CONCLUSIONS

It can be seen that for all vibration angles and amplitudes, the theory developed for a moving block gives reasonable agreement at the lowest vibration frequencies but at higher values, the theoretical velocities are considerably smaller than the experimental ones.

It could be argued that under dynamic conditions, the coefficient of friction will be less than the value of 0.25 found from static tests. (Gutman (6) gives $\mu = 0.4$ as an average value for vibratory conveyors). But substitution of a smaller value of coefficient of friction into the expression does not have much effect on the answer and so some other reason must be fought.

Careful measurement of the trough with a sensitive level while rotating the crank slowly shows no departure from the horizontal which could affect the motion. It is still possible, however, that a small "bowing" of the trough takes place at the higher speeds and produced higher velocities. It is also possible that the actual amplitude of motion is greater than under static conditions due to the elasticity of the apparatus and a slightly more rigid framework could be introduced with advantage.

It is most unlikely that spurious readings were obtained due to movement of the supporting table as this was extremely rigid.

At the higher frequencies, the block has an unexpected vibration about on axis which is the centre-line of the trough. It may be that a heavier block would not be affected so much by this vibration and so would show better agreement with theory.

For the results obtained with the sand, the graph of mean velocity against discharge gives a series of almost horizontal lines, showing that as sand discharge from the hopper is increased, mean velocity remains almost constant while the sand thickness increases. No attempt is made at this stage to estimate the variation of velocity at different levels within the moving sand.

SUGGESTIONS FOR FURTHER WORK

1. Further tests with larger cement block to observe whether vibration about centre-line of trough still persists.
2. High-speed photographic study of block in motion to check whether periods of sliding correspond with those obtained from the theory.
3. Tests with more rigid trough to eliminate any possible bowing.
4. Tests with blocks of other materials to study the effect of different coefficients of friction.
5. Tests with trough inclined at small angles to the horizontal.
6. Tests at higher speeds where the block loses contact with the trough during part of the cycle. Also development of further theory to cover this case.
7. Further tests with sand to estimate the variation of velocity at different depths.

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