

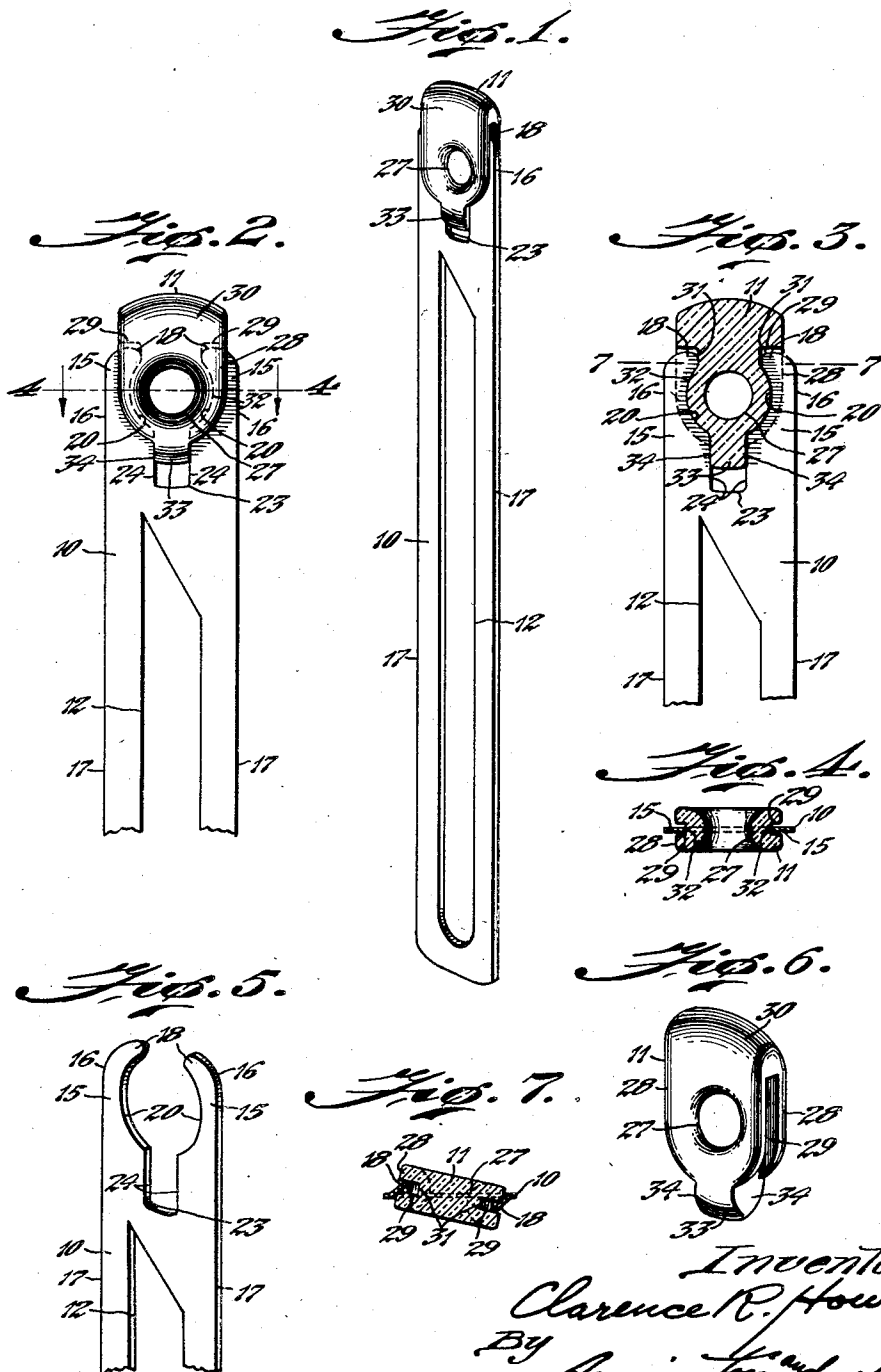
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GUIDE EYELET FOR TEXTILE APPARATUS

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GUIDE EYELET FOR TEXTILE APPARATUS

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9 Claims. (Cl. 139—368)

This invention relates to thread-eyes or similar guiding devices for yarn and other strand materials and particularly to improvements in the form and construction of the eyelet or guide and the means for mounting it upon another element such as a heddle or drop-wire.

One object of the invention is to provide an apertured guide or eyelet which is free from sharp corners or projections liable to abrade or injure a yarn drawing therethrough or passing in adjacent relation thereto.

Another object of the invention is to provide an apertured guide or eyelet having means for attaching it to a heddle, drop-wire or other mechanical element without cementing it thereto and to avoid the use of pins, screws, lugs or other extraneous parts for securing the eyelet in place.

Another object of the invention is to provide a guide or eyelet of the type specified so constructed as to be adapted for interengagement with an opening in a heddle, drop-wire or other element to permit it to be readily mounted thereon and easily detached therefrom.

Another object of the invention is to provide a heddle or drop-wire having a detachable apertured guide or eyelet of the type specified constructed of vitreous material to render it resistant to wear under the action of the thread or yarn drawing therethrough.

Another object of the invention is to provide a device of the type specified which is simple in construction, inexpensive to manufacture and proof against deterioration from wear over long periods of use.

Further objects of the invention are set forth in the following specification which describes a preferred form of construction of the device, by way of example, as illustrated by the accompanying drawing.

In the drawing:

Fig. 1 is a perspective view illustrating a preferred embodiment of the invention shown as applied to a heddle or drop-wire for use in creels, warpers, looms or like textile apparatus;

Fig. 2 is an elevational view in enlarged scale of the upper eyelet portion of the drop-wire shown in Fig. 1;

Fig. 3 is a view similar to Fig. 2 showing the eyelet in cross section;

Fig. 4 is a horizontal sectional view taken on line 4—4 of Fig. 2;

Fig. 5 is a perspective view similar to Fig. 1 showing the upper portion of the drop-wire with the eyelet removed;

Fig. 6 is a perspective view in enlarged scale of the removable eyelet illustrated in the several other figures of the drawing; and

Fig. 7 is a horizontal sectional view taken on line 7—7 of Fig. 3 illustrating a preferred method of assembling the improved eyelet on the drop-wire or heddle and disconnecting it therefrom.

The term "yarn" is herein used throughout the specification in its generally accepted sense to designate lengths of material in strand form common to the textile art whether the same be single, multi-ply, twisted or untwisted and regardless as to whether the material be cotton, silk, wool, rayon, flax or other fibers.

This invention has been stated to consist of improvements in the construction of yarn or thread-guiding devices and for the sake of a better understanding of the same one specific embodiment thereof is shown in the accompanying drawing as applied directly to the drop-wire of a warping machine, such illustrated construction being hereinafter described in detail. It is a prime purpose of the invention to provide in guide devices an apertured element or eyelet of wear-resisting material which is so constructed as to be quickly and conveniently attachable to and detachable from its mounting. While the form illustrated and described herein is especially advantageous in use on the drop-wires of warping machines it is to be understood that the invention is not limited in this respect as it may be incorporated with many other devices both in and removed from the textile art.

In addition to the feature of constructing the improved guide or eyelet and its mounting element to provide for detachment of the eyelet without disturbing the location of the element in its place of use, this invention has for a further object to provide an improved eyelet having an aperture or opening therethrough for the passage of yarn and an integral structure overlapping the contiguous or surrounding portions of the mounting. Hence, with the present novel construction the yarn may not in usual circumstances come into contact with the mounting so that the danger of cutting or abrading the strand is minimized.

Referring now to the drawing, the present illustrated embodiment of the invention comprises a drop-wire 10 formed of an elongated flat metal strip and an apertured element or eyelet 11. In its present form the drop-wire 10 is provided with a central longitudinal slot 12 which serves in use to position it relatively to a part of the stop-motion of the warping or other

machine. The slot 12 adapts the drop-wire to straddle a contact bar or electrode connected with an electrical device operating the stop-motion. The aforesaid functions of such a form of drop-wire are well known to those versed in the art and more detailed description thereof is therefore unnecessary.

In the present improved construction the upper end of the drop-wire 10, see particularly Fig. 5, is pierced or bifurcated to form a pair of opposed curved fingers 15 which have their outer sides 16 defined by continuation of the edges 17 of the drop-wire. The inner or facing edges of the finger extremities are shaped to provide a pair of opposed pointed terminal projections 18. Below the projections 18 the inner edges of the fingers 15 are arcuately shaped to provide substantially diametrically opposed segmental portions 20. These segmental edges 20, as will presently be described, serve as seats for the detachable eyelet 11. The opening between the fingers 15 is extended longitudinally downward beyond the edges 20 to provide a centrally disposed recess or slot 23 having parallel edges 24. In the present embodiment of the invention the eyelet 11 consists in a substantially flat rectangular block or body of vitreous material, such as porcelain or glass, of a greater thickness than the drop-wire 10. The body of the eyelet 11 is transversely pierced to provide a central aperture or opening 27 through which yarn or like material may be threaded or drawn. Preferably, the sides of the aperture 27 are rounded or convexed to provide a smooth surface for the yarn. The laterally disposed sides 28 of the eyelet are formed with grooves 29, the bottoms of which conform to the configuration of the inner or facing edges of the fingers 15 of the drop-wire 10 whereby the eyelet will closely fit the contour of the bifurcated portion thereof.

As shown in the drawing each side 28 of the eyelet 11 is provided with an inwardly extending groove 29 projecting from the lower end thereof to a point short of the top or head portion 30. The grooves 29 have their bottoms 32 conforming generally to the arcuate edges 20 of the fingers 15 on the drop-wire 10. Adjacent the upper end of each groove 29 the bottom 31 thereof is recessed or indented to a depth to accommodate the terminal projections 18 on the fingers 15. The lower ends of the grooves 29 terminate symmetrically at the sides of a lug or bottom projection 33 formed integral with the body of the eyelet 11 and adapted to fit between the edges 24 of the slot 23 in the drop-wire 10. The extreme upper ends of the grooves 29 flare outwardly to the sides 28 of the eyelet 11 and substantially conform to the upper edges of the fingers 15.

From the foregoing detailed description it will be apparent that both the drop-wire 10 and the eyelet 11 are provided with a plurality of complementary interengaging and interlocking surfaces by which the two elements may be detachably secured together and interlocked to resist the ordinary stresses in the uses to which the elements are applied. The bottom sections 31 and 32 of the grooves 29 in the sides of the eyelet 11 cooperate respectively with the facing edges 18 and 20 of the fingers 15 to hold the eyelet within the bifurcated or pierced opening in the drop-wire 10 and the sides 34 of the lug or projection 33 fit snugly between the edges 22 of the slot 23 whereby to firmly restrain the eyelet

against movement in any direction relative to the drop-wire.

The foregoing described details of construction of the device are provided particularly with a view to permitting the quick and easy application of the eyelet to its mounting and its convenient removal therefrom. The drop-wire 10 is constructed of thin flat metal stock and the bifurcated end thereof is adapted to be twisted or distorted sidewise to increase the distance between the terminal projections 18, in which latter condition the eyelet 11 may be slipped into or out of its mounting or seat in the drop-wire. Fig. 7 of the drawing illustrates this method of applying the eyelet to or removing it from the drop-wire 10, the eyelet and fingers 15 being shown as twisted laterally relatively to each other to spread the projections 18 apart. Upon release of the twisting pressure the inherent resiliency in the metal of the fingers 15 causes them to assume their normal closed position as shown in Figs. 3 and 4.

It has been stated that the present improved eyelet is preferably constructed of vitreous material such as porcelain. Articles made of porcelain or the like are particularly hard and adapted to receive a high surface polish which increases the density thereof to give them smoother anti-frictional wearing surfaces. In the manufacture of the present novel eyelet the entire outer surface of the porcelain body 11 is polished to a high degree and being without sharp edges or projections it forms a smooth exterior with which the yarn may contact without danger of abrasion or breakage of the strand.

The present invention contemplates further the construction of an improved eyelet formed with a smooth exterior surface blending or merging into the central aperture or guideway for the yarn and having its peripheral portions overlying and covering the surrounding sections of the drop-wire or other element on which the eyelet is used. The sides, top and lower portion of the eyelet are rounded and merged into the front and back surfaces of the main body at their points of juncture therewith and the central aperture is formed of toric shape to eliminate any resistance to the movement of the yarn therethrough. As described in detail in the foregoing, the portions of the drop-wire with which the eyelet 11 directly engages in its attachment thereto are received within the confines of the grooves 29. As a result of this construction the contiguous portions of the drop-wire are completely sheathed by the overlying portions of the eyelet provided by the sides of the grooves 29 and hence as the yarn passes through the aperture 27 it is prevented from contacting with any part of the drop-wire. Even though the yarn may whip and play in its passage through the eyelet it cannot catch or tangle on any part of the drop-wire which may be suspended thereon, or is it liable to be caught and broken by contact with neighboring drop-wires of the same type.

Another feature of the invention consists in providing efficient means for preventing the eyelet from turning or rotating in its mounting. This means is designed to function independently of the projections 18 on the drop-wire 10 to relieve the bendable parts of all stress and strain liable to deform them. As described, the bifurcation between the fingers 15 of the drop-wire 10 is formed into a lower slot 23 having side edges 24 adapted to fit the outer sides 34 of the lug or projection 33 on the eyelet. It will be obvious

that this interengagement of the projection 33 and the sides of the slot 23 acts positively to restrain the eyelet from any rotary movement in the arcuate seats 20.

5 A further and most important feature of improvement in the present invention resides in the functioning of the lug or projection 33 on the eyelet 11 to prevent the yarn from catching between the overlapping edges of the eyelet and the drop-wire or other object in which it is mounted. 10 In the case of a drop-wire used on creels or with the stop-motions of warpers, when the warping or other operation is arrested the yarns will become slack and in some cases sag to a considerable extent. In sagging the yarn may lie against the face of the drop-wire below the bottom edges 15 of the eyelet 11, for example, in a position contiguous to the edges of the eyelet which overlap the sides of the drop-wire. When the warper or other machine is again started the slack in the yarn will be taken up quite rapidly and there is the liability of the strand being caught between the edge of the eyelet and the underlying portion of the drop-wire. That is to say, the yarn 20 may be drawn into the groove in the rim of the eyelet to be caught and bound between the edge thereof and the face of the drop-wire, in which case the draft of the yarn will be impeded or prevented thus causing the strand to be broken.

30 To prevent this contingency as noted above the projection or lug 33 serves as a guard for guiding the strand across the lower edges of the eyelet 11 before it becomes taut in drawing through the aperture 27 in its normal course. It will be noted that the outer face of the projection 33 is beveled or rounded downwardly towards its under side and its lateral edges are of a smooth unbroken contour so that it will act on the strand in somewhat the manner of a wedge to cause the 40 latter to slide outwardly and upwardly until it assumes its normal course passing through the aperture 27. In this way the yarn is guided up across the bottom of the eyelet 11 to insure against its catching in the grooves in which the sides or fingers 15 of the drop-wire 10 are engaged and thereby the difficulty heretofore encountered with structures of the present type is entirely eliminated.

50 It is to be particularly noted that the present invention not only contemplates an improved form of eyelet mounted in the bifurcated end portion of a drop-wire or other guide element, but also comprehends the provision of an elongated opening in a flexible wall of any structure 55 capable of having the sides of the opening distorted laterally to increase the distance therebetween to permit the attachment of the eyelet thereto.

60 It has been stated that this invention is particularly useful in connection with the stop-motions of warping machines wherein the individual strands of yarn are fed from a creel through drop-wires which control the operation of the stopping mechanism of the machine. The drop-wires are arranged to be carried by the traveling yarns and function to actuate the stopping mechanism upon the breaking of a single strand. 65 The guide eyes in the drop-wires are subjected to the abrasive wear of the strand as it is drawn therethrough and with silk, rayon and other glazed yarns the eyelets become scored and cut after relatively brief periods of use. It is therefore necessary to frequently replace the drop-wires themselves or the eyelets embodied therein. 75

The present invention makes it possible to remove a worn eyelet and replace it with a new one most conveniently and expeditiously without the removal of the drop-wire from its supporting means in the stop-motion device or other dismantling of the apparatus. As many hundreds 80 of the drop-wires are used on each creel or with a single warping machine the interchangeability of the thread eyes constitutes a most important improvement resulting in a very considerable economy of time and money. 85

While I have herein described and illustrated the device as embodied in a preferred form of construction and applied to a specific use, it is to be understood that variations may be made in the form and arrangement of its parts and in the manner of its application without departing from the spirit or scope of the invention. Therefore, without limitation in this respect, I claim:

1. The combination with a drop-wire having a bifurcated end, of an eyelet seated in said end, and means for detachably securing said eyelet to the drop-wire. 95

2. In combination with a drop-wire having a bifurcated end, of an eyelet detachably secured therein, said eyelet shaped to overlie the surfaces of said drop-wire along the sides of its bifurcated portion. 100

3. In combination with a drop-wire having a pair of spaced laterally-resilient fingers at one end, of a grooved eyelet adapted to be inserted or removed from between said fingers upon relative lateral twisting of said eyelet and fingers. 105

4. An object having relatively thin walls formed with a bifurcation providing opposite fingers the facing edges of which are arcuately shaped and a relatively narrow slot at one side of the opening, and an eyelet having grooves in its sides the bottoms of which are shaped to the arcuate contour of the inner edges on the fingers to adapt them 110 to receive the latter to hold the eyelet in place on the object, and said eyelet formed with a projecting lug engageable with the narrow slot in the object to prevent relative turning movement of the eyelet thereon. 120

5. An article of the type specified comprising a strip of relatively thin sheet-metal formed with a substantially circular opening providing opposite fingers with their ends projecting inwardly toward each other, and also formed with a slot 125 extending radially of said opening and an eyelet formed with recesses in its sides the bottoms of which conform substantially to the contour of the facing edges of the fingers whereby said eyelet is attachable to the article by deforming the ends of the fingers to adapt them to engage within the grooves in the eyelet, said eyelet having a lug on its side engageable with the slot in the metal strip to adapt it to act as a guard to prevent a yarn from catching on the edges of the eyelet. 135

6. In combination, an object having relatively thin walls formed with an opening and a slot extended from the edge of said opening, and an eyelet having grooves in its sides shaped substantially to the inner edges of the opening to engage therewith to hold the eyelet in place on the object, said eyelet formed with a lug engageable with the slot in the object to project outwardly from the edges thereof to serve as a guard 140 to prevent a yarn or other strand from catching in the grooves in the eyelet. 145

7. In combination, a drop-wire having an opening with a slot extended from the edge thereof, and an eyelet having a body shaped to overlie 150

the edges of said opening to retain it in position therein, said eyelet formed with a projection on its side engaging the slot in the drop-wire.

8. The combination with a drop-wire having a bifurcated end, of an eyelet seated on said end, and means for detachably securing said eyelet to the drop-wire.

9. In combination with a drop-wire having a bifurcated end, of an eyelet detachably secured thereon, said eyelet shaped to overlie the surfaces of said drop-wire along the sides of its bifurcated portion.

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