O. VENTER.

APPARATUS FOR REMOVING LYE FROM FABRICS.

APPLICATION FILED OCT. 28, 1907.

934,110. Patented Sept. 14, 1909.

4 SHEETS—SHEET 1.

Fig. 1.

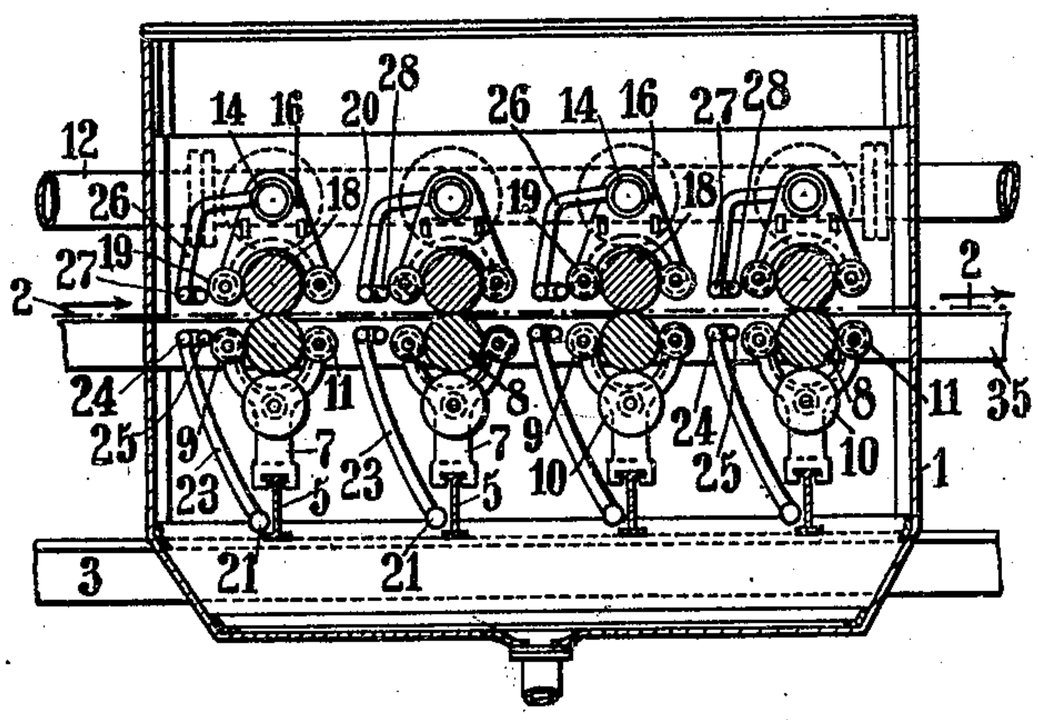

Fig. 2.

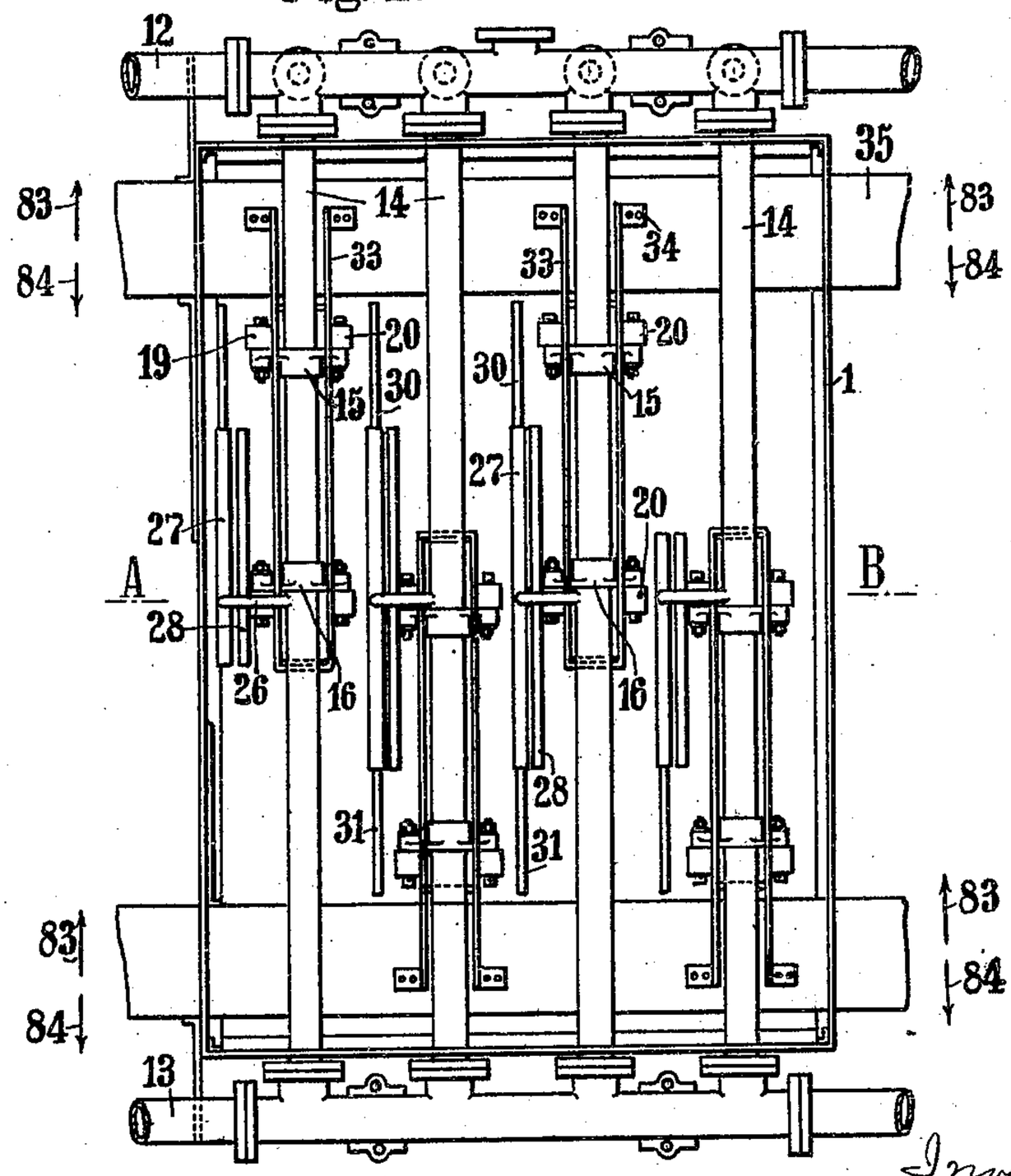

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Fig. 4.

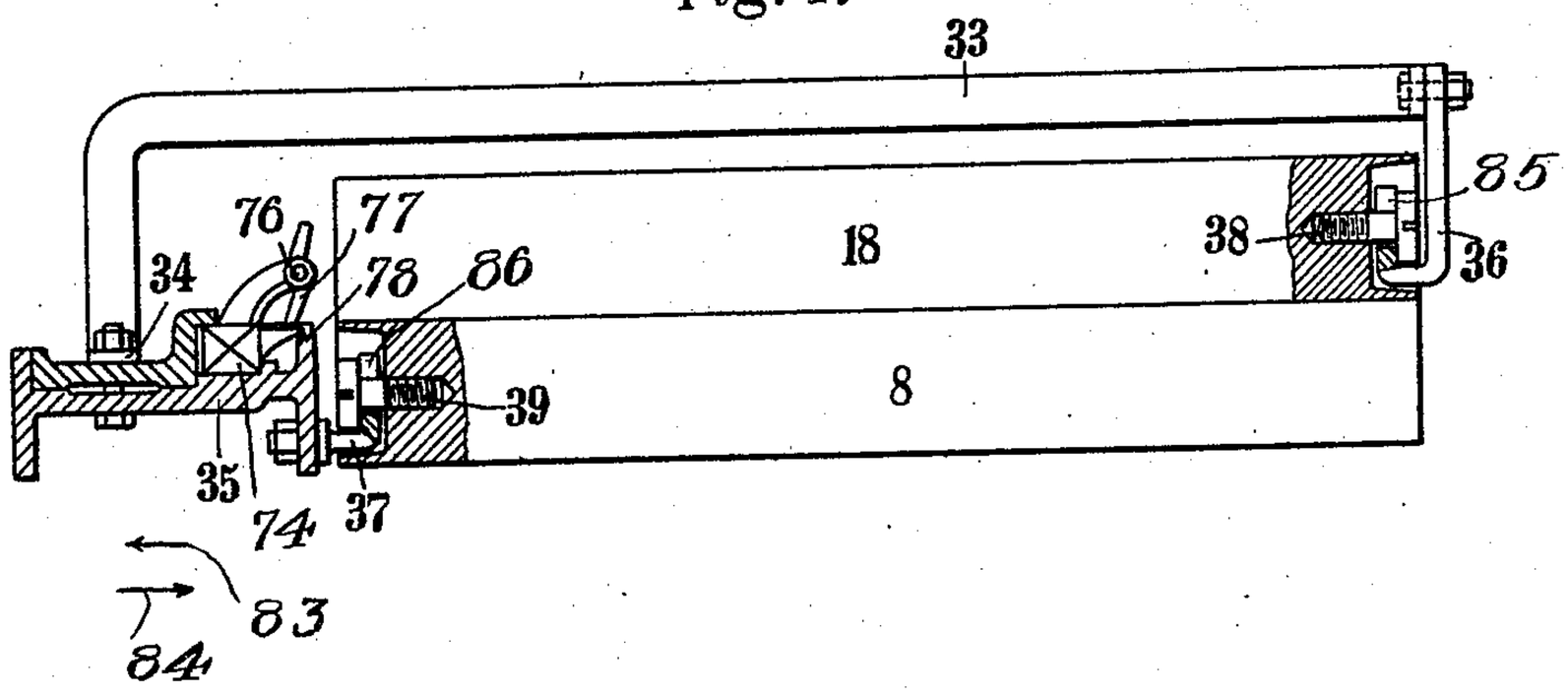

Fig. 5.

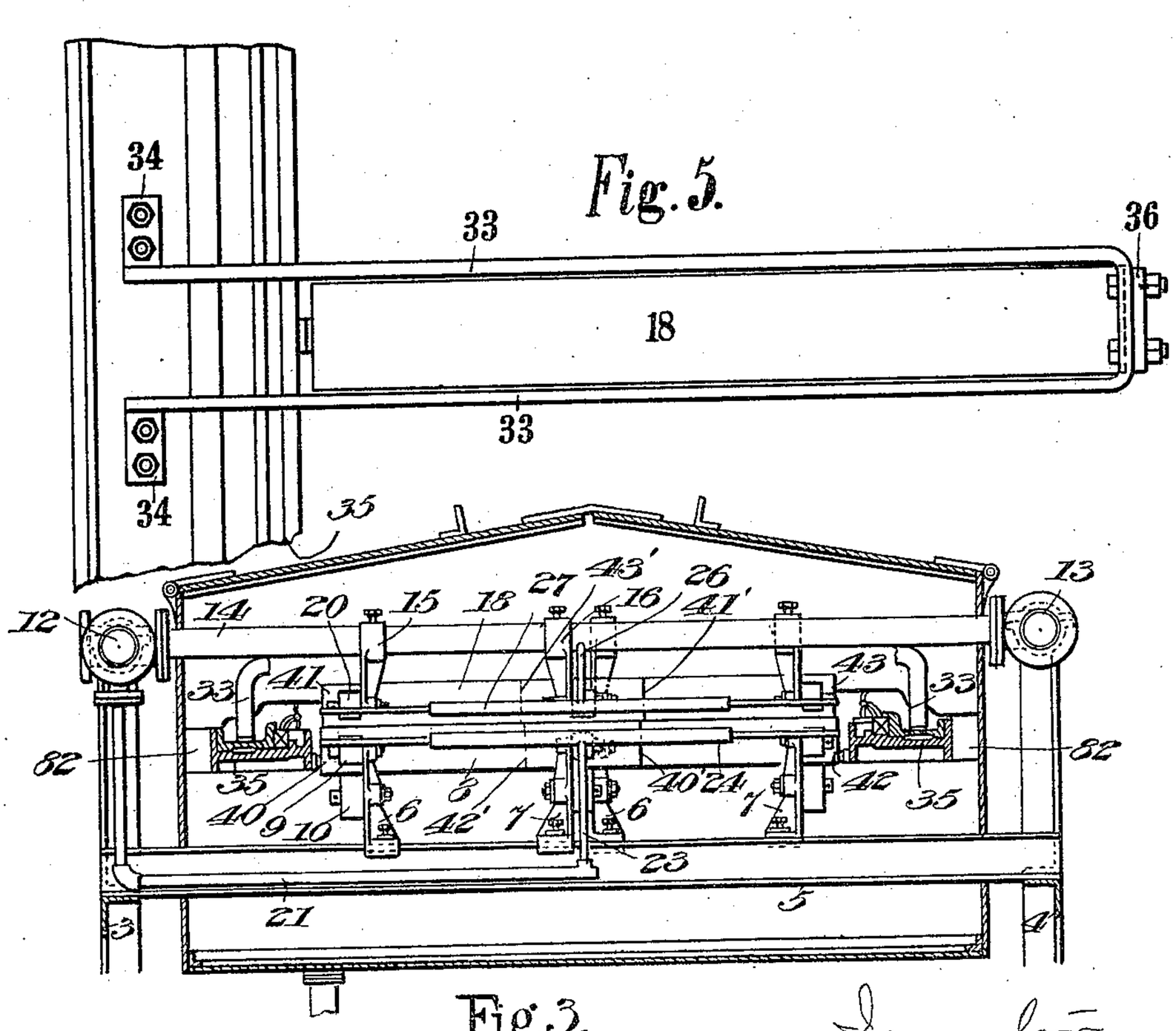

Fig. 3.

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4 SHEETS—SHEET 3.

Fig. 9.

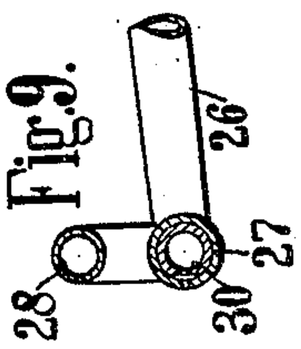


Fig. 8.

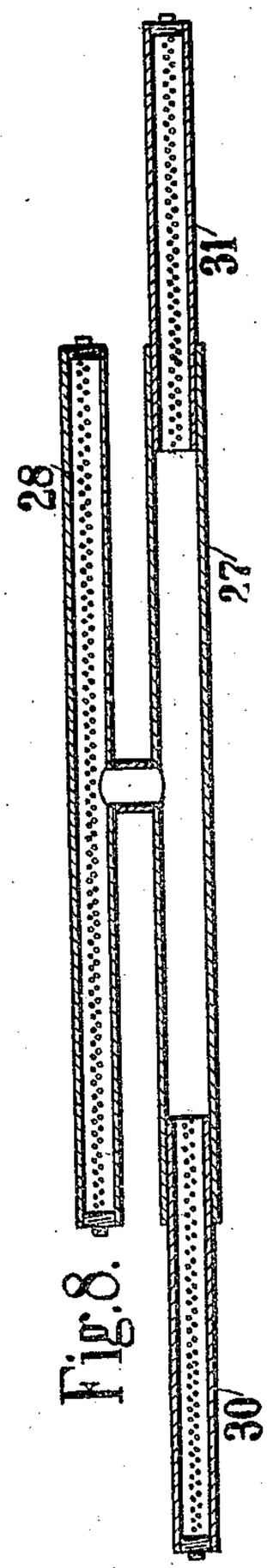


Fig. 6.

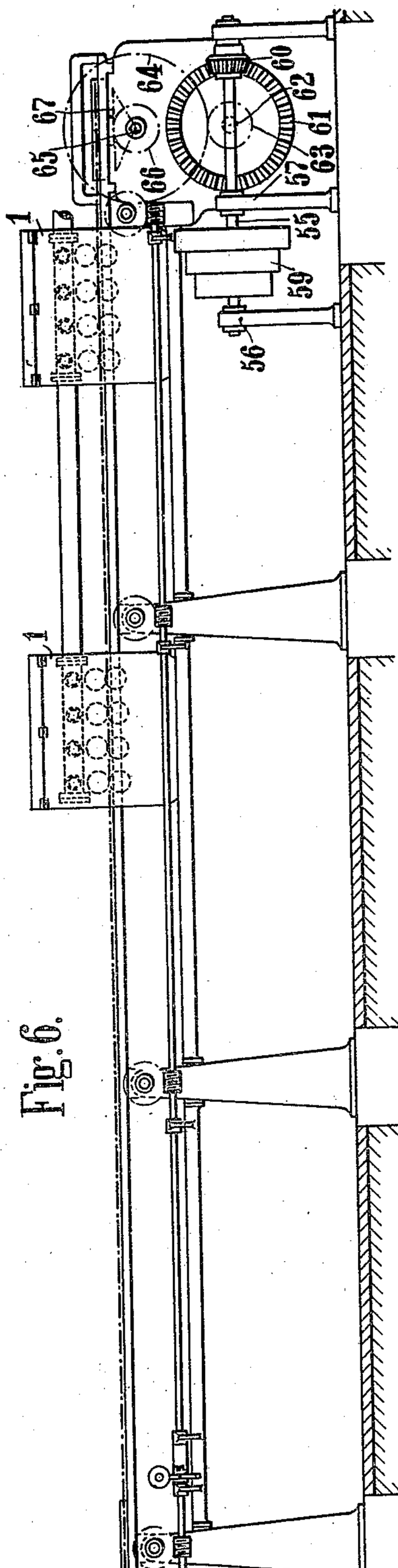


Fig. 11.

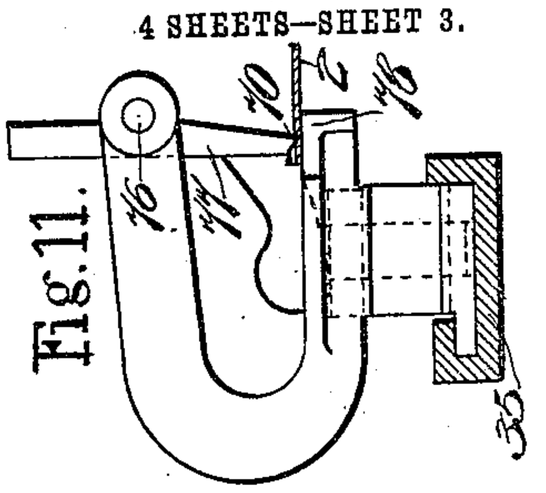
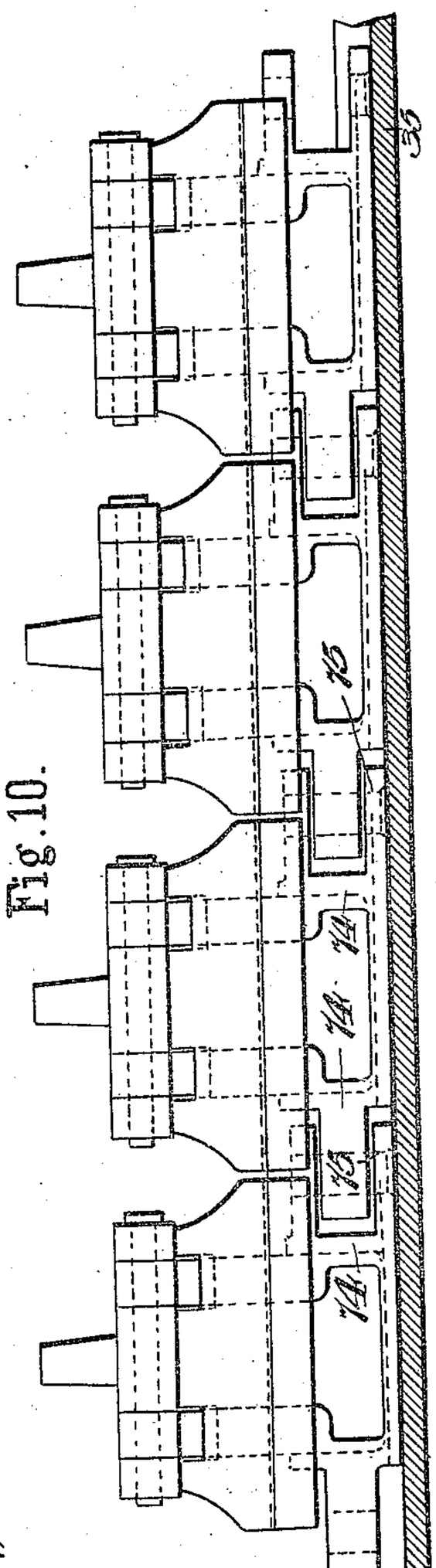


Fig. 10.



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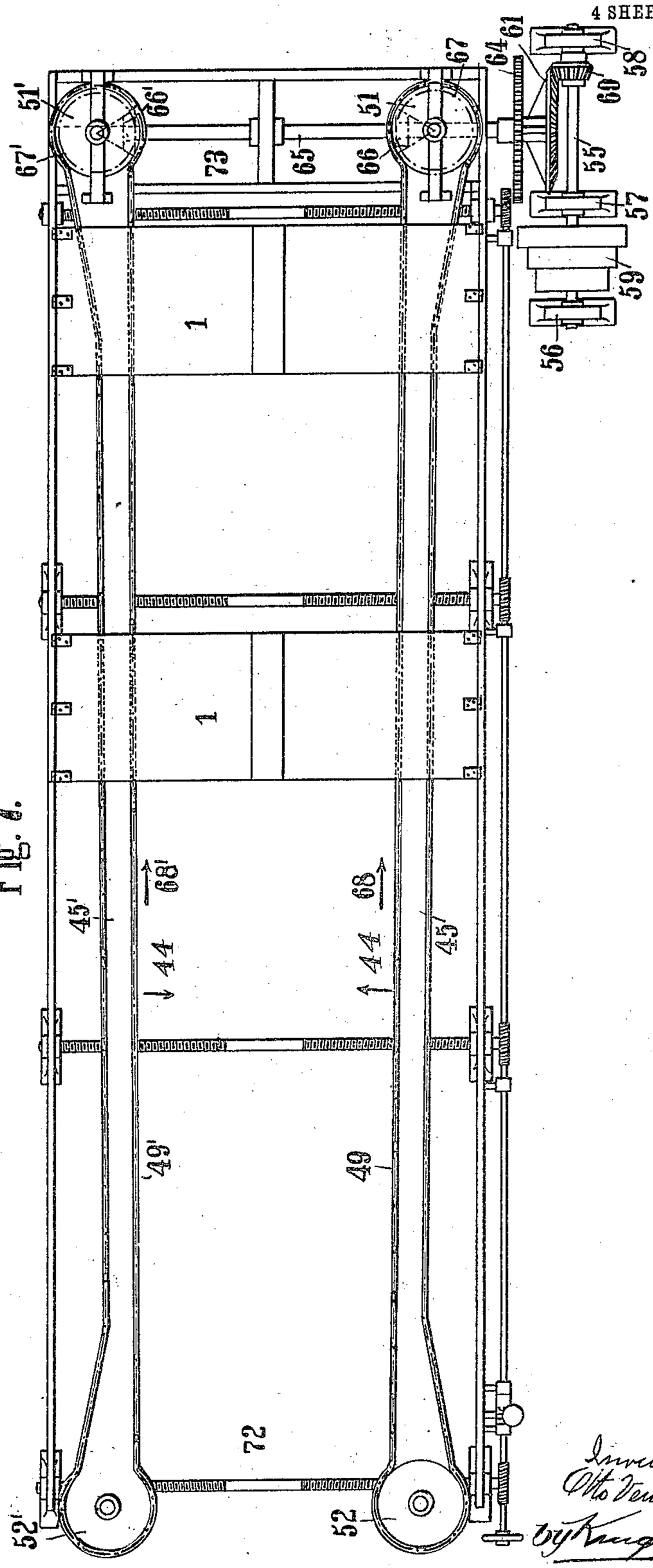
4 SHEETS—SHEET 4.

Fig. 7.



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UNITED STATES PATENT OFFICE.

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APPARATUS FOR REMOVING LYE FROM FABRICS.

934,110. Specification of Letters Patent. **Patented Sept. 14, 1909.**

Application filed October 28, 1907. Serial No. 399,585.

To all whom it may concern:

Be it known that I, OTTO VENTER, a subject of the German Emperor, and residing at Chemnitz, in the Kingdom of Saxony, Empire of Germany, have invented certain new and useful Improvements in Apparatus for Removing Lye from Fabrics Saturated with Soda-Lye, of which the following is the specification.

This invention relates to an apparatus for removing lye from fabrics, which have been saturated with soda-lye, for the purpose of mercerization.

One embodiment of my invention is represented by way of example in the annexed drawings, in which:—

Figure 1 is a vertical cross section through the apparatus on the line A—B of Fig. 2; Fig. 2 is a plan view showing the steam pipes, and Fig. 3 a vertical longitudinal section through the apparatus; Fig. 4 shows partially in side elevation and partially in longitudinal section a pair of mangling rollers in combination with the carrier, and Fig. 5 a plan of the same; Fig. 6 shows on a smaller scale a side elevation of the apparatus in combination with the stretching frame of the mercerization machine, and Fig. 7 a plan of the same; Fig. 8 shows on a larger scale a horizontal section, and Fig. 9 a cross section through the steam-jets; Fig. 10 shows on a larger scale a part of the chain which stretches the fabric in its breadth, whereas Fig. 11 shows also on a larger scale a side elevation of one link of the chain and a cross section through the guide for the chain.

As is clearly shown in the drawings, 1 is a closable box, through which the fabric 2 saturated with lye is passed in the direction of the arrow shown in the drawing. As clearly shown in Fig. 3 two girders 3, 4 are arranged at the sides of the box, on which girders the cross-beam 5 rests. On each of the latter two slides 6, 7 formed as bearing standards are supported, so as to be capable of being shifted and secured, said slides serving to support the lower mangling rollers 8. For this purpose the slides 6 and also the slides 7 are each provided with three rollers 9, 10, 11 by means of which each of the lower mangling rollers is supported securely at both ends.

For the purpose of supplying the steam, steam pipes 12, 13 are provided at the two sides of the box 1, from which pipes the transverse pipes 14 extend through the upper part of the box 1. These transverse pipes 14 at the same time serve as guides for the slides 15, 16; the latter are also arranged so as to be capable of being displaced and secured, and are each provided with two guide-rollers 19, 20 for the purpose of supporting the upper mangling rollers 18. The upper mangling rollers 18 consequently press by means of their own weight on the lower mangling rollers 8 and are prevented from moving laterally out of position by means of the rollers 19, 20. As shown in Fig. 3, the pipes 21 branch off from the steam pipe 12, the branch pipes 23 being connected with said pipes 21. The branch pipes 23 terminate in the perforated steam-jet pipes 24, 25 through which the steam is directed against the back surface of the fabric 2 as clearly shown in Fig. 1. The steam pipes 14 are connected through the connecting pipes 26 with the perforated steam-jet-pipes 27, 28, which serve to direct the steam against the upper or front surface of the fabric. The steam pipes 27 may be suitably varied in length by drawing out or pushing in the parts 30, 31, shown in Fig. 8.

The walls 80, 81 of the box are provided with slots 82. In the slots 82 two girders 35 are disposed parallel to each other. The girders 35 may be shifted in the direction of the arrows 83, 84 (Fig. 2 and Fig. 4.) On the girders 35 the carriers 33 are fastened by means of the flanges 34 (Fig. 4–5). To each of the carriers 33 a bracket or lug 36 are fastened. Every bracket or lug is provided with a slot 85. In the rollers is fastened a screw bolt 38, which is introduced in the slot 85. To each of the girders 35 a bracket or lug 37 is fastened. Every bracket is provided with a slot 86. In each of the lower rollers 8 a screw bolt 39 is fastened, which is introduced in the slot 86. In said manner the rollers 8, 18 are alternately connected with one of the two girders 35.

In Fig. 3 the lines 40, 40′ indicate the ends of the lower roller of the first pair of mangling rollers and the lines 41, 41′ the ends of appertaining upper rollers; the lines 42, 42′ indicate the ends of the lower roller of the other pair of mangling rollers and the lines 43, 43′ the ends of the appertaining upper roller.

The displacement of the girders 35 in the direction of the arrows 44 makes it possible to treat with the mangling rollers fabrics

of different breadth, but the breadth of the fabric must not exceed twice the length of the mangling rollers however.

Referring now to Figs. 6 to 11 45, 45′ is the stretching-frame of the mercerization machine serving as guide for the clamping chains 49, 49′. The chains 49, 49′ engage the sprocket-wheels 51, 52 and 51′, 52′ respectively. 55 is the driving shaft of the machine pivotally mounted in bearings 56, 57, 58 provided with the step pulley 59. Upon the shaft 55 there is mounted the bevel wheel 60 which engages with the bevel wheel 61 of the shaft 62. Upon the shaft 62 there is fastened the spur wheel 63 which engages with the spur wheel 64, the latter being attached to the shaft 65. On the latter there are fixed two bevel wheels 66, 66′ which engage with the two bevel wheels 67, 67′. The two sprocket wheels 51, 51′ are rigidly connected with the bevel wheels 67, 67′ so that they rotate with the same and thus move the chain in the direction of the arrows 68, 68′. The chains 49, 49′ consist of the links 74 (Fig. 10) which are connected by means of the pins 75. Each link of the chain is provided at 76 with a weighted lever 77 the end of which presses the fabric at 70 against the part 78 and thus firmly holds the same, as clearly shown in Fig. 11.

As at the in-coming end of the machine, *i. e.* at 72, the distance between the two chains 49, 49′ is less than at the out-going end, *i. e.* at 73, the fabric will be stretched in breadth when it passes through the stretching frame of the mercerization machine in the direction of the arrows 68, 68′.

The mode of operation of the apparatus according to the present invention is as follows:—When the fabric 2 passes through the receptacle 1 in the direction of the arrows 68, 68′ (Fig. 7) steam is directed by the steam-jet pipes 24, 25 and 27, 28 against both sides of the fabric. At the same time the fabric is stretched in breadth by the chains 49, 49′. On account of the action of the steam the soda-lye is diluted and at the same time heated to such a high temperature that the fabric is able to leave the stretching frame without shrinking. Owing to the fabric being stretched in breadth the steam can more easily penetrate the fabric and remove the lye. The condensed water collects with the lye at the bottom of the receptacle 1 and can then be removed from the same for the purpose of being further treated. The pair of the mangling rollers 8, 18 may be displaced one toward the other in the direction of their axis according to the breadth of the fabric to be treated. For this purpose the girders must be displaced in the slots 82 in direction of the arrows 83, 84 (Fig. 2 and Fig. 4) with the mangling rollers being connected with them. According to the displacement of the pairs of mangling rollers the slides 6, 7 of each of the lower rollers must be displaced on the beams 5 as well as the slides 15, 16 of each upper roller on the pipes 15.

I am aware that machines are known in which fabrics pass between a series of rollers, steam being supplied to and forcing its way through the fabric for the purpose of cleaning the same. I therefore do not claim such means broadly, as the same have been used heretofore in washing machines. In accordance with my invention such means are employed directly upon, and in combination with, the stretching frame of a mercerizing machine, and the fabric is therefore able to leave the stretching frame without shrinking, and

What I claim is:—

1. In apparatus of the type described, the combination, with a stretching frame adapted to carry and stretch the fabric, of a box inclosing part of said stretching frame, a plurality of pairs of rollers in said box between which the fabric can pass while being stretched, and means in said box for conducting steam against the fabric passing through said mangling rollers.

2. In apparatus of the character described the combination, with a girder, of a bracket thereon, a roller mounted with one end pivoted in said bracket, a carrier on said girder, a bracket on said carrier, and an upper roller mounted with one end pivoted in the latter bracket, the pivoted end of the upper roller being opposed to the pivoted end of the lower roller.

3. In apparatus of the character described, the combination, with a girder, of a bracket thereon, a roller mounted with one end pivoted in said bracket, a carrier on said girder, a bracket on said carrier, and an upper roller mounted with one end pivoted in the latter bracket, the pivoted end of the upper roller being opposite to the pivoted end of the lower roller, a slide carrying three rollers for supporting the lower roller, and a slide carrying two rollers for securing in position the upper roller.

In witness whereof I have hereunto set my hand in presence of two witnesses.

OTTO VENTER.

Witnesses:
KARL VOPEL,
DUPIL H. KOUJELANY.