 50, these gears being spaced by a portion of the bracket and meshing with the later gear is a gear 50a which is received in an upstanding fork 45a of the bracket and is splined to a horizontal shaft 51, there being one such shaft for the system comprising each pair of rolls. This shaft is journaled in a bracket 52 secured to the cross bar 46 by a set screw 53 and having affixed thereto, in the fork of such bracket, a gear 54 which meshes with the gear 18a on one of the cylinders 18.

The controlling means thus described acts in the example to advance the flattened fabric at its side folds at a faster rate than at such portions it would otherwise travel subject to the frictional resistance of the members 31; in other words, so that the drag of the fabric due to such members is compensated for and in the path of the rolls the fabric travels at the same rate as at its longitudinal mid-portion, so that the wales of the fabric are not distorted in the way stated.

Given means, as the cylinders 18, for exerting draft on the fabric and assuming that from any cause a portion of the fabric in any limited longitudinal zone tends to lag behind, or otherwise not move at the desired rate, my invention contemplates, broadly, the employment of means, arranged to engage the fabric in only a limited longitudinal zone thereof and at a point in advance or anterior of the cylinder for controlling the rate of advance of the portion of the fabric in said zone. In the present example, the members 31 (which are present to distend or spread the fabric to flat form—if not actually to stretch it—and form distinct side folds preventing the fabric passing between the rollers 18 with vagrant creases) actually intervene between and coact with the rolls in each pair as presser members, but such is not indispensable, for the driven rolls would obviously serve as controlling means without said members present between them. Instead of the members 31 being flat and the rolls cylindrical said members may be round in cross section and the rolls have curved peripheries as shown in Fig. 9.

It may be desirable in some instances to render variable the controlling action, for instance, if one ply of the fabric tends to move faster than the other. Hence the modification shown in Figs. 8 and 8a which show how the diameter of each roll can be altered. The body of the roll is formed in segments 55 encompassed by an elastic rubber tread portion or band 56. On the shaft 57 (corresponding to shaft 42) is fixed a collar 58 having lugs 59 to engage in the notches 55a between portions of the hub of the collar. The shaft is threaded and on it is screwed a conical nut 60 which extends into the roll-hub. By turning the nut on the shaft one way or the other the diameter of the roll may be changed, for instance, so that if either controlling means in the example would not otherwise act at proper speed it may be made to do so.

Having thus fully described my invention what I claim is:

1. A fabric treating machine comprising, with a fabric distending means over which tubular fabric is adapted to be drawn in encompassing relation thereto, a flat spreader for the fabric arranged to be encompassed by the fabric after leaving said means and connected to the latter to move toward and from the same and having its movement from the same limited thereby, means normally urging the spreader from said means to its limit, and propping means normally holding the spreader at such limit.

2. A fabric treating machine comprising supporting means, a pair of draft cylinders revolving in opposite directions, bearings in said means in which the cylinders are journaled, one being yieldingly urged toward the other, and means, comprising a cam-block pivotally supported on one bearing and having a cam-engagement with the other, for varying the spacing of said bearings.

3. The combination of supporting structure, of a device extending transversely of the fabric and in contact with which the fabric moves in flat form, said structure including a fixed shaft extending transversely of the fabric, a bracket splined to and slidable along the shaft, and instrumentalities, engaging opposite faces of the fabric and one of which is a roller journaled in said bracket, for controlling the rate of advance of the fabric.

4. The combination of supporting structure, a pair of draft cylinders journaled therein and coacting to grip the fabric, a fabric spreader below the cylinders and comprising a base member and a spreader proper upstanding from and pivoted to said member to swing downward, said member having limited upward movement on said structure, and a spring interposed between the base member and said structure and normally holding the spreader proper projecting between the cylinders.

5. A fabric treating machine comprising, with a device extending transversely of the travel of the fabric and in contact with which the fabric moves in flat form, and with a flat spreader for the fabric arranged anterior to said device and to be surrounded by and to hold the fabric extended transversely of such travel and in flat form and thereon presenting to one of the thus extended flat portions of the fabric a face extending substantially straight lengthwise of such travel, means, opposed to said spreader face and engaging said portion in a zone extending lengthwise of such travel and of relatively limited width, for controlling the rate of travel of the fabric.

6. A fabric treating machine comprising, with a device extending transversely of the path of travel of the tubular fabric and in contact with which the fabric moves in flat form, and with a flat spreader for the fabric arranged anterior to said device and to be surrounded by and hold the fabric extended transversely of its travel and in flat form and thereon presenting to opposed thus extended flat portions of the fabric opposite faces extending substantially straight lengthwise of such travel, means, opposed respectively to said spreader faces and engaging respectively said portions of the fabric each in a zone extending lengthwise of such travel and of relatively limited width, for controlling the rate of travel of the fabric.

7. A fabric treating machine comprising, with a device extending transversely of the travel of the fabric and in contact with which the fabric moves in flat form, and with a fabric spreader arranged anterior to said device and to hold the fabric extended transversely of such travel and in flat form, separate and independently controlled means active on the flat fabric in distinct zones extending lengthwise of such travel and each coactive with the spreader to control the rate of travel of the fabric.

8. A fabric treating machine comprising, with structure including fabric-distending means past

which the tubular fabric is adapted to be drawn while encompassing the same, and with a device extending transversely of the fabric and in contact with which the fabric then moves in flat tubular form, a flat spreader arranged between said device and the distending means and to be encompassed by and extend the fabric in flat-tubular form, said spreader having oppositely extending extremities forming trunnions pivoted in and afforded bayonet-joint connections with said structure.

9. A flat spreader for use with a machine of the class described comprising an open frame having opposite side members extending in the same general direction and blade members attached to the frame and arranged in substantially the same plane as and also outwardly of and extending in the same general direction as said side members.

10. A flat spreader for use with a machine of the class described comprising an open frame having opposite telescopic side members extending in the same general direction and blade members attached to the frame and arranged in substantially the same plane as and also outwardly of and extending in the same general direction as said side members.

11. A flat spreader for use with a machine of the class described comprising an open frame having opposite side members extending in the same general direction and blade members attached to the frame and arranged in substantially the same plane as and also outwardly of and extending in the same general direction as said side members and adjustable toward and from the same.

MAURICE M. KASANOF.