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F. FISCHER

DYEING AND SIMILAR MACHINE

Filed Oct. 20, 1925

Fig. 1.

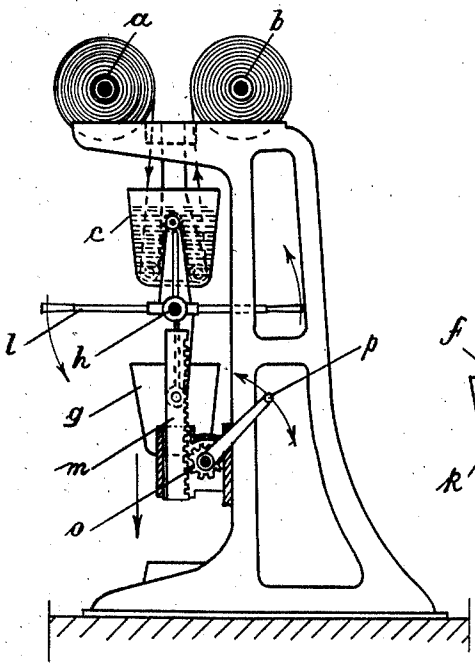


Fig. 2.

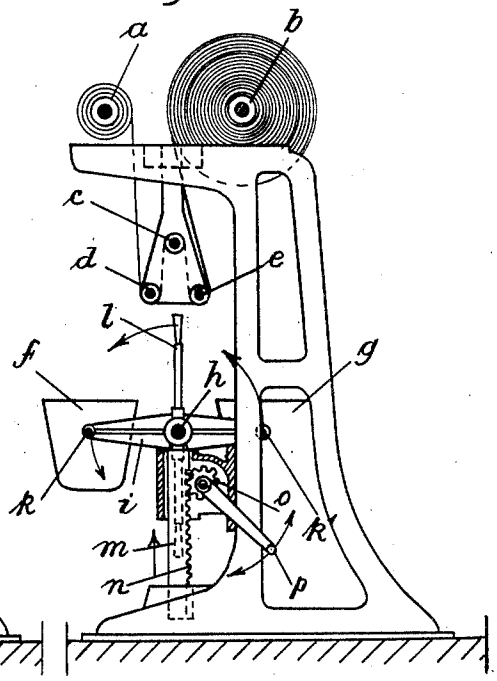
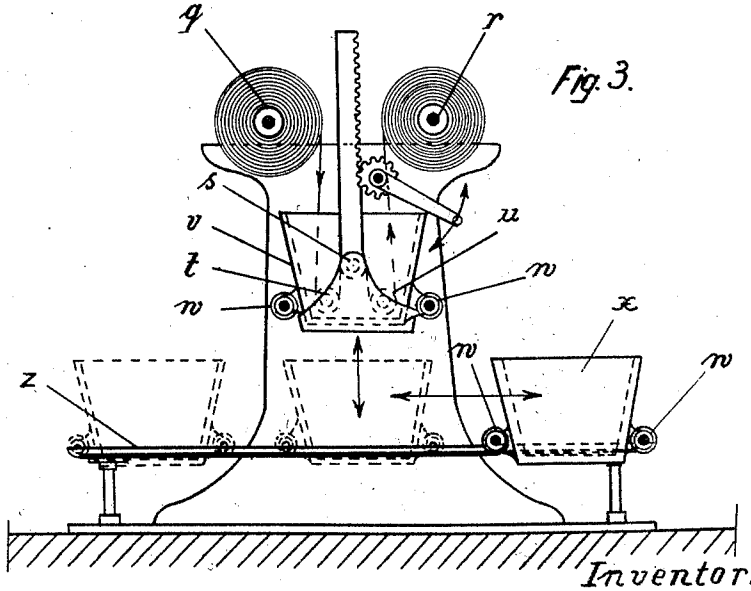


Fig. 3.



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UNITED STATES PATENT OFFICE.

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DYEING AND SIMILAR MACHINE.

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This invention has reference to machines for the treatment of yarn and other fabrics, leather and the like with liquids for dyeing, sizing, bleaching and similar treatments and it is intended to faciliate and accelerate the process of manufacture and to improve the qualities of the goods obtained by the treatment. The invention is particularly adapted for the treatment of broad goods with dyeing, bleaching and similar liquors and, in view thereof, it devises means of turning out a greater quantity of a superior grade of treated material than it was possible, as far as I am aware, in accordance with the previous art. The dyeing of piece goods of textile fabrics, for instance, is associated with a variety of working procedures, such as the preliminary cooking or bucking or the removal of the size of the goods to be dyed; then the subsequent rinsing after the dyeing, the oxidation by the action of the air and the subsequent treatment of the goods with the boiling soap liquors and the like. As heretofore practised, these various stages of treatment have usually been carried out by means of the well known dyeing-jigger with stationary trough and guiding rollers disposed therein; or two such jiggers were serially disposed of which one was used for the dyeing and the other served for rinsing or similar purposes. It was not possible, however, in accordance with the previous art, to carry out the working procedures above enumerated on one and the same machine, but it was necessary to cause the goods to pass from one machine to the other; or, in the case of only one jigger being used, it was necessary to empty the same after each particular working procedure and to make it ready for the succeeding one whereby much time and space were unduly consumed. With the progress of the chemistry of dyeing and coloring agents, however, it became imperative to devise means for allowing these and other various working procedures to be carried out in direct succession and uninterruptedly and without any substantial stoppage of the passage of the goods.

Now, in accordance with my invention these and various other important objects which will appear as the specification proceeds are accomplished by making use of substantially rockingly and rotatably disposed containers, tanks, vats or the like, the contents of which are caused to successively or alternatingly act upon the goods without substantial interruption.

The invention is shown by way of exemplification on the accompanying drawings in two modified embodiments, without, however, limiting the broad principle of the invention to these merely illustrative particular forms.

In the modification represented by Figs. 1 and 2, Fig. 1 is a diagram showing one of the containers in the operative position, while Fig. 2 shows the same device with the containers in the inoperative position. Fig. 3 is a diagram showing an elevation of a modified construction with one of the containers in the operative position.

The device may comprise a plurality of containers or vats *f*, *g*, but it should be understood that the invention is not limited to the use of but two containers, inasmuch as for some purposes a greater number will be found necessary. The containers are rockingly or pivotally mounted at *k*, k^1 on levers *i* which constitute a part of a frame or wheel pivoted at *h* and which may be rotated by manipulating the handles *l* secured to said wheel; or by any other manual or other means, motive power or the like. A crank handle *p* or equivalent means is adapted by means of a gear wheel *o* or the like engageable with a rack bar *n* on a frame member *m* upon which the wheel or rotatable cross *i* mounted to act upon the same, so as to raise and lower it with the containers, vats. buckets or the like suspended therefrom or pivotally secured thereto. *c*, *d*, *e* are guide rollers for the goods to be treated and which, in the exemplification shown, may be stationarily arranged with relation to the reciprocable and rotatable cross or wheel *i*, *l*. The goods which are guided on these rollers are run off and taken up by the dyeing and treating rollers *a*, *b*.

When the carrier, wheel, support, cross or the like *i*, *l* is in the inoperative position of Fig. 2 in which the containers *f*, *g* are lowered, the goods to be treated may be readily introduced into the machine, inasmuch as the rollers, *a*, *b*, *c*, *d*, *e* are fully exposed and at a suitable distance from the containers, so that the goods will remain in the machine from beginning to end and may pass uninterruptedly to and fro onto and between the rollers *a*, *b*. This reciprocating

passage of the goods is not dependent upon the particular position of the containers, so that the goods may be passed through the liquor of the vats as well as through the air, to be oxidized and aired in the usual manner, when neither of the containers is in the operative position. By this means it becomes also possible to carry out a variety of working procedures in uninterrupted sequence and without the goods becoming substantially arrested in their passage from one roll to the other and during the treatment. Thus, if the tank *f* is, for instance, moved into the operative position by raising the carrier *i* by means of the crank *p* and the gear wheel *o* or by an equivalent device, the goods which are caused to pass from the roller *a* and by way of the guide rollers *c*, *d*, *e* onto the roller *b* and inversely, may be preliminarily boiled or deprived of their size. While this working process is going on, the dyeing vat for the next dyeing operation may be prepared in the tank *g* which is now in the inoperative position. It frequently requires 20 minutes or more to develop such vats and this time is utilized in the machine according to this invention for the preparation of the goods. Then the tank *g* is moved into the operative position by lowering the carrier *i* and by turning the pivoted tanks *f*, *g* by means of the hand lever *l* and by the subsequent raising of the carrier *i* so as to move the tank *g* into the operative position into engagement with the goods which are now given the desired shade. During this time the tank *f* which is now inoperative may be emptied and may be prepared for the next working procedure or step of rinsing or boiling and soaping the goods and so in succession.

It therefore appears that by means of this machine the important result is produced that the goods remain in the machine during the entire series of working procedures and are practically uninterruptedly moved and that the time required for any one of the steps or procedures may be utilized for the preparation of the next charge or procedure in the most favorable manner and that all these steps and procedures including the airing may be carried out in one and the same machine and on the smallest possible space.

It is obvious that the invention is not restricted to any particular means of raising and lowering and laterally moving the various tanks, vats or the like. In the modification shown diagrammatically in Fig. 3 the raising and lowering of the containers, tanks, vats or the like may be produced by a windlass or similar means not shown in the drawing and operatively engageable with the containers *v*, *x*. These containers are, moreover, provided with laterally disposed supporting rollers *w* which are adapted to displaceably support the containers *v*, *x* upon a rail or guide *z*. In the drawing, the container *v* is shown raised in the operative position, while the container *x* is lowered. In this position of rest the containers by means of the rollers *w* are supported on the guide or rail *z* and may be moved lengthwise thereof. When the container is in the proper position underneath the guide rollers *t*, *s*, *u*, it may be vertically moved by a windlass or the like which preferably acts upon the bottom of the container. If it is, for instance, desired to move the container *x* to the operative position and the tank *v* to the inoperative position, the latter is lowered until it rests with its rollers upon the rail *z*. It is then moved, for instance, towards the left in the direction of the arrow to the far end of the rail *z* and the container *x* is horizontally displaced upon the rail *z*, until it is vertically below the guide rollers *t*, *s*, *u*. Then the raising means are operated to move the container *x* to the position previously occupied by the container *v*. It will be advisable to dispose the raising and lowering device sideways with relation to the containers in a similar manner as in the case of freight elevators, so that the working parts of those raising means will not interfere with the free movement along the rail *z*. Thus, it will be seen that the several containers may be moved to the inoperative position by merely lowering and laterally moving the same along the rail *z*. In the case of airing of the material, both containers *f*, *g* may be held at rest upon the rail *z*.

With this modification, according to Fig. 3, there is the advantage that considerably larger containers or tanks and consequently a greater amount of liquor may be used than with the embodiment illustrated in Figs. 1 and 2 of the drawing. With this latter arrangement the dimensions of the containers should not exceed a certain limit, as otherwise the parts of the machine would become too difficult to handle in practical operation, while, with the modification shown in Fig. 3 it is possible to employ containers of considerably greater and practically unlimited dimensions, without any necessity of thereby increasing the dimensions of the other parts of the dyeing or similar machine.

It should be understood that various other modifications may be made to suit the convenience of the operator and the particular conditions of the goods and other local requirements and without thereby deviating from the scope and spirit of the invention as particularly set forth in the appended claims.

I claim:—

1. In a device of the kind described the combination with a group of guide rollers for fabric, and winding and unwinding bulk rollers cooperating therewith, and

treating containers telescopingly engageable with said guide rollers, and means to laterally and vertically move the containers in separate steps with relation to the guide rollers, and into and out of telescoping engagement therewith.

2. In a device of the kind described the combination with guiding means for fabric, and winding and unwinding bulk rollers cooperating therewith and containers for liquid, telescopingly engageable with said guiding means, of moving means operatively engageable with the containers and adapted to impart lateral and vertical movement in succession to said containers and thereby to alternatingly move them into and out of telescoping engagement with the guiding means.

3. In a device of the kind described the combination with a guiding means for fabric and the like, and winding and unwinding bulk rollers cooperating therewith, of supporting means underneath said guiding means, liquid-containers seated on said supporting means and adapted for lateral and vertical movement thereupon and with relation thereto, and into and out of telescoping engagement with the guiding means.

4. In a device of the kind described the combination with guiding means for fabric and the like, of supporting means below the guiding means and liquid-containers movably seated on said supporting means for lateral and vertical reciprocating movement thereupon and with relation thereto, and into and out of telescoping engagement with the guiding means.

5. In a device of the kind described the combination with guiding means for fabric and the like, of a rotary support below said guiding means, liquid-containers rockably supported at different points from said supporting means, means to swing the supporting means and means to move certain of the containers into and out of telescoping engagement with the guiding means.

6. In a device of the kind described the combination with guiding means for fabric and the like, of a rotary support below said guiding means, liquid-containers rockably suspended at different points from said support, means to swing said support, and means to raise and lower said support with relation to the guiding means.

7. In a device of the kind described the combination with guiding means for fabric and the like of a support, pivotally mounted below said guiding means, liquid-containers rockably supported at different points from said support, means to rotate said support, a crank handle, gearing on said handle engageable with the support and adapted to raise and lower the support relatively to the guiding means.

In testimony whereof I have signed my name to this specification.

FRITZ FISCHER.