Aug. 29, 1933. O. V. PAYNE 1,924,197

ELECTRICAL FEELER

Filed Nov. 14, 1930

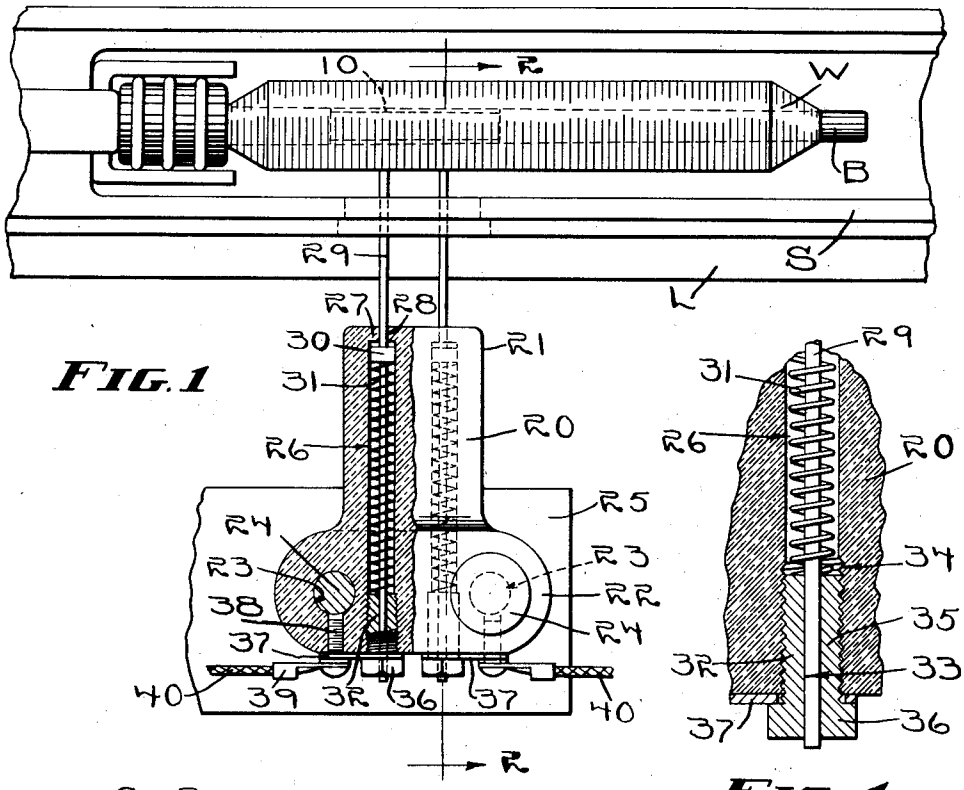


FIG. 1

FIG. 4

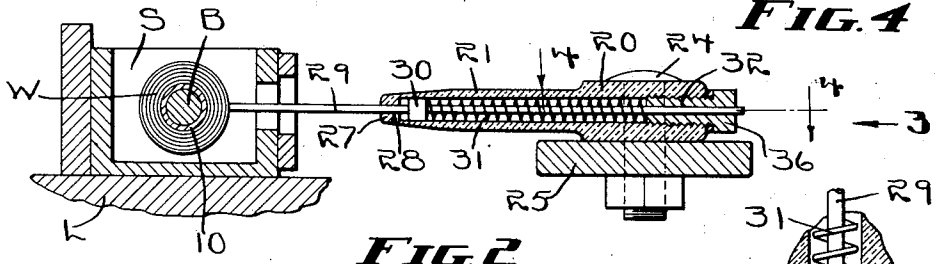


FIG. 2

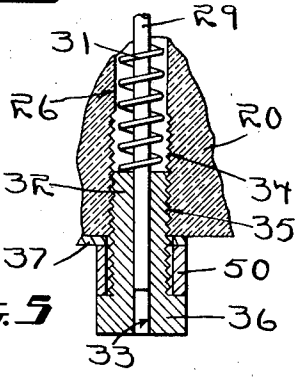


FIG. 5

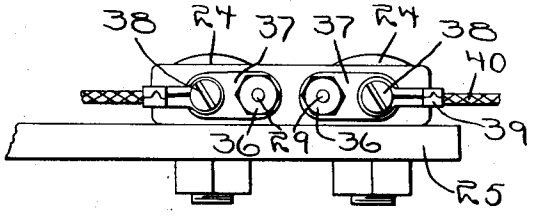


FIG. 3

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ELECTRICAL FEELER

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8 Claims. (Cl. 139—273)

The invention relates to improvements in electrical feelers for detecting the condition of weft in looms, and it is the general object of the invention to provide a compact unit which can be readily clamped in position to cooperate with a bobbin having a conducting surface that is uncovered as exhaustion approaches.

In the weaving of certain classes of goods requiring fine wefts it is desirable to employ a form of weft detector which will exert very little pressure on the yarn during the time that sufficient weft is present for continued weaving. Also, where a metallic surface is used to assist in giving the electrical indication there is the possibility that a fine weft will be pinched between such a surface and the contacting finger of the feeler, with resultant thread breakage. With coarser yarns it is not necessary to have such a light pressure as is necessary with finer yarns. It is a further object of my invention to provide a feeler of the type specified wherein the detecting fingers can have sliding contact with a guide bearing movable in such a way as to vary the pressure exerted on the feeler fingers.

It is a further object of my invention to provide a feeler having a case which is symmetrical about an axis perpendicular to the surface being detected to permit use of the feeler with either side up and facilitate manufacture.

With these and other objects in view which will appear as the description proceeds, my invention resides in the combination and arrangement of parts hereinafter described and set forth in the claims.

In the accompanying drawing, wherein a convenient embodiment of my invention is set forth,

Fig. 1 is a top plan view of a feeler made according to my invention, the fingers being shown as having contact with a full supply of weft at the beginning of the detecting operation, parts being in section,

Fig. 2 is a vertical section on line 2—2 of Fig. 1,

Fig. 3 is a front elevation taken in the direction of arrow 3, Fig. 2,

Fig. 4 is an enlarged fragmentary section on line 4—4, Fig. 2, showing the bearing screw adjusted so as to create maximum stress on the compression spring, and

Fig. 5 is a view similar to Fig. 4 but with the screw held in such position as to reduce the stress on the compression spring.

Referring to the drawing, the lay L carries a shuttle S in which is located a bobbin B illustrated herein as having a full supply of weft W. As indicated in dotted lines in Fig. 1 the bobbin has a metallic surface 10 which may be of any form and is normally covered by a sufficient supply of weft. During the weaving operation, however, the weft uncovers the metallic surface so that the latter is exposed for contact with electric feeler fingers to be described hereinafter. The bobbin and shuttle of themselves form no part of the present invention and may be made in any approved form.

In carrying my invention into effect I provide a carrier 20 made of insulating material such, for instance, as bakelite, and form the same with a relatively narrow rear portion 21 and a wider forward part 22. The latter is provided with a pair of openings 23 through which extend securing bolts 24 to hold the carrier to a supporting platform 25 which may be held to the loom frame not shown in fixed position so that the carrier itself is rigid and held against displacement during the operation of the feeler.

The carrier has a pair of parallel horizontal bores 26 extending from its front end almost to the rear end thereof, a thin wall 27 defining the end of each bore. Leading rearwardly from each bore through the wall is a small hole 28 to receive the rear end of a feeler finger or wire 29.

Each feeler wire or finger has a shoulder 30 formed thereon located within the corresponding bore adjacent the wall 27 to receive the rearward thrust of a small compression spring 31 located in the bore. Each spring surrounds the forwardly extending part of its feeler finger 29 and has its forward end restrained by engagement with a screw bearing 32. Each bearing has a hole 33 drilled therethrough to receive the forward end of the corresponding finger, these parts being so proportioned as to insure metallic sliding contact during the operation of the feeler.

The forward end of each bore has an internal thread 34 which receives the rearwardly extending threaded shank 35 of the corresponding screw, while the forward end of each screw has a head 36 which permits tightening.

Electrical connection between a finger 29 and the external circuit not shown is accomplished by means of a connector 37 lying under the head 36 and extending away from the center of the carrier to be held under a binding post or screw 38. The latter is threaded into the carrier and receives the terminal 39 carried by

a wire 40. By means of the parts just described each screw and its sliding finger has electrical contact with a wire 40, and as each finger is connected with a wire the external circuit will be closed to cause a change in the operation of the loom whenever said fingers are electrically connected at the bobbin. This change in operation may result either in an exchange of bobbins or shuttles, or in loom stoppage.

When the parts are in the position shown in Fig. 4 the maximum pressure attainable is exerted on the fingers, a condition which will assure good contact between the fingers and the metallic part of the bobbin, and can safely exist with relatively coarse yarn. When finer yarns are employed, however, it is desirable to relieve the pressure of the spring and this can be done as indicated in Fig. 5 by placing a washer 50 or similar device between a head 36 and the adjacent connector 37. In this way the rear threaded shank of the screw will be advanced so as to permit lengthening of the space in which the spring lies. Whatever the longitudinal position of the screw may be with respect to its bore the feeler finger will be free to slide through the hole 33 and at the same time maintain electric contact with the screw.

By referring to Figs. 1 and 2 it will be seen that the carrier is so formed that it may be mounted on the platform 25 with either side up because of the fact that it is formed symmetrically about a central axis parallel to the fingers 29. The rear part of the carrier is not only reduced in width in a horizontal direction as indicated in Fig. 1, but is also of less thickness in a vertical direction as indicated in Fig. 2 than is the forward part thereof through which the securing bolts 24 pass. When it is desired to replace the spring or remove a damaged finger it is necessary merely to withdraw the corresponding screw 32 after which removal may be effected in a forward direction.

From the foregoing it will be seen that I have provided a simple and compact form of electrical feeler complete in itself and readily supported on any convenient form of platform or base. It will also be seen that the tension of the compression springs 31 may be varied at will, and that whatever the pressure exerted by said springs may be the feeler fingers are free to slide through the holes 32 in the screws to establish electrical contact therewith. The rear end of the feeler finger may have bearing relation with the carrier through either the shoulder 30 or the hole 28 or both, if desired.

Having thus described my invention it will be seen that changes and modifications may be made therein by those skilled in the art without departing from the spirit and scope of the invention and I do not wish to be limited to the details herein disclosed, but what I claim is:

1. An electrical feeler for looms operating with bobbins having current conducting surfaces which are uncovered when the weft is substantially exhausted, and having a supporting platform, a body formed of insulating material with parallel top and bottom surfaces either of which is shaped to rest on the platform and having a pair of spaced substantially parallel holes therein, each hole having the forward end thereof threaded and having the rear end partly closed by a wall formed as part of the body, a wire feeler in each hole, each feeler having a shoulder located in the corresponding hole, a screw threaded in the forward end of each hole, each screw having a bore therethrough which is coaxial with the corresponding hole, and a spring located in each hole, each spring surrounding its corresponding wire finger and bearing against the associated shoulder and screw and tending to move the wire finger rearwardly, each wire finger being slidably mounted through the bore of the screw to maintain electric contact therewith, the body being symmetrical about an axis parallel to the holes and located midway therebetween.

2. In an electrical feeler for looms operating with a weft supply which uncovers a conducting surface as weft exhaustion approaches, a body of insulating material having a pair of substantially parallel bores therein, a detector wire finger in each bore, a screw threaded into the forward end of each bore and having supporting and guiding relation with the corresponding feeler wire, a connector interposed between each screw and the body of insulating material, the connectors extending from their respective screws in a direction away from a point intermediate the screws, and means in addition to the screw to hold each connector in relatively fixed position against the body of insulating material out of contact with the other connector, electrical connection between the feeler wires electrically connecting the connectors through the screws.

3. In an electrical feeler for looms operating with a weft supply which uncovers a conducting surface as weft exhaustion approaches, a supporting platform, a body of insulating material having substantially parallel top and bottom flat faces and having a pair of spaced parallel bores, a wire detector finger resiliently mounted in each bore, a screw threaded into the forward end of each bore through which the corresponding wire detector slides, a connector held against the body of insulating material by each screw and extending away from the other screw, the vertical dimension of the connectors being less than the distance between the parallel top and bottom faces of said body, and means to hold each connector out of contact with the other connector and the platform.

4. In an electrical feeler for looms operating with a weft supply which uncovers a conducting surface as weft exhaustion approaches, a supporting platform, a body of insulating material having substantially parallel top and bottom flat faces and having a pair of spaced parallel bores therethrough, a wire detector finger resiliently mounted in each bore, a screw threaded into the forward end of each bore through which the corresponding wire detector slides, a connector held against the body of insulating material by each screw and extending away from the other screw, the vertical dimension of the connectors being less than the distance between the parallel top and bottom faces of said body, and means to hold each connector out of contact with the other connector and the platform, the body of material being symmetrical about a line parallel to the bores and located between the latter and said body being reversible so that either of the flat surfaces can be supported by the platform.

5. In an electrical feeler for looms operating with a weft supply which uncovers a conducting surface as weft exhaustion approaches, a supporting platform, a body the entire surface and interior of which is formed of insulating material, said body having substantially parallel top and bottom flat faces and having a pair of substantially parallel horizontal bores therein,

a screw threaded into each bore having a head to project forwardly from the bore, an electric detector wire slidably mounted through each screw and projecting rearwardly from the body, a spring in each bore to be operatively related to the corresponding feeler wire to hold the latter yieldingly in rear position, the head of each screw in all angular position lying between the top and bottom faces, and means out of contact with the wires to hold said body against the platform, whereby the wires and screws are at all times insulated from the platform.

6. In an electrical feeler for looms operating with a weft supply which uncovers a conducting surface as weft exhaustion approaches, a supporting platform, a detector body made entirely of insulating material and having the forward part relatively thick with substantially parallel top and bottom faces from which rearwardly projects a reduced thinner extension, a pair of parallel holes extending longitudinally through the thick and into the thin portion, an electric detector wire extending through each bore and extending rearwardly beyond said extension, a screw threaded into each hole and having a bore therethrough to receive and slidingly engage the corresponding detector wire, a spring in each hole to hold the corresponding detector wire yieldingly in rearward position and projecting into a part of the body reduced thickness, means extending through the thicker forward part of the body to hold the latter to the platform, the rearward extension lying between the planes of the top and bottom surfaces of the larger part and said body being reversible on the platform and being symmetrical about the line parallel to the detector wires and passing midway between the latter.

7. In an electrical feeler for looms operating with a weft supply which uncovers a conducting surface as weft exhaustion approaches, a supporting platform, a body the entire exterior surface and interior of which is formed of insulating material, a pair of spaced detector wires insulated from each other by the material of which the body is made to be electrically connected at indication of weft exhaustion, a spring for each wire housed completely within the body and yieldingly holding the corresponding wire rearwardly, means extending through the body out of contact with the detector wires to secure said body to the platform, and supports for the forward ends of the wires threaded into the body and having bores through which the wires slide.

8. In an electrical feeler for looms operating with a weft supply which uncovers a conducting surface as weft exhaustion approaches, a body of insulating material held in fixed position, and having a bore therethrough, a detector wire extending through the bore and beyond the rear of the body to have contact with the said conducting surface, a spring located within the hole and surrounding the detector wire and acting to hold the latter yieldingly in rear position, a connector to conduct current to an external circuit, and a screw threaded into the bore and engaging the forward end of the spring to stress the latter and having a bore through which the wire slides and having a head to hold the connector tightly against the body.

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