Some Silk Mills

In no class of textile mills does the question of a proper temperature and humidity deserve and probably receive more attention than in the silk industry.

The reason is very apparent, as silk is one of the most hygroscopic of fibres, and changes in temperature and humidity greatly affect its manipulation and manufacture.

A few years ago, and only a very few, too, the best of the mill managers felt that they had done all that was necessary when they bought almost any kind of a humidifying system. They had bettered their conditions without a doubt, for even the earlier types of humidifiers were an improvement on nature. Of late, however, the more progressive of these men have been very critical in passing judgment, and have demanded something more than the mere moistening of the atmosphere of the mill.

Among their demands have been that there be provided some means for ventilation, cooling of the mill, and automatic regulation of both temperature and humidity.

Nearly all the foremost mill engineers in this country today are advocating adequate ventilation as an economical consideration as well as humanitarian.

The artificial cooling of mills was unnecessary until mills became filled with high speed machinery, using a large amount of power, with the resultant rise in temperatures.

Humidity and temperature are too closely allied for the former to be successfully treated without considering the latter.

The automatic regulation of the relative humidity and temperature has proven to be a big step toward a uniform production as well as an increased production. With an atmosphere maintained uniformly at the point best suited to the operation at hand, few adjustments in the machines are required, and usually they can be operated at increased speed.

There is only one system of Air Conditioning that does Humidifying, Cooling, Heating, Ventilating, and Automatically Controls the temperature and humidity, and that is the Carrier System—the guaranteed system.

The Carrier Air Conditioning Co. not only sell you apparatus, but also results, which are what count. Write for complete catalog, or if you desire, an engineer who is a specialist on Air Conditioning will be sent to tell you more about the system, the results and methods.

Carrier Air Conditioning Company of America
No. 30 Cortlandt Street, New York
This Company was a subsidiary of Buffalo Forge until Willis Carrier set up Carrier Engineering Corporation in 1914 together with five associates.
Catalog 13

Carrier Air Washers and Humidifiers

Applied to Public Office and Industrial Buildings

With Notes on Humidity

Patented in the United States
Canada and Foreign Countries

Copyright, 1913
Carrier Air Conditioning Company of America
New York City

Carrier Air Conditioning Company of America
39 Cortlandt Street, New York, N. Y.
Type B air washer with two banks of spray nozzles
Types A & C employed only one bank
Manufacturing air washers

Biography of Willis Carrier, 1952
(CIBSE Heritage Group Collection)
The second historic event of 1906 was the sale by Hardeman...
point, higher than the humidifier could supply under normal operation. I kept running up the water pressure on the nozzles, from 25 pounds to 50 pounds to 100 pounds. At 100 pounds I got enough moisture in the air to hold the card room around 62 percent relative humidity, the spinning room around 70 percent, and the winding room around 85 percent.

Carrier concluded that he must change his spray apparatus—somehow add more moisture to the air without pushing pump pressures to 100 pounds a square inch or appreciably increasing the size of the pump. By this time several fan-heating-humidifying systems had been installed elsewhere. They were designed to humidify, heat, and ventilate, whereas the Chronicle Mills installation involved humidifying adapted to an existing heating and ventilating system. As a result the engineers under Carrier saw that the air volumes in the new systems were adequate for all three objectives. The performance of the systems satisfied customers, but Carrier was determined to improve the spray apparatus. He did it by turning the nozzles around. Instead of discharging the water downstream with the air, he discharged it against the air stream. The counter-flow impact produced higher moisture absorption rates with lower water pressures on the nozzles.

Carrier now had two types of apparatus: one with downstream sprays, which was sold as an air-washer for installations not requiring moisture control; the other with counter-flow sprays, which was sold wherever the moisture in the air was to be controlled for humidifying or dehumidifying. The first counter-flow spray apparatus was installed early in 1907 at the Lowell Cotton Mills, at Lowell, North Carolina. When checked, its performance was found satisfactory with water pressure at the nozzle of 25 pounds per square inch.

Carrier’s visit to the Chronicle Mills in 1906 also led to a dis-
covery fundamental to the air conditioning industry. As he took readings in the hot mill he found that, within a wide limit, the relative humidity of air remained constant as long as the difference between the dry-bulb temperature and the dew-point temperature remained constant. If he saturated air at 16 degrees F below room temperature, he was able to hold 60 percent relative humidity whether the thermometer read 80 degrees F (dew point 65 F) or 90 degrees F (dew point 74 F). Carrier’s discovery, that “constant dew-point depression provided practically constant relative humidity,” later became known among air conditioning engineers as the “law of constant dew-point depression.” On this discovery he based the design of an automatic control system for which he filed a patent claim on May 17, 1907. The patent, No. 1,085,971, was issued on February 3, 1914. Carrier was thereby recognized as the inventor of what became known as “dew-point control.”

Extract from “Father of Air Conditioning”