Feb. 26, 1957 A. A. LAFERTE 2,782,808

FILLING FEELER FOR LOOMS

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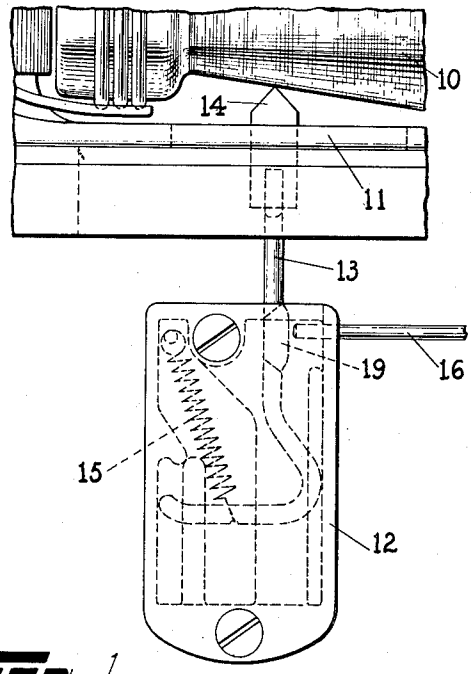


Fig. 1

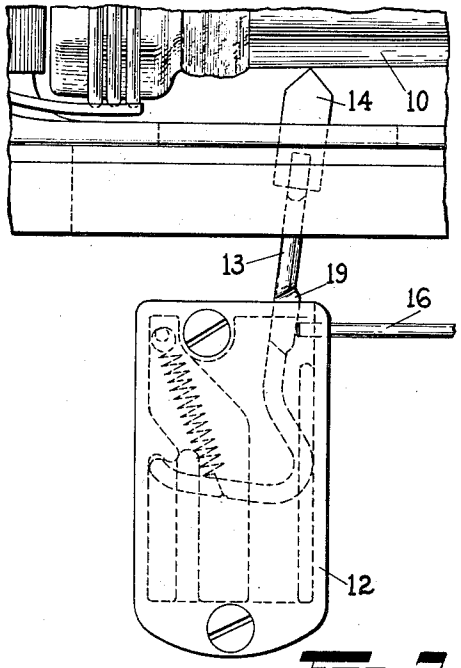


Fig. 2

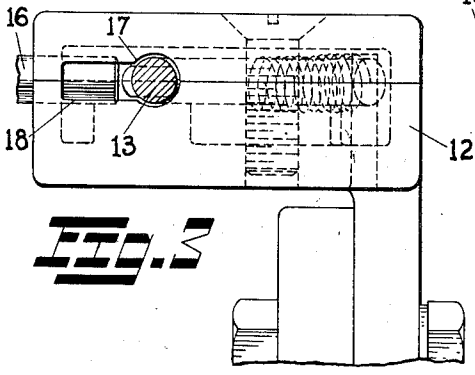


Fig. 3

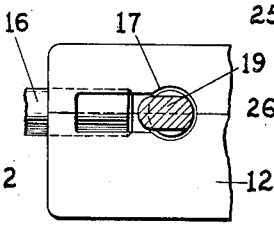


Fig. 4

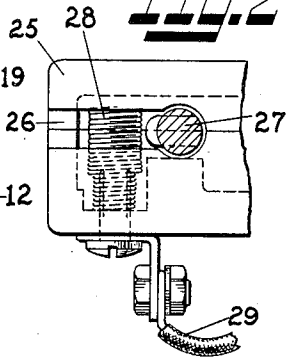


Fig. 7

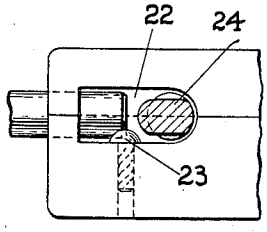


Fig. 6

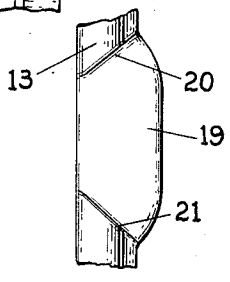


Fig. 5

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FILLING FEELER FOR LOOMS

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7 Claims. (Cl. 139—270)

This invention pertains to improvements in filling feelers for looms, and more particularly, to improvements therein directed toward preventing false indication and premature transfer of bobbins to the loom shuttle.

It is a general object of the invention to devise a filling feeler which shall perform its intended function with certainty, but which may not indicate falsely so as to cause a premature bobbin transfer in the loom.

A more specific object is that of devising a filling feeler of the side slipping type which is prevented from side slipping during the time the bobbin is being depleted of filling up to almost the point of substantial exhaustion of filling therefrom, and which, however, may at that time slip sidewise in the usual way to initiate the replenishing function.

In looms of the automatic type a filling feeler such as the well known Midget feeler is positioned in the path of the lay as it beats forwardly and a feeler member having a tip enters the shuttle to contact the filling on a bobbin therein. The bobbin still contains filling to continue weaving, the feeler stem or shank merely moves rectilinearly forward a short distance and then recovers as the lay recedes. When the filing has become depleted to the point where only two or three, for example, picks may be left on the bobbin, the feeler tip engages the bobbin surface which offers less resistance to side slipping than the filling itself. The side slipping movement, as is well known to those skilled in this art sets in motion other devices which cause a transfer of a full bobbin to the shuttle. Some filling materials are of such nature that the coefficient of friction (resistance to side slipping) offered by the filling is not far different from that of the bobbin surface itself and thus with loom vibration and other influences encountered in practice, false indications and premature transfers may become somewhat bothersome.

To correct this the invention is directed toward preventing the sidewise motion of the feeler except at that part of the cycle wherein replenishment becomes desirable. The opening through which the feeler shank passes in the casing is formed to permit the feeler to move rectilinearly only up to a point of near exhaustion of filling, then at that point the relative dimensions of the shank and slot in which it moves become such that movement sidewise is permitted.

The invention will be described in greater detail by reference to the accompanying figures of drawing wherein:

Fig. 1 is a plan view of a feeler and part of a shuttle and bobbin with which it functions.

Fig. 2 is a view similar to Fig. 1, but showing the feeler in displaced position.

Fig. 3 is a view of the inner end of the feeler casing showing the feeler shank in section.

Fig. 4 is a view of part of the mechanism of Fig. 3 wherein the shank is shown in the position it occupies when filling on a bobbin is nearly depleted.

Fig. 5 shows a detail of a critical part of the feeler shank.

Fig. 6 is a detail view showing a modification.

Fig. 7 shows the device as applied to an electrical type feeler.

Now referring to Figs. 1 and 2, a Midget type feeler is shown in cooperation with a filling bobbin **10** held in the usual shuttle part of which is shown at **11** as they would be positioned in the left hand box of a loom. The feeler comprises a casing **12**, feeler member with shank **13** and tip **14**. A spring **15** normally urges the feeler member rearwardly of the loom and permits it to move forwardly as the lay moves to beat up position at which time the tip **14** enters the shuttle to engage the filling in a known manner. When the bobbin has filling on it the movement of the feeler shank is substantially in a straight line and it has no effect upon the lifting lever connecting rod **16** by which motion is imparted to the replenishing means as the feeler side slips on a bare bobbin as in Fig. 2. What has just been said applies to intended operation of the parts, but settings must be rather delicate and thus with slippery filling and other influences, it is possible for a feeler to slip sidewise when the filling is not exhausted to the point at which bobbin transfer should occur.

To prevent such unintended and premature replenishment, the opening between the top and bottom parts of the casing is so formed in cooperation with the shank **13** of the feeler that side slipping is inhibited except at and just prior to the point of substantial exhaustion of filling. Specifically, the opening is formed as a slot, but with one end **17** circular in form and larger than the diameter of the wire from which the shank is made. The remainder **18** of the slot is of a width less than the said diameter so that the shank **13** may not move sidewise except as hereinafter explained. Since the position of the shuttle and bobbin and lay movement may vary slightly, the part **17** of the opening in which the shank moves is large enough to allow for very free passage of that shank.

The shank **13** is flattened or otherwise reduced in its thickness laterally of slot **18** to a dimension slightly less than the slot width, but only at a part **19** thereof which will cooperate with the slot or opening when the tip **14** is just about to engage the bare surface of the bobbin. Up to substantially that point in the cycle, the full or normal diameter of the shank will be involved within at least a part of the circular end **17** of the case opening. That prevents the side slipping of the feeler Fig. 3. However, as shown in Figs. 2 and 4, the feeler enters the shuttle deeper and deeper as filling is used until the reduced section becomes coextensive with the opening. Then the tip **14** when it engages enough of the bobbin surface with low coefficient of friction, will slip sidewise to perform its intended function.

As shown in Fig. 5 the shank is deformed at the part **19** in a very special way. The reduced or flattened section is preferably caused to extend to one side entirely and to diverge toward that side as viewed in plan. Thus the transition from the circular portion to the flat part **19** is angularly disposed as at **20** and **21** thereby to act as a cam surface. As above indicated, the feeler shank actually moves rather erratically in opening **17** and tends to enter the slot **18**, but, of course, cannot move far enough to indicate for transfer until the bobbin is nearly empty. At times, especially at near exhaustion of filling, the shank will tend to enter the reduced or blocked part of the opening and will be cammed back into opening **17**. Of course, when sideslipping actually takes place at transfer, the entire shank quickly moves into the slot **18** and affects the rod **16** or equivalent part.

In Fig. 6 a modification is shown in which an opening or slot **22** is of the same width along its entire length. An obstruction in the form of a head **23** of a screw or rivet or drive pin is interposed in the path of the feeler shank **24** and permits that element to side slip only when

the reduced section comes into alignment with the obstruction. The space between the head **23** and opposite side of the slot is wide enough to permit passage of the flattened section, but not the full or normal section.

Referring to Fig. 7, another modification is shown wherein the invention is applied to an electrically connected feeler. There the casing **25** is similarly constructed with an opening **26** which may take either form heretofore described. The feeler member **27** is likewise provided with a section of reduced width to side slip into the narrower part of the slot at the point desired as filling is exhausted to that extent which requires replenishment. Here the shank of the feeler contacts a spring **28** electrically insulated from the casing but connected by conduit **29** within a circuit for actuating the transfer mechanism. The remainder of the feeler is preferably grounded, or, if desired, a two wire circuit may be utilized.

To review the operation, the feeler is so set in relation to the forward movement of the lay that so long as there is any appreciable amount of filling left on the bobbin to prevent contact of feeler tip **14** therewith, the full, circular portion of shank **13** never moves entirely beyond the circular part **17** or other unobstructed part of the opening in the casing. However, as the filling on the bobbin becomes reduced to no more than a few layers at the point of contact of the tip, the feeler thus entering the shuttle to a fuller extent, the flatted or narrow section **19** will move to a position such that the feeler may side slip. As it engages the bare bobbin it will do so and start in motion those parts which effect transfer. Thus for the major portion of the cycle of weaving each bobbin of filling, the feeler is inhibited from effecting a transfer, but is in a position to perform its intended function relative thereto when that fucntion becomes needed.

While one embodiment and modifications of the invention have been disclosed, it is to be understod that the inventive concept may be carried out in a number of ways. This invention is, therefore, not to be limited to the precise details described, but is intended to embrace all variations and modifications thereof falling within the spirit of the invention and the scope of the claims.

I claim:

1. A side slipping filling feeler for looms comprising in combination a casing, a feeler member having a shank and a tip, an opening in said casing through which said shank extends and within which it may slide rectilinearly or may slip sidewise to initiate filling replenishment, spring means urging the feeler member toward a filling engaging position, said shank having cross sections of different thicknesses such that it may not side slip in the opening in the casing when a shank portion of normal cross-section is registered with that opening, but may sideslip only at such time as the filling on a bobbin contacted by the feeler tip is substantialy exhausted at which time a shank portion of reduced thickness is in cooperation with said opening.

2. A side slipping filling feeler for looms comprising in combination a casing, a feeler member having a shank and a tip, an opening in said casing through which said shank extends, said opening being of diameter slightly greater than the diameter of the feeler shank at one end and being elongated to permit the side slipping function toward its opposite end, but of a width less than the normal diameter of the feeler shank, said feeler shank having a reduced thickness at that part thereof which functions in said opening at the time filling has become substantially exhausted on a bobbin engaged by the feeler so as to permit side slipping thereof at that time only.

3. A side slipping filling feeler for looms comprising in combination a casing, a feeler member having a shank and a tip, an opening in said casing through which said shank extends, said opening being of circular contour and of diameter greater than the normal diameter of the feeler shank at one end and defined as a slot extending from said part of circular contour toward the opposite end, said slot being of a width less than the said normal diameter of the feeler shank, said feeler shank having a portion with its section of reduced thickness such that its dimension laterally of said slot permits it to move along the slot, said section of reduced thickness being confined to a portion of the shank which is coextensive with the opening through which the feeler shank projects at and just prior to indication of filling exhaustion for transfer.

4. A side slipping filling feeler for looms comprising in combination a casing, a feeler member having a shank and a tip, an opening in said casing through which said shank extends, said opening being slightly wider than the diameter of the feeler shank and being elongated to permit the side slipping function, means defining an obstruction within the casing and adjacent the end of the opening in which the feeler shank normally moves rectilinearly so that that portion of the shank of full diameter may not move past it toward the other end of the opening, and said feeler shank having a reduced thickness at that part thereof which functions in said opening at the time filling has become substantially exhausted on a bobbin engaged by the feeler so as to permit side slipping thereof at that time only.

5. Mechanism as defined in claim 4 wherein said obstruction comprises parts of the opening itself.

6. Mechanism as defined in claim 4 wherein said obstruction comprises a headed member set in one side of the opening.

7. Mechanism as defined in claim 4 wherein that part of the feeler shank of reduced thickness is characterized by a displacement of metal substantially to one side only of the shank and the surfaces defining the transition from the flattened to the circular section diverge laterally toward the side at which the said displacement of the material is effected.

References Cited in the file of this patent

UNITED STATES PATENTS

1,463,131	Snow	July 24, 1923
2,705,026	Lee et al.	Mar. 29, 1955

FOREIGN PATENTS

585,815	Great Britain	Feb. 25, 1947