A. E. HAWLEY, P. F. CROSLAND AND F. G. DIXON.

MACHINE FOR MERCERIZING HOSE AND OTHER KNITTED FABRICS.

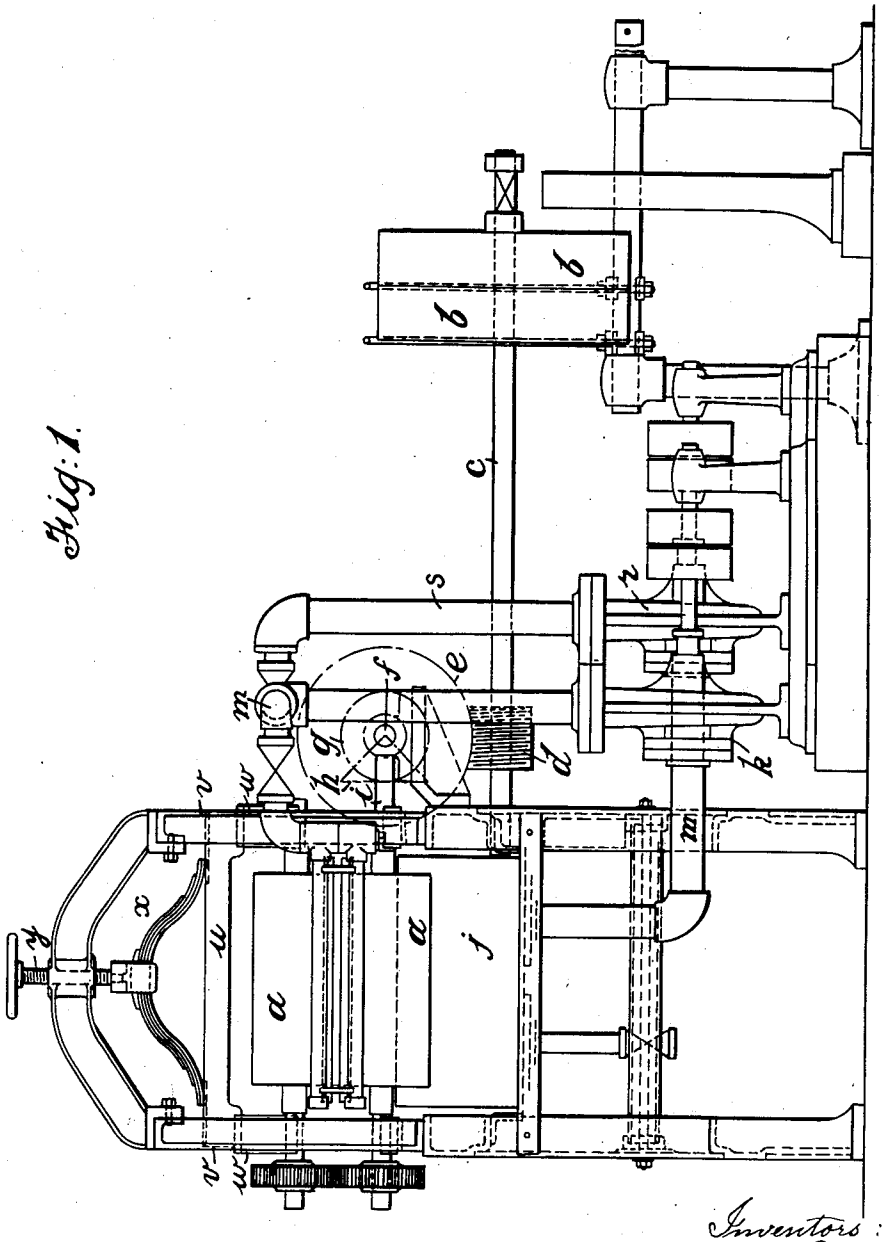
APPLICATION FILED JAN. 5, 1920.

1,400,159.

Patented Dec. 13, 1921.

3 SHEETS—SHEET 1.

Fig. 1.



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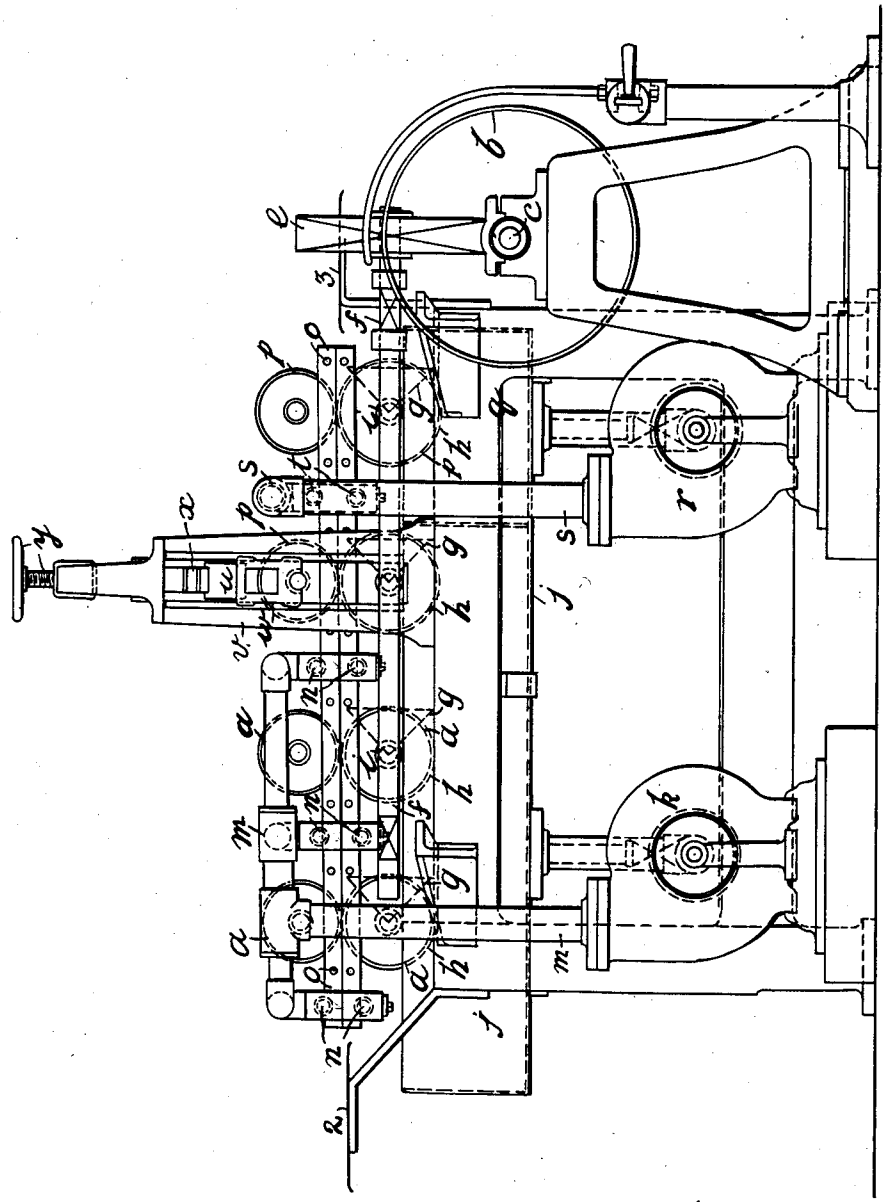
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3 SHEETS—SHEET 2.

Fig. 2.



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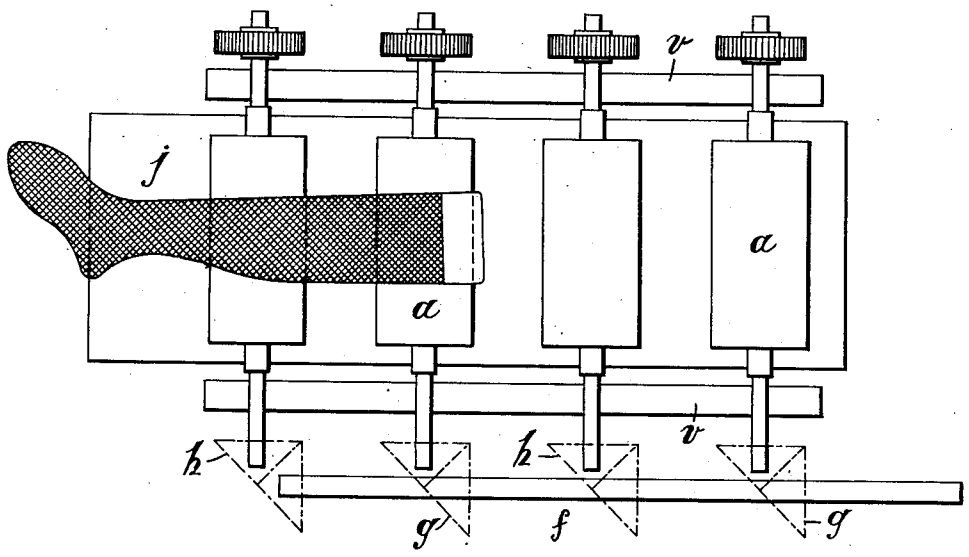
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3 SHEETS—SHEET 3.

Fig: 3.



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UNITED STATES PATENT OFFICE.

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MACHINE FOR MERCERIZING HOSE AND OTHER KNITTED FABRICS.

1,400,159. Specification of Letters Patent. Patented Dec. 13, 1921.

Application filed January 5, 1920. Serial No. 349,549.

(GRANTED UNDER THE PROVISIONS OF THE ACT OF MARCH 3, 1921, 41 STAT. L., 1313.)

To all whom it may concern:

Be it known that we, ALFRED ERNEST HAWLEY, PERCY FIELD CROSLAND, and FRANCIS GRAHAM DIXON, subjects of the King of Great Britain and Ireland, and residents of Hinckley, in the county of Leicester, Halifax, in the county of York, and Cheadle Hulme, in the county of Chester, England, respectively, have invented certain Improvements in Machines for Mercerizing Hose and other Knitted Fabrics, (for which we have filed an application in England, Oct. 10, 1918, Patent No. 133,441,) of which the following is a specification.

This invention relates to improvements in machines for mercerizing hose and similar knitted or woven goods, the object being to provide means for continuously taking the hose through a continuous operation in which they may be treated with the mercerizing and washing agents.

Our invention will be fully described with reference to the accompanying drawings which show one form of a machine constructed in accordance with our invention and in which,

Figure 1 is a front elevation of the machine and

Fig. 2, side elevation of same.

Fig. 3 is a detail plan view of certain of the rollers, drawn to a larger scale, and showing a suitable form resting on the rollers and having a stocking stretched over it.

With the aforesaid objects in view, our invention consists essentially in the employment of stretching forms or plates upon which the hose are mounted so that they may retain their shape, the plates being made of metal or other suitable material and of substantially the same shape as the forms on which hose are sometimes placed during drying operations, that is to say, the forms are flat and substantially similar to the outline of the leg and foot. The hose are stretched on these forms, being drawn down tightly from the toes and feet portion, but the upper ends of the hose are left perfectly free. The leading feature of our invention consists of a machine through which the forms supporting the stockings can be passed, the characteristic features of this machine consisting of a plurality of pairs of squeezing rollers *a* arranged at such a distance apart that the form, and likewise the hose upon it, after leaving the first nip, are always being gripped by two pairs of rollers while being treated with the mercerizing or washing agent. Each of the pairs of rollers can be driven at different superficial speeds so that the hose is being held and stretched longitudinally on the form while passing forward through the series of squeezing rollers, and consequently the fibers can resist any contracting action and recover any shrinkage due to the action of the mercerizing agent upon them.

As an example of the gear drive, *b* is a pair of fast and loose pulleys mounted upon shaft *c*, on which is also fixed a worm *d* driving a worm wheel *e* mounted upon side shaft *f* which, in turn, carries bevel gears *g* driving similar gears *h* fixed on the shafts *i* of the lower rollers of the pairs *a*.

The pairs of rollers *a* are mounted in suitable bearings in the machine frame, the upper rollers being adjustable vertically, if desired. If necessary also each pair of rollers may be adjustable in a horizontal direction with relation to the other pair, to vary the distance between them where the hose or forms are of varying length. Any number of pairs of rollers may be employed in accordance with the character of the treatment to which the goods are to be subjected.

Below the rollers we arrange a caustic tank *j* to which the caustic soda liquor or other agent is supplied by convenient liquid circulating means, such for instance as a centrifugal pump *k* and pipes *m*, the liquid being delivered to spraying pipes *n* arranged near to or between the pairs of rollers *a*, such pipes being adapted to spray the liquid upon the upper and lower sides of the hose as they pass through the machine.

In conjunction with the rollers *a* we employ a series of transverse and lateral guides *o* for guiding the hose forms in their passage between the rollers. Resilient or other pressure devices may be employed to exert the necessary pressure through rollers *a* upon the goods to express the superfluous liquor and to take them through the rollers.

The further features of the machine comprise the employment of a plurality of pairs of squeezing rollers *p* commencing with the last pair of the rollers *a* over the caustic

tank *j*, such further series of rollers being arranged in conjunction with one or a plurality of hot or cold water tanks *q* from which water can be circulated by means of a pump *r* and pipes *s*, some of the latter of which *t* are designed to spray the water on both sides of the goods as they pass between the squeezing rollers in order to facilitate the washing process of the hose.

The rollers in the washing portion of the machine may or may not have any draft between them. As in the former case these latter rollers are suitably driven and provided with means for adjusting the pressure. These consist of a cross bar *u* in frame *y* resting upon the bearing blocks *w* of the upper squeezing roller, and the bar being kept up to its work by spring *x* adjusted by hand wheel and screw *y*.

The machine is provided with a feed table 2 at one end and a delivery table 3 at the other.

What we claim and desire to secure by Letters Patent is:—

1. Means for mercerizing and washing hose and similar knitted or woven goods, said means comprising stretching forms or plates on which the goods are mounted, and a series of pairs of rollers between which pairs of rollers the forms are passed, each succeeding pair of rollers being driven at a greater peripheral speed than the preceding pair whereby the goods on the forms are firmly held or stretched while being subjected to the action of the mercerizing agent.

2. Means for mercerizing and washing hose and similar knitted or woven goods, said means comprising stretching forms or plates on which the goods are mounted, a series of pairs of rollers between which pairs of rollers the forms are passed, each succeeding pair of rollers being driven at a greater peripheral speed than the preceding pair whereby the goods on the forms are firmly held or stretched, tanks containing the treating agent, and pipes adapted to spray the treating agent on both sides of the goods on the formers as they pass through the apparatus.

3. Means for mercerizing and washing hose and similar knitted or woven goods, said means comprising stretching forms or plates on which the goods are mounted, a series of pairs of rollers between which pairs of rollers the forms are passed, each succeeding pair of rollers being driven at a greater peripheral speed than the preceding pair whereby the goods on the forms are firmly held or stretched, and transverse and lateral guides for directing the forms upon which the goods are mounted through the series of pairs of rollers.

In testimony whereof we have hereunto set our hands in the presence of witnesses.

ALFRED ERNEST HAWLEY.

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