

Jan. 16, 1945.

J. M. R. WIESBACH

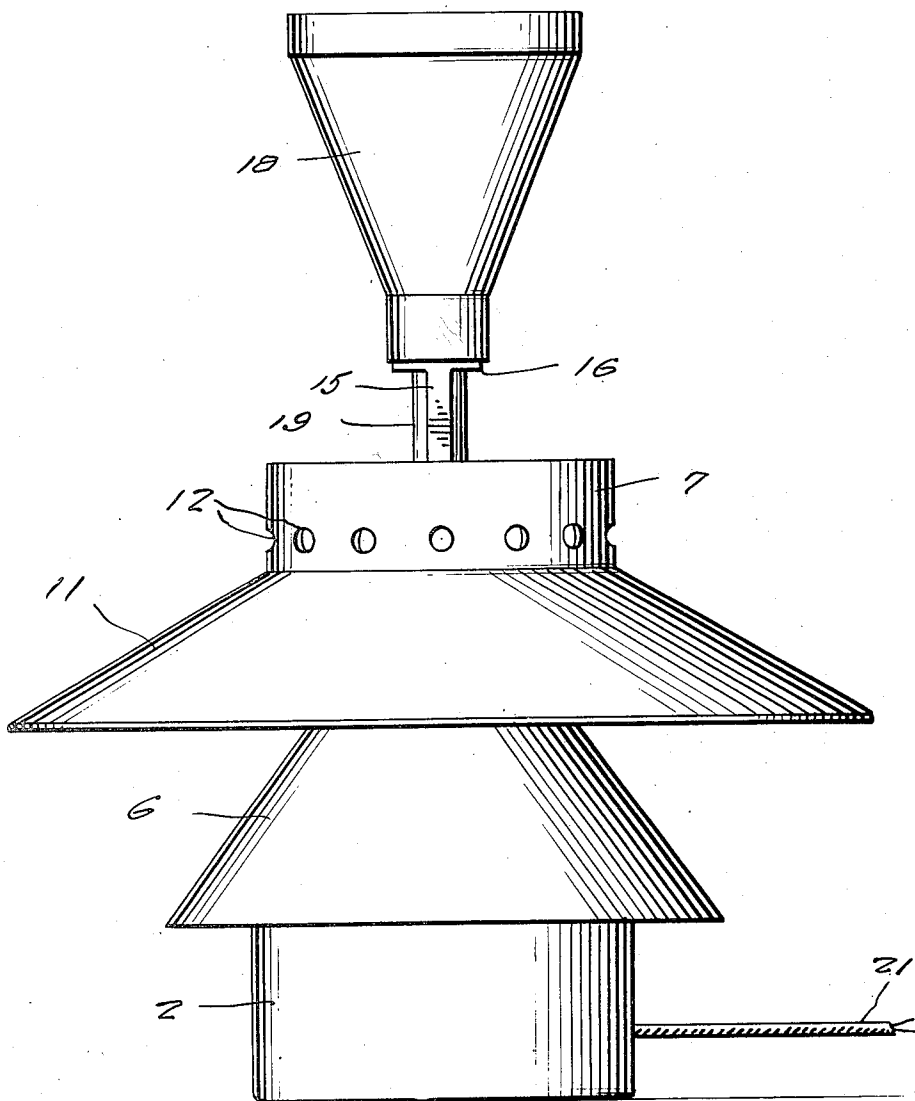
2,367,478

VIBRATORY SEPARATOR

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4 Sheets-Sheet 1

Fig. 1.



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4 Sheets-Sheet 2

Fig. 2.

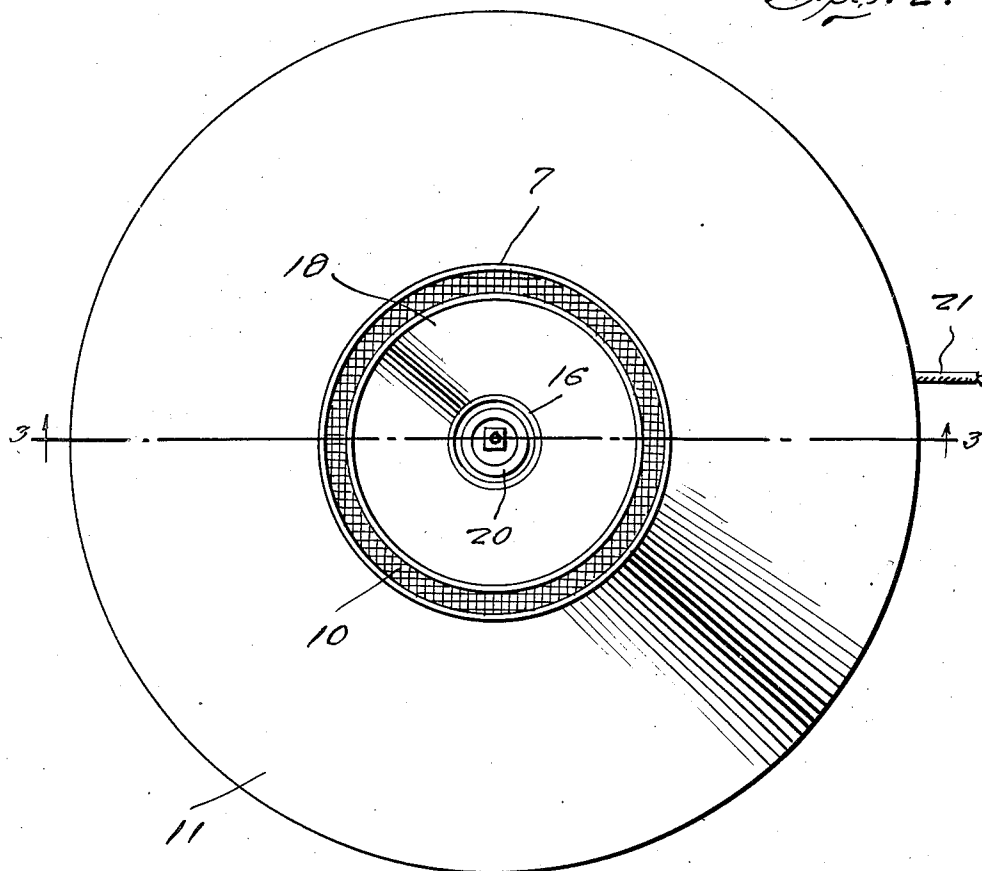
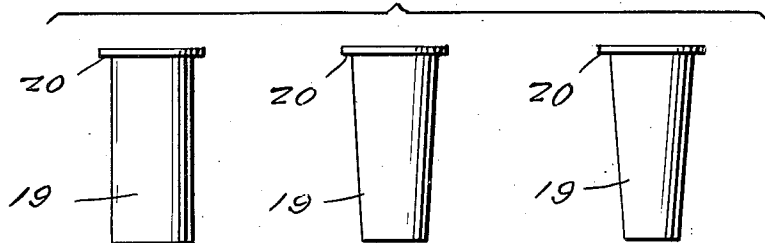


Fig. 7.



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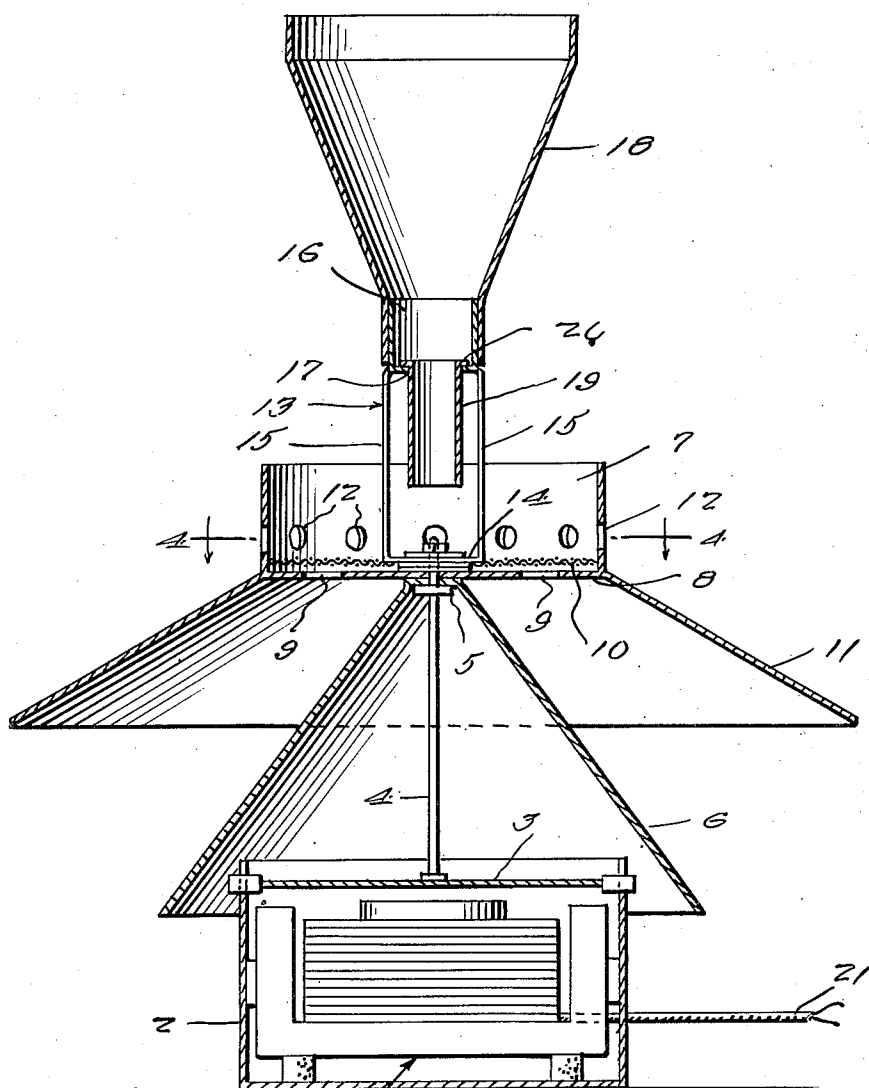
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Fig. 3.



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Fig. 4.

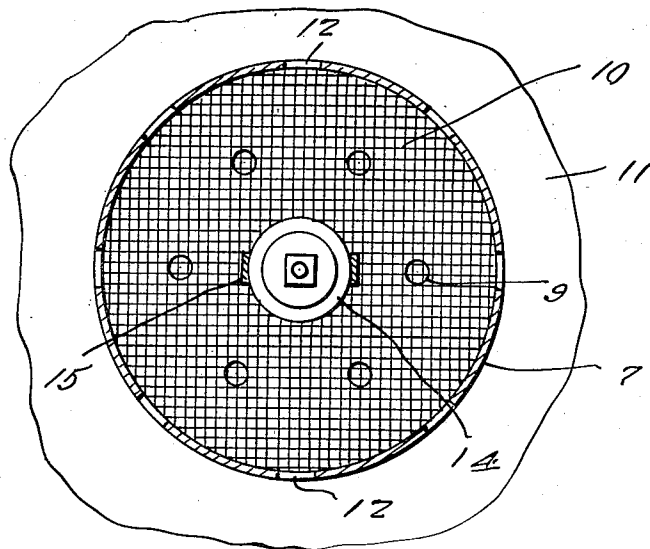


Fig. 5.

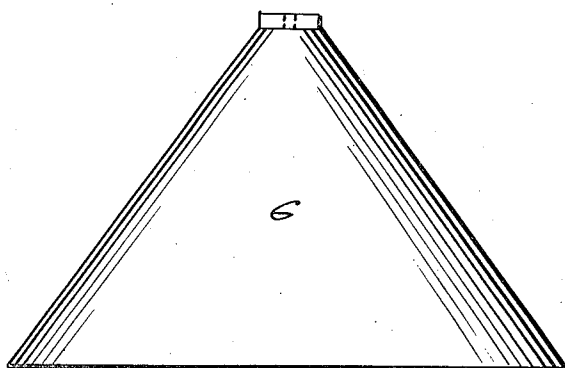
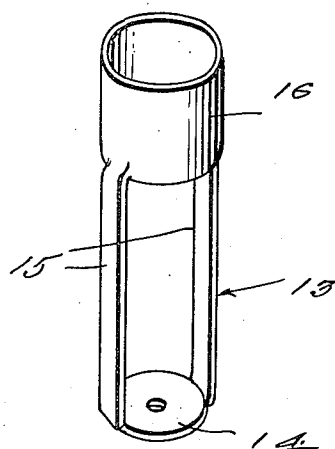


Fig. 6.



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UNITED STATES PATENT OFFICE

2,367,478

VIBRATORY SEPARATOR

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Application November 10, 1943, Serial No. 509,756

3 Claims. (Cl. 209—346)

The present invention relates to new and useful improvements in separators, and has for its primary object to provide, in a manner as hereinafter set forth, a device of this character comprising novel means for stratifying and separating various materials by subjecting them to vibration.

Other objects of the invention are to provide a vibratory separator of the aforementioned character which will be comparatively simple in construction, strong, durable, highly efficient and reliable in use, compact, and which may be manufactured at low cost.

All of the foregoing, and still further objects and advantages of the invention will become apparent from a study of the following specification, taken in connection with the accompanying drawings wherein like characters of reference designate corresponding parts throughout the several views, and wherein:

Figure 1 is an elevational view of a vibratory separator constructed in accordance with the present invention.

Figure 2 is a top plan view of the device.

Figure 3 is a vertical sectional view through the separator, taken substantially on the line 3—3 of Figure 2.

Figure 4 is a view in horizontal section, taken substantially on the line 4—4 of Figure 3.

Figure 5 is a view in elevation of the substantially conical concentrate deflector.

Figure 6 is a detail view in perspective of the feed hopper and the tube support.

Figure 7 is an elevational view, showing a plurality of feed tubes which may be selectively used.

Referring now to the drawings in detail, it will be seen that the embodiment of the invention which has been illustrated comprises an electromagnet which is designated generally by reference numeral 1. A housing 2 is provided for the magnet 1, which housing is open at its top. The magnet 1 includes a vibrating plate-type armature 3 which is mounted in the upper portion of the housing 2.

Rigidly mounted on the armature 3 and rising therefrom is a post 4. A collar 5 is provided on the upper portion of the post 4. Mounted on the post 4 and resting on the collar 5 is a substantially conical concentrate deflector 6 which extends downwardly over the housing 2 of the magnet 1.

Mounted on the post above the deflector 6 is a circular vibrating basket or container 7 of suitable dimensions. The bottom 8 of the vibrating

receptacle 7 has formed therein a plurality of openings 9 for the discharge of concentrates on the deflector 6. A screen 10 of suitable mesh is provided in the lower portion of the receptacle 7 over the concentrate discharge openings 9. Projecting from the lower portion of the vibrating receptacle 7 is a substantially frusto-conical waste deflector 11 which extends outwardly well beyond the periphery of the deflector 6. Circumferentially spaced openings 12 in the wall of the circular receptacle 7 discharge waste material onto the deflector 11 from said receptacle.

Mounted on the post 4 above the receptacle 7 is a stand 13. The stand 13 includes an apertured disk 14 through which the post 4 projects. Rising from the disk 14 is a pair of uprights 15. A cup 16 is provided on the upper ends of the uprights 15. As best seen in Figure 3 of the drawings, the bottom of the cup 16 has formed therein a circular opening 17.

Removably mounted on the cup 16 is a hopper 18 for the reception of the material. The opening 17 is for the reception of any one of several different sizes of removable feed tubes 19. The tubes 19 are provided, on their upper ends, with external flanges 20 which are engageable on the bottom of the cup 16 for suspending said tubes therefrom.

It is thought that the operation of the device will be readily apparent from a consideration of the foregoing. Briefly, the material is placed in the hopper 18 from which it flows to the receptacle 7 through the depending tube 19. When the magnet 1 is energized the entire assembly on the post 4 is vibrated. Thus, the material in the receptacle 7 is stratified, the concentrates gravitating through the screen 10 and the discharge openings 9 onto the deflector 6, the relatively light waste rising to the top and discharging through the openings 12 onto the comparatively large deflector 11. Vibration of the assembly also assists in maintaining a uniform feed of the material from the hopper 18 through the tube 19 and for preventing clogging. A conductor 21 electrically connects the magnet 1 with any suitable source of current.

It is believed that the many advantages of a vibratory separator constructed in accordance with the present invention will be readily understood, and although a preferred embodiment of the device is as illustrated and described, it is to be understood that changes in the details of construction and in the combination and arrangement of parts may be resorted to which will fall within the scope of the invention as claimed.

For example, the assembly may be hydraulically, pneumatically or mechanically vibrated.

What is claimed is:

1. A separator of the character described comprising a vibratory receptacle, means for vibrating said receptacle, said receptacle having upper and lower discharge openings therein, a supporting stand rising from the receptacle, said stand including a pair of uprights and a cup on the upper ends of said uprights, said cup including a bottom having an opening therein, a tube mounted in the opening and depending from the cup into the receptacle, said tube including a flange on its upper end engaged with the bottom of the cup for suspending said tube therefrom, and a hopper, for the reception of the material to be separated, removably mounted on the cup and communicating with the tube.

2. A separator of the character described comprising a support, a circular receptacle including a flat-bottom mounted on said support, said receptacle having circumferentially spaced discharge openings in its walls and further having additional discharge openings in said bottom, a screen in the lower portion of the receptacle between the first and second-named openings, a substantially frusto-conical deflector mounted on the receptacle below the first-named openings, a substantially conical deflector mounted on the

support below the second-named openings, means for feeding the material to be separated into the receptacle, and means for vibrating the receptacle for stratifying the material therein and discharging said material through the first and second-named openings.

3. A separator of the character described comprising an electro-magnet, a post mounted on the magnet and adapted to be vibrated thereby, a receptacle mounted on the post, said receptacle having upper and lower openings therein, a substantially conical deflector on the post below the receptacle, a substantially frusto-conical deflector on the receptacle between the upper and lower openings, a screen in the receptacle between said upper and lower openings, a stand rising from the receptacle, said stand including a disk mounted on the post, uprights rising from the disk and a cup on the upper ends of said uprights, said cup comprising a bottom having an opening therein, a removable feed tube mounted in the last-named opening and depending from the cup into the receptacle, said tube including an external flange on its upper end engaged with the bottom of the cup, and a feed hopper, for the reception of the material to be separated, removably mounted on the cup and communicating with the tube.

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