June 26, 1928. 1,675,132

W. T. PRESCOTT

BOBBIN GRIPPING DEVICE FOR SHUTTLES

Filed Oct. 14, 1926

Fig. 1

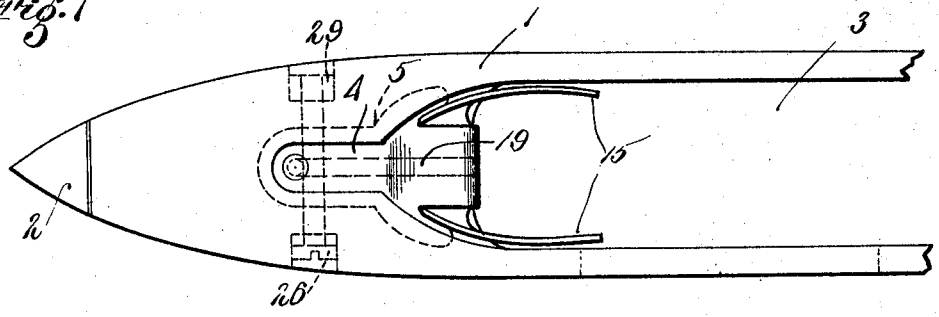


Fig. 2

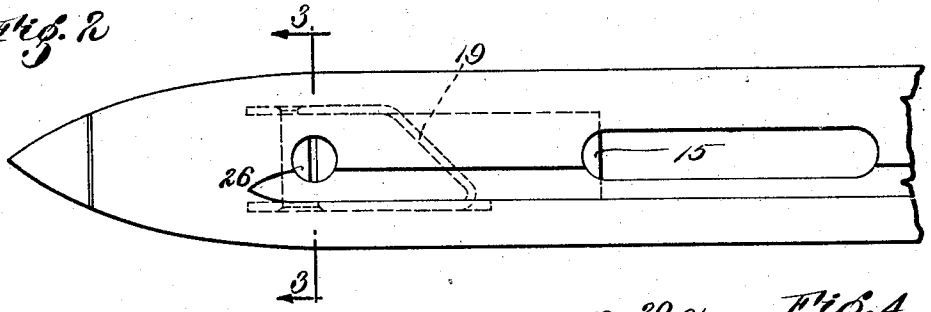


Fig. 3

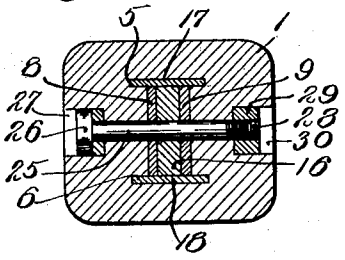


Fig. 4

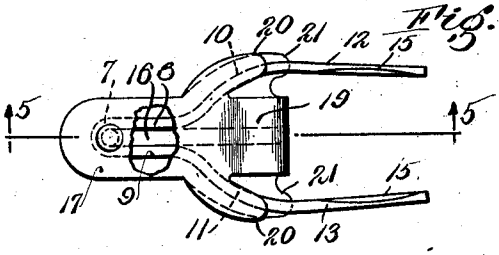


Fig. 5

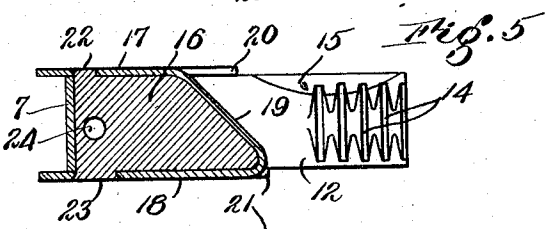


Fig. 6

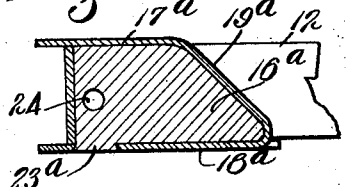


Fig. 7

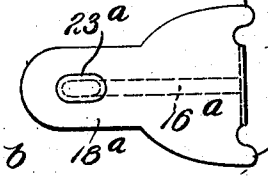


Fig. 8

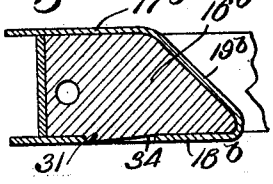
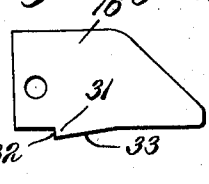


Fig. 9



Inventor
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by Roberts Cushman & Woodberry
his Attys.

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UNITED STATES PATENT OFFICE.

WILLIAM T. PRESCOTT, OF LAWRENCE, MASSACHUSETTS, ASSIGNOR TO U. S. BOBBIN & SHUTTLE COMPANY, OF PROVIDENCE, RHODE ISLAND, A CORPORATION OF RHODE ISLAND.

BOBBIN-GRIPPING DEVICE FOR SHUTTLES.

Application filed October 14, 1926. Serial No. 141,529.

This invention pertains to weaving shuttles of the type commonly employed in automatic bobbin replenishing looms, such shuttles being provided at one end with bobbin gripping means adapted to receive and to hold the butt end of a bobbin and from which the exhausted bobbin is expelled by the incoming full bobbin, the present invention relating specifically to improvements in bobbin gripping devices for such shuttles.

Usually the bobbin gripping device comprises a fork having opposed resilient jaws, the jaws being spaced apart to receive the bobbin butt between them and being disposed respectively adjacent to the opposite side walls of the shuttle body, and a bobbin guiding cam which is disposed between the planes of the jaws and which has an inclined surface adapted to engage and to guide the butt of the incoming bobbin into position between the jaws.

The fork is usually made of a strip of spring steel doubled to provide a relatively narrow shank portion for attachment to the shuttle body and having its ends spaced apart to provide the opposed jaws above referred to. The bobbin guiding cam commonly consists of a strip of sheet steel bent to provide substantially parallel top and bottom plates spaced to receive between them the shank of the fork and integrally connected by an inclined portion forming the cam surface. The bottom plate of the cam is usually furnished with integral lateral wing members which seat in grooves in the wood of the shuttle and sometimes an independent member providing such lateral wings is associated with the top plate of the cam, such wing members providing a broad bearing surface to resist the impact or blow of the bobbin as the latter is driven into operative position between the jaws.

In order to stiffen and thicken the shank of the fork it is common to introduce a filler piece between the side walls of the shank and this filler piece is sometimes extended so as to underlie the inclined or cam portion of the bobbin guide, thus reinforcing and stiffening the latter.

Although the fork with its jaws is made of tempered steel the rough treatment to which it is subjected results in frequent breakage so that it is essential to secure the fork to the shuttle body by means permitting its ready removal and replacement. Moreover, as the guiding cam embraces the shank of the fork it is likewise necessary removably to attach the cam to the shuttle body. It has been usual to secure the fork in position by means of a bolt extending transversely through the shuttle body and the shank of the fork, and to attach the cam by means of a wood screw or bolt extending vertically down from the top of the shuttle.

While the jaws of the fork are subjected to very heavy blows, the force of such blows is largely borne by the bottom wall of the shuttle so that the transverse retaining bolt experiences comparatively little stress or vibration and does not tend quickly to loosen or unscrew, and even though it should loosen no serious consequence would necessarily follow. On the other hand, the screw or bolt which holds the bobbin cam in place is subjected to severe longitudinal stress and vibration which tends to loosen its grip on the shuttle body or permit it to turn in its nut, so that in either case it may eventually project upwardly beyond the shuttle body.

Such loosening of the retaining means for the cam may result seriously, first, since it permits the cam to tip when engaged by the entering bobbin so that the latter may fail utterly to enter the jaws, possibly jamming and breaking adjacent parts, while secondly, if the fastening means project to any substantial degree above the shuttle body, it may cut the warps of the overlying shed or may cause the shuttle to be thrown out of the loom with great danger of injury to the operator.

In accordance with the present invention I provide a bobbin gripping device in which all possibility of accidental displacement of the bobbin guiding cam is substantially eliminated, although the cam is readily removable when desired, and in which the retaining means for the cam is of such character that it can never project above the shuttle body, while at the same time I obtain all of the advantages of prior devices together with a simplification of structure and reduction in the necessary number of parts.

In the accompanying drawings I have illustrated a preferred embodiment of the invention by way of example, together with certain modifications thereof and in the drawings.

Fig. 1 is a fragmentary plan view illustrating the rear or heel end of a weaving shuttle equipped with bobbin gripping means constructed in accordance with the present invention;

Fig. 2 is a side elevation of the structure illustrated in Fig. 1;

Fig. 3 is a vertical section substantially on the line 3—3 of Fig. 2;

Fig. 4 is a plan view, partly broken away, of the improved gripping device removed from the shuttle body;

Fig. 5 is a vertical section substantially on the line 5—5 of Fig. 4;

Fig. 6 is a fragmentary view, similar to Fig. 5, but illustrating a modification;

Fig. 7 is a bottom plan view of the device shown in the Fig. 6;

Fig. 8 is a view generally similar to Fig. 5 but illustrating a further modification; and

Fig. 9 is a side elevation of a filler or reinforced piece employed in the modification shown in Fig. 8.

Referring more specifically to the drawings and particularly to Figs. 1 to 5 inclusive, the numeral 1 designates the body of a shuttle of substantially usual construction, such body ordinarily being made of hard wood and being furnished at its ends with metal tips such as indicated at 2. The shuttle body is provided with the usual elongate cavity 3 for the reception of the bobbin, and at one end this cavity is furnished with a recess 4 for the reception of parts of the bobbin gripping device as hereinafter more fully described. Preferably the walls of the recess 4 are provided at top and bottom with undercut grooves 5 and 6 (Figs. 1 and 3) extending laterally into the body of the shuttle.

The bobbin gripping device constructed in accordance with the present invention comprises a fork conveniently formed by doubling a piece of sheet steel at the point 7 (Fig. 4) to provide a shank portion comprising the spaced side walls 8 and 9 substantially parallel to each other and whose free ends are bent outwardly as indicated at 10 and 11 respectively and terminate in the slightly convergent bobbin gripping jaws 12 and 13. The inner opposed surfaces of these jaws are grooved or corrugated in the usual manner as indicated at 14 for cooperation with the rings upon the bobbin butt, and preferably the upper edges of the jaws are beveled as indicated at 15 to facilitate entry of the bobbin butt between the jaws.

A filler piece or web member 16 is interposed between the spaced parallel side walls 8 and 9 of the shank of the fork. This filler piece 16 is conveniently made of sheet metal and its upper and lower edges are substantially flush with the upper and lower edges of the parts 8 and 9.

The improved gripping device also comprises a bobbin guiding cam conveniently formed by stamping from sheet material and bending in any suitable manner. This cam comprises the upper member or plate 17, (Fig. 5) the lower member or plate 18 and the inclined plate or cam proper 19, the latter integrally uniting the top and bottom plates 17 and 18 at their forward ends. Preferably the top plate 17 is provided with lateral wings 20 (Fig. 4) integral therewith, and the bottom plate 18 is likewise provided with integral lateral wings 21, the wings 20 engaging the undercut groove 5 in the shuttle body and the wings 21 engaging the corresponding undercut grooves 6 in the shuttle body, thus accurately locating the cam in the desired position.

In accordance with the preferred embodiemnt of the invention, the web-like filler piece 16 is permanently secured to the top plate 17 by an integral projection 22 extending upwardly through an opening in the plate 17 and headed over to form a connecting rivet. Likewise the lower plate 18 is permanently united to the filler piece 16 by an integral projection 23 of the latter which is headed over to form an attaching rivet.

I also prefer, although this is not necessary, to shape the filler piece 16 so that while its upper and lower edges engage the inner surfaces of the plates 17 and 18, its forward edge is shaped so as to engage the inner surface of the cam element 19, thus providing a rigid support and reinforce for the entire cam device.

The cam and filler piece 16 being permanently united, constitute in effect a single element which may be handled as a unit. The filler piece 16 is provided with an opening 24 near its rear end, and when the gripping device is properly seated in the recess 4 in the shuttle body, this opening 24 aligns with openings in the side walls 8 and 9 of the shank of the fork and with an opening extending transversely through the shuttle body. A bolt 25 is passed through the aligned openings in the several parts, such bolt having a head 26 preferably seated in a recess 27 in one side of the shuttle body, while the other end 28 of the bolt is screw-threaded for engagement with a nut 29 seated in a recess 30 in the other side of the shuttle body.

This single transverse bolt thus constitutes the sole means for securing both fork and cam in position; the cam being, as above described, permanently united to the filler piece 16 so that they are in effect a unitary structure. It is thus unnecessary to provide a vertical screw or bolt, such as is commonly employed, for attaching the cam to the shuttle body and thus not only is the entire gripping device held in position by a single element instead of by a plurality of ele-

ments so as to facilitate its removal and replacement, but all danger from a displaced bolt or screw projecting above the shuttle body is eliminated.

The gripper device thus provided comprises but two separate elements, excepting the bolt and nut, and when one of the jaws is broken during use it is simply necessary to remove the one bolt and withdraw the fork and cam from the shuttle body, replace the fork by a new one, and restore the parts to position, there being no loose or independent pieces which are readily lost or displaced.

In Figs. 6 and 7 a slightly modified arrangement is shown in which the cam comprises the upper and lower plates 17^a and 18^a connected by the inclined member 19^a. The filler piece 16^a is connected to the bottom plate 18^a only by means of the rivet member 23^a. Preferably this rivet member is of elongate form as shown in Figs. 6 and 7 so as to provide an adequate connection between the filler piece and the plate. In this construction the filler piece is not directly connected to the plate 17^a, and thus the operation of heading over the upper rivet is dispensed with. While this arrangement may be found useful in some circumstances, I prefer to employ the arrangement shown in Figs. 1 to 5 since the permanent anchorage of the upper plate 17^a through the filler piece to the lower plate prevents the upper plate from springing up out of position under the blows to which the inclined portion of the cam is subjected.

In the Figs. 8 and 9 a further modification is illustrated in which the upper plate 17^b is connected by the inclined portion 19^b on the lower plate 18^b. The filler piece 16^b is provided with a projection 31 at its lower edge, such projection having an abrupt shoulder 32 and a cam face 33. With this arrangement the filler piece 16^b may be slipped between the plates 17^b and 18^b by springing them apart until the projection 31 snaps into the slot 34 provided for it in the plate 18^b. Normally the engagement of the projection 31 with the opening prevents separation of the filler piece and cam, although these parts may be separated if desired by springing the cam members apart.

This latter construction has certain advantages since it permits replacement of a broken cam without replacement of the filler plate, but as it does not furnish as rigid a connection between the parts, I prefer that arrangement shown in Figs. 1 to 5.

I claim:

1. A bobbin gripping device for shuttles, comprising spring jaws having shank portions, combined filler and cam means composed of only two parts, one part comprising a filler piece extending between said shank portions of the jaws and having an inclined forward edge, and the other part comprising a bobbin positioning cam having a top portion engaging edges of said shank portions of the jaws and an inclined portion engaging said inclined forward edge of the filler piece, said inclined portion extending continuously across the central plane of said device to present a surface which is continuous transversely therof, said two parts of the combined filler and cam means being integrally united by a part of the material thereof, thereby avoiding the use of bolts to hold said parts together and affording a unitary structure which is substantially free from projections on top and which presents a continuous unbroken cam surface.

2. A bobbin gripping device for weaving shuttles, said device comprising a one-piece resilient fork having a narrow shank and spaced substantially parallel gripping jaws, a bobbin guiding cam having substantially parallel upper and lower plates spaced vertically to receive the shank of the fork between them and an inclined plate integrally united to the upper and lower plates respectively, shuttle engaging wings projecting laterally from the upper and lower plates, a filler piece fitting snugly within the shank of the fork and between the upper and lower plates of the cam, said filler piece having an inclined surface engaging the inner surface of the inclined plate to support and stiffen the latter, and lugs projecting from the filler piece into openings in the upper and lower plates respectively, the lugs being riveted over, whereby permanently to unite the cam and filler piece, the shank of the fork and the filler piece having aligned openings for the reception of a transverse bolt for securing the gripping device within a shuttle body.

Signed by me at Boston, Massachusetts this 13th day of October, 1926.

WILLIAM T. PRESCOTT.