April 8, 1924. 1,489,584

E. L. TINKHAM

SHUTTLE TIP

Filed July 2, 1923

Fig. 1.

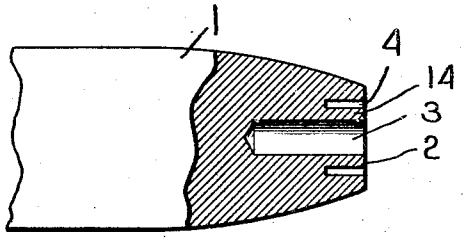


Fig. 2.

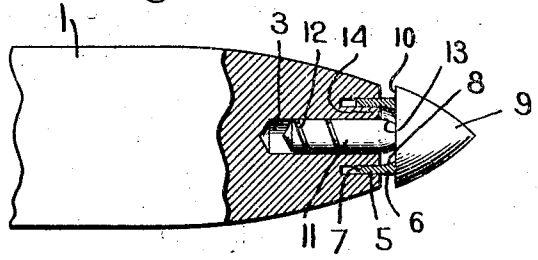
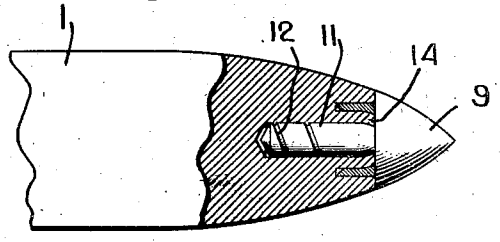


Fig. 3.



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UNITED STATES PATENT OFFICE.

EUGENE L. TINKHAM, OF HOPEDALE, MASSACHUSETTS, ASSIGNOR TO DRAPER CORPORATION, OF HOPEDALE, MASSACHUSETTS, A CORPORATION OF MAINE.

SHUTTLE TIP.

Application filed July 2, 1923. Serial No. 648,899.

To all whom it may concern:

Be it known that I, EUGENE L. TINKHAM, a citizen of the United States, and resident of Hopedale, county of Worcester, State of Massachusetts, have invented an Improvement in Shuttle Tips, of which the following description, in connection with the accompanying drawing, is a specification, like characters on the drawing representing like parts.

This invention relates to shuttles such as are used in looms for weaving and particularly to the metal tip construction with which such shuttles are usually provided and means for locking such tip device in place in the wooden shuttle body. The shuttle tip is provided primarily to receive the blow of the picker and thus prevent damage to the wood of which the shuttle body is made.

The object of the invention is to provide a form of construction which will insure the interlocking of the wooden shuttle body and the metal tip so as to prevent loosening or separation of the tip from the shuttle body notwithstanding the severe usage to which the tip end of the shuttle is necessarily subjected in use.

These and other objects and features of the invention will appear more fully from the accompanying description and drawings and will be particularly pointed out in the claims.

As this invention relates solely to the construction at the ends of the shuttle and as both ends of the shuttle have the same construction it is only necessary to describe and illustrate an application of the invention to one end of a shuttle.

In the drawings:

Fig. 1 is an elevation partially in central cross section of one end of the wooden body of an ordinary loom shuttle bored out to receive a metal tip and a metal annulus in accordance with the present invention;

Fig. 2 is a view similar to Fig. 1 showing the metal annulus and the metal tip inserted in their respective bores and brought into contact ready to be driven into final position;

Fig. 3 is a view similar to Fig. 2 showing the metal annulus and metal tip driven into place.

The shuttle body may be of any desired shape and size and is usually made of hard close-grain wood such as dogwood or persimmon. The metal tip structure in the preferred form of the invention comprises two separate pieces, namely, a metal annulus and a metal tip comprising a conoidal head and a cylindrical shank extending axially from the flat base of the head.

The end of the wooden shuttle body 1 is generally slabbed off at 2 to present a flat end. In this end of the shuttle body there are formed two concentric bores. The central bore 3 is of cylindrical form and of a diameter to fit tightly the shank of the tip. The annular bore 4 is formed concentrically of the cylindrical bore 3 and receives with a tight fit the metal annulus. These bores may be formed simultaneously or successively by any suitable operation.

In describing the metal annulus and the metal tip the terms "upper" and "upwardly" will be used as indicating direction longitudinally away from the center of the shuttle, the term "lower" as indicating direction longitudinally toward the center of the shuttle, and the term "inwardly" as indicating direction toward the longitudinal axis of the shuttle, but it will be understood that these terms are merely used for convenience in description and are to be taken relatively. The metal annulus is of the general shape of a hollow cylinder as shown in cross section in Figs. 2 and 3. It may be considered as divided into two sections, a lower section 5 and an upper section 6. The lower section is preferably bevelled off, as shown at 7, at its lower end. The exterior surface of this annulus is cylindrical throughout. The upper section 6 at the inner surface converges upwardly and inwardly to its upper end as indicated at 8.

The metal tip comprises a head 9 of conoidal shape having a flat base 10 and a cylindrical shank 11 projecting axially from the center of the base of the head. This shank may be, and usually is, provided with means such as a helical groove 12 to afford a frictional engagement with the wood of the shuttle body. The upper section of the shank 11 converges upwardly and inwardly at 13 in conformity with the upper section of the metal annulus. The construction is such that when the head 9 of the tip engages the upper end of the annulus the inner surface 8 of the upper section of the annulus

and the upper section 13 of the shank conform in shape, both converging upwardly and inwardly

In assembling the shuttle after the cylinder bore and the annular bore have been formed as illustrated in Fig. 1 the lower section of the metal annulus is inserted into the annular bore 4 leaving the upper section projecting beyond the end of the shuttle body as shown in Fig. 2. The tip shank is then inserted into the cylindrical bore 3 until the base 10 of the conoidal head 9 engages the upper end of the annulus. The parts are then in the position shown in Fig. 2. In the next step of the method the tip is forced into final position in the shuttle body thus carrying with it the metal annulus. Since the tip shank and the metal annulus are thus simultaneously forced into place, the annulus 14 of the wood of the shuttle body which extends between the metal annulus and the tip shank at the upper end of the shuttle body is brought between the converging upper sections of the annulus and tip shank and crowded over the upper section of the shank thus firmly locking the tip in place as shown in Fig. 3.

The degree of convergence of the inner surface of the upper section of the metal annulus and of the upper section of the tip shank must be such as not materially to weaken the metal tip and must be such as not to destroy or break down the fibre of the wood of the shuttle body in the annulus 14. This convergence is probably somewhat exaggerated for purposes of illustration in the drawings

The construction thus provided insures a firm locking engagement between the wood of the shuttle body and the shank of the tip and the maintenance of this locking relation by the position of the metal annulus when the parts are in place. Since the metal tip and the metal annulus are forced in simultaneously, the exact relation of the wood of the shuttle body and the metal parts at the locking point is insured.

There is thus produced a very simple and efficient construction in this vital feature of a loom shuttle.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent, is:

1. A shuttle comprising a wooden body; a metal tip having a conoidal head with its base seated against the end of the shuttle body, having a cylindrical shank embedded in the body and having the upper section of the shank adjoining the base of the conoidal head converging upwardly and inwardly; and a metal annulus embedded in the body concentrically of the tip shank and having the inner surface of its upper section opposite the upper section of the tip shank converging upwardly and inwardly with the wood of the shuttle body between the converging upper sections of the annulus and tip shank crowded inwardly over the upper section of the shank and locking the tip in place.

2. A metal tip and a metal annulus for a shuttle; the metal tip having a conoidal head and a cylindrical shank, the upper section of the shank adjoining the base of the conoidal head converging upwardly and inwardly; the metal annulus having its internal diameter substantially greater than the external diameter of the tip shank and having the inner surface of its upper section converging upwardly and inwardly in conformity with the upper section of the tip shank.

In testimony whereof, I have signed my name to this specification.

EUGENE L. TINKHAM.