In the Laboratory

A Vibrating Muller for the Preparation of Dispersions of Fine Pigments for Electron Microscopy [1]

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In the preparation of fine pigments for examination in the electron microscope it is often difficult to break apart the smaller aggregates of the material. Where it is desired to resolve the ultimate particles in the micrograph, a considerable amount of work must be exerted upon the pigment.

A small portion of pigment, oil, and plastic are generally placed upon a flat glass plate, and a hand muller is used to press and grind and thus disperse the powder in the matrix. From a solution of the mixture a thin film is cast upon water and forms a support for the included pigment particles (*1*). Some other aspects of the technique involving solvents and the wetting of pigments have been described (*2*).

In the mulling of fine-particle pigments such as carbon black the aggregates remain unbroken in the film between the muller and the glass plate.

A new mechanical vibrating muller (Fig. 1), greatly increases the work exerted upon such a pigment mixture. It consists of a 110-volt A.C. electromagnetic vibrator unit, to which is attached a hardened steel mulling head. The mulling head is very slightly convex so that more perfect contact with the glass plate is obtained. The vibration occurs in an arc with the mulling head shaft as its radius. A handle on the vibrator unit permits hand-mulling concurrent with the vibrating effect.

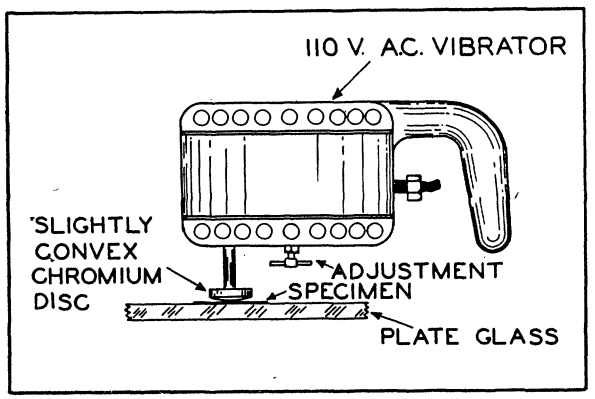

FIG. 1

The use of this device results in greatly increased work upon the pigment through direct contact and through the transfer of energy by vibrations in the matrix. By this method the time and effort required to disperse ultimate particles is substantially decreased.

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References

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A Note on the Silencing of Air-stirring Motors

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Air-stirring motors are often viewed with disparagement in the laboratory because of the rather large amount of noise which attends their use. This noise may be traced to four sources: (1) that arising from the turbulent discharge of air from the compressed air lines into tubing connecting with the motor; (2) that due to air rushing through the pipes and the connecting tubing; (3) that inherent in the use of an air motor, *i.e.* bearing noise and the clear tone of audio-frequency which is associated with all turbines; and (4) that resulting from the air rushing out of the small escape ports generally provided in the flat surface on top of the motor. Of these sources, the first and fourth are by far the most important because of both the intensity and the raucous character of the noise arising from them. The devices suggested here have been found very useful in reducing to a very large extent the noise from these two sources. The second and third sources enumerated are of smaller importance, but their contribution to the total noise may be minimized by suitable choice of connective tubing and by judicious oiling.

The noise associated with the discharge of air through a regulating valve from the compressed air lines into the connecting tubing may be reduced greatly if the air flow is controlled not by this valve, but rather by a screw clamp operating on the tubing a few inches from its junction with the air line. If the air is supplied at high pressure, it will probably be found necessary to wire the tubing onto the outlet.