April 28, 1925. 1,535,251

C. H. RAMSEY ET AL

APPARATUS FOR TREATING FABRICS WITH LIQUIDS

Filed July 13, 1923 2 Sheets-Sheet 1

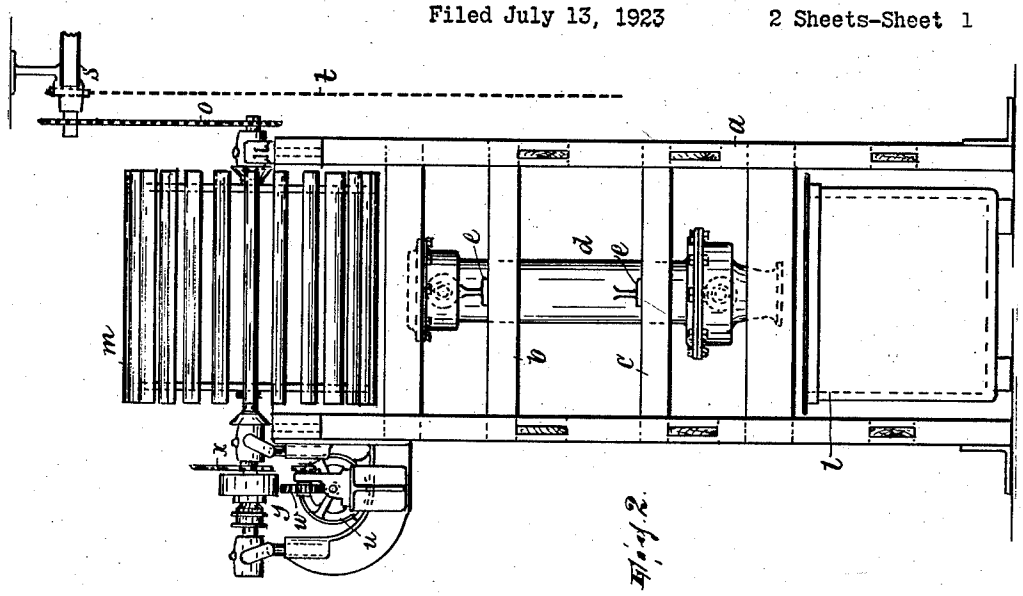


Fig. 2.

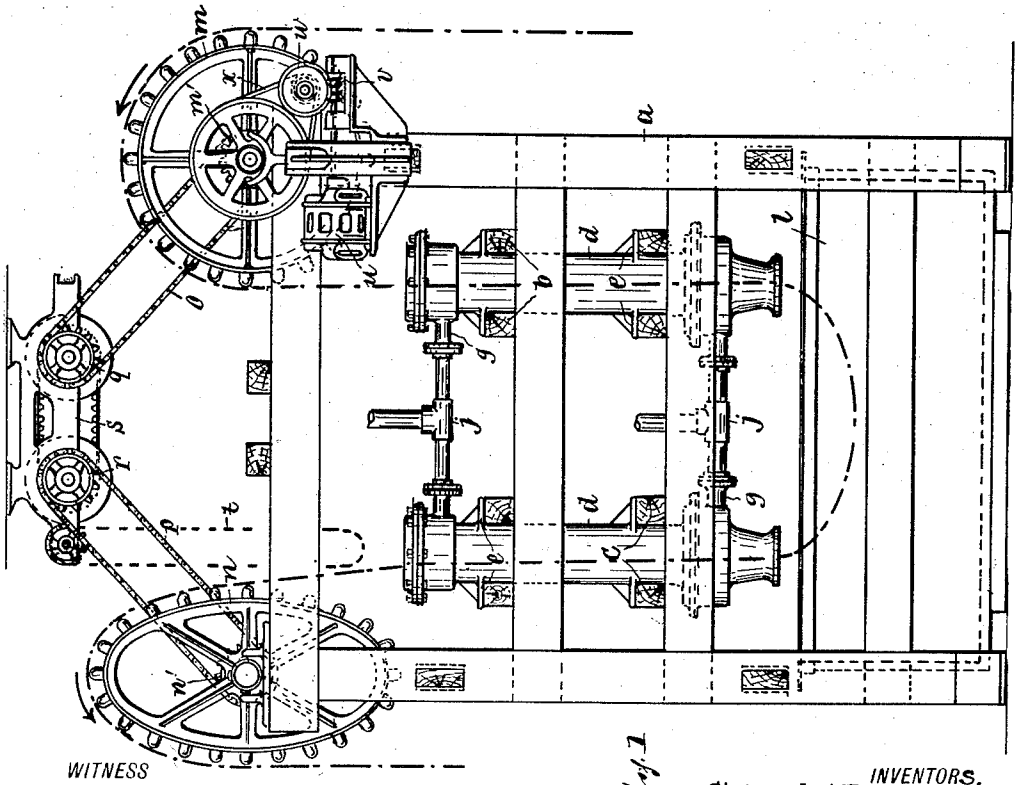


Fig. 1.

WITNESS

Wm. Ball

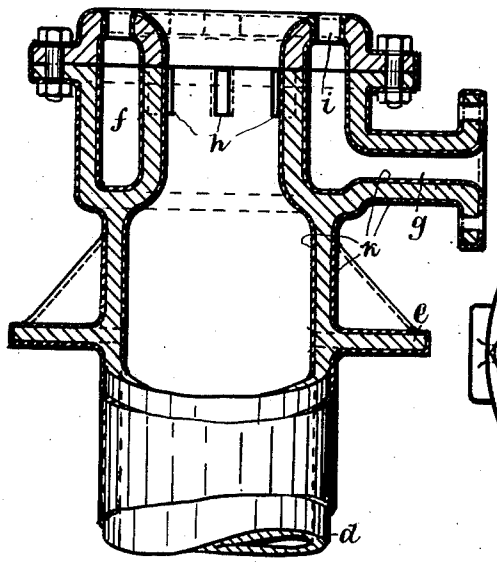
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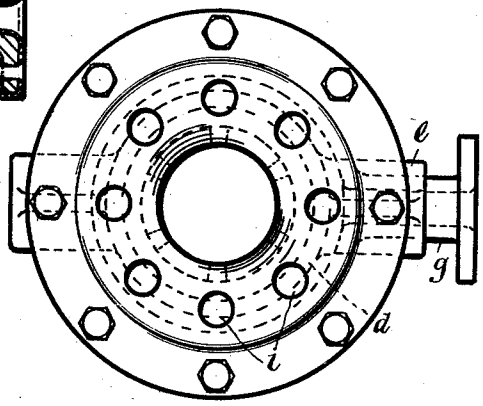
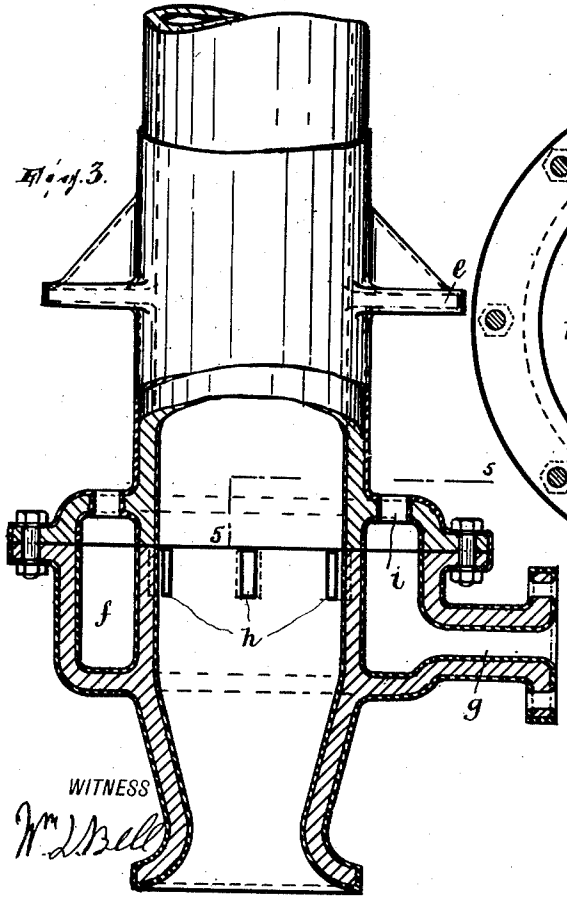


Fig. 4.

Fig. 3.



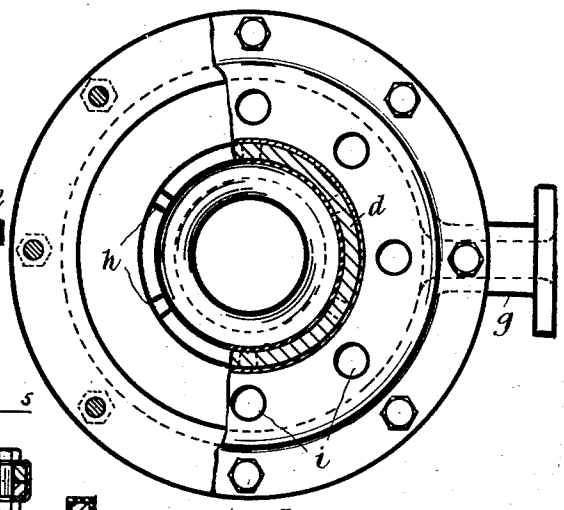


Fig. 5.

WITNESS

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UNITED STATES PATENT OFFICE.

CLIFFORD H. RAMSEY, OF GLEN ROCK, AND ARTHUR C. MASKERY, OF PATERSON, NEW JERSEY, ASSIGNORS TO MORRISON MACHINE COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

APPARATUS FOR TREATING FABRICS WITH LIQUIDS.

Application filed July 13, 1923. Serial No. 651,363.

To all whom it may concern:

Be it known that we, CLIFFORD H. RAMSEY and ARTHUR C. MASKERY, citizens of the United States, residing at Glen Rock, Bergen County, New Jersey, and Paterson, New Jersey, respectively, have invented certain new and useful Improvements in Apparatus for Treating Fabrics with Liquids, of which the following is a specification.

This invention relates to apparatus for treating fabrics and other attenuated textile materials with liquids, being designed especially for washing fabrics, as fabrics which have been subjected to a weighting solution and require to have the solution eliminated therefrom. The principal object of the invention is to provide an apparatus in which the treatment may be expeditiously and thoroughly performed without chafing the material being treated and without any possibility of its being discolored by contact with any part of the apparatus.

In the drawings,

Fig. 1 is a front elevation of the apparatus;

Fig. 2 is a side elevation thereof;

Fig. 3 shows one of the nozzles or tubular conductors on a larger scale, partly in section;

Fig. 4 is a plan of said conductor; and

Fig. 5 is a sectional view on line 5—5 of Fig. 4.

a is a rectangular frame having two spaced pairs of upper beams *b* and two spaced pairs of lower beams *c* extending transversely. Each upper pair and lower pair of these beams support a vertically arranged tubular conductor or nozzle *d* constructed as follows:

Each conductor or nozzle is a tube of cast-metal having brackets *e* whereby it is made to rest on the pairs of beams *b c*, and at its upper and lower portions it has annular chambers *f* to which the liquid is adapted to be supplied by tubular radial extensions *g* (which may be flanged as shown for connecting them with liquid supply means) and from which the liquid is adapted to be delivered radially into the bore of the tube through delivery orifices *h* arranged at regular intervals around the chamber; each chamber also has at the top an annular series of vents *i*, open directly to the atmosphere. The tube, for the purpose of facilitating the casting thereof, may be formed in sections, as shown in Fig. 3. The said liquid supply means is shown at *j*. All surfaces of the tube that are exposed are covered, as shown in Fig. 3, with a shell or layer *k* of some substance that is not appreciably subject to corrosion by the substances coming into contact with it, the product of which corrosion might discolor the fabric being treated; this is especially needed where chloride of tin is the substance to be removed from the fabric, and where such a substance is present we prefer to coat the tube with vulcanized rubber, on which chloride of tin has practically no effect.

Under the two conductors is placed a vat *l* to collect the liquid which falls therefrom.

The material to be treated is passed through the two conductors, down through one and up through the other, in the form of an attenuated flexible piece. If it is a fabric which has been weighted in a weighting solution it has this form because while wet with the weighting solution it is massed transversely into what is known in the art as a "rope." It is kept advancing by a feeding reel *m* and a take-up reel *n* which are journaled in the frame *a* above the two conductors and which have peripheral wooden slats, as shown, over which the rope extends. (The take-up reel is preferably formed elliptical, as shown in Fig. 1, so that it will lay the rope as delivered on some horizontal surface in back and forth folds). The reels are geared together in some way so that the speed of one may be varied with reference to that of the other as by connecting the reel *n* with the reel *m* by power-transmitting means shown in Fig. 1 as endless sprocket chains *o* and *p* extending around the sprocket wheels *m' n'* on the reels and also around sprocket wheels *q* and *r* forming rotary parts in a variable speed transmission means *s* which is subsubject to manual control by a means *t*; the details of this variable speed transmission means are not shown because such devices are well known in the art, but we refer to the one known as the Reeves variable speed transmission as well suited to our purpose. It is necessary to keep either reel from overrunning the other with the effect of either producing a diminishing or increase of the bight of rope depending from the two con-

ductors, such diminishing of the bight leading to chafing of the rope on the lower ends of the conductors and the increase of the bight leading to the rope either chafing on the bottom of the tank or dipping into the liquid, which latter in certain cases might prove undesirable since the fabric would thereby take up again some of the substance that had been washed off. With the variable speed transmission means present and subject to manual control, as by the means *t*, the attendant can always maintain the proper extent of the bight. The power to rotate the reels may be applied to either reel, being here afforded by an electric motor *u* mounted on frame *a* and having a worm *v* on its shaft which is in mesh with a worm-wheel *w* which through a sprocket-and-chain connection *x* drives the reel *m*, preferably through the medium of a clutch *y* shown in Fig. 2.

In operation, and assuming that the treatment is to be the washing of the fabric, the latter is first extended over the reel *m*, then down through the right-hand conductor and up through the left-hand conductor, and then over the reel *n*, its position being generally indicated by the dot-and-dash line in Fig. 1. The means to rotate the reels is then started and the washing water allowed to flow to the two conductors from the supply means *j*. It first enters each of the chambers *f* and then is delivered therefrom, radially, through the orifices *h* into the bores of the conductors and against the fabric. It is desired in many instances, as where the fabric is delicate in texture, that the streams of water flowing from the orifices should be copious but not squirted, so that the fabric will be well soaked with the water without its being perhaps injured by the force of the water jets; hence the orifices are formed rather large and the vents *i* permit the attendant to determine the force that the inflowing water is exerting against the fabric and adjust the flow accordingly. The washing water of course falls into the vat carrying with it the substance (as chloride of tin) which it has washed from the fabric. As the fabric is being advanced through the two conductors while it is being washed in this way in each it not only receives a double washing, first at one point and then at another, but since it moves down through one conductor and up through the other particles of the substance which is to be removed therefrom by the washing which might be displaced downwardly in the first conductor only to lodge at a new place on the fabric later undergo displacement in the relatively opposite direction in the second conductor, which of course augments the elimination of the substance. When the depending bight in the farbric tends to tauten to such an extent that it would rub on and thus become chafed by the lower ends of the conductors, or to increase to an extent where it would trail on the bottom of the vat *l* or (which may not be desirable in some cases) dip into the liquid in the vat, which sooner or later becomes more or less charged with the substance that has been washed from the fabric, the attendant varies the relative speeds of the feeding and take-up means as already explained.

One important feature of our invention is the provision of guiding means for the flexible attenuated material to be advanced and treated with liquid, the material being adapted to have a portion thereof hang substantially pendent therefrom while it is being advanced, together with a passaged conductor extending substantially vertically with its passage in position to receive said pendent portion and having means to admit to its passage liquid for treating said material, whereby the fabric may be adapted to be moved through said passage with the least amount of rubbing against the conductor or other undue violence and without wiping over surfaces on which there might find lodgment substances that would discolor or mar the material.

While the invention has been specifically designed for washing fabrics, it is to be understood that it may be applied to other liquid treatments of flexible attenuated materials.

Having thus fully described our invention, what we claim and desire to secure by Letters Patent is:

1. In combination, with guiding means for the flexible attenuated material to be advanced longitudinally and treated with liquid, said material being adapted to have a portion thereof hang substantially pendent from the guiding means while the material is advanced, a passaged conductor extending substantially vertically with its passage in position to receive said pendent portion and formed to contain the same freely therein and having means to admit to its passage and against the pendent part of the material liquid for treating said material.

2. In combination, with rotary means for advancing longitudinally the flexible attenuated material to be treated with liquid, said material being adapted to have a portion thereof hang substantially pendent from said rotary means while being advanced, a passaged conductor extending substantially vertically with its passage in position to receive said pendent portion and formed to contain the same freely therein and having means to admit to its passage and against the pendent part of the material liquid for treating said material.

3. In combination, a substantially straight tubular conductor having means to admit liquid to its bore and through whose bore the flexible attenuated material to be treated

is adapted to be advanced longitudinally, and means exterior of the bore to guide the material, while being advanced through the bore, in a path in which it will move substantially without contact with said bore.

4. In combination, a substantially straight tubular conductor having means to admit liquid to its bore, and means exterior of the bore to advance through the same substantially without contact with the interior thereof the flexible attenuated material to be treated.

5. In combination, a pair of passaged conductors having their passage-axes upright and being adapted to receive the upstanding portions of the depending bight of the flexible attenuated material to be advanced longitudinally and each having means to admit to its passage liquid to treat the materal while being advanced, and separate means over said conductors from which said bight hangs.

6. In combination, a pair of passaged conductors having their passage-axes upright and being adapted to receive the upstanding portions of the depending bight of the flexible attenuated material to be advanced longitudinally and each having means to admit to its passage liquid to treat the material while being advanced, and separate means to advance said material arranged over said conductors and from which said bight hangs, one of said means arranged to deliver the material down to one conductor and the other to draw it up from the other conductor.

7. In combination, a pair of passaged conductors having their passage-axes upright and being adapted to receive the upstanding portions of the depending bight of the flexible attenuated material to be advanced longitudinally and each having means to admit to its passage liquid to treat the material while being advanced, separate means to advance said material arranged over said conductors and from which said bight hangs, one of said means being arranged to deliver the material down to one conductor and the other to draw it up from the other conductor, and means to vary at will the relative advancing speeds of said means.

In testimony whereof we affix our signatures.

CLIFFORD H. RAMSEY.
ARTHUR C. MASKERY.