

FABRIC ANALYSIS.

(Continued from April issue.)

Boring Machine.

The nature of the fractures produced by this method of wearing are shown in diagrams C and D of Fig. 90.

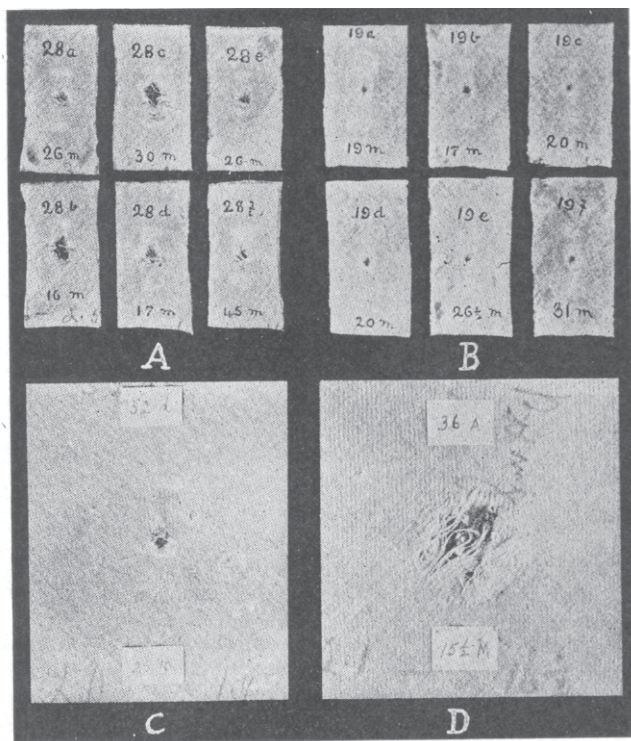


Fig. 90

Fig. 91 shows in its elevation a specimen of such a boring machine tester, the end of the acting tool of which may be fluted, or serrated, or roughened in any other suitable manner, or it may be covered with cloth or any other desired substance.

The cloth to be tested is mounted in a frame, which is borne in an upward direction by means of a weighted lever. If desired, the spindle may revolve all the time in one direction, or its direction of rotation may be reversed after a fixed number of revolutions, and either the number of revolutions or the time taken to wear through the cloth may be recorded. As far as possible, the weight which presses the frame upward should only be sufficient to keep the cloth in close contact with the drill and should not exert a breaking or tearing influence on the texture.

Cylinder Rubbing Machine.

Fig. 92 shows a diagram of the working part of the machine. The same consists of a cylinder *A* having a knorled surface of a similar character to the other wearing devices; to this a circular motion is given in the direction of *D*, by means of the driving rope *B*; the cloth is gripped at *C*, and a weight is suspended below *D*.

E is a weighted saddle, introduced with a view to locating the influence of the wearing action. This saddle *E*, having a metallic surface, it is obvious that the knorled surface of the cylinder would be liable to some injury immediately before a cloth was worn through and to considerable damage upon the breaking of the cloth, hence it was found necessary to introduce something between the saddle and the fabric and after trying various substances, two layers of drawing paper have been used in the recorded tests and they have proved quite satisfactory. Here again, great advantage has been experienced by having the cloth cut on the cross, as this insures the even wearing of all the threads.

Moisture Absorbing and Retaining Qualities of Cloth.

Fabrics composed of different fibres or treated in different ways have greater or less hygroscopic powers, and in making of certain types of cloth it would be well to know to what extent fabrics made in certain ways attract and retain moisture, so that if possible or desirable, alterations could be made to increase or to diminish these features.

In order to determine the hygroscopic properties of cloth, the apparatus shown at Fig. 93 is suggested. The cloth is first weighed, then subjected to steam from boiling water for a given period during which time shot is added in the lower pan to balance the amount of moisture taken up by the cloth. This is poured out and weighed and the cloth is dried until the first weight is balanced.

POROSITY OF FABRICS.

It has been thought necessary by some manufacturers to test fabrics in such a manner as to determine their resistance to the passage of air. This, for example, is an important feature in aeroplane cloth, as considerable weights have to be upheld by the cloth planes.

In 1901 J. E. Kennedy patented a machine in England for testing the porosity of cloth by passing gas under pressure through the cloth and then registering the amount passed through.

Recently the Municipal School of Technology, Manchester, Eng., had an apparatus constructed to test the porosity of certain fabrics. It consists of a long box, in the middle of which is a metal slide containing the fabric to be tested; the air is admitted behind the slide and as the end of the box is closed the air must pass through the cloth, and the speed at which it does so is registered by an anemometer. If the cloth is fairly close, a kind of back pressure is set up, and this is recorded along with the speed of the air passing through the fabric.

A New Method for Testing the Durability of Cloths.

It has been the practice to test cloths by means of the dynamometer, but the inaccuracy of this method for obtaining a measure of the qualities in actual wear has been repeatedly demonstrated. For example, after treating cloth with dilute sulphuric acid, dynamometer tests show an increased tensile strength, but on storing, such cloth becomes brittle, and the German military authorities refuse to accept cloth in an acid or alkaline condition.

The Dutch War Office tried testing cloths with a rotary scraping machine, and the Swiss War Office later adopted for a time the Hasler apparatus with scraping knives. This machine has obtained also some vogue in other quarters, but results obtained with it are very misleading.

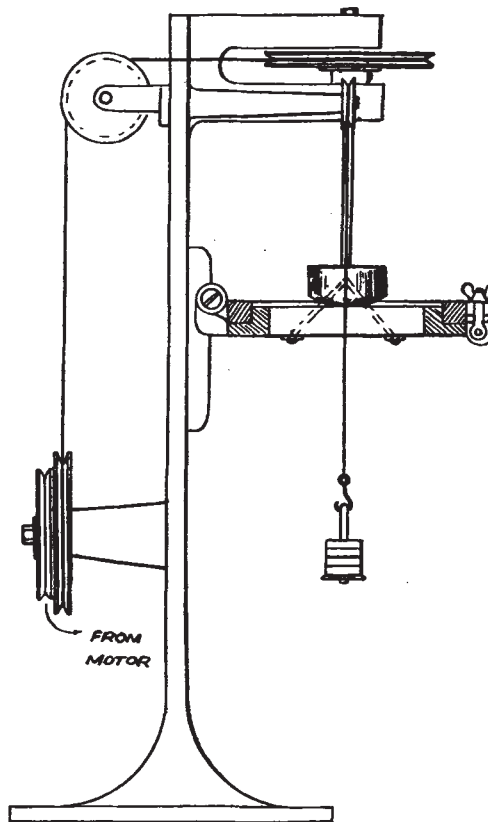


Fig. 91

It seemed necessary in devising an efficient method to first of all equalize the physical surface of cloths to be tested, and mechanical means were tried, *i. e.*, raising, soaking, pressing, etc., but failed.

Some time ago a machine was constructed in the Municipal School of Technology, Manchester, Eng., for the purpose of testing the wearing qualities of a number of fabrics.

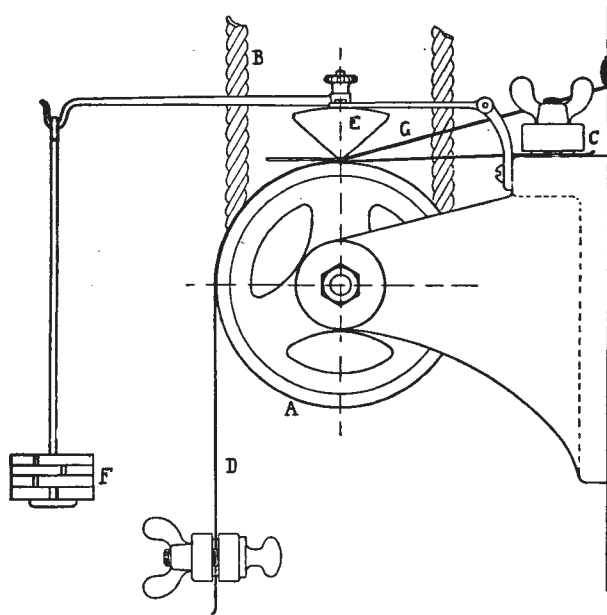


Fig. 92

The first machine consisted of a roller in which were set a number of steel blades parallel with its axis; one end of the cloth was held in clips, while the other end had a weight suspended from it. The cloth was laid over the roller, and as the latter revolved a rubbing action was set up which was continued until the cloth was worn away; the blades were quite smooth along their working edges so that the action of the blades was purely rubbing and not scratching. It was found, however, that the treatment was too rough for some of the cloths.

A new roller was put in and this was covered with several layers of the same kind of cloth which was being tested, the idea being to see the effect of cloth rubbing against cloth; the fault of this was that it took too long, unless a heavy weight was hung on the cloth, and this was considered objectionable. It may be mentioned that some of the samples were treated for 70 or 80 hours, and even then it looked as though the weight eventually broke the cloth in some cases. Several other experiments were tried but they were not satisfactory, and another method had to be tried. Two machines have been designed, one on the to and fro rubbing principle, and the other on the boring or drilling plan.

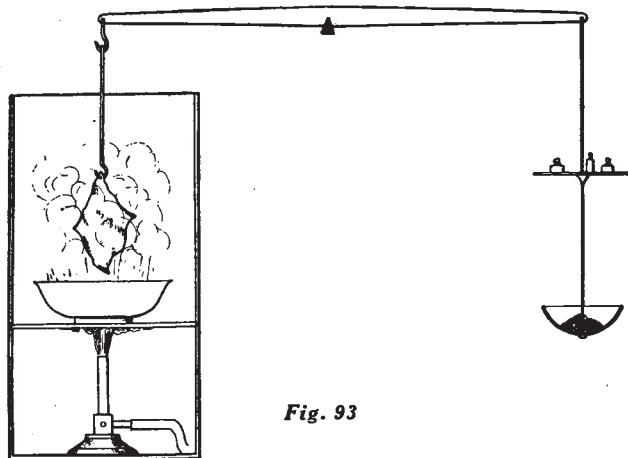


Fig. 93

Chemical means, however, have given the desired result in a preliminary treatment with hydrochloric acid and alcohol, which remove salts and grease, giving a new even surface formation. Cloths tested in this prepared state on the scraping machine give good comparative results.

Preliminary treatment is carried out as follows:

Cuttings of cloth 23 cm. long (warp direction) and 32 cm. broad (filling direction) are treated three-quarters of an hour at 94° C. with 10 per cent hydrochloric acid 34° Tw. in a liquor 40 times the weight of the cloth. The cutting must not be folded during treatment. It is rinsed with distilled water till almost neutral, squeezed off, and extracted in a Soxhlet apparatus with 400 cc. alcohol 96 per cent for 1½ hours, the material being turned inside out after three-quarters of an hour. The samples are squeezed, rinsed, and squeezed again, followed by drying two hours at 65° to 70° C. After drying, they are kept for at least half an hour in an oven at 25° C. before scraping tests are made. The cuttings are divided into six strips, each 5 cm. broad, and these strips are stretched singly in the jaws of the machine, three being scraped on the face and three on the back. The testing is done comparatively with some standard cloth, the relative figures being given by the number of revolutions required before the cloth tears. Scraping rollers provided with engraved flutes proved best suited for the purpose, while special carborundum rollers were also used.

So far only fulled cloths come into consideration for this method of testing, and for this purpose it has proved satisfactory.

Fabric Gloves Popular.

Each year since the war began glove manufacturers have bought all the high grade stock their buyers could find in an exhausted market. As shipments from abroad became fewer and quantities available lessened the glove man had to make inroads on his reserve stocks. To-day the glove industry has struck the bed rock of available supplies, says one of the largest manufacturers.

The high prices that must be quoted on some gloves no doubt will restrict their sale. Prices of from \$3 to \$3.50 for *mochas* hardly are warranted by their usefulness.

In fact, some retail centres find the prevailing costs insurmountable and are turning to fabric and woolen glove substitutes.

The cloth glove, in the eyes of the trade can be retailed at what was formerly the popular price for leather gloves. They are trim in appearance and are made in a variety of colors. Their sale throughout the country is mounting to unusual figures. The fabric brands are meant for warmer weather wear. They are made in duplex textures and are serviceable. The woolen gloves for cold weather wear use are made of knitted fabric.

Silk glove manufacturers for the jobbing trade are placing their new sample lines in readiness for 1919. The price lists will show another advance, corresponding with the increased cost of silk and labor.

With the government taking supplies for leather gloves, silk gloves will be the backbone of the retailers' stock, for half the year at least.

Importers of French kid gloves are said to be receiving the last of their goods for spring delivery orders and some additional stock as well. The demand continues heavy for grays and browns. The call for colors has placed this class of merchandise at a premium and in some instances command a premium of \$1.50, minimum, up to what is claimed to be \$2.50 on the average, and occasionally as high as \$4 a dozen.

More Sheep More Wool.

The Milwaukee Sheep & Wool Co., organized about eight months ago to establish a sheep ranch on cutover timber lands in Price County, has increased its capital stock from \$150,000 to \$250,000. The ranch consists of 6,000 acres, which already have been stocked with 5,200 sheep. Walter H. Diener is president and George A. West, treasurer.

A large tract adjoining this ranch has been acquired for the use of the Northern Wisconsin Sheep & Wool Co., now in process of organization by Churchill, Fierlein & Co., fiscal agents, First National Bank Building, Milwaukee.

The capital stock of this company will be \$420,000, divided into 4,200 shares of a par value of \$100. The action of the government in fixing a price of 65 cents a pound for Wisconsin wool has served to greatly stimulate interest in the "More Sheep More Wool" movement in this State.

Rice Straw as Textile Fibre.

The straw is first subjected to 1½ to 2 atmospheres for two hours in contact with a hot solution of carbonate of soda and oxide of calcium. It is then treated in a concentrated alkaline solution, and next washed in a bath of fluoride of ammonium at 1 to 2° B., rinsed in a carbonate of soda solution and dried. The treatment dissolves the ligneous substances very gradually and without weakening the fibrous part.