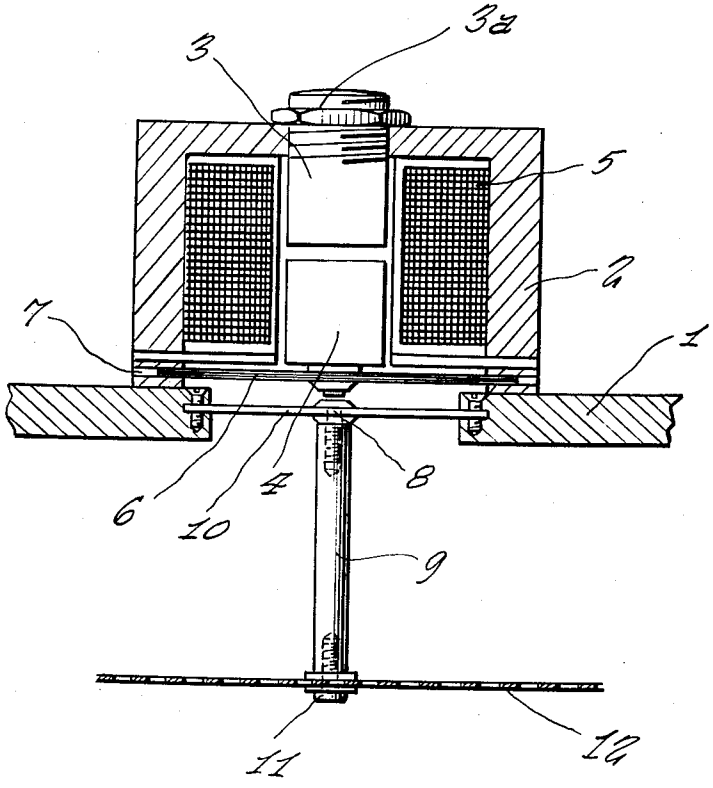
Dec. 23, 1958 P. BRÜNINGHAUS 2,865,505

MEANS FOR STARTING HIGH FREQUENCY VIBRATIONS IN FILTERS WITH FINE NETTING

Filed June 6, 1955



INVENTOR:
PAUL BRÜNINGHAUS
BY
Mestern & Kollin
ATTORNEYS

United States Patent Office 2,865,505 Patented Dec. 23, 1958

2,865,505

MEANS FOR STARTING HIGH FREQUENCY VIBRATIONS IN FILTERS WITH FINE NETTING

Paul Brüninghaus, Remscheid-Lennep, Germany, assignor to Rhewum Rheinische Werkzeug- und Metallwarenfabrik G. m. b. H., Remscheid-Luettringhausen, Germany

Application June 6, 1955, Serial No. 513,459

Claims priority, application Germany June 14, 1954

3 Claims. (Cl. 209—310)

The present invention relates to means for starting high frequency vibrations in filters with fine netting.

The known means for starting high frequency vibrations in filters, more particularly with fine netting, use direct transmission of electromagnetically generated vibrations to the netting. However, it has been found that such direct transmission is not desirable since there is no neat separation between the fundamental oscillations and the harmonics. The active principle in such processes are very high frequencies which may reach into the ultrasonic range, whereas larger amplitudes only are an obstacle.

For generating oscillations of highest frequencies on fine netting, it is therefore suggested to use a system which is rigid per se and which consists of a membrane and a reciprocating rod closely connected, said system having an inherent frequency which can be chosen as high as desired and which is effected electromagnetically. By the rigid connection with the fine netting, the oscillating energy is directly transmitted to the netting.

The invention will now be more particularly described with reference to the accompanying drawing, but it should be understood that this is given for illustration and not for limitation and that changes may be made without departing from the spirit of the invention.

In the drawing, which is a diagrammatic showing partly in section of the device according to the invention, a base is designated by **1**. Said base is used as supporting member for a magnetic oscillator and for the netting.

The magnetic oscillator mainly consists of a frame **2**, a stationary armature **3** and an oscillating armature **4**. Within the frame **2**, a coil **5** is arranged. The stationary portion **3** of the armature, which is provided with a screw thread, is adjustable by means of a screw nut **3***a*. By this means, a maximum free oscillation can be adjusted.

The oscillating portion **4** of the armature is supported by a set of springs **6** which is mounted at **7**. Near the oscillating armature, a strong membrane **10** is arranged in the base support **1** and rigidly screwed into the same. This disk-shaped membrane **10** is centrally connected at **8** to a reciprocating rod **9**. At the free end **11** of rod **9**, the netting **12** is fixedly secured thereto.

The system is so adjusted that the free swinging armature performs an elastic pounding action on a head portion of the reciprocating system, so that the system membrane-reciprocating rod has imparted thereto a movement of natural oscillations which are dependent on the

dimensions of the membrane and the rod and being capable of reaching more than 10,000 C. P. S. The amplitudes are of course very small, but may be adjusted by proper tuning of the swinging system to be within the magnitude of the mesh openings of the fine netting, whereby maximum effectiveness is attained.

The oscillating armature portion **4** can be made with a striking surface of a resistant plastic, whereby the noise is reduced to a minimum. The oscillating system proper is almost noiseless due to its high frequency, so that it may be used in places which are sensitive to noise.

In plant operation, a system of this type will be operated with A. C. of 50 C. P. S. In this way, the freely oscillating armature attains a frequency of 100 C. P. S., which means that it will strike the membrane-rod system 100 times per second. In the system, damped natural oscillations will be generated, which will, however, practically appear as undamped oscillations due to the frequency of the pounding action. Whereas the freely oscillating armature has amplitudes of about 3 mm., which are limited by the pounding by $\frac{1}{10}$ mm., the amplitudes of the swinging system, as mentioned above, depend on their dimensions.

What I claim is:

1. A device for imparting vibrations of high frequency in fine netting of filters, comprising in combination, a substantially horizontal base support having an opening therein, a membrane secured in said opening to the edges thereof, a rod having its one end secured to said membrane and extending downwardly therefrom, netting secured to the other end of said rod, said membrane, rod and netting being adapted for reciprocating vibratory movement, an electromagnetic oscillator mounted on said base support above said opening, and including a stationary armature portion, and a reciprocating armature spaced between said stationary armative portion and said rod in axial alignment with said rod and adjacent said one end of said rod and normally spaced therefrom, flexible spring means in said electromagnetic oscillator, for maintaining said rod spaced from said armature, whereby when said oscillator is energized, said armature by pinpoint-like impact upon one end of the rod imparts vibratory reciprocating movement of high frequency to said rod, said membrane and said netting.

2. A device for starting vibrations of highest frequency, according to claim 1, wherein the freely reciprocating armature is provided with a pounding head of hard plastic.

3. A device for starting vibrations of highest frequency, according to claim 1, wherein the free amplitude of the oscillating armature portion is adjustable by means for adjusting said stationary armature portion.

References Cited in the file of this patent

UNITED STATES PATENTS

1,456,067	Leahy	May 22, 1923
1,928,812	Dawson	Oct. 3, 1933
2,225,967	Berman	Dec. 24, 1940
2,274,914	Wilcox	Mar. 3, 1942
2,412,840	Snyder	Dec. 17, 1946
2,468,949	Snyder	May 3, 1949

FOREIGN PATENTS

392,778	Great Britain	May 25, 1933