weather. In hotel, theater, etc., cooling work recirculation will conserve heat in winter and refrigeration in summer.

The development of the science of air conditioning has been rapid and the textile industry has derived great benefit from the adoption of adequate systems. Its applications are wide entering somewhere into every process in making of articles used every day, such as clothing candy, meat products, and a host of others. Mass production of uniform quality products has been made possible and has placed manufacturing schedules on a year round basis for many industries. It has also improved conditions of comfort and permitted the operation of theaters and other assembly places every day of the year contributing greatly to the health comfort and wealth of the nation.

CHAPTER XXII

DRYING

DRYING is an extraordinarily interesting problem in engineering, and thousands of the products that we use every day go through some sort of drying process during their manufacture. Wood when dried becomes a workable and dependable material, the leather used in our shoes must submit to the drying operation, and the manner of its drying determines its value in the finished product. Clay when dried becomes ceramic ware, flour mixed with water when dried becomes macaroni, wood pulp dried becomes paper and gelatine dried and sensatized becomes photographic film. All textiles require the drying process at sometime during their manufacture.

The term drying is often used to cover dehydration, distillation, oxidation, evaporation or any chemical action due to each of these conditions. Drying in its broader sense is not confined to the removal of moisture alone, but may refer to the evaporation or removal of substances other than water and to such operations as paint and varnish drying, linoleum manufacture and many other materials which require special treatment with respect to temperature, relative humidity and rates of moisture removal.

METHODS OF DRYING

In general, drying processes may be divided into three classes: vacuum drying, drying with radiant heat, and drying with air currents.

The vacuum method is particularly adapted to material which must be dried quickly at low temperatures and is generally used in the drying of milk, sugar, vegetables and similar products.

In drying with radiant heat the temperature of the material being dried is above that of the air surrounding it. The uniform distribution of radiant heat is important in the proper drying of materials, and the radiator used should have relatively large radiating surface and be well distributed in the drying area. About one-third to one-half of the heat given off by the radiating surface passes through the air to the object which is to be dried without materially raising the air temperature, the remaining portion of the heat emitted by the radiator warms the air by convection and produces air currents which assist in the removal of the moisture from the material being dried.

Drying with currents of air or air processing as this method is usually termed, depends for its success upon the proper circulation in the drying chamber so that it will come into direct contact with the substance to be dried. In ordinary work air temperatures carried are from 70–200 deg. fahr. with a relative humidity of 90–50 per cent. When temperatures exceed 200 deg. the process is referred to as high temperature