

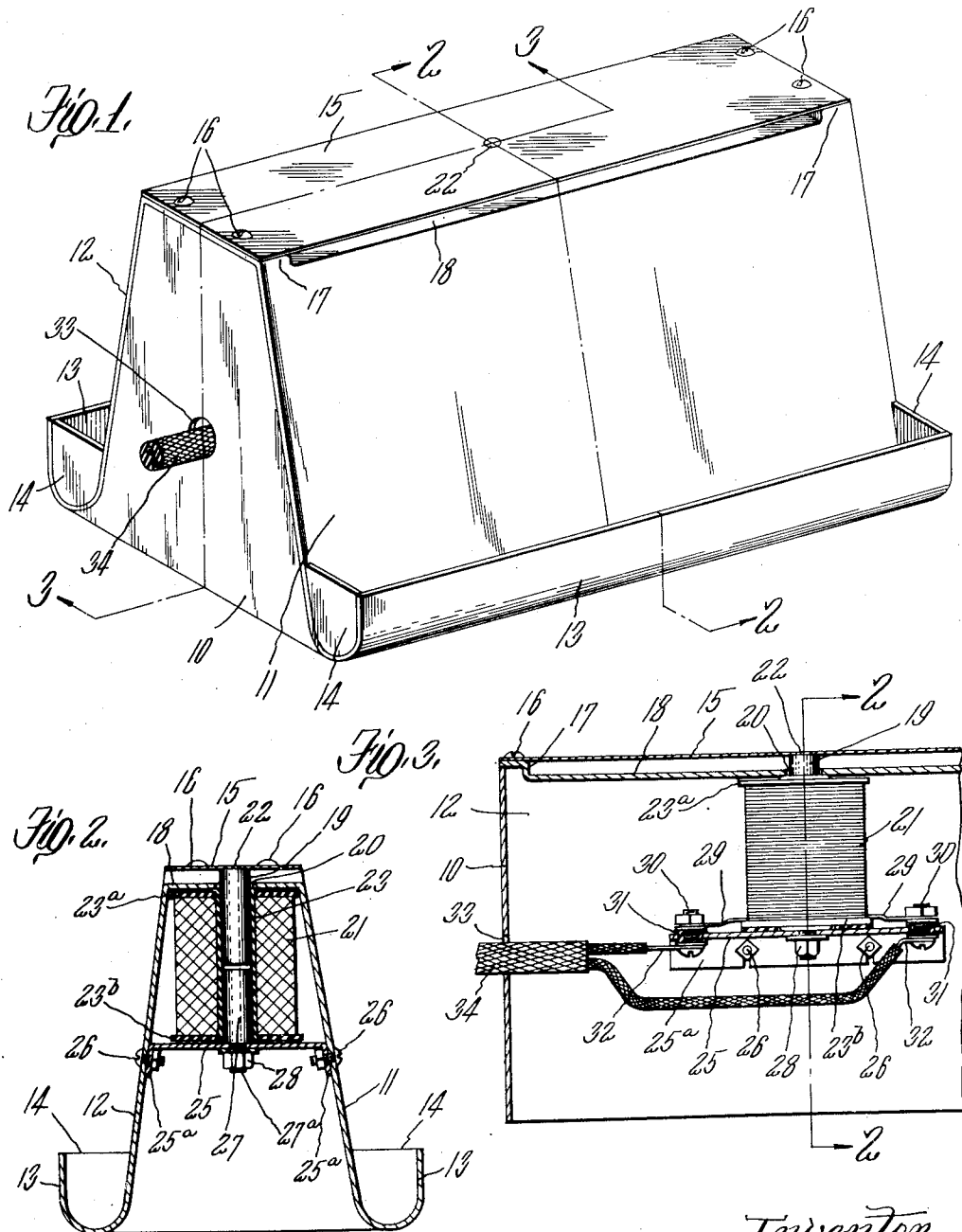
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VIBRATING INSTRUMENT FOR PRODUCING FLOCKED ARTICLES

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## UNITED STATES PATENT OFFICE

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VIBRATING INSTRUMENT FOR PRODUCING  
FLOCKED ARTICLES

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3 Claims. (Cl. 91—8)

This invention relates to a vibrating instrument or device adapted more especially for producing attractive flock designs or ornamentation on small articles, such as cards, toys, etc., or producing small flock designs, such as a monogram, on such articles as towels, handkerchiefs, napkins, etc. In making flock designs or ornamentation on various articles, particularly flat articles, it is the practice to apply suitable adhesive or cement through a stencil to the surface of the article to shower or deposit excess fiber flock of the desired color onto the adhesive-treated area, and to subject the article as a whole or its flocked area to vibrating action for the purpose of distributing the fibers substantially uniformly and densely over the adhesive-treated area and at the same time eliminating excess fibers before the adhesive dries or sets. The vibratory distribution of the fiber flock onto the adhesive-treated area tends to fix the individual fibers in what appears to be an upstanding position and to impart to the finished flock design an attractive suede-like or velvety appearance and feel. I need not dwell further on the method of producing flocked articles, as the method is well known and is described, for example, in my Patent No. 1,955,552, dated April 17, 1934.

An objective of the present invention is to provide a simple, compact, and inexpensive vibrating instrument for producing flocked articles, particularly small articles, so that inexperienced persons or amateurs, including even children, when equipped with the necessary supplies, such as stencils, cement, and fiber flock, may be able to employ such an instrument in producing the flocked articles. While not limited thereto, the instrument hereof may be used, as by children, for divertimento or play and for usefully ornamenting various small articles. In the household, the instrument hereof may serve such constructive or useful purposes as producing attractive flock designs on such diverse articles as greeting cards, linen, wearing apparel, etc.

Briefly stated, the instrument hereof comprises a pair of supports to which is fixed a flexible or vibratile strip so that the strip bridges the supports and is free to vibrate therebetween. The instrument further includes electromagnetic means for rapidly vibrating the vibratile strip as the work to be flocked is held thereon; and, to this end, the strip may carry between its supports an electromagnetic portion or piece and the instrument includes an electromagnet arranged in electromagnetic relationship to such portion and capable of being energized by a pulsating

electric current to vibrate the strip. Thus, the vibratile strip may to advantage consist of a flexible steel band carrying, preferably at its center, a magnetic pin or rod projecting downwardly into the electromagnetic field of a solenoid which may be wired for plugging into the socket of the usual alternating current circuit and thus being energized for vibrating the strip.

With the foregoing and other features and objects in view, the present invention will now be described with particular reference to the accompanying drawing, wherein,—

Figure 1 shows in perspective an instrument embodying the invention hereof.

Figure 2 represents a section on the line 2—2 of Figures 1 and 3.

Figure 3 is a fragmentary section on the line 3—3 of Figure 1.

As appears in Figure 1, the frame of the instrument may be box-like and include upstanding end walls 10 and front and back walls 11 and 12, respectively, whose lower end portions may be bent upwardly to afford troughs 13 for catching the excess flock removed from the work during the vibrating treatment thereof. As shown, the troughs 13 are closed off at their ends by plates 14. The various frame walls described may advantageously be sheet metal stampings, for instance, sheet steel stampings, but any other suitable material of construction may be employed for the walls.

A flexible or vibratile strip or band 15, for instance, a steel band, may be fixed near its ends as by screws 16 to the upwardly projecting end flanges 17 of a top closure 18 spaced somewhat below the strip and serving to close off the top of the box-like frame or structure defined by the walls 10, 11, and 12. The strip 15 is shown provided with a downwardly projecting magnetic or steel pin 19 entering through an aperture 20 in the closure 18 into the center or magnetic field of a solenoid 21 suitably mounted immediately under such closure. The pin 19, which may be fixed to the strip 15 as by a rivet 22, serves as the electromagnetizable element by which the strip may be rapidly vibrated upon energization of the solenoid 21 by suitable pulsating electric current.

The windings of the solenoid 21 may, as best shown in Figure 2, be carried on a fiber spool 23 into whose hollow tubular interior the pin 19 may project and whose upper flange 23a may be situated immediately below the closure 18 and whose lower flange 23b may be supported on a shelf 25 provided with downwardly flanged front and back edge portions 25a adapted for secure-

ment to the front and back walls 11 and 12, respectively, as by bolts 26. Preferably, as shown, the magnetic pin 19 projects downwardly only part way into the tubular hollow or interior of the spool 23 and a second magnetic pin 27 projects upwardly into the tubular hollow of the spool with its upper end normally slightly spaced from the confronting lower end of the pin 19 and with its threaded lower end portion 27a fixed, as by a nut, 28 to the shelf 25. The fixed magnetic pin 27 thus serves as a stop to limit the downward movement of the magnetic pin 19 and, accordingly, the amplitude of vibration of the strip 15. Energization of the solenoid 21 by a pulsating current, for instance, by the usual 60-cycle alternating current, is accompanied by the generation of a rapidly shifting or reversing magnetic field in the solenoid and in the fixed magnetic pin 27 and by rapid oscillation of the magnetic pin 19 and attendant vibration of the vibratile strip 15 of which it forms part.

The ends 29 of the wire winding for the solenoid 21 may be fastened to the shelf 25, as by electro-conducting posts or bolts 30, which, as shown, pass through the shelf and are electro-insulated from the shelf by suitable encompassing insulating bushings 31 and receive the electric current from a pair of wires 32 leading therefrom out through an opening 33 in an end wall 16 of the frame as an insulated, two-wire cord 34. The cord 34 may terminate as a suitable plug (not shown) capable of being plugged into the usual socket or outlet of a 60-cycle alternating current circuit such as is common in the household and elsewhere.

After an article has been stencilled or otherwise treated with adhesive over the desired areas and fiber flock has been showered onto such areas in sufficient amount to ensure proper flocking, the adhesive-treated area or the article as a whole is held down against the flat upper surface of the vibratile strip 15 as such strip is being rapidly vibrated, in consequence of which the flock becomes distributed uniformly and densely over the adhesive-treated area and excess flock may be directed to fall into the collecting troughs 13, from which the flock may be recovered for reuse.

Not only is the instrument hereof simple and foolproof to operate but its power consumption is low and the flocked goods produced thereby are of excellent appearance and serviceability, particularly when fiber flock and adhesives of the proper quality are employed. It may hence be used by amateurs either for divertimento or for utilitarian purposes. Of course, the instrument hereof may also be used to good advantage by

professional or commercial workers in producing flock designs on various articles or goods.

I claim:

1. An instrument for producing flocked articles comprising a pair of spaced supports, a vibratile member bridging said supports and fixed thereto, said member being free to vibrate between said supports, a solenoid arranged under said member, said member including integral therewith an electromagnetic piece projecting downwardly therefrom part way into said solenoid, a second electromagnetic piece fixed within said solenoid with its upper end normally slightly spaced from and confronting the lower end of said first-named electromagnetic piece, and means for supplying a pulsating electric current to said solenoid and thereby causing oscillation of said first-named electromagnetic piece and vibration of said vibratile member.

2. An instrument for producing flocked articles comprising a pair of spaced supports, a vibratile strip bridging said supports and fixed thereto, said strip having a substantially flat upper surface but including integral therewith an electromagnetic piece projecting downwardly therefrom, a solenoid arranged under said strip into which said electromagnetic piece projects part way, a second electromagnetic piece fixed within said solenoid with its upper end normally slightly spaced from and confronting the lower end of said first-named electromagnetic piece, housing for said solenoid including a top and side walls, and electro-conducting wires passing through said housing to said solenoid and being adapted to supply a pulsating electric current to said solenoid and thereby to cause oscillation of said first-named electromagnetic piece and vibration of said vibratile strip.

3. An instrument for producing flocked articles comprising a pair of spaced supports, a vibratile member bridging said supports and fixed thereto, said member being free to vibrate between said supports, a solenoid arranged under said member, said member including integrally therewith an electromagnetic piece projecting downwardly therefrom into said solenoid, a stop element for limiting the downward movement of said electromagnetic piece and, accordingly, the amplitude of vibration of said vibratile member, said stop element normally permitting downward movement of said electromagnetic piece, and means for supplying a pulsating electric current to said solenoid and thereby causing oscillation of said electromagnetic piece and vibration of said vibratile member.

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