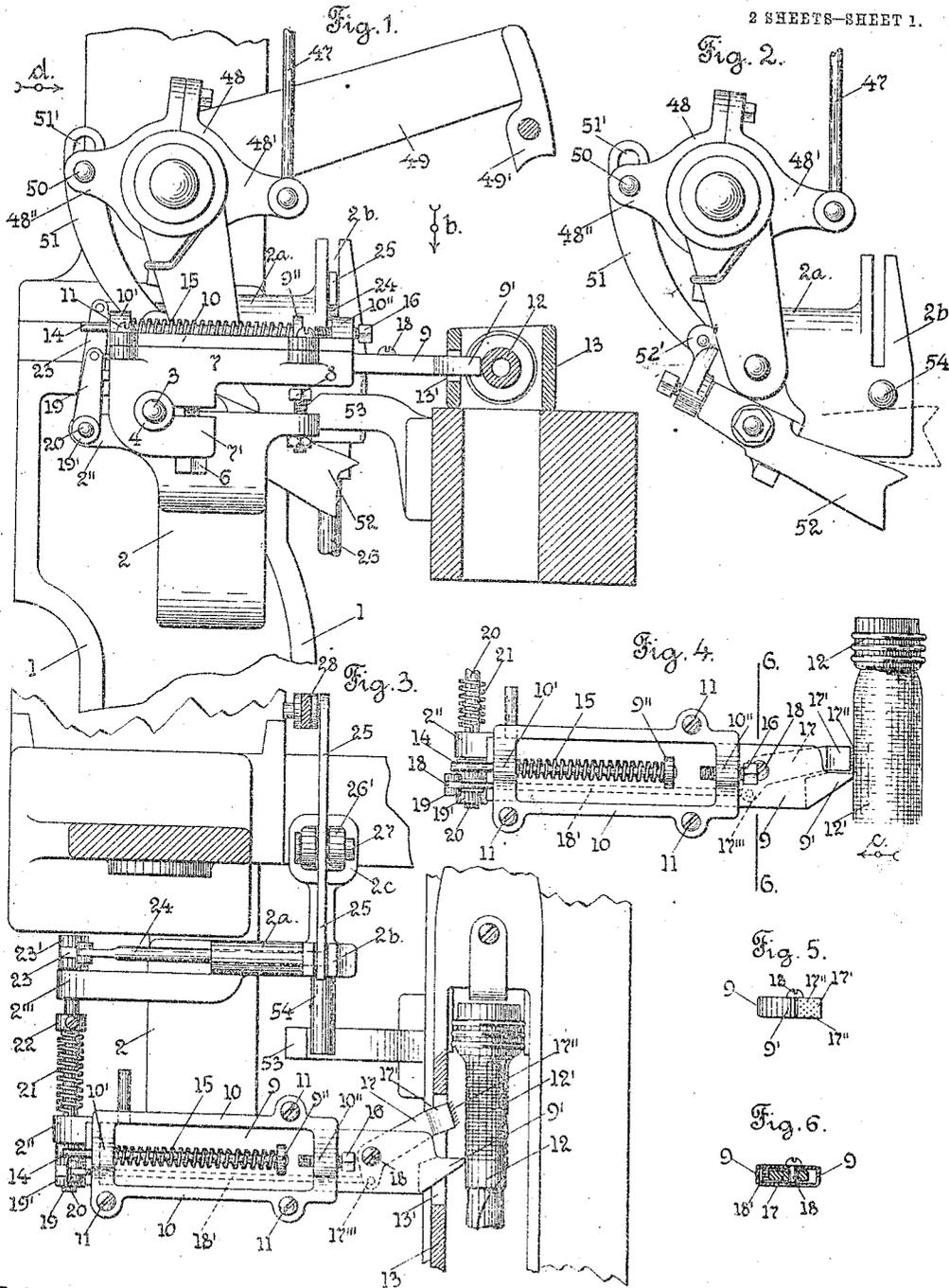


E. H. RYON.  
WEFT REPLENISHING LOOM.  
APPLICATION FILED DEC. 20, 1909.

972,722.

Patented Oct. 11, 1910.

2 SHEETS-SHEET 1.



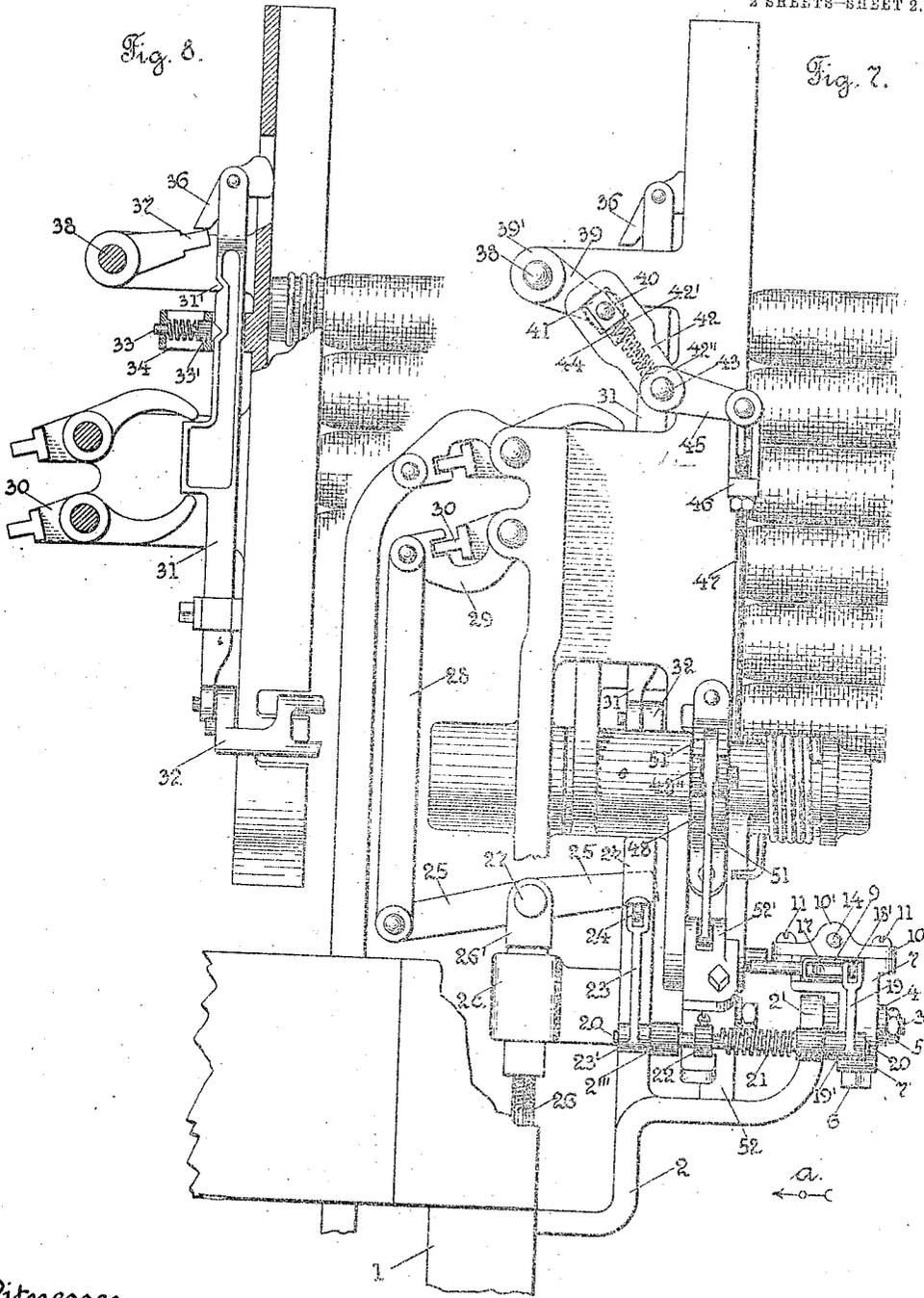
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# UNITED STATES PATENT OFFICE.

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## WEFT-REPLENISHING LOOM.

972,722.

Specification of Letters Patent. Patented Oct. 11, 1910.

Application filed December 20, 1909. Serial No. 534,049.

*To all whom it may concern:*

Be it known that I, EPPA H. RYON, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Weft-Replenishing Looms, of which the following is a specification.

My invention relates to weft replenishing looms, and more particularly to a filling detector or feeler mechanism for weft replenishing looms, which is preferably located at the magazine end of the loom, on the loom side or end frame. The filling detector or feeler is adapted to feel through an opening in the front wall of the shuttle and engage with the filling on the bobbin in the active shuttle, and on the substantial exhaustion of filling to put into operation mechanism to cause the weft replenishing mechanism to supply a fresh bobbin in place of the substantially exhausted bobbin, in the usual and well known way.

The object of my invention is to improve upon the construction of filling detector mechanisms of the class referred to, and more particularly to provide a very sensitive and delicate detector mechanism, having a feeler which will feel for and detect the practical or substantial exhaustion of filling on the bobbin without regard to the size of the bobbin on which the filling is wound, or the position of the bobbin in the shuttle.

In my improvements I provide a feeler device consisting of two members. One of said members is in the form of a slide suitably guided in a stand, and is yieldingly held against the filling on the bobbin on the forward movement of the lay, and move with the bobbin a certain distance toward the front of the loom as the lay beats up; said sliding member has preferably a broad engaging surface, preferably rectangular in shape, relative to the length of the bobbin, to engage the bobbin on its greatest diameter. The movement of the slide toward the breast beam or the front of the loom causes a lever, to be hereinafter described, to be rocked, which causes the pivot point of an operating lever to be removed, and leaves the replenishing mechanism at rest as long as a sufficient amount of filling is left on the bobbin.

The second member of the feeler device

consists in this instance of an angle lever, which is suitably pivoted on the first member or slide and has its engaging end located in substantially the same horizontal plane as the engaging end of the first mentioned member of the feeler device. One arm of the angle lever extends preferably toward the engaging end of the slide, and is also adapted to engage the filling on the bobbin. The end of said arm is in this instance preferably provided with short bristles forming a brush surface, which will, in engaging the bobbin, penetrate the filling without spoiling or injuring the yarn. In my feeler device, one of the filling engaging portions is adapted to be moved away from and toward the other filling engaging portion, in the direction of the bobbin or filling carrier. Upon the engagement of the bobbin by the feeler, both members will move in unison until substantial exhaustion of the filling is reached. Upon the substantial exhaustion of filling on the bobbin, when the sliding member engages the bobbin, there will not be a sufficient amount of filling on the bobbin to hold the arm of the second member or angle lever stationary, this will allow said arm to move freely sidewise, and through connections to a lever, hereinafter described, cause said lever to remain in its position and not act to withdraw the pivoted point of the operating lever of the replenishing mechanism, and a fresh bobbin will be dropped from the magazine in the usual way.

I have shown in the drawings a detached portion of a stationary magazine, and some of the operating parts, of the type shown and described in U. S. Letters Patent No. 933,492, dated September 7, 1909, with my improvements combined therewith, sufficient to enable those skilled in the art to understand the construction and operation thereof.

Referring to the drawings:—Figure 1 is an end view of a detached portion of a weft replenishing loom, with my improved filling detector mechanism combined therewith, looking in the direction of arrow *a*, Fig. 7; the lay, shuttle, and bobbin are shown in section, and the magazine shown in Fig. 7 is not shown in this figure. Fig. 2 shows some of the parts detached, which are not fully shown in Fig. 1. Fig. 3 is a plan view of the filling feeler or detector, looking in the direction of arrow *b*, Fig. 1, the transferrer

arm shown in Fig. 1 is left off in this figure. Fig. 4 shows the sliding part of the feeler mechanism shown in Fig. 3, detached, and in a different position. Fig. 5 is a front view of the feeler slide, detached, looking in the direction of arrow *c*, Fig. 4. Fig. 6 is a section through the feeler slide, detached, on line 6, 6, Fig. 4, looking in the direction of arrow *c*, same figure. Fig. 7 is a front view of the parts shown in Fig. 1, looking in the direction of arrow *d*, same figure, and also shows a stationary magazine and other parts of the type shown and described in said Letters Patent, No. 933,492, and, Fig. 8 is a detached portion of the stationary magazine shown in Fig. 7, showing a locking device for the upright bars combined therewith.

I will first describe my improvements in filling detector mechanism.

Secured to the loom side 1 and extending out therefrom, is stand 2, having a boss 2' and a stud or bolt 3 thereon, see Figs. 1 and 2. The stud 3 is provided with a bushing 4, preferably secured thereon by a nut 5, see Fig. 5. The bushing 4 has adjustably secured thereon by a bolt 6, see Fig. 1, the clamping portion 7' of the feeler guide 7. The guide 7 preferably rests with its end upon an adjusting screw 8, and is grooved to loosely receive the feeler slide 9. A cap 10 is preferably secured upon the guide 7 by screws 11. The feeler slide 9 is made in this instance of thin sheet metal, forming an oblong hollow member, see Fig. 5, which has a solid engaging end 9', with one or more wedge shaped surfaces, adapted to engage the bobbin 12 in the shuttle 13, through an opening 13' in the side of said shuttle, as shown in Fig. 3. The feeler slide 9 is one member of the feeler device, and the engaging end 9' is elongated or of considerable thickness, as shown in Fig. 1, to engage a considerable surface of the filling, transversely of the bobbin. The slide 9 is provided with a lug 9'', to hold the wire or rod 14 which extends through a lug 10' on the cap 10. A helically coiled expansion spring 15 encircles the rod 14, and bears at one end against the lug 10' on the cap 10, and at its other end against the lug 9'' of the slide 9, and acts to yieldingly move the slide 9 toward the bobbin 12 in the shuttle 13, to engage with the filling 12' on said bobbin. An adjusting screw 16, which turns in a threaded hole in an extension 10'' on the inner end of the cap 10, serves to regulate the outward movement of the slide 9. By the engagement of the engaging end of the slide 9 with the bobbin 12 in the shuttle 13, a backward sliding movement is communicated to said slide every other pick, when the lay beats up.

Within the hollow part of the slide 9 is in this instance located the second member

of the feeler device which is in the form of an angle lever 17, which is pivotally mounted on a screw 18 on the slide 9. The angle lever 17 has the enlarged end 17' on one arm, which is located in substantially the same horizontal plane as the engaging end 9' of the feeler 9, and is preferably provided with a brush portion, or stiff bristles 17'', which are adapted to engage and penetrate the filling 12' on the bobbin 12, see Fig. 4. The brush portion or stiff bristles 17'' may be dispensed with, and any suitable friction surface, as vulcanized fiber may be substituted. The second arm 17'' of the angle lever 17 is pivotally connected to one end of a connector rod or wire 18', see Figs. 3 and 4, and the other end of said rod 18' is pivotally connected to the end of an upright lever 19, see Fig. 1, which has its hub 19' fast on a shaft 20 which is loosely mounted in bosses 2'' and 2''' on the stand 2. A helically coiled torsion spring 21 encircles the shaft 20, and has one end connected with the boss 2'', and the other end connected to a collar 22 fast on the shaft 20, see Fig. 5. The torsion spring 21 rocks the shaft 20 and moves the upright lever 19, and the rod 18 attached thereto, to operate the angle lever 17, when the slide 9, upon its engagement with the bobbin 12, is moved toward the front of the loom. If there is not a sufficient amount of filling 12' on the bobbin 12 to hold the brush portion 17'' on the lever 17, the engaging end of said lever 17 will move outwardly, as shown in Fig. 3, and the upright lever 19 will remain stationary in the position shown in Figs. 1 and 3. The other end of the shaft 20 has secured thereon the hub 23' of an upright lever 23. The upper end of the upright lever 23 is pivotally connected with the end of a horizontally extending rod 24, see Fig. 3, which is loosely guided in the enlarged portion 2<sup>a</sup> on the stand 2. The rod 24 extends into the lower part of the slotted recess 2<sup>b</sup> in the stand 2, see Fig. 1, and is adapted to form a rest or support for the end of a horizontally extending lever 25, which extends into the slotted portion 2<sup>b</sup>, and rests upon the end of the rod 24, see Fig. 5. The lever 25 has a vertical reciprocating movement communicated thereto from some driven part of the loom, not shown, through a connector 26 provided with a rod-head 26', which is loosely guided in the boss 2<sup>a</sup> on the stand 2. The rod-head 26' carries a stud 27 on which the lever 25 is pivotally mounted, see Fig. 3. The other end of the lever 25 is pivotally connected to the lower end of an upwardly extending connector 28, and the upper end of said connector 28 is pivotally connected to the end of a rocking lever 29, which operates the lever 30, to raise the upright bar 31 to rock the cradle 32, see Fig. 6, all as fully described in said Letters Patent, No.

933,492, above referred to, to release a bobbin from the magazine preparatory to being transferred into the active shuttle, in the usual way.

5 If a bobbin 12 in the shuttle 13 is provided with a sufficient amount of filling, the brush portion 17', on the engaging end of the lever 17, carried on the slide 9, will penetrate the filling, as shown in Fig. 4, and the  
10 angle lever 17 will remain in the same position relative to the slide 9, and through the backward sliding movement of the slide 9, through its engagement with the filling on the bobbin, as the lay beats up, the wire 18'  
15 will move the upright lever 19, and rock the shaft 20, and through the upright lever 23 will move the horizontally extending rod or wire 24, and withdraw the same from the slotted part 2', and out of the path of  
20 the end of the lever 25, and allow said lever to move downwardly with the connector 26 and not to move the upright connector 28 and the rocking lever 29, to rock the cradle 32, all as will be readily understood by those  
25 skilled in the art.

I will now describe my improvements in mechanism for locking the cradle 32 in its position. A spring actuated plunger 33, see Fig. 6, is suitably guided in a stand 34 on the magazine. The inner engaging end 33'  
30 of the plunger 33 enters a notch 31' in the upright bar 31, to lock said bar in its upper and lower position, as required, to operate the cradle 32. As shown and described in U. S. Letters Patent, No. 933,492, above referred to, the upright bar or bars 31 have the weighted hooks 36 thereon, and the downward motion of a bar 31, through the engagement of a hook 36 with a lever 37 fast  
40 on a rock shaft 38, moves said lever and rocks said shaft 38. The outer end of the shaft 38 has secured thereto the hub 39' of an arm 39, see Fig. 5. A stud 40 on the arm 39 enters a hole in a block 41, which is adapted to loosely slide in an elongated opening 42' in a lever 42, which has its hub 42'' loosely mounted on a stud 43. A helically coiled expansion spring 44 bears at one end against the block 41, and at its other end against the hub 42'' on the lever 42, and acts to hold and lock the levers 37 and 39 in their upper and lower position. Extending  
50 out from the hub 42'' of the lever 42 is a second arm 45, the outer end of which is pivotally connected with the rod-head 46 on the upper end of a connector 47. The lower end of the connector 47 is connected to one arm 48' of a lever 48, which has its hub loosely mounted on the hub of the transferrer arm 49, see Figs. 1 and 2. The other arm 48'' of the lever 48 has a pin 50 thereon, which extends into the slot 51' in one end of a downwardly extending connector 51. The other end of said connector 51 is pivotally connected to an extension 52' on the bunter 52,  
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and said bunter 52 is adapted to be raised, from the position shown in full lines to the position shown in broken lines in Fig. 2, through the connections above referred to, so that said bunter 52 will be in position to be  
70 engaged by the dagger 53, carried on the lay, see Fig. 1, to operate the transferrer arm 49 and the transferrer 49' thereon, to transfer a bobbin. A stud 54 secured to the stand 7', see Fig. 2, limits the upward movement  
75 of the bunter 52.

It will be understood that the details of construction of my improvements may be varied if desired. Instead of having a brush portion or bristles 17' on the filling engaging end of the angle lever 17, forming the second member of the feeler device, I may provide said end with any other suitable friction surface, as vulcanized fiber.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a filling detecting mechanism for looms, a member having a wedge shaped elongated or thickened end to engage the bobbin transversely of its length, a second member to engage the filling, pivoted on said first mentioned member, and having its engaging end in substantially the same horizontal plane as the engaging end of said first mentioned member, said second mentioned member adapted to swing on its pivot attachment in the direction of the length of the bobbin when the filling on the bobbin has been substantially exhausted.  
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2. In a filling detecting mechanism for looms, a member to engage the filling on the bobbin in the active shuttle, a second member, having a friction surface to engage the filling on said bobbin, and pivoted on said first mentioned member, said second mentioned member having its engaging end in substantially the same horizontal plane as the engaging end of said first mentioned member, and adapted to swing in the direction of the length of the bobbin when the filling on said bobbin has been substantially exhausted.  
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3. In a filling detecting mechanism for looms, a member to engage the filling on the bobbin in the active shuttle, a second member having a yielding friction surface to engage the filling on said bobbin, and pivoted on said first mentioned member, said second mentioned member adapted to swing in the direction of the length of the bobbin when the filling on said bobbin has been substantially exhausted.  
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4. In a filling detecting mechanism for looms, a member to engage the filling on the bobbin in the active shuttle, a second member having a brush or bristles on its engaging end to engage the filling on said bobbin, and pivoted on said first mentioned member, said second mentioned member adapted to  
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swing in the direction of the length of the bobbin when the filling on said bobbin has been substantially exhausted.

5. In a filling detecting mechanism for looms, a member to engage the filling on the bobbin in the active shuttle, a second member to cooperate with said first mentioned member, said second mentioned member having a yielding friction surface to engage the filling.

6. In a filling detecting mechanism for looms, a member to engage the filling on the bobbin, having a wedge shaped end to enter between the coils of filling on the bobbin, and to contact with the bobbin when the filling is substantially exhausted, and a second member to cooperate with said first mentioned member, said second mentioned member having a yielding friction surface to engage the filling.

7. In a filling detecting mechanism for looms, a hollow reciprocating member having a filling engaging end, and means to yieldingly hold said end in position to engage the filling on the bobbin in the active shuttle, a second member having a filling engaging end to engage the filling, and pivotally mounted within said first mentioned member, and having a yielding connection with the weft replenishing mechanism whereby said second mentioned member is moved about its pivotal point through the movement of said first mentioned member.

8. In a filling detecting mechanism for looms, a reciprocating member having an elongated or thickened wedge shaped end, and means to yieldingly hold said end in position to engage the filling on the bobbin in the active shuttle, a second member, pivotally mounted on said first mentioned member, and having a yielding connection with the weft replenishing mechanism, whereby said second mentioned member is moved about its pivotal point through the movement of said first mentioned member, when the filling is practically exhausted.

9. In a filling detecting mechanism for looms, a member to detect substantial exhaustion of filling, a device to support a plurality of bobbins in the magazine, a sliding bar connected with said magazine device, said bar having notches to engage a spring plunger, and said plunger, and con-

nections from said first mentioned device to said sliding bar.

10. In a filling detecting mechanism for looms, a member having an elongated wedge shaped end to engage the bobbin transversely of its length, a second member to engage the filling, said second mentioned member adapted to swing in the direction of the length of the bobbin when the filling on the bobbin has been substantially exhausted.

11. In a filling detecting mechanism for looms, a member to engage the filling on the bobbin in the active shuttle, a second member having a brush or bristles on its engaging end, to engage the filling on said bobbin, said second mentioned member adapted to swing in the direction of the length of the bobbin when the filling on said bobbin has been substantially exhausted.

12. In a filling detecting mechanism for looms, a member to engage the filling on the bobbin in the active shuttle, a second member to cooperate with said first mentioned member, said second mentioned member having bristles thereon to engage the filling.

13. A filling detecting mechanism for looms, a feeler device, including two members with engaging portions, said members adapted to cooperate with the filling in the bobbin, and one of said members to impinge against the filling, and the other, having a wedge shaped end, to enter between the coils of filling transversely of the length of the bobbin, and one of said engaging portions adapted to be moved away from and toward the other engaging portion, in the direction of the length of the bobbin or filling carrier.

14. In a filling detecting mechanism for looms, a feeler device, including two members with portions to engage the filling on a bobbin, one of said members fulcrumed on the other, and both of said members adapted to be moved in unison by the filling in a shuttle, until said filling is practically exhausted, when the fulcrumed member is moved on its fulcrum in the direction of the length of the bobbin.

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Witnesses:

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