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ARRANGEMENT FOR THE DETECTION OF BREAKAGE AND ABNORMAL YARN TENSION

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FIG. 1

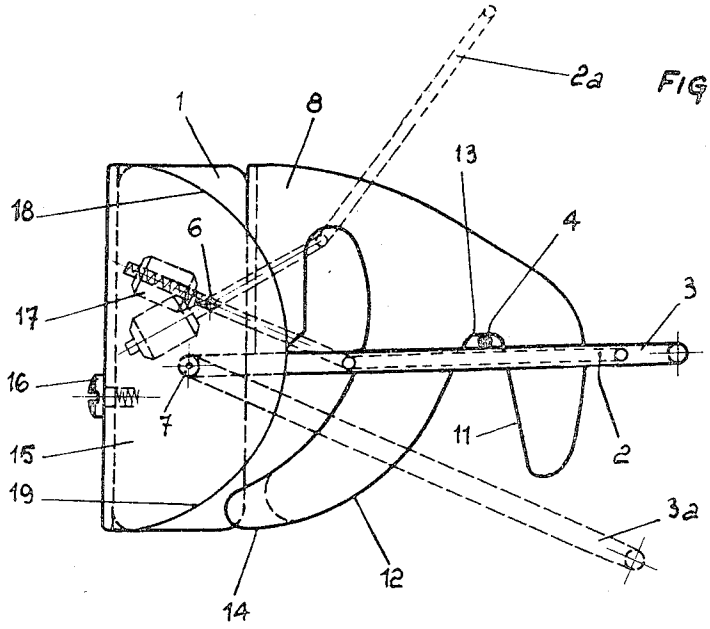
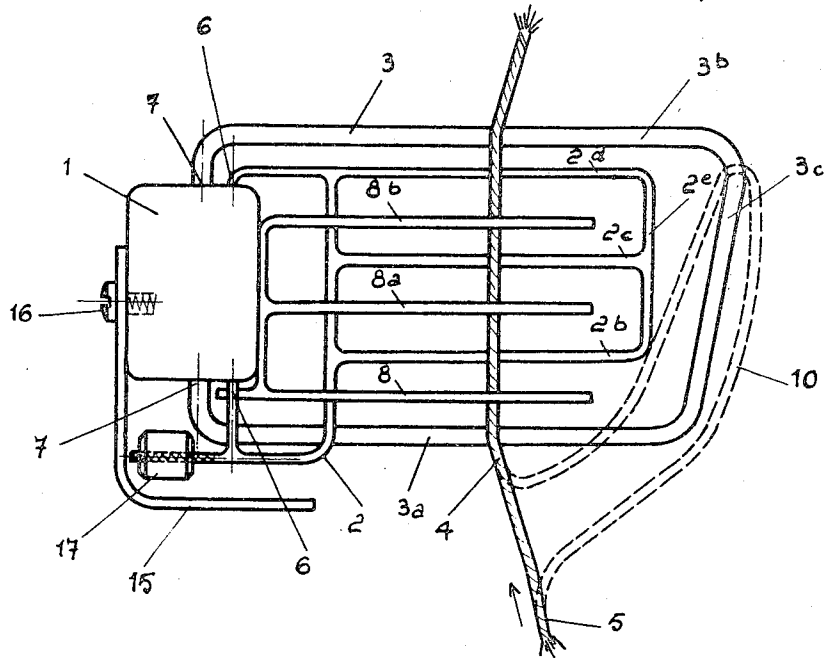


FIG. 2



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ARRANGEMENT FOR THE DETECTION OF BREAKAGE AND ABNORMAL YARN TENSION

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Int. Cl. D04b 35/14
U.S. Cl. 66—158 5 Claims

ABSTRACT OF THE DISCLOSURE

The invention concerns a device for the detection of breakage and abnormal yarn tension, which is located on the yarn course between the feed bobbins and the needles of a knitting machine. This arrangement prevents the entangling of yarn loops which are produced during unwinding and allows the detaching of loops which become entangled accidently.

It is general practise to use on knitting machines security arrangements commonly referred to as "stop motions" (which are located usually in the machine superstructure above the feed bobbins.

These arrangements are usually composed of pivoted feeler arms on which passes the yarn to be unwound. The purpose of these feeler arms is to stop the machine immediately in the case of yarn breakage or of excess tension.

On the majority of existing arrangements, these feeler arms have often been constructed with a fork shaped extremity, i.e. the part receiving the yarn being unwound, which is inserted between a series of fixed blades which gives the yarn course a zig zag form so as to prevent the inutile stoppage of the machine during abrupt changes of tension in the yarn concerned during the knitting operation.

If these existing arrangements have been more or less acceptable for the standards required, the present requirement of knitting, and principally in the use of certain synthetic or artificial fibres, create certain difficulties.

Often during the knitting operation a yarn is released brusquely when it is subjected to variations of feed, sudden unwinding stresses, or when it is left inactive as is sometimes necessary for the working of certain knitting structures. It is often found that the yarn loops itself around the end of the feeler arms or sometimes gets entangled in the support housing of the arrangement. The consequences are naturally quite serious, when, on continuation of knitting, the yarn, being irregularly distributed on the needles, is stretched excessively, sometimes just to the point of breaking before the detection devices have been able to function and command the stopping of the machine.

The principal purpose of this invention is to remedy these inconveniences and in this connection the invention provides a detection arrangement for detecting breaking and abnormal tensions on yarn in knitting machines comprising means for minimizing the hooking and entangling of yarn loops which are produced during unwinding and for allowing the detaching of loops which become hooked or entangled accidentally. The embodiment disclosed comprises a pivoted detecting feeler for abnormal tension which comprises at least two arms which are joined at their outer arms to form a closed assembly, the joining part being disposed to form an angle in relation to the arms and the said angle being open along the direction of yarn unwinding. The outer arms and the joining part

of said feeler encircling a pivoted yarn break detecting feeler.

The invention applies equally to the following descriptions, claims, and accompanying drawings in which:

FIGURE 1 is a schematic plan view of a detection arrangement with two detecting arms or feelers and including protecting means as embodying the invention.

FIGURE 2 is a plan view of the same arrangement.

Concerning these figures:

The numeral **1** represents the housing of the detection arrangement which supports two detectors or detector arms **2** and **3** on which passes the yarn **4** which is fed from the feed source such as a bobbin **5**. These two detector arms or feelers which pivot on **6** and **7** may occupy positions *2a*, *3a*, respectively in the case of a break or excess tension, thus stopping the machine either by closing of the electric circuit or by the operation of a control mechanism. This detail of the arrangement is not shown.

The part of the detector arms or feelers **2** in contact with the yarn **4** is divided into several parallel branches *2b*, *2c*, *2d* which are inserted between a series of fixed blades **8**, *8a*, *8b* which form a part of the support housing **1**, the end of this detector **2** being closed as shown in *2e*.

The two arms *3a*, *3b* of the abnormal tension-detecting feeler are closed by the part *3c* which prevents the entangling of the loops. This part forms an angle to allow the loops of yarn **10** which form because of stress variations or the violent stoppage of the machine to slide along the part *3c* and to be rearranged.

The intervening blades **8**, *8a* and *8b* contain openings **13** which increase or diverge in area at their lower parts **11** and **12**—see FIGURE 1—to simplify the introduction of the yarn on the two detector arms **2** and **3**. The openings **13** present a passage for the yarn being unwound. The lower part **14** of the first blade **8** formed as a tongue **14** which extends towards the housing so that it covers a part of the base of the support housing **1** thus forming a protection guard against the stray loops which may otherwise become entangled.

A curved cover plate **15** is fixed to the front of the support housing **1** by means of a fixing screw **16** and it protects the yarn from the projecting parts of the mechanism such as the counter weight **17** which controls the sensitiveness of the detecting feeler **2**.

As can be seen on this construction, the loops of yarn which tend to become entangled are deviated by means of the curvatures **18** and **19** of the plate **15**.

As should be understood, this invention is not limited solely to the example described above. Other means of realization and other methods of execution can be envisaged, which rest within the scope of the invention.

What I claim is:

1. A detection arrangement for breakage and abnormal tension of unwinding yarn in a knitting machine comprising a plurality of fixed blades, means securing said blades against movement, a pair of detecting feeler means, means pivotally supporting said feeler means for parallel movement to and from a normal position in which unwinding yarn is fed on the said pair of feeler means transversely to the direction of said parallel movement, and means balancing said pair of feeler means for movement in opposite directions upon the occasion of a breakage or abnormal tension, one of feeler means comprises a plurality of branches projecting between said blades and the other feeler means comprises a pair of parallel arms positioned outside of said plurality of fixed blades, the said arms being interconnected at their ends opposite to said pivoting means by a joining part to form a closed assembly.

2. A detection arrangement as set forth in claim **1** wherein said joining part is disposed to form an angle

in relation to the said arms of the said other feeler means, said angle being open along the direction of the yarn unwinding.

3. A detector arrangement as set forth in claim 2 wherein said fixed blades are formed with downwardly extending openings flared outwardly toward the bottom thereof, and means forming a housing supporting said blades.

4. A detector arrangement as set forth in claim 3 wherein the first of said fixed blades in the direction of unwinding yarn includes a tongue extending downwardly to mask the front part of the said housing.

5. A detector arrangement as set forth in claim 4 including a cover plate extending from said housing and projecting forwardly.

References Cited

UNITED STATES PATENTS

1,172,950	2/1916	Crawford	66—160
3,001,389	9/1961	Vossen	66—163
3,257,518	6/1966	Vossen	66—163
3,388,565	6/1968	Mishcon	66—161

FOREIGN PATENTS

716,549	10/1954	Great Britain.
482,004	6/1953	Italy.

MERVIN STEIN, Primary Examiner

U.S. Cl. X.R.

66—163