

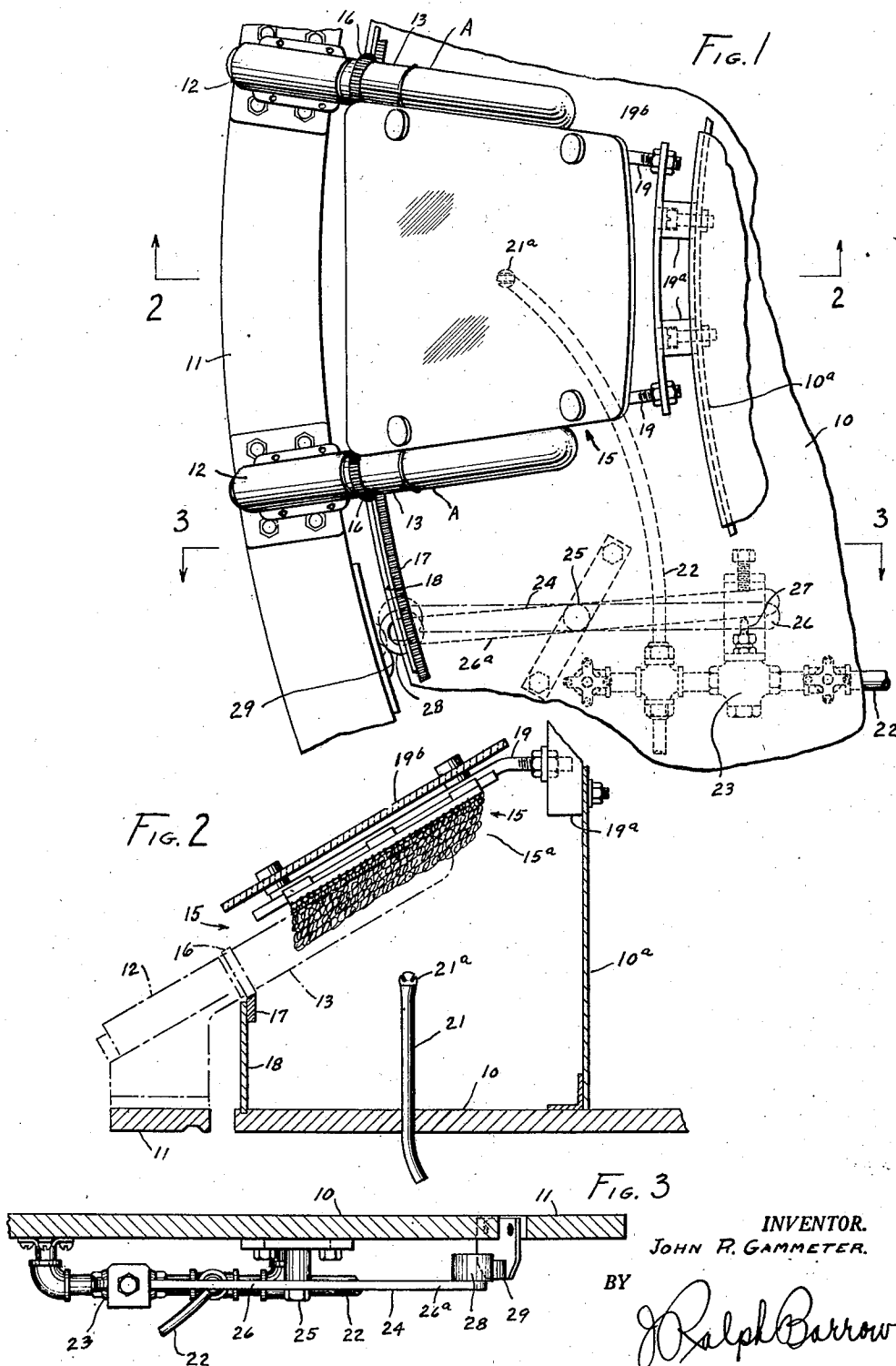
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DEVICE FOR TESTING THIN RUBBER ARTICLES

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DEVICE FOR TESTING THIN RUBBER ARTICLES

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6 Claims. (Cl. 175-183)

This invention relates to a device for testing thin rubber articles.

An object of the invention is to provide a device of the character described having flexible electro-conductive elements for conforming to the shape of articles mounted on forms, with means for eliminating dust, such as powdered soapstone used in the manufacture of thin rubber articles, from said element and thereby to prevent said electro-conductive elements from becoming insulated.

These and other objects of the invention will be manifest from the following brief description and the accompanying drawing.

The present invention embodies improvements in the testing device shown and described in copending application, Serial No. 226,112, filed August 22, 1938, and issued as Patent No. 2,221,323.

Of the accompanying drawing:

Figure 1 is a fragmentary plan view, partly broken away, illustrating the apparatus embodying the invention.

Figure 2 is a cross-section taken on line 2-2 of Figure 1.

Figure 3 is a cross-section taken on line 3-3 of Figure 1.

Referring to the drawing, the numeral 10 designates a suitable table about the periphery of which there is arranged an annulus 11 which revolves about table 10. Details of construction for supporting table 10 and for revolving annulus 11 are substantially the same as disclosed in the forementioned copending application. The annulus carries thereon a circumferential series of equally spaced form mountings 12 in which are journaled electro-conductive forms 13, these forms being so shaped as to receive the articles A to be tested and to hold them in distended unwrinkled condition.

The forms 13 are arranged to be rotated while passing through the testing device, indicated generally at 15. For this purpose each form is provided with a pinion 16 for engaging a rack 17, fixed on an arcuate of plate 18 mounted on table 10, whereby rotation of annulus 11 about table 10 will cause the forms to rotate. The forms are arranged in upwardly inclined relation to table 10 to facilitate placing articles A thereon at an article-applying station (not shown).

The testing device 15 is electrically operated for manifesting defective goods. This unit comprises an electro-conductive element 15^a of flexible, pervious material connected to a source of high-tension electricity in the manner disclosed

in the forementioned copending application, element 15^a being adapted to be engaged by the articles A on the forms 13, and to shape about and conform to the shape of the article along the length thereof and down about the end of the article. The forms are electrically connected in a high tension circuit (not shown) with the element 15^a, so that a high potential is present between the element and the forms 13 thereunder, this circuit being broken only by the non-conducting or dielectric articles A. As described in said copending application, this potential is sufficient to leap an air gap of thickness of the articles A, but normally insufficient to pierce the goods. When the articles have thin spots or are under gauge or have "pin holes" therein, current will flow through the high tension circuit, this current being utilized for controlling subsequent operations on the articles or forms, such as article sorting and branding operations in the manner disclosed in said copending application.

A fine-mesh flexible fabric, such as is used in women's handbags, has been found to be most satisfactory as the element 15^a. Flexible element 15^a is supported in sagging relation, substantially as shown in Figure 2, by being secured along the radial edges thereof to spaced supporting members 19, 19, the latter being secured to an upright member 10^a of table 10 through insulated connections 19^a, 19^a. A glass plate 19^b is secured over element 15^a to the members 19 to protect workmen from accidental contact with the element.

In the manufacture of thin rubber goods, a considerable amount of powdered soapstone is used to facilitate handling of the goods, as will be understood by those skilled in the art. Much of this powdered soapstone is stirred up around the testing equipment and tends to collect on the element 15^a, and thereby to insulate the same in such a manner as to reduce the efficiency of the testing device. Supported in upright position beneath the element 15^a may be an upright conduit 21 connected to a suitable source of air-pressure supply (not shown), through a supply line 22, having a control valve 23 therein. For controlling the valve 23, a lever 24 pivoted at 25 to table 10 may have one arm 26 extending inwardly of table 10 for engagement with a spring-pressed control plunger 27 in the valve, another arm 26^a of said lever having a roller 28 mounted thereon for engagement with cam 29 secured at the inner edge portions of annulus 11. The arrangement is such that periodically cams 29 will engage roller 28 to swing the arm 24 on its pivot,

thereby to momentarily actuate plunger 27 of valve 23 to blow a blast of air through a slotted head or nozzle 21^a in the end of conduit 21. The slots in the nozzle are so arranged that the blast of air will reach and penetrate through every portion of the pervious element 15^a, thereby to blow all soapstone dust or the like therefrom, whereby contacting portions of the mesh element 15^a are prevented from becoming insulated against each other. The cams 29 are preferably arranged so as to actuate valve 23 at periodic intervals when no article or form is in contact with the element 15^a, as best shown in Figure 1. The blast of air from nozzle 21^a may be of such force as to agitate the element 15^a, thereby thoroughly to shake all particles clinging within the interstices of the element.

In the operation of the device, the annulus 11 is continuously rotated about table 10 to move the forms 13 into association with the device 15 in succession, articles A to be tested having been slipped over the forms in distended unwrinkled condition by a previous operation. The presence of defective goods on the forms is manifested by the testing element 15^a, for the purposes and in the manner previously described. At periodic intervals determined by the rate at which soapstone dust or the like collects on the element 15^a, a cam 29 on the annulus 11 will operate the lever 24 momentarily to actuate the valve 23, thereby to blow a blast of air which shakes or vibrates the flexible, pervious element 15^a and simultaneously penetrates through the same for removing substantially all soapstone dust or like particles from the element.

Modifications of the invention may be resorted to without departing from the spirit thereof or the scope of the appended claims.

What is claimed is:

1. Apparatus for testing thin rubber articles or the like for defects, comprising an electro-conductive element of flexible metallic mesh fabric, a conveyor, electro-conductive forms on said conveyor for carrying articles in succession past said element, said element being applicable to the surface of articles on said forms and conforming to the shape thereof, means for establishing a high potential of electricity between said element and said forms sufficient to leap an air gap comparable to the thickness of the articles but of insufficient potential to pierce articles of normal thickness, and means for intermittently directing air under pressure onto said element to pass through and clean the same.
2. Apparatus for testing thin rubber articles or the like for defects, comprising an electro-conductive element of flexible metallic mesh fabric, a conveyor, electro-conductive forms on said conveyor for carrying articles in succession past said element, said element being applicable to the surface of articles on said forms and conforming to the shape thereof, means for establishing a high potential of electricity between said element and said forms sufficient to leap an air gap comparable to the thickness of the articles but of insufficient potential to pierce articles of normal thickness, and means operable by movement of said conveyor for intermittently agitating said element to shake dust or like particles therefrom.
3. Apparatus for testing thin rubber articles or the like for defects, comprising an electro-conductive element of flexible metallic mesh fabric, a conveyor, electro-conductive forms on said conveyor for carrying articles in succession past

said element, said element being applicable to the surface of articles on said forms and conforming to the shape thereof, means for establishing a high potential of electricity between said element and said forms sufficient to leap an air gap comparable to the thickness of the articles but of insufficient potential to pierce articles of normal thickness, and means intermittently operable by movement of said conveyor for directing a blast of air onto said element, said blast of air being of such force as simultaneously to agitate the element and to penetrate through the same for removing dust or like particles from the element.

4. Apparatus for testing hollow rubber or like articles of dielectric material for defects, comprising an electro-conductive form for receiving articles thereon to be tested, an electro-conductive element of flexible sheet-like material, applicable to the surface of an article on said form and adapted to conform to the shape thereof over a substantial area, for establishing a high potential of electricity between said element and said form sufficient to leap an air gap comparable to the thickness of the goods but of insufficient potential to pierce articles of normal thickness, means for moving said form with contact with said element, and means for directing air under pressure onto said element to clean the same, said last-named means including a nozzle, a valve operable to connect said nozzle with a source of air supply, and means operable upon movement of said form away from engagement with said element for controlling said valve to direct air onto the element.

5. Apparatus for testing articles of dielectric material for defects, comprising an electro-conductive form or forms for receiving articles thereon to be tested, a sheet-like, flexible electro-conductive element applicable to the surface of an article on said form and adapted to conform to the shape thereof over a substantial area, for establishing a high potential of electricity between said element and said form sufficient to leap an air gap comparable to the thickness of the articles but of insufficient potential to pierce articles of normal thickness, means for moving a form into and out of engagement with said electro-conductive element, and means operable when the flexible element is free of engagement with a form for agitating said element to shake dust or like particles therefrom.

6. Apparatus for testing articles of dielectric material for defects, comprising an electro-conductive form or forms for receiving articles thereon to be tested, an electro-conductive element of sheet-like pervious, flexible material, said element being applicable to the surface of an article on a form and conforming to the shape thereof over a substantial area, for establishing a high potential of electricity between said element and said form sufficient to leap an air gap comparable to the thickness of the articles but of insufficient potential to pierce articles of normal thickness, means for moving a form into and out of engagement with said electro-conductive element, and means operable when the flexible element is free of engagement with a form for directing air under such pressure as simultaneously to agitate the element and to penetrate through the same for cleaning dust or like particles from the surfaces of the element.

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