June 2, 1942. K. P. BRACE ET AL 2,284,943

ELECTRIC SIFTER

Filed Feb. 28, 1940

Fig. 1

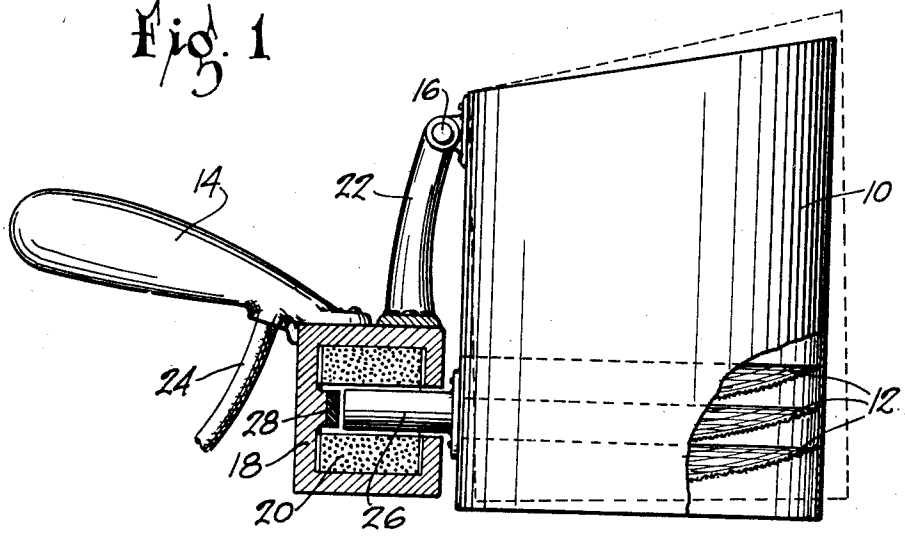


Fig. 2

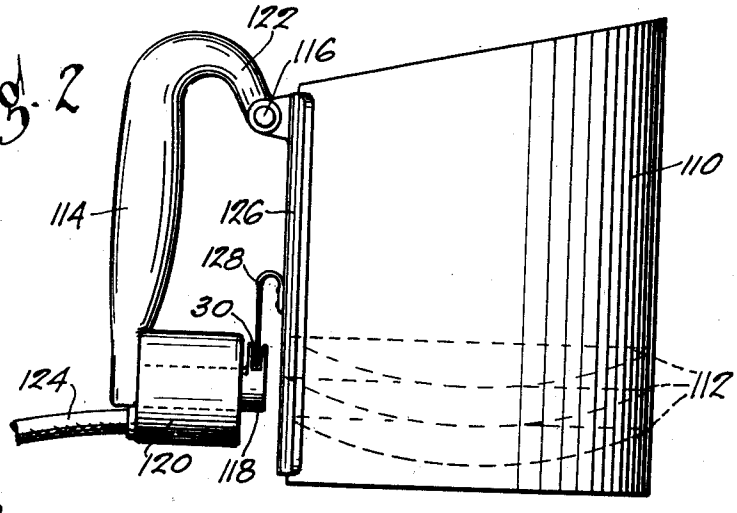
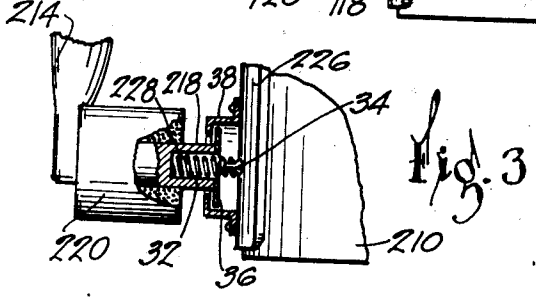


Fig. 3



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Patented June 2, 1942 2,284,943

UNITED STATES PATENT OFFICE

2,284,943

ELECTRIC SIFTER

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Application February 28, 1940, Serial No. 321,198

5 Claims. (Cl. 209—275)

This invention relates to a household utensil particularly adapted to the sifting of flour or the mixing of dry ingredients for cooking.

An object of the invention is to provide a simple, automatically operated sifter which reduces the labor involved in sifting or mixing and which leaves one hand free so that ingredients can be measured and added while the sifter is working.

We prefer to accomplish this object by providing a supporting element which may preferably be a handle, pivotally securing to it a container having its bottom formed of wire mesh or other suitable material to act as a sieve, and actuating the container in a vibratory fashion on the pivot by means of a simple electro-magnetic motor energized by alternating current. A preferred form of motor comprises merely a coil, iron elements in fixed relation to the coil and forming a partial magnetic circuit, and an armature adapted to substantially close the magnetic circuit but arranged with an air gap between it and said iron elements. Preferred embodiments include a resilient element in the form of a rubber bumper or a metallic spring interposed between the handle and the container at some point so as to maintain an air gap between the armature and the other elements forming the magnetic circuit whereby the armature is always free to vibrate.

Other objects and desirable particular arrangement of parts will become apparent upon reading the following detailed descriptions of several illustrative embodiments of our invention shown in the accompanying drawing, in which:

Figure 1 is a side elevational view with parts in section of a preferred embodiment of our invention;

Figure 2 is a side elevational view of another modification; and

Figure 3 is a partial side elevational view with parts in section of still another modification.

Referring to Figure 1, our novel utensil may comprise a cylindrical, open-topped container 10 of the type generally used for flour sifters and the like, having one or more sieves 12 in the bottom thereof. The sieves 12 may be of any suitable material such as woven wire mesh. Three such sieves, one above the other, are shown, but the exact arrangement or construction thereof forms no part of this invention.

A handle 14 is secured to the container 10 by a hinge joint 16, although any suitable connection which permits a relative vibratory motion between the container 10 and handle 14 would be suitable. In the illustrated embodiment the handle structure comprises three separate elements, one of which is a laminated C-frame structure 18 adapted to receive a coil 20 and form part of a magnetic circuit about the coil. The remaining parts of the structure are the handle 14 which is riveted or screwed to the frame 18 and a bracket 22 also riveted to the frame 18 and forming a part of the hinge 16. Naturally many modifications of this structure could be devised within the scope of this invention.

Electrical connections to the coil 20 are provided in the form of a flexible two-wire cord 24 which is shown passing into the hollow or opening in the handle 14, within which it may be suitably connected to the terminals of the coil. The remote end of the cord 24 should be provided with the usual plug in fixture (not shown). The electrical characteristics of the coil must be varied in accordance with the current provided at the point of use but the current must be alternating since an important advantage of the invention resides in its simplicity in having no circuit breaker or commutator. For general use the coil should be constructed to receive 110 volt 60 cycle alternating current.

An armature 26 is riveted to the container 10 so as to pass between the arms of the C-frame 18 and into the center of the coil 20 to substantially complete a magnetic circuit about the coil. A rubber bumper or spring 28 is secured to the rear portion of the C-frame within the coil, and is adapted to engage the end of the armature to prevent a complete closing of the magnetic circuit. By this means the container is held resiliently suspended so that it may vibrate freely.

Operation of the device is extremely simple. Whenever the cord 24 is plugged in and the device is raised from any support other than the handle 14, the container 10 vibrates at extremely high frequencies. As a result, any powdered or ground substance which is then placed, or has formerly been placed, in the container, passes rapidly through the meshes of the sieves. If several different dry ingredients such as flour, sugar, salt, and baking powder are placed in the container, they are intimately mixed together as they pass successively through the several sieves. Of course, for best mixing results, it is desirable to scoop up the mixture and permit it to pass through the sieves several times.

Referring now to Figure 2, which shows a modified structure, parts performing similar functions are designated by like reference numerals increased by 100. The handle 114 is formed of magnetic material and is C-shaped. The upper

arm 122 of the C forms a part of the hinge 116. The armature 126 is formed as a generally flat plate of magnetic material forming a part of the hinge 116 and extending down to a point adjacent the lower arm 118 of the C-shaped handle 114. The lower arm 118 is formed generally cylindrically and the coil 120 is wound upon it as a core. The cord 124 may be attached directly to the terminals of the coil 120.

The extreme end of the arm 118 may be formed with a notch 30 receiving the free end of a non-magnetic flat metallic spring 128. This spring is formed as a U and is anchored conveniently to the armature 126. The function of this spring is to prevent the air-gap between the arm 118 and the armature 126 from closing, whereby the armature and the container 110 attached thereto vibrates freely under the periodic impulses of the magnetic field created by alternating current passing through the coil 120. The spring 128 also serves to keep the handle 114 and container 110 substantially in the correct relationship, regardless of whether the device is always held in the correct vertical position, e. g., it enables the device to be used as a scoop in order to fill it with material to be sifted.

The operation of this modified device does not differ materially from that previously described and will not be described in detail.

The structure of Figure 3 is much the same as that of Figure 2 and like parts are designated by the same reference numerals increased by 100. This structure differs from Figure 2 in having a coil spring 228 one end of which is seated in a recess 32 in the end of the arm 218. The other end of the spring 228 bears against the armature 226 where it is supported and positioned by a lug 34. The handle 214 and container 210 are held in operative relationship at all times by a flange 36 on the end of the arm 218 which is fitted into a cup 38 secured to the armature 226. The flange 36 and cup 38 are preferably of non-magnetic material such as brass. When in operation the attraction of the armature 226 toward the arm 218 moves the flange 36 away from the cup 38 so that these elements do not interfere with the vibratory action.

Since the operation of this device is obvious from what has gone before no detailed description of it will be embodied in this specification.

While three embodiments of our invention have been described in detail it is not our intention that the scope of our invention should be limited to those embodiments or otherwise than by the terms of the appended claims.

We claim:

1. A household utensil comprising a handle, a container movably mounted on the handle and having its bottom formed as a sieve, a coil secured to said handle, said handle including parts forming part of a magnetic circuit about the coil, and an armature rigidly secured to one side of the container and lying closely adjacent thereto and extending from a point adjacent the connection of the container to the handle to a point adjacent the coil and substantially completing the magnetic circuit.

2. A household utensil comprising a handle, a container movably mounted on the handle and having its bottom formed as a sieve, a coil secured to said handle, said handle including parts forming part of a magnetic circuit about the coil, an armature rigidly secured to one side of the container and lying closely adjacent thereto and extending from a point adjacent the connection of the container to the handle to a point adjacent the coil and substantially completing the magnetic circuit, and resilient means urging the coil away from the armature to maintain an air gap between the armature and said parts.

3. A household utensil comprising a handle element, a container element pivotally mounted on the handle element and having its bottom formed as a sieve, an electro-magnetic motor comprising a coil and magnetic circuit elements secured to one of the first-named elements and spaced from the pivotal connection therebetween, and an armature secured rigidly to the other element and extending from a point adjacent the pivotal connection between the container and handle to a point adjacent the coil, and spring means interposed between the armature and the magnetic circuit elements urging them apart.

4. A household utensil comprising a handle at least partially formed of magnetic material, a sieve hinged to the handle and including an element of magnetic material rigidly connected to the sieve and extending from the connection thereof to the handle substantially parallel to the handle to form a magnetic circuit with the handle spaced from the hinged connection thereof to the sieve, and a coil mounted on the handle.

5. A household utensil comprising a handle at least partially formed of magnetic material, a sieve hinged to the handle and including an element of magnetic material rigidly connected to the sieve and extending from the connection thereof to the handle substantially parallel to the handle to form a magnetic circuit with the handle spaced from the hinged connection thereof to the sieve, a coil mounted on the handle, and a resilient element interposed between the handle and the element and arranged to maintain an air gap between them.

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