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ELECTROSTATIC PRECIPITATORS

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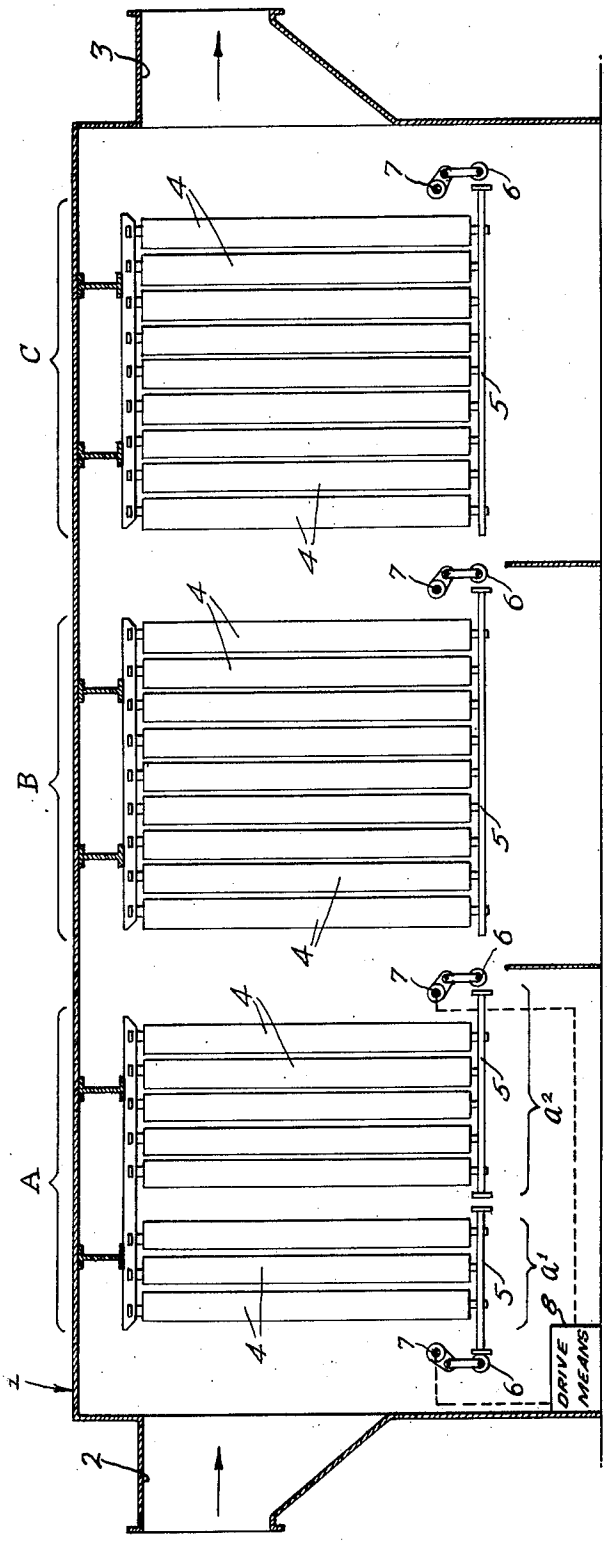

INVENTOR:
STIG GUSTAFSSON

BY Howson & Howson

ATTYS.

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ELECTROSTATIC PRECIPITATORS

Stig Gustafsson, Jonkoping, Sweden, assignor to Aktiebolaget Svenska Flaktfabriken, Stockholm, Sweden

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The present invention relates to electrostatic precipitators, particularly to a precipitator having horizontal gas flow, consisting of one or more sections each comprising a number of rows of freely-suspended flat electrodes, arranged one after the other parallel to the direction of gas flow, and means for rapping the electrodes clean. It is known to be unavoidable when rapping the electrodes that part of the dust shaken off is discharged with the outgoing gas stream, which often involves great disadvantages. In large precipitators, where the construction often necessitates a division into several sections, each being independent with respect to its suspension and power supply, a separate rapping mechanism has been provided for each section in order to eliminate the above-mentioned disadvantage. It has proved, however, that such an arrangement does not appreciably eliminate this drawback, which depends on the fact that the main part of the dust collected in the precipitator is deposited in the first section. As an example, it can be stated that if a precipitator collects 99% of the total dust, about 90% will be deposited in the first section. The possibility of attaining a better result by dividing the precipitator into a large number of very small sections is precluded for economic reasons.

The invention—which takes into account the above mentioned fact and is designed to reduce the dust losses into the cleaned gas to a minimum without altering the division into sections—is characterized in that at least the first section traversed by the gas stream is equipped with double rapping mechanisms mounted on each side of the section, i.e., on the upstream and downstream sides, respectively, and each arranged to separately actuate a separate group of electrodes included in the section. According to a suitable embodiment of the invention, the two rapping mechanisms for the first section of the precipitator are arranged to operate at different times, either out of phase or at different frequencies. The rapper rods of the two mechanisms are located in end-juxtaposed relationship to each other preferably in such position that they act as recoil stops for each other.

The invention will now be described in more detail with respect to the accompanying drawing, which shows a vertical longitudinal section through an electrostatic precipitator with rapping mechanisms for cleaning the electrodes arranged according to the invention.

In the drawing, 1 designates the casing of an electrostatic precipitator constructed for horizontal gas flow and fitted with an inlet 2 for raw gas and an outlet 3 for cleaned gas. The precipitator is equipped with a number of rows of freely-suspended flat electrodes 4 arranged one after the other parallel to the direction of gas flow and divided up into three sections A, B and C. For cleaning the electrodes the precipitator is equipped with rapping mechanisms of a design known per se, comprising rapper rods 5 fitted under each row of electrodes and designed to be actuated by a corresponding number

of power rappers or hammers 6 attached to a rotatable shaft 7. According to the invention, the electrodes in the first section (A) are split up into two groups a^1 and a^2, as regards cleaning, and each group is equipped with a separate rapping mechanism. These mechanisms are arranged on each side of the section, i.e., on the upstream and downstream sides, respectively, and are driven so that the rapping on the two groups is at different times; that is, there is either a suitable time interval between the cleaning of groups a^1 and a^2 or the rapping is at different frequencies. To this end conventional drive means 8 are incorporated in conjunction with the power rapping means to provide either rapping at different times or at a different frequency.

What I claim is:

1. An electrostatic precipitator comprising in combination: a casing arranged for the horizontal flow of gas therethrough, a plurality of sections of electrodes suspended from their upper ends in said casing, each section including a plurality of rows of vertical elongated generally flat electrodes arranged flat-wise in the direction of gas flow thereover; separate rapping means for each section of electrodes; at least said section which is first traversed by the flow of entering gas being subdivided into two groups; said rapping means for said subdivided section comprising separate end juxtaposed and aligned rapper rods and power rapping means for said rods disposed upstream and downstream respectively of the electrodes of said section; said rapper rods being positioned to engage end-wise when either is rapped and act as mutual recoil stops for each other.

2. An electrostatic preciptator as set forth in claim 1 wherein said power rapping means includes drive means for said two groups of electrodes operative to rap at different times.

3. An electrostatic precipitator as set forth in claim 2 wherein said drive means for said two groups of electrodes is operative at different frequencies.

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ROBERT F. BURNETT, *Primary Examiner.*
HARRY B. THORNTON, *Examiner.*