Sept. 17, 1968 J. E. R. GREGORY 3,402,269
APPARATUS FOR THE DETECTION OF BROKEN YARN
AND THE LIKE ON TEXTILE MACHINES
Filed May 2, 1966

Fig. 1.

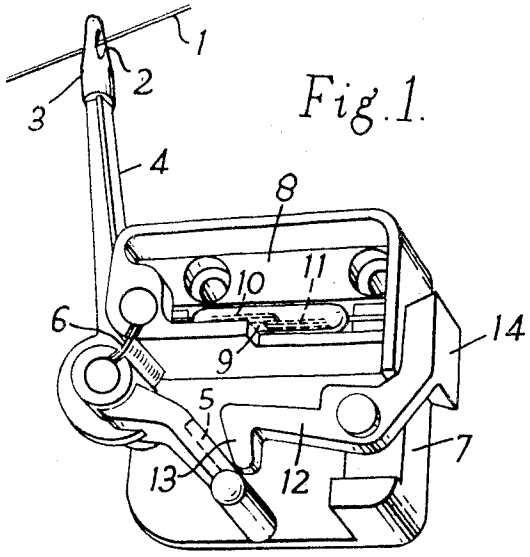


Fig. 3.

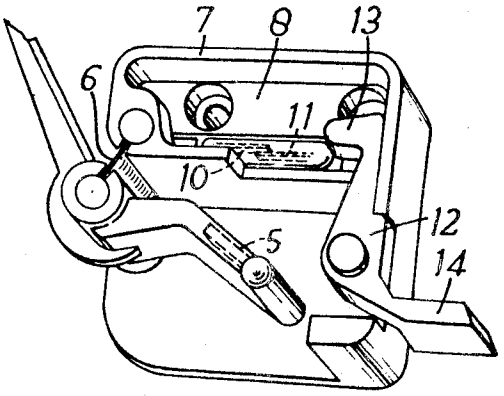
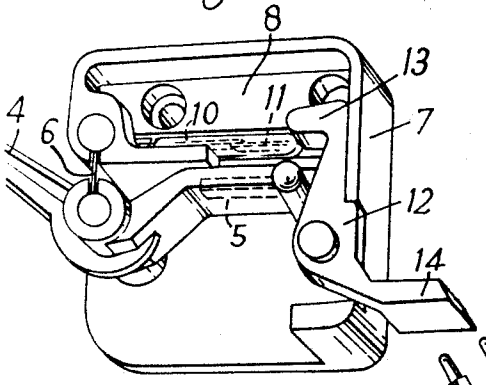


Fig. 2.



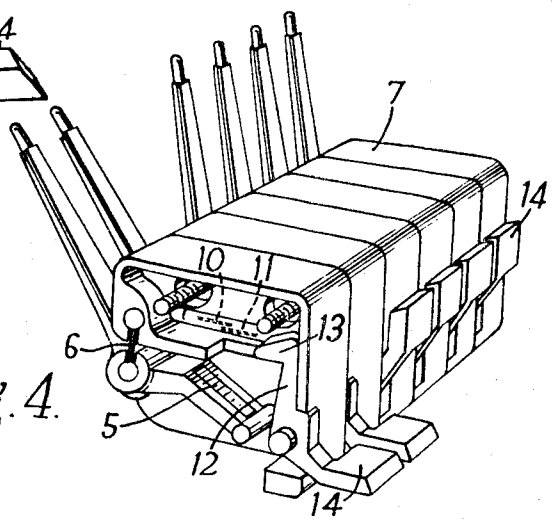


Fig. 4.

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APPARATUS FOR THE DETECTION OF BROKEN YARN AND THE LIKE ON TEXTILE MACHINES

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5 Claims. (Cl. 200—61.13)

ABSTRACT OF THE DISCLOSURE

An apparatus for detecting breaks in continuous textile material including an arm movably suspended from a flexible membrane. The textile material passes through an eyelet in one end of the arm biasing it to a first position. When the material breaks, the arm swings on the membrane to a second position wherein a magnet mounted on the arm effects activation of switch contacts, the operation of which will cause an appropriate alarm.

This invention relates to apparatus for the detection of breaks in textile material such as yarns and rovings in textile machines.

The textile material may be the warp yarn passing through a warping machine for the manufacture of carpets, belts and the like or may be any kind of textile material including synthetic textile material.

An object of the present invention is to provide an improved form of yarn break detector apparatus.

A further object of the invention is to provide an improved form of yarn break detector apparatus and in particular to provide an improved pivot and pivoted arm.

A further object of the invention is to provide means associated with the pivoted arm for indicating whether the arm is in an operative or inoperative position.

Thus according to the present invention there is provided an apparatus for detecting the occurrence of a break in textile material passing through a textile machine comprising an arm suspended by means of a membrane and having one end thereof normally supported by the textile material and having a magnet located on the other end of the arm in the vicinity of switch contacts such that whenever a break occurs in the material, the arm swings on the flexible membrane to allow the magnet to effect actuation of the switch contacts.

According to a further feature of the invention there is provided a pivoted member arranged such as to be moved into the path of the suspended arm to prevent swinging movement thereof and actuation of the switch contacts by the magnet carried by the arm.

The constructional features of a preferred embodiment of the invention will now be described by way of example only with particular reference to the accompanying drawing wherein:

FIGURE 1 is a perspective view of a yarn break detector device of the present invention with the yarn unbroken and the pivoted arm in the raised position;

FIGURE 2 is a view similar to that of FIGURE 1 with the arm in the "dropped" position following breakage of the yarn;

FIGURE 3 is a view similar to that of FIGURE 1 but with the "parking" lever in the "operate" position; and

FIGURE 4 is a perspective view of a bank of yarn break detectors.

Referring to FIGURE 1, the yarn **1** passes through an eye **2** formed in a guide **3** located at one end of a cranked arm **4**, the other end of which carries or has incorporated therewithin a permanent magnet **5** (FIGURE 4). The

cranked arm **4** is suspended at a point intermediate the eye **2** and magnet **5**, by means of a membrane **6** preferably formed of thin plastics material, from a point in a casing **7** of the detector device. Preferably, the casing **7** and arm **4** are moulded from plastics material and the end of the arm **4** remote from the magnet **5** is formed with the yarn guide preferably of ceramic material provided with the eyelet **2** through which the yarn **1** passes.

A recess **8** in the casing **7** is provided with a reed-type magnetically-operated switch **9** having normally-open switch contacts **10, 11**. The arrangement is such that normally the running yarn **1** passes through the eye **2** in the ceramic yarn guide **3** and holds the arm in a position where the magnet **5** is out of range of the switch contacts **10, 11** and unable to exert influence thereon.

When a break occurs in the running yarn **1**, the weight of the ceramic guide **3** on the end of the cranked arm **4** causes the arm to swing with the membranous suspension **6**, bringing the magnet **5** into close proximity with the normally-open contacts **10, 11**, of the reed-type switch **9**, as shown in FIGURE 2. The contacts **10, 11** close under the influence of the magnet and signal the breaking of the yarn **1** such that appropriate action may be taken.

The switch contacts **10, 11** may be connected in circuit with means such as audio or visual warning mechanism, machine stop mechanism or yarn re-joining mechanism and may be normally-closed and actuated to the open state upon the occurrence of a break in the yarn.

The suspension of the arm by means of a membrane obviates the need for the use of conventional type pivots which may be effected by cotton fly and dust from synthetic fibres, which may be of an extremely abrasive nature.

As indicated above, the magnet may be located within the arm and where the arm is of plastics material, may be moulded therein during the moulding operation.

It is advantageous to be able to locate the switch arm **4** in the non-operative position when not in use and for this purpose as shown in FIGURE 3, a further member **12** is pivotally mounted on the casing **7** of each detector device such that the nose **13** thereof can be moved into the path of the magnet end of the switch arm **4** and prevent this end of the switch arm moving into actuating range of the switch contacts **10, 11**. The pivoted member **12** is provided with a distinctive tail portion **14** such that when a plurality of such detector devices are arranged in a blank as shown in FIGURE 4, the devices in the operative position are clearly distinguished from those in the inoperative position.

In an alternative embodiment of the invention, the yarn passes through an eye formed at one end of the cranked arm, or in a ceramic yarn guide associated therewith, the other end of the arm remote from the eye being connected to a bar or rod pivotally mounted in a casing of the detection apparatus. The bar or rod is provided at one end with an annular magnet located around the contacts of a reed-type magnetically-operated switch supported within the casing.

The arrangement is such that normally, the running yarn passes through the eye in the cranked arm and supports the arm against the bias of a spring such that the magnet is located in a position surrounding the switch contacts and maintaining closure thereof.

When a break occurs in the running yarn, the cranked arm and associated magnet swing and the magnet is biased to a position where the switch contacts are no longer maintained closed and the breaking of the contacts signal the breaking of the yarn such that appropriate action may be taken, as described in connection with the previous embodiment.

It will be appreciated that the invention is susceptible

of considerable modification and is not to be deemed limited to the particular constructional features described by way of example only.

I claim:

1. An apparatus for detecting the occurrence of a break in textile material passing through a textile machine comprising an arm, means on one end of said arm for engaging said textile material, magnet means mounted on said arm, flexible membrane means suspending said arm for swinging motion, electrical switch contact means actuatable by magnetic flux, said textile material normally holding said arm in a first position, said arm swinging on said flexible membrane to a second position wherein the flux of said magnet actuates said electrical switch contact means upon breaking of said textile material.

2. An apparatus according to claim 1 further comprising a member mounted for movement into and out of the path of said arm to selectively prevent movement of said arm and subsequent actuation of said electrical switch contact means.

3. An apparatus according to claim 1 wherein said textile material engaging means comprises a ceramic yarn guide having an eyelet therein through which said material passes.

4. An apparatus according to claim 1 wherein said electrical switch contact means comprises an encapsulated reed-type magnetically actuated switch.

5. An apparatus for detecting the occurrence of a break in textile material passing through a textile machine comprising an arm, means on one end of said arm for engaging said textile material, a member one end of which is pivotally connected to said arm, magnetic means mounted on the other end of said member, flexible membrane means suspending said arm for swinging motion, electrical switch contact means actuatable by magnetic flux, said textile material normally holding said arm in a first position where upon breaking of said textile material said arm swings on said flexible membrane to a second position displacing said magnetic means with respect to said electrical switch contact means to effect actuation of said switch contact means.

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