METHOD AND APPARATUS FOR APPLYING FLOCKING TO AN ARTICLE
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This invention relates to a method and apparatus for applying flocking to an article, and more particularly to a method and apparatus for imparting a static charge to the flocking material to cause the flock to adhere in a vertical position to the adhesive of an article which has been treated with an adhesive material.

The principal object of the present invention is to place an article such as a card, article of clothing or the like, which has been treated to provide an outline or image as desired with a paint, adhesive or other sticky surface, on an electrically operated vibrating table or jogging device, imparting a static charge to the flocking material and depositing the same upon said card, article of clothing or the like in a vertical position to obtain a compact mass of flock so that the image or article is covered to simulate a velvet material.

Other objects of the present invention are to provide a housing for the flock having a screen or sieve therein and agitating the flock on said screen so as to impart a static charge thereto as it flows through the screen; to provide an electrically operated jogging device in said housing below said screen having a table upon which the articles to be worked upon are placed to create a magnetic field by vibratory action of the jogging or vibrating machine to repel the flocking material as it passes through said screen but still allow it to settle on the table on the vibrating machine in a vertical position; to provide a jogging or vibrating device having a direct current magnet with a make and brake set up creating a single direction field thereabove so that the flocking material will be contacted thereby as it passes through the screen to the articles to be worked upon; to provide a housing for the flocking material; to provide a hopper for collecting the flocking material which passes over the vibrating table; to provide a blower for returning the flocking material from the hopper to the housing so that excess flocking passing through the device may be returned thereto for use; and to provide a device of this character of simple construction and economical to operate.

In accomplishing these and other objects of the invention, I have provided an improved structure, the preferred form of which is illustrated in the accompanying drawings wherein:

Fig. 1 is a perspective view of my invention with parts broken away to illustrate the interior thereof and particularly as the article being worked upon is placed on the vibrating table.

Fig. 2 is a cross-sectional view taken on line 2—2, Fig. 4 particularly illustrating the screen in the housing containing the flocking and the reciprocating agitator.

Fig. 3 is a vertical cross-sectional view through the device particularly illustrating the magnetic field created by the electric vibrator.

Fig. 4 is a vertical cross-sectional view particularly illustrating the blower for return of the excess flocking material from the hopper back to the cyclone separator and then to the housing for the flocking material for reuse.

Referring more in detail to the drawings:

1 designates an apparatus for practicing the method of applying flocking to an article such as a card, article of clothing or the like comprising a housing 2 having sides 3, 4, 5 and 6 and a tapered bottom 7 mounted on legs 8. The housing has a cover consisting of sloping sides 9, 10, 11 and 12 and terminating in a plane surface 13 provided with an opening 14 in which is mounted a cyclone separator 15 for a purpose later described.

Mounted on the inside of the sides 3, 4, 5 and 6 of the housing are brackets 16 and 17 upon which is mounted a screen or sieve 18 and forms a compartment 19 for flock 20 in the upper part of the housing. An agitator 21 is provided for movement across the screen 18 and comprises a rod like frame 22 having a plurality of cross rods 23 and an arm 24 extending from one end of the agitator as best illustrated in Fig. 2. The side 5 of the housing is provided with an opening 25 through which the arm 24 extends. Mounted on the side 6 of the housing is a support 26 for a motor 27 having a shaft 29 connected to gears in a gear box 29. Mounted on the side 5 of the housing are bearing brackets 30 for receiving a shaft 31 having one end connected to the gears in the gear box 29 and its other end provided with a cam 32 having an arm 33 connecting with the arm 24 of the reciprocating agitator 22 so that the agitator may be moved over the screen upon operation of the motor for a purpose later described.

Mounted on the frame 34 of the housing is a jogging device 35 having a platform or table 36. The jogging apparatus includes a direct current magnet 37 having a core 38. The magnet is provided with a make and brake set up as is the usual practice and the platform 36 is spring mounted upon the jogging apparatus. A metal plate is fastened opposite the core of the magnet to the platform 36 as indicated at 39, electric current being supplied to the magnet from the source of supply (not shown).

The tapered bottom 7 below the jogging apparatus provides a hopper for gathering of the excess flock which passes over the platform 36 into a hopper 40 which is provided with a throat 41 leading to a duct 42 having connection with a blower 43 operated by a motor 44. The duct 42 is progressively larger as it extends upwardly along the side 6 of the housing so that the air current will be reduced as it nears the enlarged end 45 and connects with the cyclone separator 15 as indicated at 46. The separator has an air outlet as indicated at 47.

The motor 44 operates the blower 43 through shaft 48 having a pulley 49 on the end thereof and having connection with a pulley 50 on a shaft 51 by a belt 52. The shaft 51 is connected to the blower 43 and also to a blower 53 of smaller capacity than the blower 43 mounted upon a base 54 as best illustrated in Fig. 3. The blower 53 has tubes 55 and 55 extending upwardly and are connected to tubular members 56 and 57 which are secured to the sides 3 and 5 of the housing by brackets or the like 58 or other suitable means.

The sides 3 and 5 of the housing have longitudinal openings 59 and 60, respectively, and extending along the lower edge of such openings are shelves 61 and 62 extending outwardly from the housing and the openings provide means for insertion of the article to be worked upon as indicated at 63 on the vibrating platform 36 and may be removed from the opposite opening in the housing if desired. The tubular members 56 and 57 extending alongside the housings 3 and 60 have slots 64 along their lower edges and air from the blower 53 will prevent the flock from escaping through the openings 59 and 60 and tend to force the
same downwardly from above the platform 36 through the passageway 65 to the hopper 40 provided by the sloping bottom 7 so that the flock will continue downwardly through the throat 41 and to the duct 42 to be carried by the force of the blower 43 through the duct to the cyclone separator where it will fall downwardly to again enter the compartment 19 for reuse.

An opening is provided in the tapered top 10 and is completed by a door 66 so that the flock may be inserted therethrough to compartment 19 as desired.

The method practiced by use of the apparatus as shown and described is that by energizing the direct current magnet, a magnetic field will be set up as indicated by the dotted lines 67 (Fig. 3) and a static charge is imparted to the flock particles in the compartment 19 by the reciprocating agitator 21 causing the same to fall through the screen or sieve 18. When it enters the magnetic field the poles of the respective fibers or particles will be attracted by the opposite poles in the field causing the particles to descend in a vertical position to contact the adhesive surface of the article 63 and through vibration of the platform 36, the direct current magnet action will cause the particles to stand on end on the surface of the article and provide a very thick, smooth finish thereon.

Operation of apparatus constructed and assembled as described is as follows:

The flock 20 may be placed in the compartment 19 and energizing of the direct current magnet 37 will cause the table 32 to vibrate in a vertical motion. Cards, articles of clothing, or other objects 65 to be worked upon are placed on the platform 36 and if desired may be held in place thereon by thumb tacks, adhesive tape or the like (not shown). After energizing the electromagnet to create the vibratory action, the motor 27 is also energized to reciprocate the agitator 21 on the screen 18 and a static charge will be imparted to the particles of flock as they pass through the screen 18 and will fall onto the surface of the article to be worked upon as described. The excess flock will pass through the passageway 65 between the platform 36 and the wall of the housing and be returned to the compartment 19 by operation of the blower 43 through duct 42 to the cyclone separator 15. Operation of the blower 53 by the motor 44 will also repel the flock from escaping through the openings 59 and 60 in the sides 3 and 5 of the housing. The article 63 to be worked upon is inserted through either of the openings 59 or 60 and may be removed upon opening or an operator can stand on either side of the housing with one placing the article to be worked upon through one of the openings and removed through the opposite opening by the other operator.

It will be obvious from the foregoing that I have provided an improved method and apparatus for imparting static charge to flock by movement of a reciprocating agitator over the screen and providing the magnetic field therebelow and above the workpiece so that the flock will be attracted to the workpiece in a vertical position and provide a very thick, smooth finish to the desired article as well as providing for preserving the excess flock and returning it for reuse.

What I claim and desire to secure by Letters Patent is:

1. Apparatus for applying flock to an article having an adhesive surface comprising, a housing having side walls, brackets secured to said side walls, a screen mounted on said brackets in said housing providing a compartment for said flock, an agitator mounted on said screen, means for reciprocating said agitator on said screen for imparting an electro static charge to said flock as it passes through said screen so that the flock when upon which the article is placed to be worked upon, and magnetic means for vibrating said table, whereby the fibers of the flock will pass from the screen in a vertical position and will attach in parallelism to said adhesive surface to provide a thick smooth surface thereon.

2. Apparatus for applying flock to an article having an adhesive surface comprising, a housing having side walls, brackets secured to said side walls, a screen mounted on said brackets in said housing providing a compartment for said flock, an agitator mounted on said screen, means for reciprocating said agitator on said screen for imparting an electro static charge to said flock as it passes through said screen, a table in said housing below said screen upon which the article is placed to be worked upon, means for vibrating said table including a magnet whereby a magnetic field is set up, the effect of the charged flock operating on said flock to assume a vertical position as they attach to said adhesive surface to provide a thick smooth surface thereon, a hopper below said table for collecting excess flock falling from the table, and means for returning said flock from the hopper to the compartment for reuse.

3. Apparatus for applying flock to an article having an adhesive surface comprising, a housing having side walls, brackets secured to said side walls, a screen mounted on said brackets in said housing providing a compartment for said flock, an agitator mounted on said screen, means for reciprocating said agitator on said screen for imparting an electro static charge to said flock as it passes through said screen, a table in said housing below said screen, said housing having openings in opposing sides thereof above said table for insertion of said article upon said table and for removal therefrom, magnetic means for vibrating said table in a vertical and horizontal direction alternatively whereby a magnetic field is set up below said screen, said electro static charged fibers of the flock causing the opposite poles to be attracted to each other to cause the same to assume a vertical position as it attaches to said adhesive surface to provide a thick smooth surface thereon, a hopper below said table for collecting excess flock falling from the table, and means for returning said flock from the hopper to the compartment for reuse.

4. Apparatus for applying flock to an article having an adhesive surface comprising, a housing having side walls, brackets secured to said side walls, a screen mounted on said brackets in said housing providing a compartment for said flock, an agitator mounted on said screen, means for reciprocating said agitator on said screen for imparting an electro static charge to said flock as it passes through said screen, a table in said housing below said screen, said housing having openings in opposing sides thereof above said table for insertion of said articles on the table and removal therefrom, and magnetic means for vibrating said table in a vertical and horizontal direction alternatively whereby a magnetic field is set up below said screen, said magnetic field repelling said flock as it falls through said screen whereby the fibers will attach to said adhesive surface perpendicular to the plane of the adhesive on the article to provide a thick smooth surface thereon, tubing members secured to the housing above said openings, said tubing members having slots along their lower sides, a blower, tubs connected to said blower to said tubing members whereby air from the blower will prevent flock escaping from said openings, a hopper below said table for collecting excess flock falling from the table, and means for returning said flock from the hopper to the compartment for reuse.

5. The method of applying flock particles to an article having a sticky surface on a table or the like in a closed housing comprising, agitating said flock particles to frictionally impart a static charge to the particles as they pass through a screen above said article, creating magnetic field for imparting vibration to the table upon which the article is placed whereby the fibers of the flock particles falling from the screen will assume a vertical position and one end of such fibers adhere to said article so
that said fibers will be in parallelism to one another to provide a thick smooth finish on the article. 

6. The method of applying flock particles to an article having a sticky surface on a table or the like in a closed housing comprising, agitating said flock particles to frictionally impart a static charge to the particles as they pass through a screen above said article, creating a magnetic field for imparting vibration to the table upon which the article is placed whereby the fibers of the flock particles falling from the screen will assume a vertical position and one end of such fibers adhere to said article so that said fibers will be in parallelism to one another to provide a thick smooth finish on the article, and returning the excess flock particles to said housing for reuse. 

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