

ing the fabric between cylinders or rolls under pressure; hence the origin of the term, which is a corruption of cylindering. The familiar domestic process of starching and ironing illustrates in a simple form the object and result of calendering, and the common domestic mangle is a near approach in a simple form of the large calendering machines used in paper and textile manufacture. These machines consist of a series of from 3 to 12 rolls or "bowls" set one above the other in a strong iron frame and so arranged that heavy pressures can be brought to bear on the rolls, and therefore on the fabric which is passed between them. The rolls were formerly made of wood, but this material proved unsatisfactory because it warped. At present, when metal rolls are not used, the rolls are made of paper or cotton rendered solid by hydraulic pressure. Metal rolls are made of steel, chilled cast-iron, or brass, and are often made hollow, to allow them to be heated internally where hot calendering is required. The process of calendering consists in passing the fabric between the rolls a number of times, depending upon the material and the finish required. Often cloths are starched before being calendered, and for a highly glazed surface a little paraffin or soap may be added. To impart a glaze or polish one of the pair of rolls is made to revolve faster than the other, which causes it to slide on the fabric, with exactly the same effect as results from the sliding back and forth of the flatiron in "ironing" or polishing the domestic linen. Sometimes the surfaces of the rolls have slightly raised patterns which produce the effect known as watering. In making the rolls for calendering the utmost accuracy of workmanship is exercised to secure a truly cylindrical surface; metal rolls are turned on a lathe, then ground and finally polished. Great care has also to be taken in setting the rolls in the frame and in adjusting them to each other. The method of applying the pressure is by using weights or by hydraulic presses, or by means of screws. Consult Beaumont, *The Finishing of Textile Fabrics* (London, 1909); Edge, *Practical Cotton Finishing* (London, 1911). See BEETLING; PAPER.

CALENDERING (Fr. *calandre*, roller, from Lat. *cylindrus*, Gk. *κύλινδρος*, *kylindros*, cylinder, roller). The term applied to the finishing process by which a glazed or polished surface is given to paper and various textile fabrics, such as linen and cotton. It is usually done by pass-