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ELECTROSTATIC APPARATUS FOR SEPARATING ARTICLES

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FIG. 1

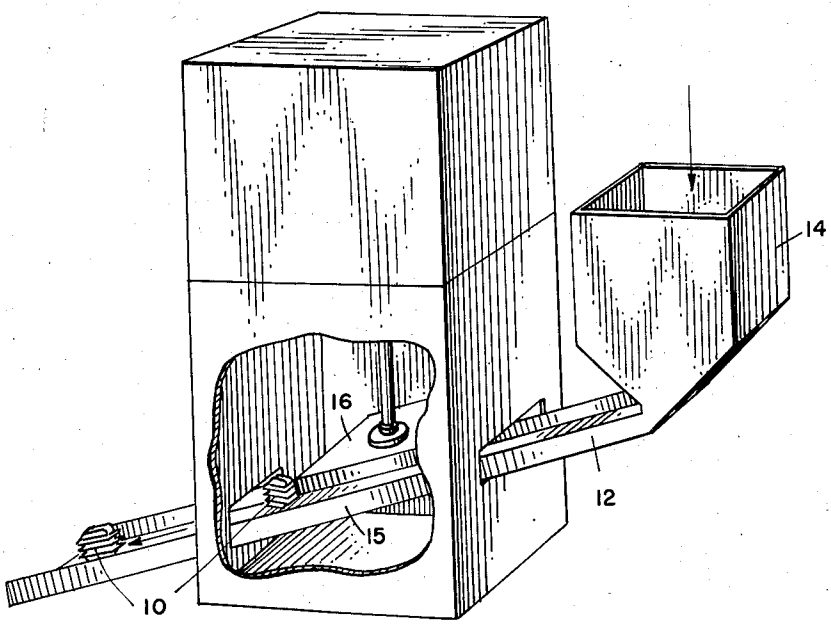
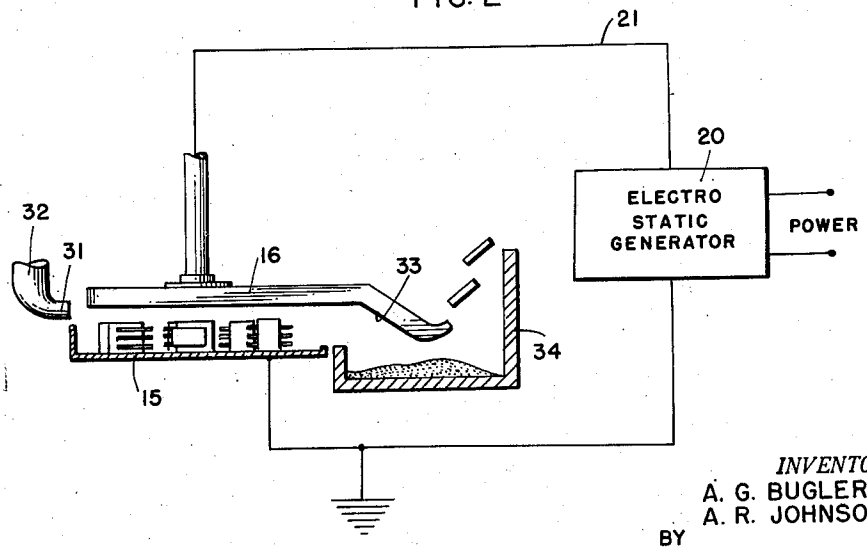


FIG. 2



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ELECTROSTATIC APPARATUS FOR SEPARATING ARTICLES

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1 Claim. (Cl. 15—1.5)

This invention relates to apparatus for separating articles, and more particularly to methods of and apparatus for electrostatically removing dust and dielectric particles from articles, such as, for example, relays.

In the manufacture of electrical parts, such as, for example, relays which become dusty or have dielectric particles getting between the laminations and contacts of the various cavities therein, it is necessary to clean the articles before they are placed in service. With past known methods and apparatus, this has been a very difficult thing to accomplish. Furthermore, in articles such as relays wherein cards of dielectric material are provided, often splinters stuck to the cards cannot be separated from the cards by known cleaning methods and interfere with the operation of the articles so that the articles must be discarded.

An object of the invention is to provide new and improved apparatus for separating articles.

Another object of the invention is to provide apparatus for electrostatically removing dust and dielectric particles from articles.

A further object of the invention is to provide apparatus for removing dielectric particles from articles such as relays or the like, which are very difficult to clean by previously known methods and apparatus.

In a method and apparatus illustrating certain features of the invention, articles to be cleaned are subjected to an electrostatic field to draw the dielectric particles from the articles advanced therethrough.

In a method and apparatus forming more specific embodiments of the invention, a pair of electrostatic electrodes are provided and articles are advanced between the electrodes. A potential is applied to the electrodes to create an electrostatic field therebetween, which pulls the dielectric particles from the articles to one of the electrodes, and a stream of air is directed across the latter electrode to remove the particles therefrom.

A complete understanding of the invention may be obtained from the following detailed description of a method and an apparatus forming specific embodiments, when read in conjunction with the appended drawings, in which

Fig. 1 is a perspective view of an apparatus for practicing the method forming one embodiment of the invention and

Fig. 2 is a fragmentary schematic view of a portion of the apparatus shown in Fig. 1.

Referring now in detail to the drawings, there is shown therein an apparatus for removing dielectric particles, such as dust, insulator fragments and splinters secured to

insulating components of relays **10**. This apparatus includes a chute **12**, to which the articles are fed from a raised hopper **14** and the relays roll and slide down the chute between plates or electrodes **15** and **16**. The electrode **15** is grounded and is connected to the negative side of an electrostatic generator **20** of a well-known type. The generator generates a potential such as to create a high electrostatic field between the electrodes **15** and **16**. The positive side of the electrostatic generator **20** is connected by a conductor **21** to the electrode **16**.

The strong field created between the electrodes **15** and **16** charges particles to be removed from the relays **10**, and draws the particles to the electrode **16**, which removes the charges therefrom. As the particles reach the electrode **16**, they are swept therefrom by a continuous, sheet-like blast of gas, such as air, for example, from a nozzle **31** supplied with gas under pressure by a conduit **32** leading from a suitable source (not shown). The particles are swept past a downwardly directed portion **33** of the electrode **16** into a trap **34** which removes the particles from the gas stream. The stream of gas flowing across the face of the electrode **16** also creates a low pressure area above the articles, which assists the electrostatic field in drawing the particles upwardly to the electrode **16**. Thus, as the articles roll and slide slowly down the chute **12**, and the low pressure area pulls the electrostatic field, the particles from the relays, and the plate **16** removes the charge from the particles, which are dropped into the trap **34** so that the particles do not again contaminate the articles further. The above-described method and apparatus simply and effectively remove dielectric particles from all portions of the relay.

It is to be understood that the above-described arrangements are simply illustrative of the application of the principles of the invention. Numerous other arrangements may be readily devised by those skilled in the art which will embody the principles of the invention and fall within the spirit and scope thereof.

What is claimed is:

An apparatus for cleaning dielectric particles from articles, comprising an inclined chute for guiding articles therealong, an upper electrode spaced above a portion of the chute and extending thereacross, said electrode having a lateral deflecting portion offset to one side of the chute, a trough positioned laterally of the chute and below the deflecting portion of the electrode, baffle means positioned laterally of the deflecting portion, means for applying an electrical potential across the chute and the electrode, and means for blowing air across the lower face of the electrode in a direction such as to blow particles on the electrode to and across the deflecting portion to drop them into the trough.

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