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MACHINES FOR MANIPULATING CUT TOBACCO

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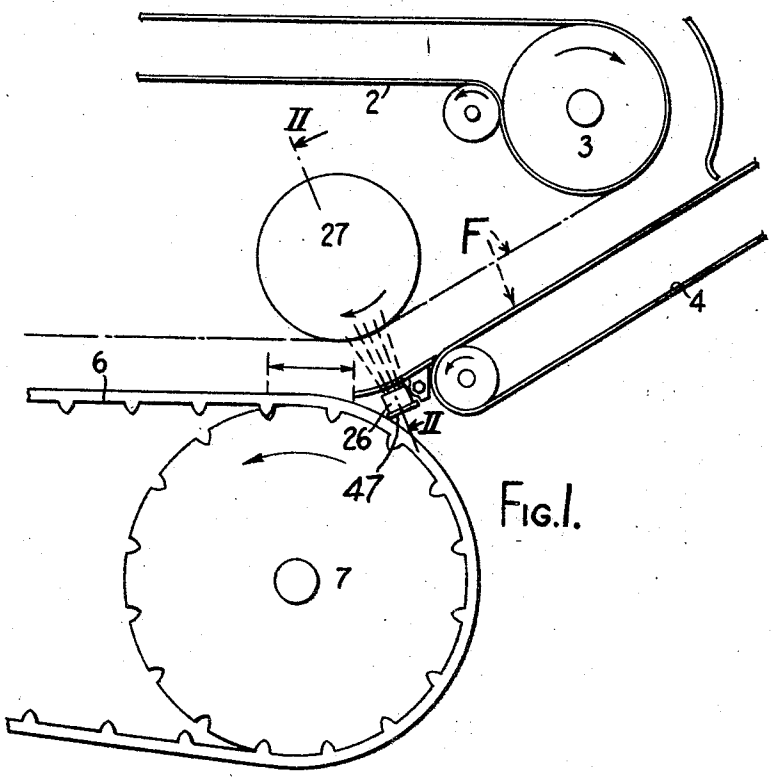
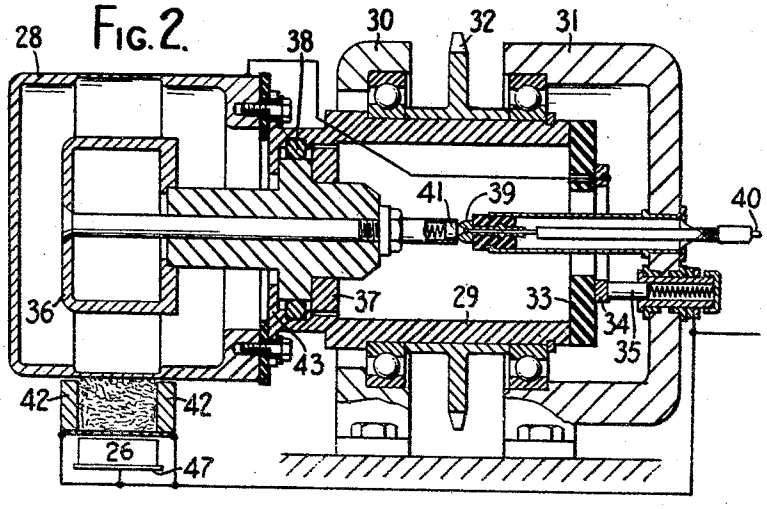


FIG. 1.

FIG. 2.



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MACHINES FOR MANIPULATING CUT TOBACCO

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Original application March 15, 1954, Serial No. 416,374, now Patent No. 2,800,131, dated July 23, 1957. Divided and this application July 12, 1955, Serial No. 521,590

3 Claims. (Cl. 250—83.6)

This application is a division of our prior co-pending application, Serial No. 416,374, filed March 15, 1954, now U. S. Patent 2,800,131, and the invention described herein is more particularly concerned with the construction of an ionization chamber which is specially suitable for use with a machine for manipulating cut tobacco, for example, a cigarette-making machine of the kind wherein the mass of a length of moving tobacco filler is measured by a detector by subjecting the length to rays from a radioactive source of penetrative radiation, for example beta rays, the ionization powers of which are absorbed by the material in known proportion to its mass, and determining changes in the absorption with variations in the tobacco mass by an ionization chamber and applying the current due to the ionization to regulate at some stage in the machine the rate at which tobacco is being fed at that stage for the formation of the final product. Machines of this kind are hereafter called "machines of the kind referred to."

According to the present invention there is provided in or for a machine of the kind referred to a source-gap-chamber detecting device, the ionization chamber whereof comprises a rotatable hollow member having a circular periphery forming the outer electrode of the chamber and adapted to coact with and guide the filler being detected and means for effecting electrical connections with the rotating elements of the chamber.

The invention will be more fully described with reference to the accompanying drawings in which:

Figure 1 is a diagram of part of a cigarette machine, showing the location of the ionization chamber, and associated devices for feeding a filler past it;

Figure 2 is a section on the line II—II of Figure 1, drawn to a larger scale.

As is well-known, the radioactive source is separated from the ionization chamber by a space or gap in which the material being measured is placed. For convenience the whole arrangement is termed herein a "source-gap chamber detecting device."

Referring to the drawings an ionization chamber according to the invention is particularly suitable for use in an arrangement such as that shown in Figure 1, where a tobacco filler F, supported on a sloping belt 4 and bounded by the chain line shown, is to be transferred to another belt 6 carried on a pulley 7 and detection is to take place at the point of transfer. Tobacco to form the aforesaid filler is supplied from a belt 2 running round a pulley 3. At the position of transfer is a source-gap-chamber detecting device constructed and arranged as follows. The source 26 is located as close as possible to the delivery point of the tobacco on to the belt 6 and is very short. It is supported on a plate 47. The ionization chamber of the combination, which chamber is generally represented in Figure 1 by the reference 27, is constructed in pulley form. An ionization chamber consists of three main parts, namely, an outer member constructed as a chamber, with an inner member, usually of hollow construction, these parts being connected respectively to appropriate terminals of an amplifier or like with which the ionization chamber is to be used, and a guard ring which is grounded. The construction of such an ionization chamber when made in pulley form will now be detailed. The chamber section can be seen in Figure 2, where it will also be seen that the outer part 28 of the chamber is fixed by insulated screws to a long hollow hub 29 running in ball races in housings 30 and 31. At the part where the chamber 28 engages the filler the thickness of its rim is approximately 0.010". A sprocket wheel 32 is fixed to the hub, whereby the chamber is rotated at the required speed. An insulating ring 33, fixed at one end of the hub, carries a slip ring 34 contacted by a brush 35 to apply the polarising voltage to the outer part 28 of the chamber. The inner part 36 of the chamber is clamped to the part 28 by a nut 37 with a sealing ring 38 between the parts. Contact is made to the rotating part 36 by a contact 39 at the end of a signal cable 40, the contact engaging a spring-pressed stud 41. The end of the hub is shaped to form the guard ring 43 of the chamber and is thus grounded through the hub, bearings and housings. Side guides 42 for the tobacco filler F are also shown.

It will be understood that a rotary ionization chamber as above described is suitable for use at any place where a filler changes its direction, the diameter of the chamber varying with the angle made by the filler at the point where it changes direction.

What we claim as our invention and desire to secure by Letters Patent is:

1. In apparatus for measuring the mass of a length of moving tobacco filler by subjecting the length to rays from a radioactive source of penetrative radiation, the combination with means for feeding tobacco filler in a predetermined path having a bend, of a source-gap-chamber detecting device located at the bend for measuring the mass of a length of the moving filler, said device including an ionization chamber located at the inner side of the bend of said path, said chamber comprising a rotatable hollow member having a circular periphery forming the outer electrode of the chamber and positioned to engage with and guide the filler being detected, and an inner electrode, means for effecting electrical connections with the electrodes, and means for rotating the chamber in a direction to cause the periphery of said hollow member to move with the filler at the point of engagement thereof.

2. Apparatus as claimed in claim 1 wherein said hub is connected to the outer electrode by a flange insulated from said electrode, said flange constituting the guard ring of the ionization chamber.

3. In apparatus for measuring the mass of a length of moving tobacco filler by subjecting the length to rays from a radioactive source of penetrative radiation, the combination with means for feeding tobacco filler in a predetermined path, the path having two adjacent straight portions forming an angle of less than 180° at their juncture, of a source-gap-chamber detecting device located at the juncture of the two straight portions of the path for measuring the mass of a length of the moving filler, said device including an ionization chamber located within the angle formed by the straight portions of the path, said chamber comprising an outer hollow member having a circular peripheral portion constituting an electrode, a hub fixed to said outer member and coaxial therewith, said hub being journaled for rotation, driving means for rotating said hub, an inner electrode fixed to said hub, and contact brush devices for connecting the outer and inner electrodes to a circuit.

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