VEZELINSTITUUT T.N.O.

RAPPORT

SOME COMMENTS ON THE APPLICATION OF
IRREGULARITY OF YARNS

by

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Introduction

From the I.W.T.O. co-operative experiments on yarn irregularity [1] it appeared that the visual appreciation of the cloth, manufactured from the yarns S, T and V was well conformable to the "overall irregularity" of the mass per unit length of the yarns.

There is, however, an alternative possibility of obtaining an impression of the evenness of the yarns which proves to be in accordance with the appreciation of the cloth.

As regards the estimation of regularity by visual judgment, the following remarks can be made:

1) An appreciation of a great length of yarn is obtained in a small compass.
2) If one looks at a certain yarn element of e.g. a weft thread, one compares this involuntarily with neighbouring yarn elements lying in adjoining weft threads. Accordingly, one does not compare two successive yarn elements of the same thread (which do not differ appreciably as a rule), but elements of this thread lying much further apart, viz. at an average distance of the width of the fabric. A similar line of thought can be applied to the warp threads.

Description of the method

Taking this into consideration, it is possible to produce diagrams of the regularity of yarns in a very short time by applying a method which produces diagrams giving a visual impression which is probably in good agreement with the visual estimation of the regularity of the cloth, viz. by recording the diagrams discontinuously. The result is that two successive dashes on the diagram originate from two yarn elements lying at a certain distance from one another in the yarn with an interspace of, say, 30 to 60 cm. By doing so an appreciation of the regularity by "sampling" is possible, while at the same time a diagram of about 1 m long is representative of several hundreds of meters of yarn, which is impossible if the normal continuously recorded diagrams are used.

As an illustration of our method, diagrams of the afore-mentioned yarns S, T and V made in this way, are represented in Fig. 1.

On the ordinate the mass per unit length of the yarn has been plotted. The diagrams were recorded on an electrically controlled regularity tester with automatic registration. The yarn is passed through the feeler discontinously, i.e. the thread stops between the feeler for 0,5 sec. (the registration apparatus moving continuously), thus producing the vertical dashes in Fig. 1, and subsequently it is pulled rapidly through the feeler during the next 0,5 sec., producing the whimsical communicating lines between the dashes. Then the yarn stops again for 0,5 sec., records another dash, moves for another 0,5 sec., etc.

When these diagrams of the yarns S, T and V are placed in the order of increasing irregularity, one cannot but arrange them as is done in Fig. 1, which arrangement is in perfect agreement with the visual judgment of the cloth. If, however, diagrams are recorded continuously, the differences are less striking (cf. Fig. 2). This is obviously connected with the fact that these diagrams are not representative of an adequate quantity of yarn.

When the regularity of the yarns was compared by means of the black card method, the differences between the yarns S and T turned out to be very small, so that several persons, to whose judgments these cards were submitted, placed them in the order T, S and V rather than S, T and V.

Discussion

The appreciation of irregularity of yarns by means of discontinuously recorded diagrams is more efficient because it gives, statistically speaking, more information in the same length of graph than the continuously recorded diagrams. In addition, the first-mentioned diagrams are a much better approach of the visual examination of the irregularities in a fabric. The visual judgment necessarily lacks the objectivity of the "overall irregularity" method. It is feasible, however, to make "standard diagrams" which could serve as a basis of comparison at every laboratory [2] and might enable us to interchange data which are sufficiently exact for practical purposes.

Delft, January 1949.

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[1] I.W.T.O. Techn. Comm. Proc. 1948 (proof), p.25.
[2] This by analogy with the A.S.T.M. black card standards for cotton.
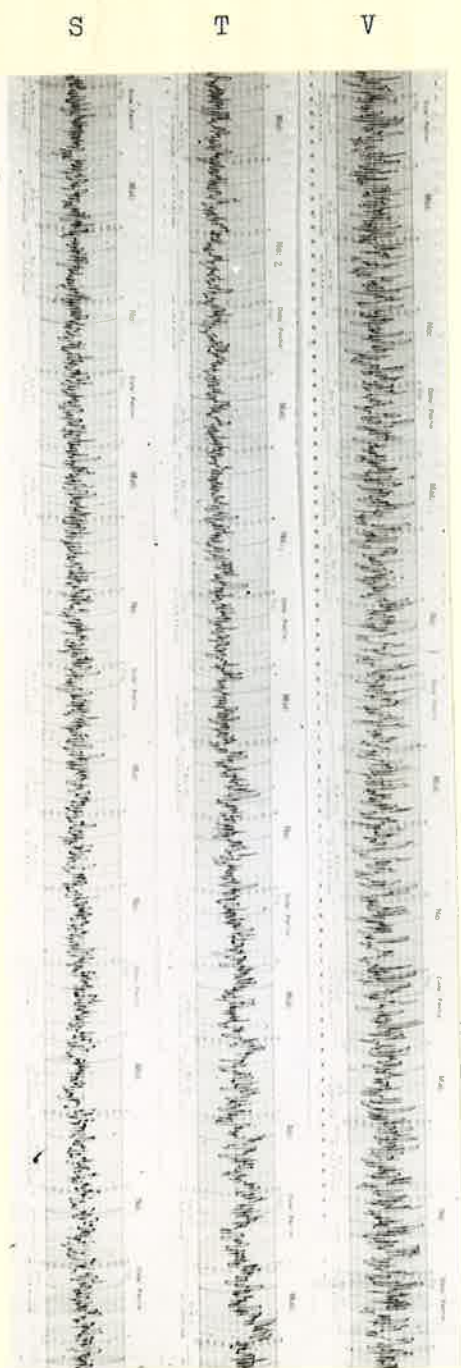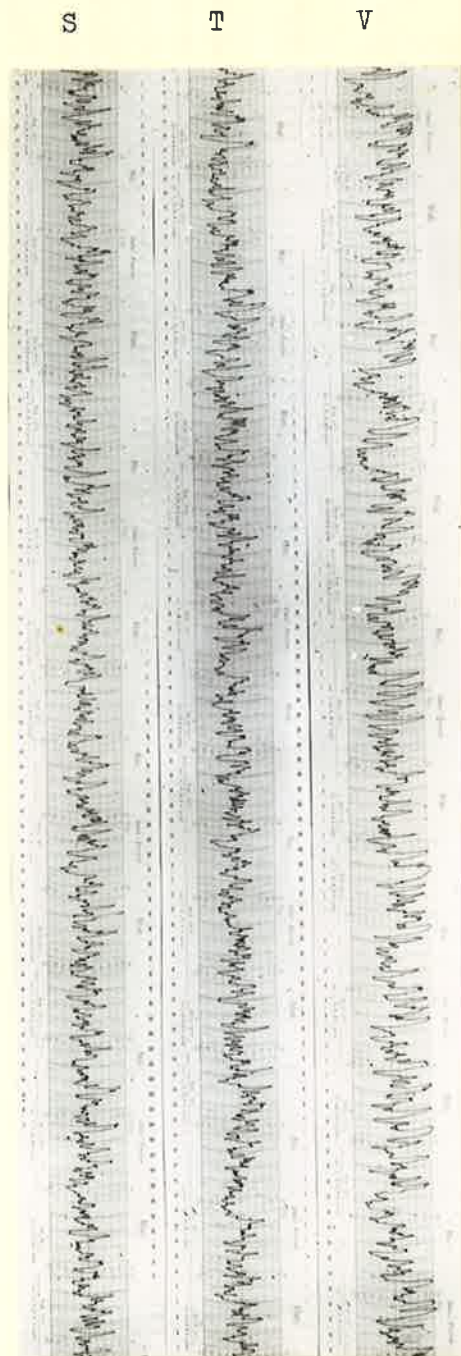
S T V S T V

Fig. 1   Fig. 2

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