

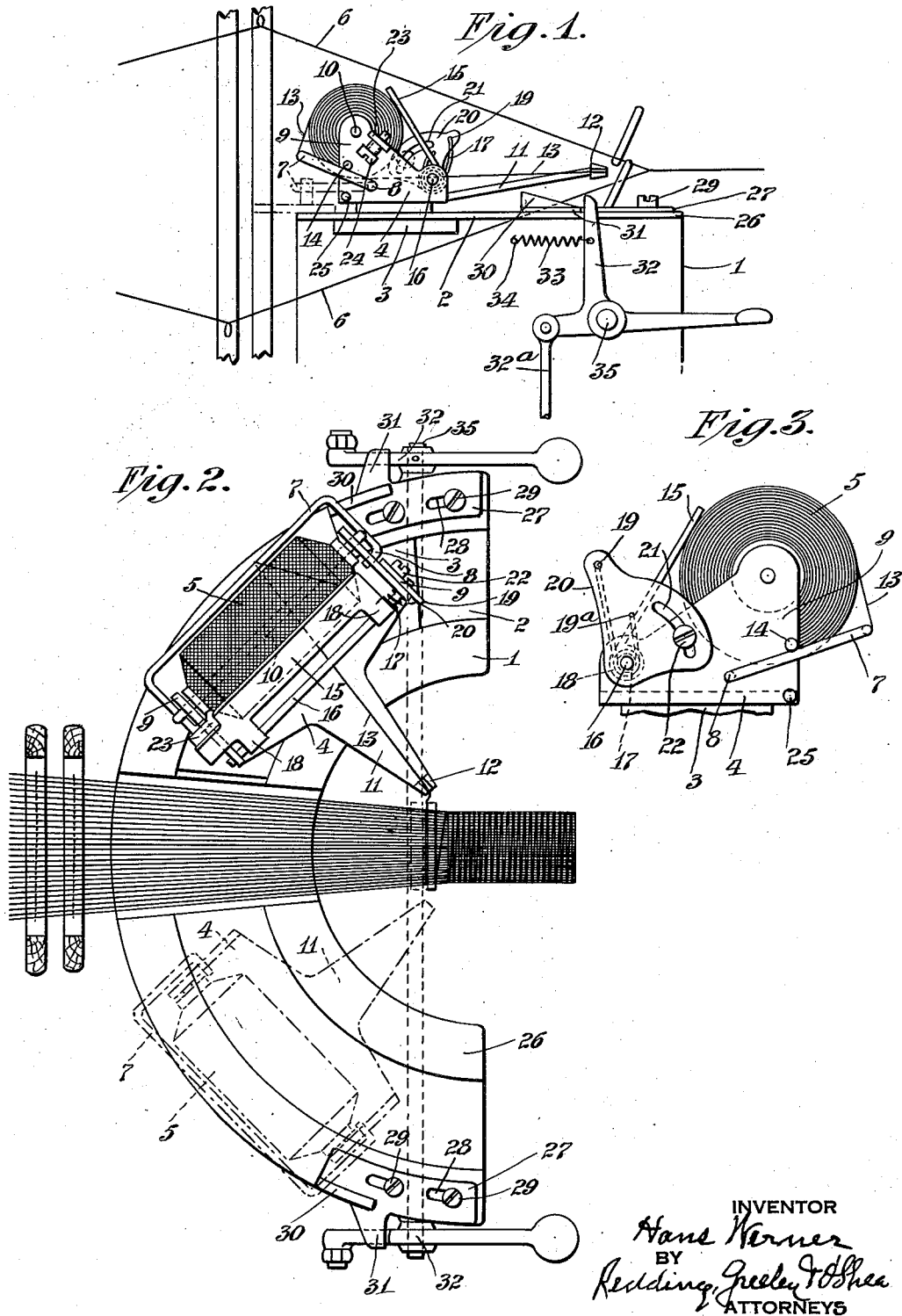
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LOOM

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## LOOM

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This invention is concerned with weft thread stop motion devices for looms and has been developed in connection with ribbon looms. In such looms in particular it is necessary to stop the loom before the weft thread is withdrawn completely from the shuttle bobbin. It is known in the art to provide devices for stopping the loom in the event of breakage of the weft thread and it is also known in the art to provide special weft thread feelers by means of which the stopping of the loom is effected shortly before the weft thread is withdrawn completely from the bobbin.

In braiding or lace bobbin machines it has also been sought to provide for the stopping of the loom through a quicker unwinding of the thread from the bobbin when only a few turns of thread remain on the bobbin core, the bobbin core being provided with a split, spring sleeve, capable of revolving on the core and upon which the first few turns of thread are wound when filling the bobbin, the sleeve acting to effect the stopping of the loom when it is freed from the coils of the thread. Such an arrangement involves consumption of time in winding the bobbin and also entails additional expense by reason of the provision of the sleeve.

In accordance with the present invention the bobbin, when only a small amount of thread is left on the core, is relieved of the pressure of the usual brake, so that the so slackened thread brings about the stopping of the loom. The improved stop motion mechanism therefore has the advantage of rendering unnecessary the provision of a special feeler to guard against the running down of the spool and the provision of a special device such as the split, spring sleeve referred to. In the improved mechanism the stopping of the loom is brought about by one and the same feeler, both in the case of breakage of the weft thread and in the case of the withdrawal of all or nearly all of the thread from the bobbin. In accordance with the invention there is provided a single preferably yoke-like feeler, arranged to swing on the shuttle, so that, although normally supported by the thread, it is permitted to drop when the thread is slackened and in the movement of the shuttle toward either extreme position acts upon the stopping lever to effect the stopping of the loom.

In the drawing, in which an embodiment of the invention is illustrated,

Figure 1 is a view in side elevation, partly diagrammatic, of so much of a ribbon loom as is necessary to enable the application of the invention thereto to be understood.

Figure 2 is a plan view of the same; and

Figure 3 is a detail end view, in elevation on a larger scale, of the shuttle carrier and bobbin as seen from the direction opposite to that in which Figure 1 is viewed.

In the embodiment of the invention illustrated the loom frame 1 is provided with a curved guide 2 for the shuttle carrier 3 to which the shuttle 4, carrying the weft bobbin 5, is secured, the carrier and shuttle with the bobbin being moved to and fro in the arc of a circle to cause the shuttle to pass through the shed formed by the warp threads 6, by means well known in the art and not necessary to be described herein.

A preferably yoke-like feeler 7 has its inwardly bent ends, as at 8, engaged in holes of the side plate 9 of the shuttle in which the bobbin spindle 10 is also mounted. The shuttle bill 11, forming part of the shuttle, is provided at 12 with a guide eye through which the weft thread, led from the bobbin behind and under the cross bar of the feeler, is laid into the shed, the feeler, in the normal operation of the loom, being held in its upper position against the stop 14, on one of the side plates 9 of the shuttle, by the tension of the weft thread.

The bobbin 5 is normally braked by a brake plate 15, hingedly supported on a rod 16, mounted in the side plates 9 of the shuttle, the brake plate 15 normally resting against the periphery of the filled bobbin. A light spring 17, coiled about one of the bosses 18, in which the rod 16 is mounted in the side plates 9, has one end engaged in a hole 19, in the sector plate 20, and the other end arranged to bear upon the brake plate 15 to press it against the periphery of the filled bobbin. The sector is arranged to swing about the rod 16 and is provided, as at 21, with a slot through which a screw 22 may be threaded into the shuttle side plate 9. By this arrangement it is possible to regulate the tension of the spring 17 and therefore, by adjustment of the plate 20, to regulate the braking pressure of the brake plate 15 upon the filled bobbin.

In a lug 23, which projects laterally from the side plate 9 of the shuttle, shown in Figure 1, there is threaded a stop screw 24 with the upper end of which the brake plate 15 comes in contact when the thread supply on the bobbin is nearly exhausted and thereby the bobbin is positively relieved of the braking pressure and is permitted to rotate freely and slacken the thread so that the feeler 7 is permitted to drop and effect the stopping of the loom as hereinafter explained. A stop pin 25 on the plate 9 is provided for the purpose

pose of limiting the fall of the feeler 7 whether it is initiated by breaking of the thread or by slackening of the thread.

At each end of the shuttle guide 2 is mounted a slide 27 capable of displacement by the yoke-like feeler 7 at the end of the movement of the shuttle if the feeler has dropped. The slide 27 is held to the loom frame so as to be capable of limited movement by screws 29 which pass through slots 28 of the slide into part of the shuttle guide 2. The slide is provided with a lug 30, preferably shaped as shown in Figure 1, for contact with the feeler 7 and with a lateral lug 31 which, in the movement of the slide, engages an arm 32 of a stopping lever connected by a link 32<sup>a</sup> with the usual stopping mechanism not necessary to be shown or described herein. A spring 33, connected at one end to the arm 32 and at the other end to a fixed point 34, serves to maintain the stopping lever 32 in non-stop position until it is shifted by the lug 31 of the slide 30 as it is moved by contact with the feeler 7 when the shuttle approaches the end of its movement in one direction or the other.

It will be understood that the feeler 7 ordinarily passes freely over the lug 30 of either slide 27 and that if the weft thread breaks or is slackened sufficiently the feeler drops by its own weight and as a result of the centrifugal force developed in the movement of the shuttle in its circular path and, in the continued movement of the shuttle, acts upon the stopping lever 32 and shifts it so as to effect the stopping of the loom.

It will be understood that in the normal operation of the loom the brake plate 15 bears against the surface of the weft thread on the bobbin, under the pressure of the spring 17, thereby preventing the free unwinding movement of the bobbin and so maintaining the weft thread under tension, and that, upon the breaking or slackening of the weft thread, the feeler drops and initiates the stopping of the loom. By adjustment of the screw 24 the point at which the bobbin is positively freed of the pressure of the brake plate can be varied as conditions may require and the operation of the stopping mechanism can be initiated at once and definitely at the proper instant in the operation of the loom without the uncertainty consequent on dependence upon the ex-

haustion of the bobbin which may take place at an inopportune point in the operation of the loom.

It will be understood that various changes in details of construction and arrangement can be made to suit different conditions of use and that, except as pointed out in the accompanying claims, the invention is not restricted to the particular construction and arrangement shown and described herein.

I claim as my invention:

1. In a loom, the combination of a shuttle, a bobbin, a brake adapted to bear against the thread on the bobbin in the shuttle, means whereby the bobbin is positively relieved of the pressure of the brake as the supply of thread on the bobbin approaches exhaustion, a feeler supported normally by the thread from the bobbin and permitted to drop when the thread breaks or is slackened, and stopping mechanism arranged for coaction with the feeler in the movement of the shuttle when the feeler has dropped.

2. In a loom, the combination of a shuttle, a bobbin, a brake adapted to bear against the thread on the bobbin in the shuttle, an adjustable stop for cooperation with the brake whereby the bobbin is positively relieved of the pressure of the brake as the supply of thread on the bobbin approaches exhaustion, a feeler supported normally by the thread from the bobbin and permitted to drop when the thread breaks or is slackened, and stopping mechanism arranged for coaction with the feeler in the movement of the shuttle when the feeler has dropped.

3. In a loom, the combination of a shuttle, a bobbin, a brake adapted to bear against the thread on the bobbin in the shuttle, means whereby the bobbin is positively relieved of the pressure of the brake as the supply of thread on the bobbin approaches exhaustion, a feeler supported normally by the thread from the bobbin and permitted to drop when the thread breaks or is slackened, a slide, and a stopping lever, the slide having a lug to be engaged by the dropped feeler in the movement of the shuttle, whereby the slide is moved, and having a lug for engagement with the stopping lever as the slide is moved.

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