Oct. 31, 1950 R. S. HART 2,527,815

ROLLER CONTACTOR FOR MOISTURE METERS OR THE LIKE

Filed Oct. 4, 1946

Fig. 1

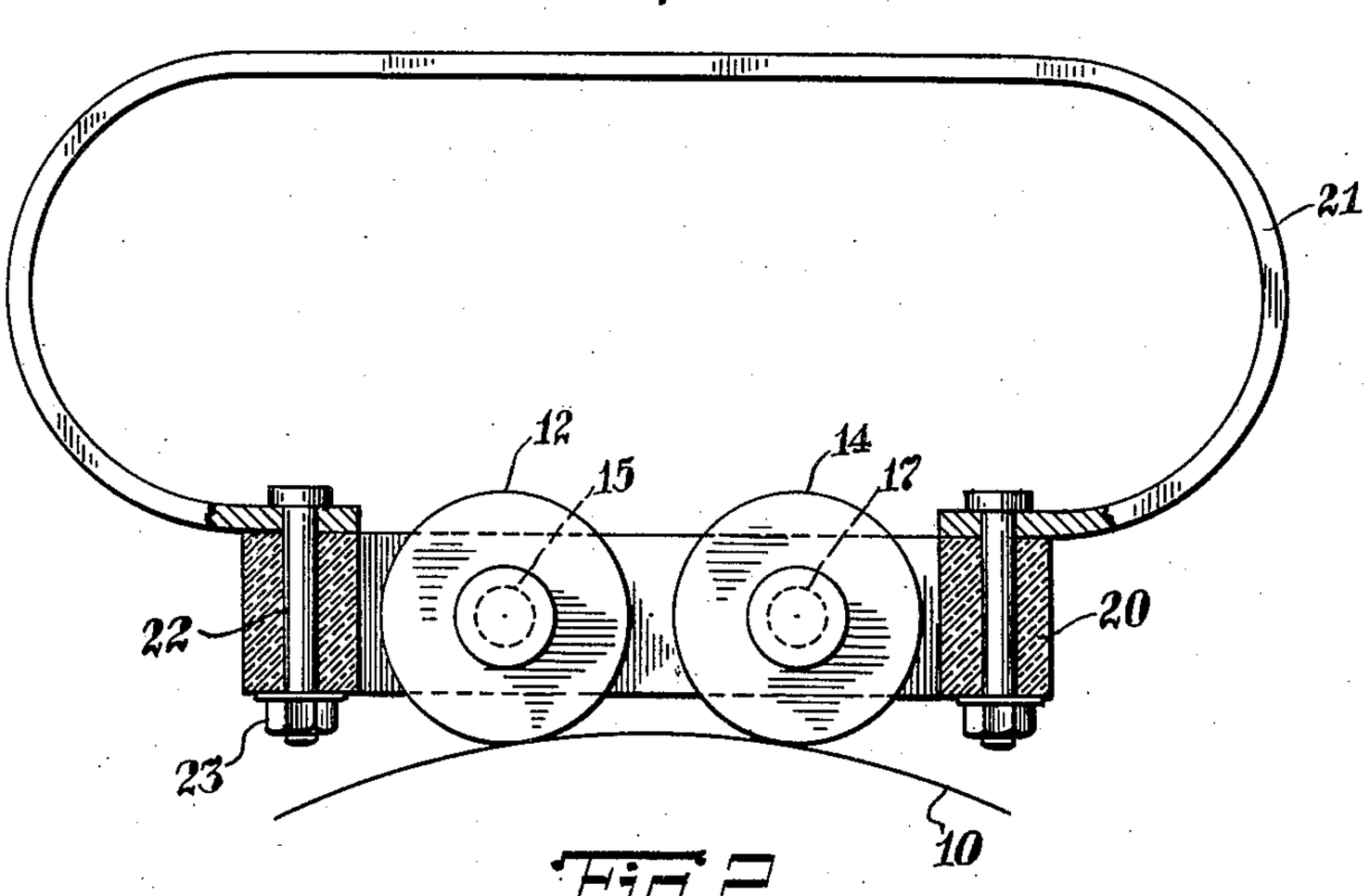


Fig. 2

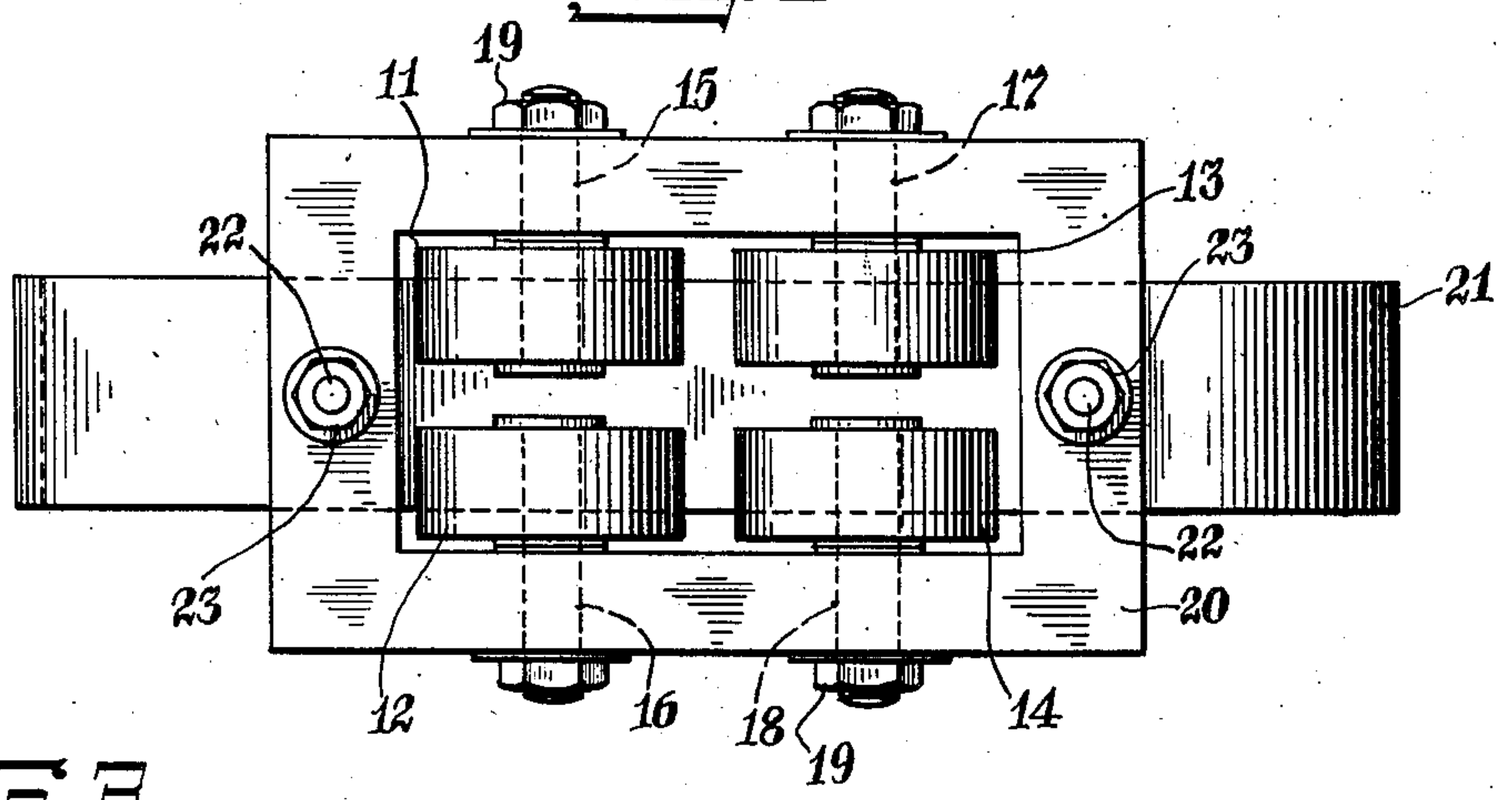
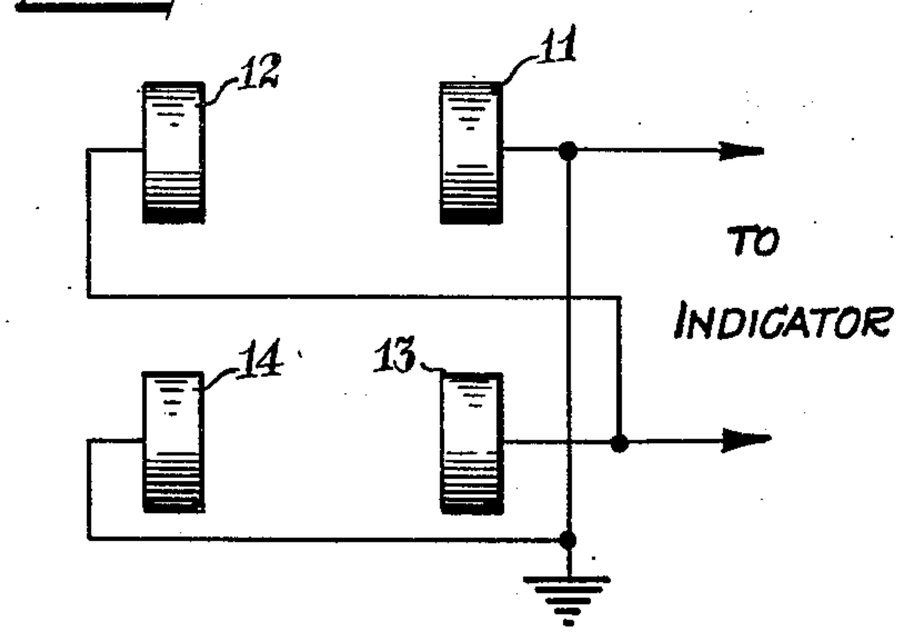


Fig. 3



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ROLLER CONTACTOR FOR MOISTURE METERS OR THE LIKE

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1 Claim. (Cl. 173—324)

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The present invention relates to improvements in contactors for moisture meters or the like and, more particularly, to roller contactors adapted for use with a running web of sheet material.

Such a roller contactor may be used to apply an electric current to a sample portion of the material which is to be examined, for instance, for its moisture content by determining its electrical conductivity, a method of making such measurements having been disclosed in my earlier U. S. Patent No. 2,183,333 dated December 12, 1939.

Readings may be obtained by connecting one or more rollers of the contactor to a sensitive device, such as the meter described in my aforesaid patent. When such readings are attempted between a single roller and ground, or between a pair of rollers connected to the input of the measuring device, severe static conditions primarily due to friction frequently interfere with the making of accurate measurements; this is especially true with materials which are running at great speed and which are relatively dry. It has been observed, however, that the static introduced by a pair of rollers reads in reverse polarity if the rollers are interchanged so that the trailing roller is placed in leading position, and vice versa, with respect to the oncoming material.

The principal object of my invention is to provide a roller contactor having electrodes arranged in such a manner as to eliminate any objectionable interference by static charges with the measurements to be taken.

With this and other objects in view, which will be apparent in the course of the following description, I provide in accordance with the present invention a contactor having a plurality of rollers, including at least two roller-electrodes arranged for the mutual neutralization of their static charges with respect to some further electrode or electrodes.

The invention will be described with reference to two specific embodiments shown in the accompanying drawing in which—

Fig. 1 is an elevation, partly in section, and Fig. 2 a bottom view of a preferred embodiment of the invention;

Fig. 3 represents a circuit diagram for the device shown in Figs. 1 and 2.

Referring first to Figs. 1 and 2, there are shown in contact with a web 10 two pairs of coaxially arranged rollers 11, 12 and 13, 14. Rollers 11 and 12 are journaled on axles 15 and 16, and

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rollers 13 and 14 on axles 17 and 18, respectively, these axles being secured by nuts 19 to a frame 20 of insulating material. The frame 20 is preferably made of a moldable plastic material, such as an acrylate and methacrylate resin, and has a metal handle 21 fastened to it by means of bolts 22 and nuts 23.

Electrically, the four rollers are cross-connected to form two pairs of diagonally positioned electrodes one of which may be grounded, as has been shown in Fig. 3. The two pairs 11, 14 and 12, 13 are connected to respective conductors leading to the input circuit of the indicator, not shown. It will be seen immediately that each pair of electrodes comprises one roller in leading position and one in trailing position with respect to an aligned roller of the other pair, thus being arranged to have the effects of their respective charges cancel each other. The rollers make contact with the material to be tested with their outer cylindrical working surfaces which in technical language is commonly referred to as their faces.

In Fig. 3, the grounded upper conductor is connected to a fixed-potential electrode and the lower conductor to the control electrode of the indicator. Since the distance between rollers 11 and 14 on one hand and between rollers 12 and 13 on the other hand are equal, the latter two rollers will have similar potential with respect to ground and the same current will flow in the two circuits which include, respectively, the pairs of correlated electrodes 11, 13 and 12, 14. The current measured by the indicator will be the sum of the two branch currents, or double the current through either circuit; thus the resistance between a pair of correlated electrodes may be readily determined. On the other hand, in keeping with the principles outlined above, the parasitic currents due to static charges will substantially compensate each other, leaving the indicator virtually unaffected.

Additional modifications and adaptations of the contactor according to this invention will undoubtedly occur to those skilled in the art, it being understood that departures from the precise embodiment described and illustrated may be made without exceeding the spirit and scope of my invention as defined in the appended claim.

I claim:

A roller contactor comprising an insulating frame having a rectangular opening; a handle bridging said opening; two pairs of pivots mounted in said frame with their free ends ex-

tending into said rectangular opening; two pairs of rollers rotatably mounted on said pivots inside said rectangular opening such that all the working faces of said four rollers are parallel to a common plane, and electrical conducting means connecting said rollers in two groups whereby two rollers of one polarity are separated by two rollers of the opposite polarity.

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