July 22, 1924. 1,502,330

A. BERNINI

ELECTROSCOPIC APPARATUS FOR TESTING THE GENUINENESS OF WOOLEN AND LIKE MATERIALS

Filed Sept. 20, 1922

Fig. 1.

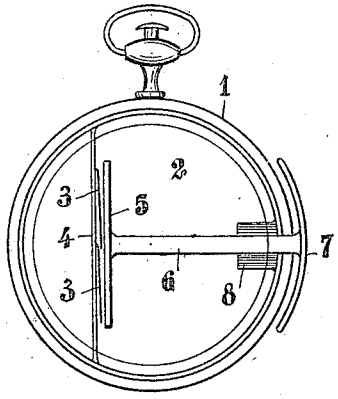


Fig. 2.

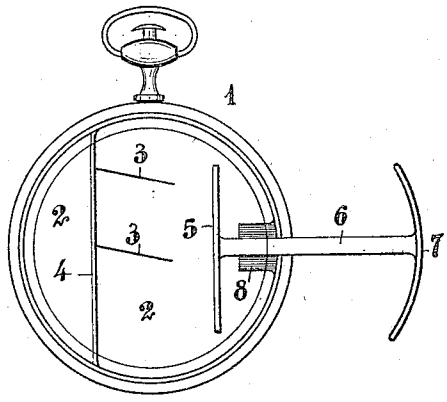


Fig. 3.

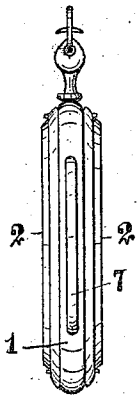
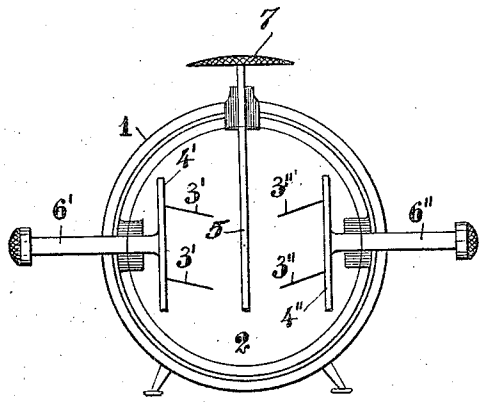


Fig. 4.



Inventor

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By Attorneys

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UNITED STATES PATENT OFFICE.

ARCIERO BERNINI, OF GENOA, ITALY.

ELECTROSCOPIC APPARATUS FOR TESTING THE GENUINENESS OF WOOLEN AND SILK MATERIALS.

Application filed September 20, 1922. Serial No. 589,385.

To all whom it may concern:

Be it known that I, ARCIERO BERNINI, a subject of the King of Italy, and a resident of Genoa, in the Kingdom of Italy, have invented certain new and useful Improvements in Electroscopic Apparatus for Testing the Genuineness of Woolen and Silk Materials, of which the following is a specification.

It is well known that there are on the market artificial silk materials and woolen materials mixed with cotton which have the same appearance as the materials made of pure silk or wool.

It is also known that, in the manufacture of such artificial materials, special baths or dressings are used for to give them a beautiful appearance; the dressing however is particularly noxious when applied in excess, for in practical use it diminishes the tenacity and wear of the material as well as the resistance of its colour.

My invention consists in an electroscopical method for ascertaining the genuineness of woolen and silken materials, detecting the presence of vegetable or artificial fibers and of the dressing. This method is substantially based on the fact that wool and silk, if pure, are perfect insulators, while artificial silk or the fibers generally used in the manufacture of mixed woolen goods, as well as the substances used in the preparation of the dressing, are more or less good conductors of electricity.

It is obvious therefore that the degree of purity of the material to be tested may be easily detected by means of an electroscope; in fact by bringing in contact with the knob of a charged electroscope a piece of pure silk or pure woolen material, the electroscope will be discharged very slowly; the electroscope is discharged however more or less rapidly when the material tested is artificial silk or mixed wool or has been impregnated with an excessive dressing, according to the quantity of the extraneous substances contained in the material.

My invention consists in an electroscopic apparatus particularly suited for the practical application of the aforesaid method. The apparatus is of such shape and the various parts are so arranged that a person can carry the apparatus in his pocket like a watch and use it with facility and readiness in any place or at any moment whatsoever.

In the annexed drawing which diagrammatically illustrates two embodiments of an electroscopic apparatus made according to the present invention:

Fig. 1 is a front view of the electroscopic apparatus the conductor being within the case;

Fig. 2 is a like view showing the conductor partially withdrawn from the case;

Fig. 3 is a side view of the apparatus;

Fig. 4 is a front elevation of a modification.

In the drawing 1 is the metal cylindrical case open at both ends which are closed by two glass discs or caps 2 suitably flattened the case thus having the shape and size of a watch case.

The strips 3 of gold-leaf, when the apparatus is discharged, rest against a conducting partition 4 communicating with the metal case 1, to which partition they are connected with one of their ends and are kept adherent to the partition itself by means of a thin metal plate 5 at the end of the conducting stem 6.

Said stem 6 is provided with a head 7 and can slide within an insulating guiding tube 8 which prevents it from electrically communicating with the metal case 1; the metal plate 5 can thus be moved toward or away from the gold leaves 3.

To use the apparatus the stem 6 is drawn out into the position shown in Fig. 2; then it is charged with electricity by touching its head 7 with an ebonite rod which has been rubbed with a woolen cloth.

The gold leaves 3 which are grounded through the metal case 1, with which they communicate electrically, and the hand of the operator, are electrified through induction by the metal plate 5 and are attracted by the latter so that they tend to assume the position shown in Fig. 2.

In the usual electroscopes, the strips of gold-leaf form part of the electrified conductor and diverge through the action of the charges of the same distributed on them, with a tendency, however, to approach the glass discs towards which they are attracted, thus they sometimes remain attached on them. This occurrence is prevented in my device wherein the leaves are electrified by induction and therefore tend to approach the plate 5 and not the glass walls, even if these are so close to each other as to leave

just enough place for the small leaves themselves. This feature allows the reduction of the dimensions of the apparatus so that it may be easily carried in one's pocket.

The use of the apparatus is very simple. When the head 7 which has previously been electrified is touched with a strip of the material to be tested, which must be dry and contain no dust, if the material is manufactured of pure silk or wool, the leaves 3 will not move, i. e.; they will remain practically in the position shown in Fig. 2. However if the material is mixed with artificial silk or consists of mixed wool, or if the material is heavily impregnated with a dressing, the leaves will instead drop against the partition 4.

An indication enabling to estimate, at least approximately, what quantity of extraneous substances is contained in the material, is furnished by the rapidity wherewith the gold leaves drop against partition 4, and in order to facilitate such estimate it is advisable that the number of leaves be even larger than two and that they be all of different shape and size.

By moving toward the head 7 a piece of artificial silk, which is an excellent conductor, the leaves will drop all together and very quickly against the partition 4. When a piece of mixed woolen material is moved toward the head 7 the leaves will fall down one after another at an interval of appreciable time, said interval being the greater the less is the quantity of conducting substances in the material.

Instead of following the method above described, a somewhat different course may be followed in using the same apparatus. Instead of first electrifying the electroscope, the operation may be begun by rubbing with an ebonite rod the material to be tested, which is then moved toward the head 7 just far enough to touch it. If upon such approach the leaves 3 tend to rise it means that the material is made of genuine silk or wool. If, notwithstanding the heavy rubbing with the ebonite rod against the material the latter does not on its approach towards the head 7 cause the leaves to rise, it must be concluded that the material is either cotton or mixed with it. This second method may be used also to check off the first one.

The electroscope may of course be modified in various ways according to the particular requirements but always working in the same manner as described in connection with Figs. 1 and 2.

A modification, for instance, is that shown in Fig. 4 wherein the same reference numerals are used to indicate like parts shown in the other figures. In this case, the head 7 is fixed directly to the metal plate 5 which is located centrally within the case 1. Instead of one partition 4, there are two, 4′ and 4″, on both sides of the metal plate 5, each one carrying two leaves, 3′ and 3″. In the position of rest the leaves remain down and both partitions, 4′ and 4″, are pressed against the central metal plate 5. When the apparatus is used the partitions are drawn away from the metal plate 5, by pulling out the stems 6′ and 6″. Then the head 7 is rubbed with the ebonite rod to charge the electroscope and all the gold leaves are caused to rise, or the apparatus is touched with a piece of the rubbed material to ascertain whether the leaves will rise. After the apparatus has been charged with the ebonite rod, it is touched with the material under examination while the operator keeps the head 7 in his hand to ascertain whether the gold leaves fall down or not.

I claim as my invention—

1. An apparatus for testing the genuineness of woolen and silk materials, comprising a metal case provided with two outside walls of transparent and insulating material and having the shape and size of a watch, electroscopic leaves inside said case, means for supporting said leaves, and means insulated from the said supporting means and adapted to be electrified from the outside of said case and to transmit an electric charge to the said electroscopic leaves, the said supporting means and the said other means being adjustable relative to each other.

2. An apparatus for testing the genuineness of woolen and silk materials, comprising a metal case having two outside walls of transparent and insulating material and being in the shape of a watch case, a metal plate disposed centrally within the said case and carrying a head outside thereof to be charged with electricity, two movable metal plates adjustable relative to the said central plate, and strips of gold-leaf carried by the said movable plates, the latter being moved away from the said central plate when the apparatus is used.

In testimony whereof I affix my signature in the presence of two witnesses, at Genoa this 30 day of Agosto 1922.

ARCIERO BERNINI.

Witnesses:

PAMALERI RONDO,

OBUGOLS BARDO.