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GENERAL ASBESTOS & RUBBER DIVISION OF RAYBESTOS-MANHATTAN, INC.

BY- RALPH B. SMITH

Fans- From practically the beginning it was proven, to us, that the Type "E" Standard Industrial Fan was best suited to handle our dust. These fans are equipped with the "Long Shaving" Standard Paddle Type Wheels in preference to the "Multi-Vane" Type. This conclusion was drawn from the fact that the "Long Shaving" Wheel is self-cleaning whereas the "Multi-Vane" Wheel had a tendency to clog up, since the fans handle the dust laden air directly.

We use several size fans, but the average has an inlet and outlet diameter of 23". The wheel diameter being 40" and running approximately 850 R.P.M. with static pressures of 3.0" Inlet and 1.5" Outlet. The speed of our dust laden air in our main pipes is from 3,000 ft. per min. for the Card Room to 4,000 ft. per min. for the Preparation Department.

All of our fans are located in the departments in which they are serving. Therefore we consider our systems as "Push Type", since we are actually pushing our dust laden air into the collecting equipment.

DUST COLLECTORS- Our experience with dust collecting dates back some 35 years and a lot of this time it has been sad. The first half of this time was spent trying to make Cyclone Type Collectors work. This type was effective in collecting the dust, but the top outlet would discharge very fine particles of dust to the atmosphere. This would create a problem to the Plant Property and adjoining community. With this problem, much time was spent in the following sequence:

1- A fine water spray was placed on top of the collectors (there were 8 large ones involved approximately 14 ft. in diameter) trying to wet the discharged air and make the dust settle out. This did not prove too practical because of the mess and expense involved.

2- The collectors were discontinued. All of the fan discharge pipes were connected into one large duct. This duct was run into a room and the dust laden air discharged through an atmosphere of steam and water. This also involved a mess and was discontinued.

3- The discharge was left piped into one large duct, but was inserted in to tunnels that were constructed of burlap. This worked very well, however was not the final answer yet, as the amount of air was too great for the amount of burlap.

PLAINTIFF'S EXHIBIT
SF 818.8

4- It was next decided to expand on the idea of the burlap covered tunnels. To do this, a Sheet Metal Building was constructed 60 ft. wide x 160 ft. long x 22 ft. high. Into this building nine burlap tunnels were built. These tunnels were 150 ft. long and backed up to an existing brick building having 1900 sq. ft. floor area and ceiling height of 26ft. This brick building was used as a Settling Chamber with the dust laden air entering directly into it. This air then passed through holes in the brick wall into the 9 burlap tunnels and filtered out through the pores in the burlap. This arrangement would leave the longer heavier fibers in the Settling Chamber, with the rest dropping out through the entire length of the nine tunnels and collecting on the inside of the burlap. This system would require a crew of 7 men from midnight to six o'clock in the morning every day "Beating Down" the burlap and entering each tunnel to shovel up the dust and fibers from the floor. This system was costly to clean and also subjected the cleaners to dusty working conditions.

5- In January 1953 we discontinued the above described dust tunnels and began operating our two new collecting units purchased from American Wheelabrator & Equipment Corporation. This installation was accomplished by removing 4 of our burlap tunnels from the above Sheet Metal Building. These 4 tunnels occupied a space of approximately 20 ft. x 160 ft. long. In this area we erected our two Wheelabrator Units. One unit was purchased to handle our Preparation Department Air and the other to handle the Card Room Air. Both of these units are on the discharge end of the fans, the same as the burlap covered tunnels were. These two units are as follows:

PREPARATION DEPARTMENT: Handles all dust laden air from this department. It is 15 feet wide x 36 feet long x 22 feet high. Has 736 Cotton Sateen Dustubes 8" diameter x 138" long. Handles 56,200 c.f.m. of air with a ratio of 3.21 per sq. ft. of cloth. Has a total cloth area of 16,928 sq. ft., with an average static pressure at the unit of 1.60" W.G. before shaking and 1.10" W.G. after shaking.

CARD ROOM: Handles all dust laden air from the cards in this department. This unit is 15 feet wide x 56 feet long x 22 feet high. Has 1152 Cotton Sateen Dustubes 8" diameter x 138" long. Handles 93,053 c.f.m. of air with a ratio of 3.50 c.f.m. per sq. ft. of cloth. Has a total cloth area of 26,496 sq. ft., with an average static pressure at the unit of 2.00" W.G. before shaking and 1.00" W.G. after shaking.

These dustubes are supported from the top by automatic shakers and on the bottom are inserted in cell plates. Directly under these cell plates are two hoppers with a Screw Conveyor mounted in the bottom of each hopper. The dust laden air enters into the side of the hoppers, where the longer fibers fall directly out of the air stream into the Screw Conveyor and are conveyed

out. The dust remains in the air stream and is carried up into the dustubes. As the air escapes through the cloth tubes, the dust is deposited on the inside. At the end of 8 hours for the Preparation Unit and 16 hours for the Card Room Unit the fans are stopped and the shaker motors turned on. This shaking of the tubes causes the accumulated dust and dirt to break loose and drop into the Screw Conveyors. This residue is then conveyed out for disposal. This system produces two separate grades of dust. One that is falling all day long and the other that is conveyed out during the 15 minute shaking cycle. The entire operation is conducted in a dust free atmosphere now and with only 4 men.

NOTE: The above described involves only the Preparation Department and Card Room. We have a Kleissler bag type collector for our Brake Bank Department, a large burlap screen house for the Weave Room, a Cyclone type collector for our Winding Department, a Wet Roto-Clone and Pangborn collector for our Rubber Department. From this, it can be realized that we have a large investment in dust collecting equipment.

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Conclusion of a factory physician from X-ray Reports of workers in an asbestos manufacturing plant which is not working at the present time.

The x-ray exam of 88 employees, male and female, of the plant shows interesting facts on the frequency of asbestosis and the x-ray clinical findings of this workmens' disease.

For the purpose of utmost accuracy, I have excluded from these 88 employees 8 who have not worked permanently in the manufacturing depts.; boilermem, masons, carpenters, etc.

Among the 80 workers, 15 have asbestosis to a more or less marked degree, i.e., 18.7% that are subdivided as follows:

1. According to Age

15 to 20 yrs	2 workers	0 asbestosis
20 to 25 yrs	3 "	0 "
25 to 30 yrs	7 "	0 "
30 to 35 yrs	11 "	1 "
35 to 40 yrs	13 "	3 "
40 to 45 yrs	12 "	1 "
45 to 50 yrs.	14 "	5 "
50 to 60 yrs.	14 "	4 "
60 to 70 yrs	3 "	1 "
70 & over	1 "	0 "

2. According to Seniority

0 to 5 yrs	8 workers	0	asbestosis
5 to 10 yrs	21 "	1	" 4.7%
10 to 15 yrs	20 "	3	" 15 %
15 to 20 yrs	13 "	3	" 23 %
20 to 30 yrs	16 "	7	" 43.7%
30 & over	2 "	1	" 50 %

3. According to Departments

6 Weavers
2 Braiders
1 Caneteuse (?)
5 Spinners
1 Carder

There were five men & 10 women out of a total of 34 men and 46 women.

The most interesting statistics refer to the seniority of the worker. The number of asbestosis cases increases with seniority.

The figures that I have found are comparable with the statistics published in the paper "Asbestos" of the l'Encyclopedie Medico-Chirurgicale fascicule No 6018 C.10 paper of Prof. Luton and Dr. Chamieix of the Medical School in Clermont-Ferrand and published in 1951. The statistics in this paper and due to two Englishmen published in 1930:

0 to 4 yrs.	of presence	0% asbestosis
5 to 9 "	" "	23% "
10 to 14 "	" "	32% "
15 to 19 "	" "	53% "
20 & over	" "	80% "

These figures refer to 350 workers.

In addition to these 15 cases of asbestosis, I have found with some workers unusual shadows of the lung which are subdivided as follows:

Lung TB in an early stage with a worker 49 yrs. old and employed for 32 yrs. There is a little cavity on the top of the left lung. The lungs of this man do not show any shadows that would indicate asbestosis. With 13 others, a minimum effect of cancer (d'inoculation) incurred during childhood or from pleurisy had no adverse affects on the general physical condition. I have not found among these workers x-rays which would indicate an association of asbestosis and TB.

Asbestosis is a frequent workmens' disease hitting 18.7% of a group of 80 workers. It is an unusual disease. The x-rays are quite unusual and different from other diseases which are caused by dust (coal & silicoses) or by infection of diversified microbes. It seems to me that the disease hits exclusively the lower inner section of the pulmonary bases mainly at the right side (the right inner bronchi is the direct prolongment of the trachea). At this time an enlargement of the normal broncho vascular shadow is characteristic. They are light, small, very fine (criss-cross) and at times look like masses of star-like formations. The most inner part of the diaphragmatic dome at the right side becomes soft. Then, one perceives on the cliches showing the lungs more seriously affected, these shadows gain more in space and in tensity and occupy the inner middle half of the lungs as well as the upper half and the tops. These shadows have, at this moment, an unusual shape like splintered glass whose fragments are increasingly lying closer together. At this stage, one notes an immobilization of the diaphragm and an increase in the shape of the heart. At this time, I want to stress one particular angle in the x-ray technique. The x-rays should be preferably taken when the patient breathes in. It is necessary that the photographic paper be 60" x 72" for the purpose of greater clarity.

Fluoroscopes do not catch the very supply shadows and it is of utmost importance to diagnose this disease at an early stage.

Systematic x-ray examination is the only way to determine the beginning of asbestosis; asbestosis being a very insidious disease which for years does not cause any functional troubles and doed not respond to stethoscopic examination.

EXAMPLE:

Worker A. 45 yrs. old, employed 22 yrs., has never had a disease of the lungs

Worker B. 52 yrs. old, employed 23 yrs., has never had a disease of the lungs.

Worker C. 34 yrs. old, employed 19 yrs., has never had a disease of the lung.

Worker D. 40 yrs. old, employed 11 yrs., has never had a disease of the lung.

The first symptoms of this disease is the dyspnea showing up under strain and increasing slowly. As soon as the worker has difficulty breathing, it is normal that the aggravation advances faster. Nasal respiration becomes insufficient at certain times. The worker has to breathe through the nose and mouth at times; the air is not filtered by the nasal passages. The dust particles penetrate in greater numbers to the base of the small bronchi and to the avelia of the lungs and furthermore, these patients become more susceptible to infections of the larynx, the trachea and the bronchi.

The disease takes an insidious beginning, requiring 10 to 15 yrs. to become evident. It can only be diagnosed by means of systematically x-raying workers who have worked 10 yrs in the asbestos plant.

The use of a dust mask or a respirator should reduce the feequency of asbestosis to a considerable extent.

Another point that needs stressing; physical condition at the hiring date and close examination of the breathing through the nose.

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