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HEATING VENTILATING

A MONTHLY MAGAZINE FOR ENGINEERS AND CONTRACTORS CONCERNED WITH COMMERCIAL, INDUSTRIAL AND INSTITUTIONAL AIR CONDITIONING, REFRIGERATION, AIR SANITATION, PIPING, HEATING AND VENTILATION

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THIS MONTH'S COVER

The engineer must view the cow as a heating and air conditioning plant in the design of dairy stables. See an engineer's analysis beginning page 81.

Air Fills the Bag

WM. B. FOXHALL
Assistant Editor
HEATING AND VENTILATING

CONTROLLED air was the answer in one plant to the problem of packaging powdered asbestos.

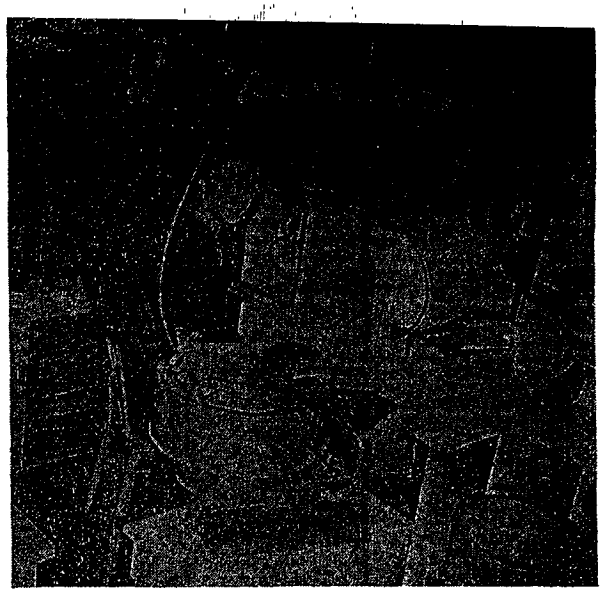
Arthur A. Gardner put the research department of Breslee Mfg. Co. to work on the problem of filling thousands of cotton bags with asbestos for dummy propelling charges required by the Army for practice firing of the 105-mm howitzer. The problem was complicated in several ways. First, each charge consists of seven bags loaded to specified weights ranging from 1.7 oz to 13.1 oz. Second, the tackiness of the asbestos made hand weighing difficult and prevented the use of gravity feed machines. Third, the dust of powdered asbestos is a health hazard.

Mr. Gardner's engineers designed an assembly line of seven filling machines piped into a master vacuum system which both filled and weighed the bags by air.

The operation of filling the bag takes place within an air-tight box opened on one side by a sliding door, the frame of which is lined with sponge rubber to make an air-tight seal when the door is closed.

The operator clamps the empty bag to a nozzle suspended from the top of the box. This nozzle connects outside the box to a flexible transparent plastic tube about 4 ft long. The open end of the tube is used by the operator in picking up asbestos from a hopper resting on one side of a scale. The other side of the scale carries several small metal plates, the total weight of which perfectly balances the asbestos in the hopper. Each plate represents the exact weight of one filled bag.

With the scale in perfect balance, the operator removes a single metal plate, throwing the scale off balance the exact amount necessary to fill one bag.



Showing scale arrangement and open door of vacuum box containing bag clamped to end of saran plastic tube.

She then inserts the mouth of the tube into the hopper and steps on a treadle to open a valve connecting the tube and fill-box to a vacuum system. Asbestos is drawn from the hopper and deposited in the bag. As soon as the scale returns to balance, the operator closes the valve and the flow of asbestos stops immediately.

Breslee engineers estimated that their vacuum filling system required 450 cfm through the tube. They installed a Spencer turbine blower powered by a 7½ hp motor at 3500 rpm, which maintained the required vacuum with a volume of 600 cfm, more than sufficient for the proper functioning of the system.

This vacuum method of precision filling resulted not only in extreme accuracy but also in about 600% increase in production over hand weighing and filling. Still more important, however, was the elimination of the hazard to health represented by the manual handling of the finely powdered asbestos.



Part of packaging assembly line. Hoppers of asbestos on scales balance boxes of measured weights. As weights are removed one by one, asbestos is vacuum drawn out of hopper into cotton bag through flexible transparent tube to return scale to balance. Foot treadle controls vacuum.

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