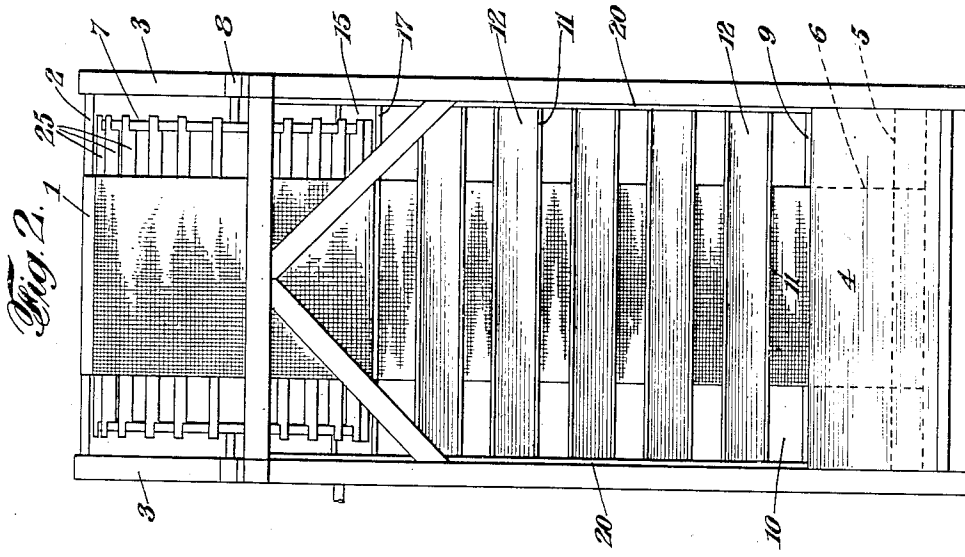
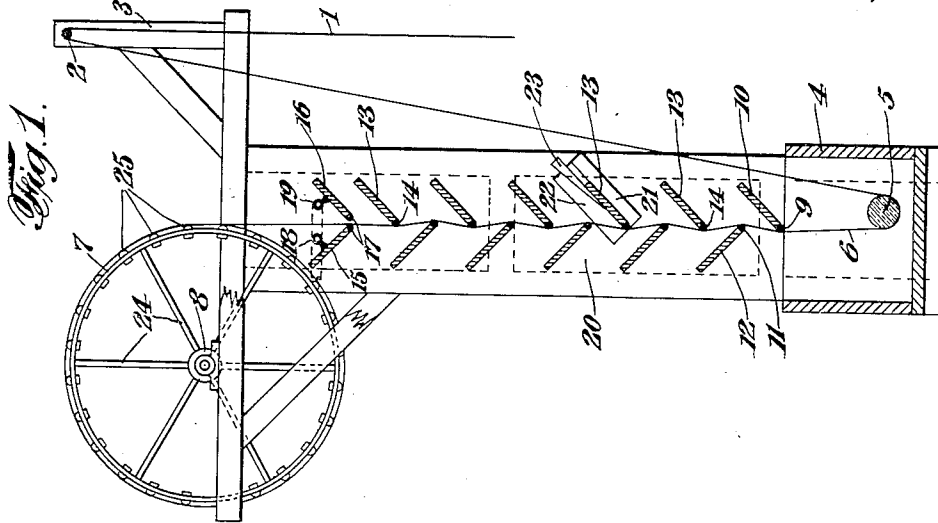


A. RAU.
CLOTH HANDLING DEVICE.
APPLICATION FILED FEB. 5, 1921.

1,398,043.

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ALBERT RAU, OF CLIFTON, NEW JERSEY, ASSIGNOR TO UNITED PIECE DYE WORKS, INC., A CORPORATION OF NEW JERSEY.

CLOTH-HANDLING DEVICE.

1,398,043.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ALBERT RAU, a citizen of the United States, residing at Clifton, county of Passaic, and State of New Jersey, have invented certain new and useful Improvements in Cloth-Handling Devices, of which the following is a specification.

This invention relates to cloth handling devices and is herein described as embodied in an apparatus adapted to wash or dye silks, and is more particularly described as one adapted to wash chiffons. In handling many kinds of cloth, especially cloth which is light in weight and light in color, such as light colored silk chiffons, it has been found difficult to effect washing and dyeing without producing streaky goods, due to the fact that the cloth tends to fold over on itself, or tends to direct the washing or dyeing waters in definite streams, with the result that streaks are produced, depending on the direction and force of the streams.

In the endeavor to overcome these and other difficulties, it has hitherto been usually found necessary to employ very large volumes of water, especially for washing purposes, with consequently great expense for water and often for power. According to the present invention these and other difficulties are avoided by washing the goods or dyeing them in a counter-current stream, especially by carrying the goods upwardly through a stream or past a stream which is flowing downwardly and at the same time carrying the goods in contact with smooth edges, which under some circumstances may bend the goods back and forth more or less, with the result that the relative tension of the threads and fibers changes conducing to the thorough washing of the goods.

In the accompanying drawing,

Figure 1 is a side view of an apparatus found suitable for washing chiffon, many parts being broken away or only partly shown.

Fig. 2 is a similar face view of the same. The silk chiffon or other goods in piece form 1 is drawn over a bar 2, such as $1\frac{1}{2}$ -inch diameter glass rod, suitably supported in a frame 3 and is carried down in a nearly straight stretch into a tub 4 beneath a suitable guide or bar 5 extending across the tub and preferably of glass or other exceedingly smooth material such as smooth brass.

The cloth runs upward at 6 after passing

under the guide or rod 5, being drawn upward by winding it upon a suitable reel 7 at the top of the device and carried in journals 8 at the opposite end of the frame 3. As the goods 1 are drawn upward by being wound upon the reel 7 they pass upward, and are somewhat stretched over a glass rod 9 which may be one inch in diameter and forms the edge of a deflector 10 which may be mounted at any suitable angle, such as 45 degrees, so that water falling upon it or flowing across it is thrown downward to its edge 9 against the stretch 6 of the goods. This may bend the goods slightly to one side. The goods then pass upwardly to a second edge 11 which may be a glass rod one inch in diameter, like the edge 9, and form the lower edge of a deflector 12, standing at a similar angle and tending to throw against the goods 6 water flowing upon it. The goods then pass upwardly to other deflectors 13 having similar edges 14, each deflector usually being so positioned that the goods are bent slightly over it because the cloth in passing from the deflector below to the deflector above is bent out of a straight path by the edge 14.

Above the topmost deflector 14 is a special deflector 15 facing a similar special deflector 16, each having preferably a glass rod edge 17, the two deflectors 15 and 16 forming a funnel device into which water is sprayed against the sides 15 and 16, respectively, by pipes 18 and 19 so that the spray falls against the 45 degree angle faces of the special deflectors 15 and 16 and flows down against the upwardly moving cloth. The water in flowing downwardly against the cloth washes it thoroughly with clean water at this point and then flows down past the successive deflectors 14 arranged oppositely and offset to each other, like the deflectors 10 and 12 so that the water finally reaches the tub 4.

It is found that in washing a light weight and light colored chiffon, eleven deflectors 10, 12, 13, etc., thoroughly wash the fabric clean in a height of some nine or ten feet, the goods running thirty yards per minute. The water supply with such a fabric was found to work satisfactorily if the spray was adjusted to feed water at such a rate that one-quarter inch depth, or possibly a little more, is intermittently backed up on each of the lower deflectors against the face of the goods.

It has been found that it is entirely unnecessary to adjust the spray for the width

of the goods, since a spray extending across the entire device adapted to scour, wash, or dye 54-inch goods has been found to work equally well on narrow goods no more than 28 inches wide, because for some reason the water seems to tend to flow upon the deflectors toward the goods and thus wash them thoroughly even though the goods are narrow compared with the width of the device. It is found that with different weights and kinds of goods the amount of bending at the edges 9, 11, 14, etc., should be varied according to the character of the goods if the best results are to be obtained, and to enable such variation in the position of the edges the end walls 20 of the washing device may be provided with battens 21 upon which the deflectors 10, 12, 13, etc., are adapted to rest and against which they may be wedged in place because battens 22 are provided against which wedges 23 are adapted to bear when driven in between the deflectors 13 and the battens 22.

The reel 7 may be built with spokes 24 and face slats 25 and be driven in any suitable manner. It is found that where the reel is driven to draw the cloth to be washed at the rate of thirty yards a minutes, the cloth is washed about as efficiently as if carried through ninety-six hundred yards of water in the form of a still bath.

The device has been found to work satisfactorily for dyeing and has been found for some purposes to be more satisfactory if the glass rods or surfaces are replaced by some other material, especially a non-fibrous glassy material like rounded brass plates. The baffles 10, 12, 13, etc., may be made of wood $\frac{3}{4}$ -inch thick and 10 inches across. The water running off into the tub 4 is utilized in any suitable manner and under some circumstances has been found even suitable for washing a second time when the device is used for washing, and may be circulated continuously if it is used as the dye solution when dyeing is being done.

Having thus described one embodiment of my invention, what I claim is:

1. The combination with means for drawing cloth upward, of means for feeding water against the cloth near the top of its run so that it may flow downward along the upwardly moving cloth, fixed edges by which the cloth is guided so that it is diverted from a straight line in both directions, and fixed deflectors extending from the edges for bringing the down-flowing water against the cloth from each side.

2. The combination with means for drawing cloth upward, of means for feeding water against the cloth near the top of its run so that it may flow downward along the upwardly moving cloth, and oppositely facing fixed deflectors offset from each other and adapted to bear against the opposite faces

of the cloth as it is drawn upward and adapted to bring the down-flowing water against the cloth on both sides.

3. The combination with means for drawing cloth upward, of means for feeding water so that it may flow downward along the upwardly moving cloth, and deflectors offset from each other adapted to bear against the opposite faces of the cloth as it is drawn upward and inclined to cause the down-flowing water to flow against the cloth.

4. The combination with means for drawing cloth upward, of means for feeding water against the cloth near the top of its run so that it may flow downward along the upwardly moving cloth, fixed edges by which the cloth is guided so that it is diverted from a straight line in both directions, deflectors extending from the edges for bringing the down-flowing water against the cloth on both sides, and non-fibrous smooth faces on the edges against which the cloth bears.

5. The combination with means for drawing cloth upward, of means for feeding water against the cloth near the top of its run so that it may flow downward along the upwardly moving cloth, oppositely facing fixed deflectors offset from each other adapted to bear against the opposite faces of the cloth as it is drawn upward and adapted to bring the down-flowing water against the cloth on both sides, and non-fibrous smooth edges on the deflectors against which the cloth bears.

6. The combination with means for drawing cloth upward, of means for feeding water so that it may flow downward along the upwardly moving cloth, deflectors offset from each other adapted to bear against the opposite faces of the cloth as it is drawn upward and inclined to cause the down-flowing water to flow against the cloth, and non-fibrous smooth edges on the deflectors against which the cloth bears.

7. The combination with a tub, of a guide in the tub beneath which a length of cloth is adapted to be carried, a second guide above the tub over which the cloth is drawn down to the first guide, offset fixed edges spaced apart above the tub so that the cloth rising from the first guide passes between them and bears against one or the other of them with each of its faces, deflectors forming extensions of said edges adapted to direct down-flowing water against both sides of the cloth, means for feeding water to the top deflectors so that the down-flowing water flows against the cloth, and means for drawing the cloth upwardly.

8. The combination with a tub, of a frame above the tub, inwardly facing sloping fixed deflectors in said frame between which a cloth is adapted to be drawn upward so that it bears against the deflectors on both sides and down-flowing water is directed against both sides of the cloth, highly polished non-

fibrous edges on the deflectors against which the cloth bears, and water feeding devices at the top deflectors adapted to deliver water so that it flows downwardly over the upwardly moving cloth.

9. The combination with a tub, of a frame above the tub, inwardly facing sloping fixed deflectors in said frame between which a cloth is adapted to be drawn upward so that it bears against the deflectors on both sides and down-flowing water is directed against both sides of the cloth, and bends slightly over each deflector, highly polished non-fibrous edges on the deflectors against which the cloth bears, and water feeding devices at the top deflectors adapted to deliver water so that it flows downwardly over the upwardly moving cloth.

10. The combination with a tub, of a frame, offset inwardly sloping deflectors between which a length of cloth is adapted to be drawn upward from the tub so that it bends first over one deflector and then over another backing up downwardly flowing water upon each deflector, and guides at the top forming a funnel between which the cloth is drawn out, and which are adapted to flow water against the cloth.

11. The combination with a tub, of a frame, offset inwardly sloping deflectors between which a length of cloth is adapted to be drawn upward from the tub so that it bends first over one deflector and then over

another backing up downwardly flowing water upon each deflector, guides at the top forming a funnel between which the cloth is drawn out, and which are adapted to flow water against the cloth, non-fibrous polished edges for the deflectors, and guides over which the cloth bends.

12. The process of washing cloth which consists in drawing it upwardly against a downwardly flowing stream of water, and bending the cloth oppositely at intervals around smooth edges as it passes the stream of water so that the water backs up first on one side of the cloth and then on the other.

13. The process of washing cloth which consists in drawing it upwardly against a small downwardly flowing stream of water continually directed against it on both sides, and bending the cloth oppositely at intervals around fixed smooth edges where the water is directed against it, so that the cloth is bent first to one side and then to the other while thoroughly wetted by flowing water on both sides.

14. The combination with means for drawing cloth along, of devices for repeatedly feeding a body of water to the opposite faces of the cloth, so that it intermittently backs up against the cloth on both sides thereof.

In testimony whereof I have affixed my signature to this specification.

ALBERT RAU.