

Nov. 14, 1961

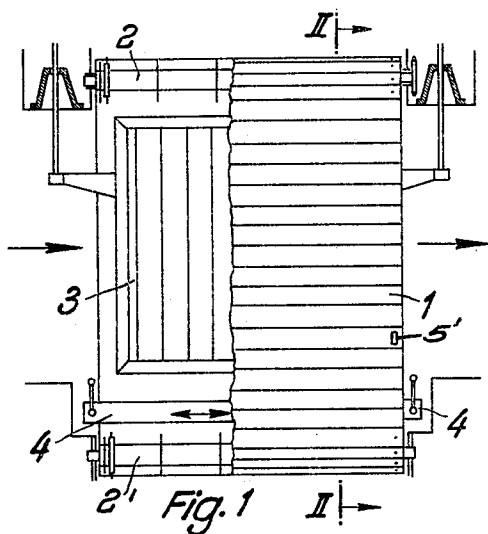
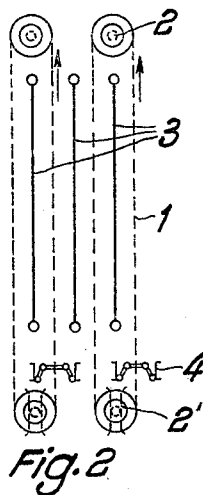
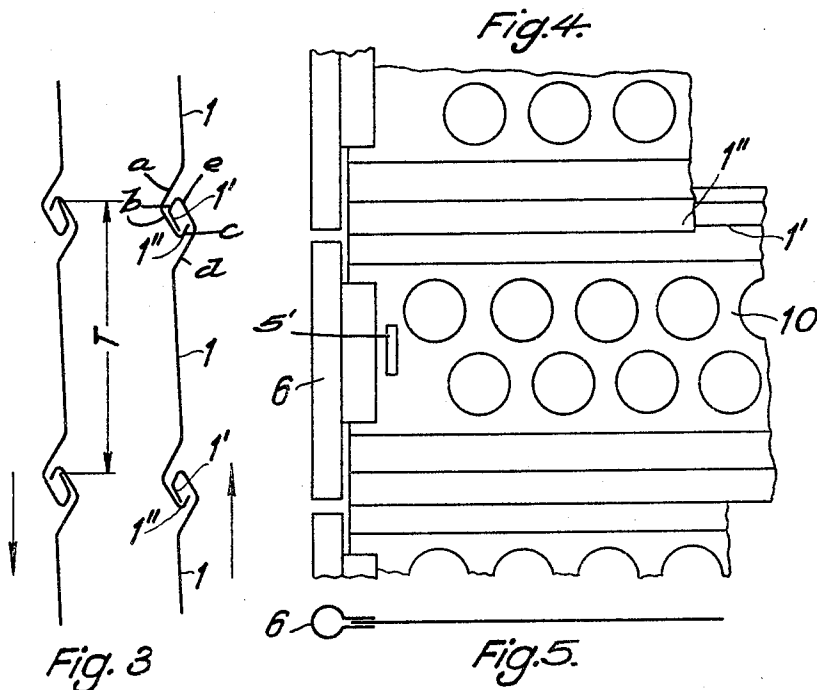
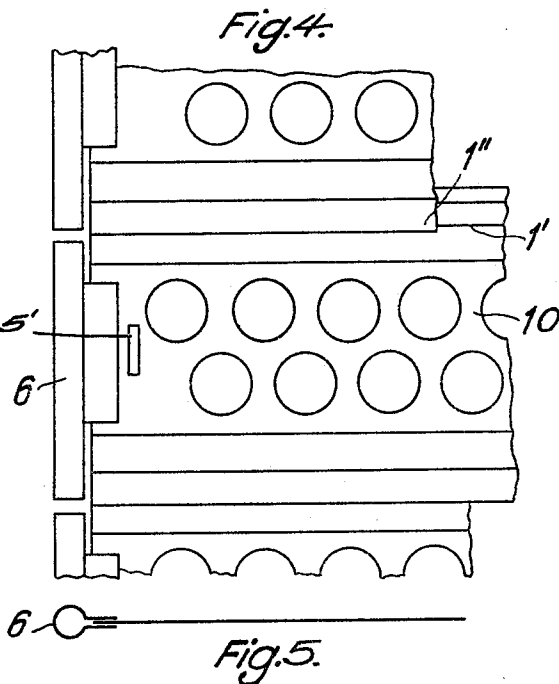
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3,008,541

PRECIPITATING ELECTRODES FOR ELECTROFILTERS

Filed May 23, 1958

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

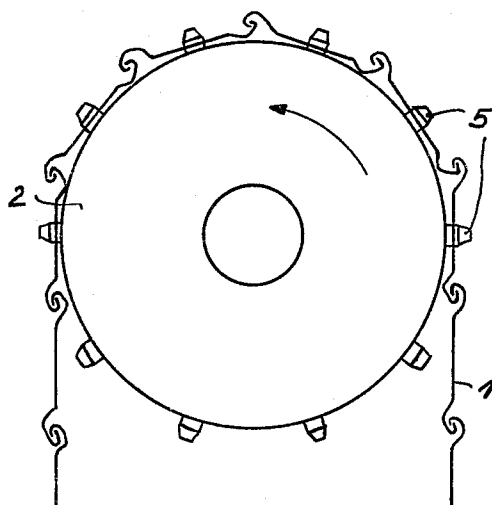


Fig. 6.

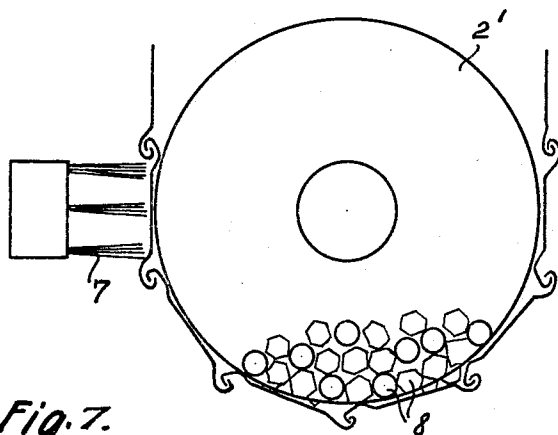
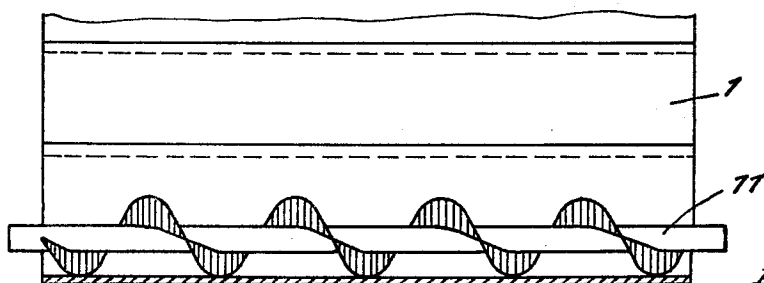


Fig. 7.



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PRECIPITATING ELECTRODES FOR ELECTROFILTERS

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Filed May 23, 1958, Ser. No. 737,262

Claims priority, application Germany May 23, 1957
6 Claims. (Cl. 183—7)

The invention relates to electrofilters and precipitating electrodes therefor, and particularly to movable electrodes.

It has been known to construct electric filtering devices which include movable precipitating electrodes in the form of endless bands. However, heretofore only individual strips individually movably mounted on fixed bands have been used, so that the bands are like жалюзи. These movable band electrodes have not come into use because the driving mechanisms wear out very quickly as a result of the dust and consequent sliding friction.

The primary object of the present invention is to provide a movable band electrode which is practical in use and is of inexpensive construction.

A further object of the invention is to provide a movable band electrode structure in which the friction existing in prior devices is substantially reduced, so that the electrodes are durable and do not require frequent replacement.

According to the invention, the precipitating electrodes are formed as individual strips, and connected through joints which are subjected only to rolling or rocking friction so as to reduce wear. For this purpose, it is especially advantageous to use knife edges engaging in grooves, by making the mating longitudinal edges of the strips hook-shaped so as to grip each other. Especially, the longitudinal edges at one side of the strips are bent around to form knife edges and those at the other edges are bent in the opposite direction to form receiving grooves. The resulting strip has the cross-section of a very much elongated S.

The bending of the joint-forming edges has the purpose of preventing the dust from filling the joint, in that, through the bending of the plates, the joint is at least partly covered against the entrance of dust. The actual shape is that of a plate bent a number of times.

Further objects and advantages of the invention will appear more fully from the following description, particularly when taken in conjunction with the accompanying drawings which form a part thereof.

In the drawings:

FIG. 1 shows in side elevation, partly in section, a dust collecting apparatus embodying the invention;

FIG. 2 is a cross-section on the line II—II of FIG. 1;

FIG. 3 is a detailed view of the electrode band in side elevation;

FIG. 4 shows in front view a fragment of a modified form of electrode band;

FIG. 5 is a cross-section through such band;

FIG. 6 shows on an enlarged scale an electrode band with a modified form of cleaning device; and

FIG. 7 is a cross-section through a portion of a further modification.

In FIG. 1, the right half of the figure is shown in elevation while the left half is shown in section. The individual movable strips constitute the collecting electrodes of the filter. The strips 1 are arranged in an endless band over guide rolls 2, 2'. These guide rolls constitute sprockets 2, 2' which, as shown in FIG. 6, have teeth 5 which engage in slots 5' in the ends of the strips 1. Within the collecting space are arranged discharge electrodes 3, which, as shown in FIG. 2, are positioned both inside the bands 1 and between adjacent bands, so that the strips can be coated on

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both sides with the dust contained in the gas which flows through the device in the direction of the arrows in FIG. 1.

The strips 1 are connected to each other in the manner shown in FIG. 3. Each strip has along one edge (1'') a part *a* bent outwardly from the plane of the strip at an acute angle, a second part *b* bent inwardly towards such plane at a similar angle, and a part *c* bent backwardly towards the center of the strip. The parts *b* and *c* form a groove facing towards the center of the strip, with its lowest point substantially in the plane of the strip and thus constitute a bearing member substantially V-shaped in cross-section. The outer edge (1') of the strip has a part *d* bent outwardly at an acute angle from the plane of the strip, a second part *e* bent inwardly towards such plane at a similar angle, and a backwardly bent part *f* (which may have two portions at a slight angle to one another), thus forming a roll having a tongue engaging the cavity of the V-shaped member. The free edge of part *f* is in the plane of the strip, and engages rockingly in the bottom of the groove formed by parts *b* and *c*.

By virtue of this construction, the strips are effectively hinged together. At the same time, dust falling down the faces of the strips is deflected almost completely out of the hinges or joints, and the wear on the joints is reduced.

The width of the strips, indicated at T, is preferably between 70 and 180 mm.

The dust may be removed from the band electrodes by brushes 4 which engage permanently the lower ends of the bands, or by any other conventional cleaning arrangement.

The guide rolls 2' are preferably provided with movable axes, and either by their own weight or by springs may maintain any desired tension on the endless bands.

FIGS. 4 and 5 show strips 10 provided with holes 11 through which dust loosened by the cleaning devices can escape.

Because the ends of the strips in passing through the apparatus tend to a positive discharge, a tubular part 6 is secured lengthwise across the end of the strip. These tubular parts extend in a straight line along the straight reaches of the band and effect an electrical screening of the ends.

It is also possible as shown in FIG. 6 to clean the outside of the bands by brushes 7, and to provide inside the bands substantially spherical balls or shapes 8 which are rolled over by the movement of the band knocking against it, to clean its surface.

FIG. 7 shows another cleaning arrangement in which the lower guiding member or roller 11 is formed as a screw conveyor which engages the inner faces of the plates and feeds the dust endwise to remove it from the interior of the endless band.

While I have described herein some embodiments of my invention, I wish it to be understood that I do not intend to limit myself thereby except within the scope of the claims hereto or hereinafter appended.

I claim:

1. In an electrofilter, a precipitating electrode structure comprising at least two rotatable guiding members having parallel axes of rotation, and an endless band of elongated plane parallel strips mounted on said guiding members, said strips having their longer dimensions parallel to the direction of said axes of rotation, the adjacent edges of the strips having on one strip a bearing member substantially V-shaped in cross-section and on the other strip a roll having a tongue engaging the cavity of the V-shaped member so as to hinge the strips to each other.

2. In a device as claimed in claim 1, said bearing member and roll each including a first part bent outwardly at an acute angle from the plane of the strip, a second part bent inwardly towards the plane of the strip, and a third part bent backwardly towards the center of the strip, said

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second and third parts of the bearing member defining the groove, and the free edge of the third part of the roll constituting the tongue and engaging the groove, said free edge lying substantially in the plane of the strip.

3. In a device as claimed in claim 1, said guiding members comprising sprockets, said strips having holes therein engaging the teeth of the sprockets.

4. In a device as claimed in claim 1, in which one of the guiding members is higher than the other, a plurality of loose substantially spherical members inside the band in the area of the lower guiding member for cleaning the inside of the band.

5. In a device as claimed in claim 1, the lower guiding member comprising a screw conveyor engaging the inner faces of the strips for cleaning them.

6. An electrofilter comprising a plurality of precipitating electrodes as claimed in claim 1 arranged in parallel relation, and a plurality of discharge electrodes some ar-

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ranged between adjacent precipitating electrodes and others arranged within the spaces defined by said endless bands.

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