Nov. 24, 1953 W. THOMMEN 2,660,055

APPARATUS FOR TESTING THE FASTNESS OF DYEINGS ON WETTED TEXTILES

Filed April 6, 1948

FIG. 1

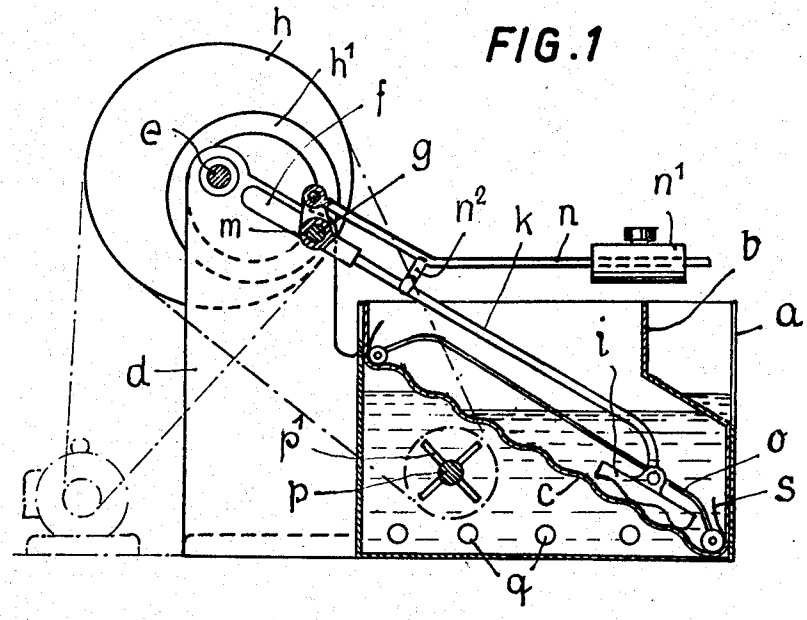
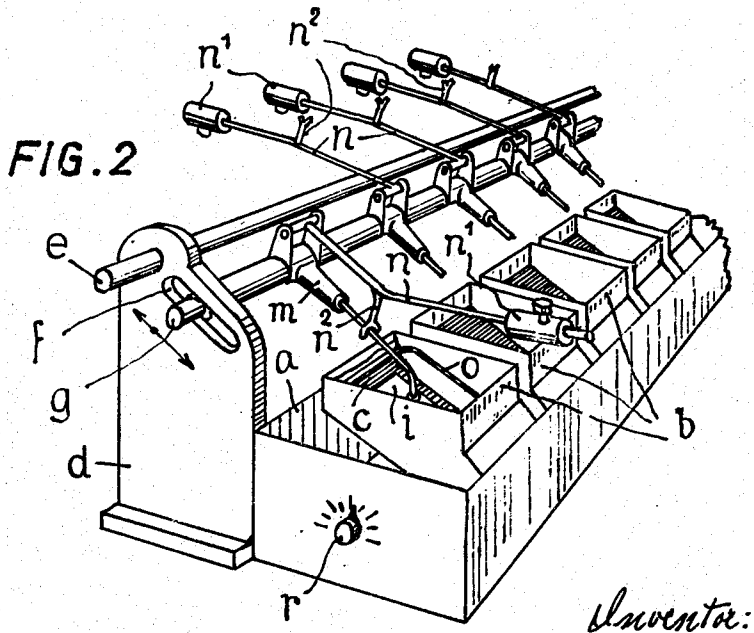


FIG. 2



Inventor:
W. Thommen
By E. F. Kenderoth
Atty

Patented Nov. 24, 1953

2,660,055

UNITED STATES PATENT OFFICE

2,660,055

APPARATUS FOR TESTING THE FASTNESS OF DYEINGS ON WETTED TEXTILES

Willy Thommen, Basel, Switzerland, assignor to J. R. Geigy A. G., Basel, Switzerland, a Swiss company

Application April 6, 1948, Serial No. 19,284

Claims priority, application Switzerland April 8, 1947

5 Claims. (Cl. 73—159)

1

This invention relates to a new apparatus for examining the fastness properties, particularly fastness to washing and milling, of dyeings on textile material or yarn, under wet conditions.

The usual method of examining such fastness properties has been, up to the present, as follows:

The dyed samples of material or yarn, after soaking in a test-solution, are rubbed between both hands of the operator employing a certain prescribed number of hand-movements. The degree of discoloration or bleeding of the sample is then estimated by observation. Experience has shown that this method is not absolutely reliable, since there is no guarantee that it is always carried out under identical conditions, especially when several operators are making such tests. Thus, one person may employ a slightly greater pressure than another when rubbing the sample material, so that different results are given by two samples dyed with the same dyestuff. For a long time it has been clear that such tests are much more reliable when carried out purely mechanically and such equipment is already known but has been applied only to a limited extent because of difficulties in use and maintenance.

The apparatus of the present invention not only gives absolutely reliable and repeatable results, but is simple in construction and operation. Furthermore, the possibility of coupling together many individual elements enables a very high capacity to be attained.

A novel feature of the equipment is that separate holders for test solutions are fitted into a bath, which may be held at any desired temperature. The base of each holder consists of corrugated or ribbed friction-surfaces, e. g., slantingly arranged. Another rubbing-surface, which is mechanically driven backwards and forwards, works in conjunction with each such holder upon the base of which it exerts a regulable pressure during its motion to and fro. Thus, a test-sample of dyed material or yarn situated between the two friction-surfaces can be submitted to a rubbing-process while immersed in the test-solution, e. g., soap solution.

The accompanying drawing shows an example of an apparatus incorporating the principles of the invention.

Fig. 1 represents a section through the test-apparatus and Fig. 2 gives a perspective view, in which various details have been omitted for greater clarity and which has been broken off lengthwise.

The apparatus as shown in Figs. 1 and 2 consists of a heating bath in the form of an elongated bath, *a*, open at the top, in which smaller

2

test-solution holders, *b*, are inserted beside one another. Each of these holders *b*, has an inclined base, *c*, consisting of corrugated sheet metal forming a friction surface. The holders, *b*, contain the test-solutions, such as, e. g., soap solution, which can be held at a fixed temperature, when necessary, for example, by electrical heating of the bath (water-bath). By the side of the bath, *a*, is a crank mechanism fitted in the end supports, *d*, comprising a driving-shaft, *e*, as well as an actuating shaft, *g*, which fits into a sloping guide-slot, *f*, in the end supports, *d*. At each end of the shaft, *e*, projecting through the support, *d*, is fitted a driving-wheel, *h*, furnished on the inner side with an eccentric, circular groove, h^1. The ends of the actuating shaft, *g*, projecting through the guide-slot, *f*, fit into the circular groove, h^1. Thus, when the electric motor, shown with dotted lines in Fig. 1, is started it sets the driving wheels, *h*, in motion, so that the ends of the actuating shaft, *g*, move backwards and forwards in the guide-slot, *f*. A scrubber-like rubbing component, *k*, is provided to work in conjunction with the corrugated bottom, *c*, of each container. At its free end it is fitted with a friction-shoe, *i*, and at the other end it is connected to the actuating shaft, *g*, through a coupling, *m*, which can move freely on the shaft. To the coupling, *m*, is fixed a loading-lever, *n*, which carries a sliding weight, n^1. The loading-lever is made to bear on the arm, *k*, by means of the small limb, n^2, as shown in the drawing. As can be seen, the loading-lever, when in this position, causes the friction-shoe, *i*, to press against the bottom of the holder, *c*. To take the load off the friction shoe, *i*, it is merely necessary to rotate the loading-lever, *n*, backwards until it rests on the shaft, *e*. Each holder, *b*, is also equipped with a spring holder, *o*, by means of which the sample of material under test, *s*, can be held against the sloping holder-bottom, as can be seen in Fig. 1. A shaft, *p*, runs longitudinally along the lower part of the bath, *a*. It is driven from one of the pulley-wheels, *h* and carries paddles, p^1, at regular intervals, so that the liquid in the heating-bath may be kept stirred. Immediately above the bottom of the bath, *a*, and running lengthwise along it are electrical heating elements, *q*, serving to heat the liquid in *a* (usually water). The temperature can be regulated by means of an adjustable thermostat *r*, contained in the heating circuit. The whole apparatus may advantageously be made of non-corroding material, e. g., of sheet chrome steel.

Using the test-apparatus described above it is possible to test simultaneously as many samples of materials as there are holders, *b*, available, all

under exactly the same test-conditions. For example, a dyed skein is plaited together with one of white wool and one of white cotton in the usual manner and secured on the rubbing surface of the friction shoe, *i*, or a piece of dyed cloth is laid between a piece of white cotton and one of white woollen cloth, the ends sewn together and the whole fixed in the holder, *o*, not so that it is tightly stretched, but so that it lies rather loosely on the holder-bottom, *c*. The to and fro movement of the friction-shoe, *i*, then brings about a reciprocal rubbing and kneading of the three cloths exactly corresponding to the effect obtained in hand-washing.

In addition to testing the fastness to washing, it is also possible to determine fastness to milling with the apparatus. For the latter test it is merely necessary to increase the weight, n^1, or to fix it further forward on the loading lever, *n*, and to maintain the temperature of the test-solution higher than when testing the fastness to washing. After the cloths have been removed from the apparatus the extent of discoloration, if any, is determined by visual observation.

What I claim is:

1. Apparatus for examining the fastness properties of dyeings on textiles under wet conditions, comprising a bath adapted to contain a heatable liquid, at least one test-solution holder fitted into said bath and adapted to be immersed in said liquid, the bottom of each holder being provided with a stationary inclined internal friction surface, a member in each holder provided with a friction surface in reciprocable movable contact under regulable pressure with said first-named friction surface, a pressure applicator on said member for applying said pressure thereto, and actuating means for reciprocating said reciprocable member comprising an actuating shaft, a slotted support through the slot of which said actuating shaft extends, said slot being inclined in a direction substantially parallel to said inclined friction surface, a coupling interconnecting said actuating shaft and reciprocable member, a crank mechanism for reciprocating said actuating shaft, and means for securing between said friction surfaces a dyed sample to be tested, whereby said dyed textile sample thus situated between the stationary and movable friction surfaces and immersed in the test-solution can be submitted to a process of rubbing between such surfaces and under the said regulable pressure.

2. Apparatus for examining the fastness properties of dyeings on textiles under wet conditions, comprising a bath adapted to contain a heatable liquid, at least one test-solution holder fitted into said bath and adapted to be immersed in said liquid, the bottom of each holder being provided with a stationary internal friction surface, a member in each holder provided with a friction surface in reciprocable movable contact under regulable pressure with said first-named friction surface for applying said pressure thereto, said member comprising a pivotally mounted lever and a weight slidably mounted on said lever, and means for securing between said friction surfaces a dyed textile sample to be tested, whereby said dyed textile sample thus situated between the stationary and movable friction surfaces and immersed in the test-solution can be submitted to a process of rubbing between such surfaces and under the said regulable pressure.

3. Apparatus for examining the fastness properties of dyeings on textiles under wet conditions, comprising a bath adapted to contain a heatable liquid, at least one test-solution holder fitted into said bath and adapted to be immersed in said liquid, the bottom of each holder being provided with a stationary inclined internal friction surface, a member in each holder provided with a friction surface in reciprocable movable contact under regulable pressure with said first-named friction surface, a pressure applicator on said member for applying said pressure thereto, said applicator comprising a lever pivotably connected to said member and a weight slidably mounted on said lever, and actuating means for reciprocating said reciprocable member comprising an actuating shaft, a slotted support through the slot of which said actuating shaft extends, said slot being inclined in a direction substantially parallel to said inclined friction surface, a coupling interconnecting said actuating shaft and reciprocable member, and a crank mechanism for reciprocating said actuating shaft, whereby a dyed textile sample situated between the stationary and movable friction surfaces and immersed in the test-solution can be submitted to a process of rubbing between such surfaces and under the said regulable pressure.

4. Apparatus for examining the fastness properties of dyeings on textiles under wet conditions, comprising a bath adapted to contain a heatable liquid, at least one test-solution holder fitted into said bath and adapted to be immersed in said liquid, the bottom of each holder being provided with a stationary internal friction surface, means for securing to said surface a dyed textile sample to be tested, a member in each holder provided with a friction surface in reciprocable movable contact under regulable pressure with the dyed textile sample secured to said first-named friction surface, and a pressure applicator on said member for applying said pressure thereto, whereby the dyed textile sample situated between the stationary and movable friction surfaces and immersed in the test-solution can be submitted to a process of rubbing between such surfaces and under the said regulable pressure.

5. Apparatus for examining the fastness properties of dyeings on textiles under wet conditions, comprising a bath adapted to contain a heatable liquid, at least one test-solution holder fitted into said bath and adapted to be immersed in said liquid, the bottom of each holder being provided with a stationary internal friction surface, a spring holder for securing to said surface a dyed textile sample to be tested, a member in each holder provided with a friction surface in reciprocable movable contact under regulable pressure with the dyed textile sample secured to said first-named friction surface, and a pressure applicator on said member for applying said pressure thereto, whereby the dyed textile sample situated between the stationary and movable friction surfaces and immersed in the test-solution can be submitted to a process of rubbing between such surfaces and under the said regulable pressure.

WILLY THOMMEN.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
18,483	Wisner	Oct. 20, 1857
107,793	Lieb	Sept. 27, 1870
457,223	Seyler	Aug. 4, 1891
2,347,661	Butland	May 2, 1944