

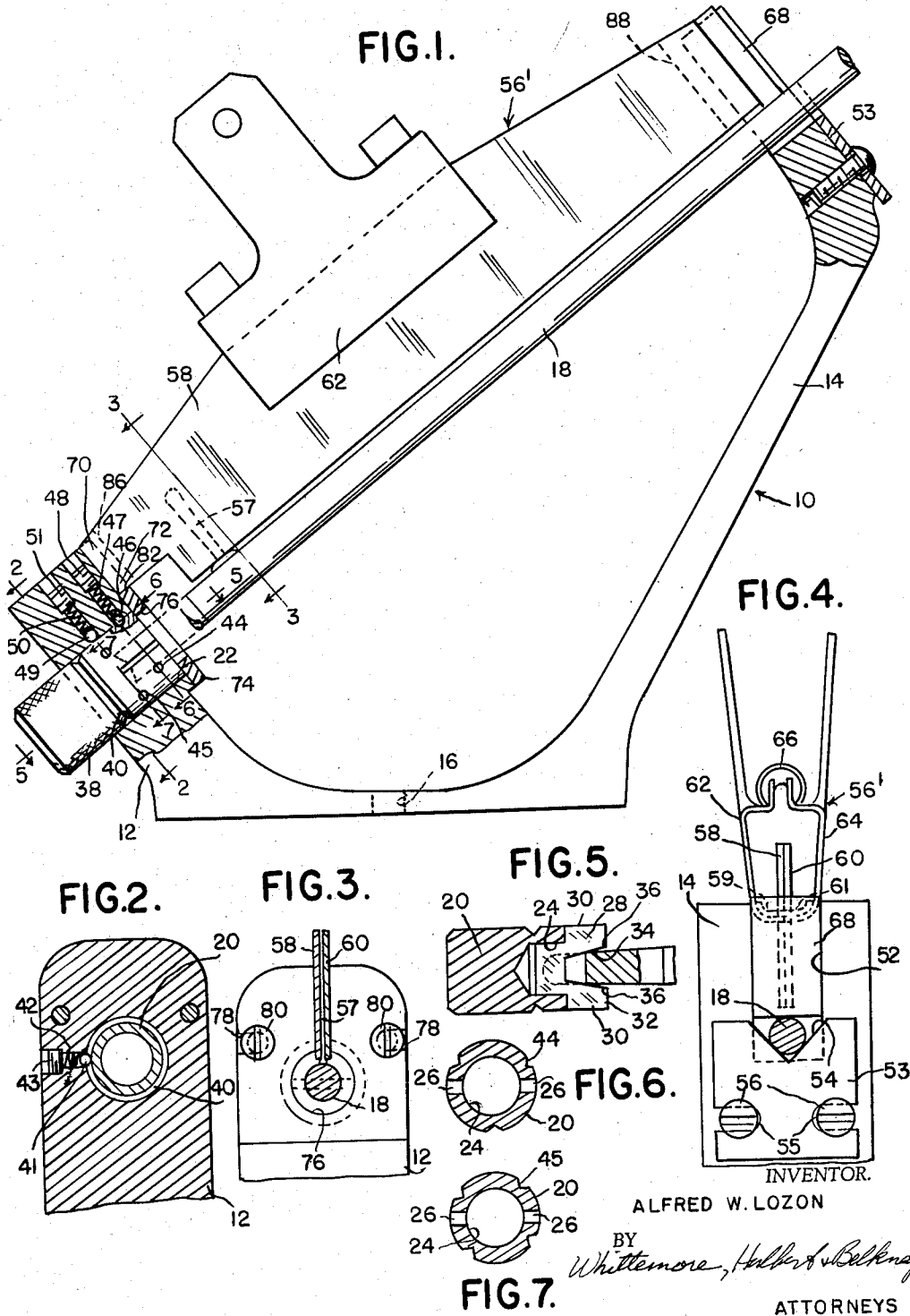
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ARROW FLETCHING FIXTURE

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ARROW FLETCHING FIXTURE

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This invention relates to arrow fletching fixtures.

An arrow fletching fixture usually comprises a supporting structure for rotatably supporting the shaft of an arrow for the application of feathers. One object of the invention is to provide a fixture having novel indexing mechanism for indexing the shaft to a plurality of selected rotative positions for the application of feathers in circumferentially arranged relation.

Another object of the invention is to provide an arrow fletching fixture having a nock holder with which the indexing mechanism is associated.

The number of feathers on an arrow shaft depends on a number of factors such as the use for which the arrow is intended and the preference of the user. Most arrows will have three or four feathers. In the past, indexing devices have been adapted to apply a particular number of feathers to the arrow and if it was desired to apply a greater or lesser number of feathers, a separate indexing device had to be employed. This has required that the operator of the fixture have on hand one indexing device for making a three-feathered arrow, another for a four-feathered arrow, etc. The necessity for a complete set of indexing devices has materially increased the cost of the operation and has increased the time required to turn out the arrows since the indexing devices must be removed and replaced at times depending upon the number of feathers desired. A further object of the invention is to provide an indexing device for an arrow fletching fixture which is adapted to be employed in applying varying numbers of feathers to the shaft of an arrow, thereby reducing the time and expense of the operation.

Other objects and features of the invention will become apparent as the description proceeds, especially when taken in conjunction with the accompanying drawing, illustrating a preferred embodiment of the invention, wherein:

Fig. 1 is a side elevational view of apparatus embodying the invention, partly in section.

Figs. 2 and 3 are sectional views taken along the lines 2-2 and 3-3, respectively, on Fig. 1.

Fig. 4 is an end view.

Fig. 5 is a sectional view of the rotatable nock holder.

Figs. 6 and 7 are sectional views taken along the lines 6-6 and 7-7 on Fig. 1.

Referring now more particularly to the drawings and especially to Fig. 1 thereof, the arrow fletching fixture is generally indicated at 10 and will be seen to comprise a frame having legs 12 and 14 which support the arrow shaft. The fixture 10 is provided with an opening 16 in the bottom for receiving suitable securing means adapted to securely mount the fixture on a base support such as a turntable, for example. In accordance with accepted practice, a plurality of fixtures 10 may be mounted in a circular array on a turntable so that an operator standing at an operating station may tend all of these fixtures, applying in sequence a feather to each of the arrow shafts supported on the fixtures. Then by the time the glue for securing the feather to the shaft of the first fixture has dried, the first fixture will return to the operating station whereupon the operator may apply the second feather to the arrow shafts in sequence.

The fixture 10 is arranged and constructed to rotatably support the shaft 18 of an arrow extending between the legs 12 and 14 of the fixture as shown in Fig. 1. The nock of the arrow is received and securely supported against lateral shifting movement by a rotatable nock holder 20 mounted in a circular opening 22 formed in

leg 12 of the fixture. The nock holder is formed with an axially extending recess or bore 24 which faces in the direction of the other leg 14 and into which the nock end of the arrow shaft is adapted to extend. The nock holder is formed with a pair of diametrically opposite slots 26 and disposed in the bore 24 is a relatively thin flat plate 28 having its opposite side portions 30 disposed in the slots 26. The inner edge 32 of the plate which faces the other leg 14 of the fixture is formed to provide a notch 34. The opposite side walls 36 of the notch diverge slightly as shown in Figure 5 at an angle of approximately 9 degrees to the axis of the nock holder.

As seen in Fig. 5, the nock of the shaft 18 receives the inner edge portion 32 of plate 28 and the opposite sides of the nock are securely gripped between the diverging sides 36 of the notch 34. The plate 28 may thus receive and support arrow shafts of different diameters.

The nock holder 20 has a knurled outer end portion 38 for rotating the nock holder and inwardly of the knurled portion it is formed with a circumferential groove 40 of V cross section which is disposed in a plane perpendicular to the axis of rotation of the nock holder. A ball 41 is pressed into groove 40 by a compression coil spring 42 which bears against the ball at one end and against a threaded plug 43 which threads into the leg 12 of the fixture and closes the hole in the fixture in which the ball and spring are slidably disposed. The spring pressed ball prevents axial movement of the nock holder. However the nock holder may be removed from the leg of the fixture by the application of sufficient force and at the same time releasing the spring pressure on the ball 41 by backing off the threaded plug 43 if necessary.

The nock holder 20 is provided on its outer surface with a plurality of conical recesses 44 which are arranged equal distances apart in circumferentially spaced relation about the axis of rotation of the nock holder and in a common plane perpendicular to the axis of the nock holder. In the present instance three such recesses are provided. The nock holder is also provided on its outer surface with a plurality of conical recesses 45 which are spaced apart equal distances in circumferentially spaced relation about the axis of rotation of the nock holder and lie in a plane perpendicular to the axis of rotation which is spaced from the plane of the recesses 44. The number of recesses 45 is different from the number of recesses 44 and in the present instance four recesses 45 are provided. The recesses 44 and 45 may be formed by a simple drilling operation.

A ball 46 is slidably supported in a passage in the leg 12 of the fixture in registration with the set of recesses 44 and is pressed toward the nock holder by a compression spring 47, the outer end of which engages the threaded plug 48. A ball 49 is slidably supported in another passage in the leg 12 of the fixture in registration with the set of recesses 45 and pressed toward the nock holder by the compression spring 50, the outer end of which is engaged by the plug 51. The plug 48 or 51 may be backed off by rotation to render the associated ball inoperative to releasably hold the nock holder in an indexed position. Normally one of the plugs 48 or 51 will be backed off and the other will be tightened to load the associated spring and press the associated ball against the outer surface of the nock holder so that it will enter a recess in the registering set of recesses and thereby releasably hold the nock holder in an indexed position. The nock holder may nevertheless be rotated from one indexed position to another since the recesses are conical and the balls are simply cammed out of the recess when sufficient torque is applied to the nock holder. It will be apparent that by tightening down on one of the plugs 48 or 51 and backing off the other, one of the balls 46 or 49

will be rendered operative, that is pressed tightly against the nock holder to provide for indexing the arrow shaft through a number of positions determined by the number of recesses in the registering set. The other ball will be inoperative and have no retarding effect on the rotation of the nock holder.

Referring now to Figs. 1 and 4, the end portion of leg 14 of the fixture is formed with a slot 52 through which the shaft of the arrow extends. The slot 52 is aligned with the axis of rotation of the nock holder. Mounted on the outer side of the end of leg 14 is a plate 53 having a V-shaped recess 54 in which the shaft of the arrow is seated. The opposite sides of the plate are formed with slots 55 and receive bolts 56 which secure the plate to leg 14. As seen in Fig. 4, these slots permit a degree of lateral adjustment of the mounting plate 53 so that the recess 54 may be accurately positioned to support a shaft in alignment with the axis of rotation of the nock holder.

A feather clamp illustrated generally at 56' is provided for gripping a feather 57 to be applied to the shaft. Provision is made for supporting the clamp adjacent to and in substantial alignment with the arrow shaft. The clamp comprises a pair of cooperating clamping members 58 and 60 which are secured to legs 62 and 64 of the clamp. As seen in Fig. 4, portions at the inner ends of the clamping members are turned out as at 59 and 61 and may be secured to legs 62 and 64 as by spot welding, for example. The spring 66 urges the clamping members toward one another to clamp a feather therebetween.

As seen in Figs. 1 and 4, the clamping member 58 is provided with a guide block 68 at one end which is adapted to be slidably received between the opposite guiding surfaces of the slot 52 in leg 14 of the fixture. This guide block 68 rests upon the arrow shaft in operative position. The other end of the clamping member 58 has an extension 70 which is adapted to be slidably received in a slot 72 formed in plate 74 secured to the inner side of leg 12 of the fixture. Plate 74 also has a central opening 76 loosely receiving the arrow shaft. The plate is provided with slots 78 on opposite sides which receive bolts 80 for securing the plate to the fixture, the slots permitting a limited lateral adjustment in the mounting of the plate.

The bottom 82 of slot 72 is arranged and positioned with respect to the lower edge of clamping member 58 to maintain and support the clamping member in spaced relation to the shaft of the arrow. It will also be noted that the lower edge portion of guide block 68 extends below the lower edge of clamping member 58. Thus the clamping member 58 does not press down upon the arrow shaft and engages the latter only where the guide block 68 at one end thereof rests upon the shaft. Accordingly, there is no tendency to shift the nock end of the shaft and a high degree of accuracy can be maintained. Where arrows having larger diameter shafts are to be feathered or where feather clamps of other dimensions are employed, shims may be provided in slot 72 to maintain the proper clearance between the clamp and the shaft.

The other clamping member 60 is completely free of the fixture in operative position and it will be seen that the ends of clamping member 60 terminate at 86 and 88. The lower edge of clamping member 60 coincides with that of clamping member 58 so as to have the same spaced relationship to the shaft as clamping member 58.

The operation of the fixture will be readily apparent from the foregoing. The shaft of an arrow to be feathered is seated in the V-shaped recess of plate 53 with its nock end projecting into nock holder 20. The plate 28 of the nock holder is securely received by the nock of the shaft and the opposite sides of notch 34 tightly grip and prevent any lateral shifting of the shaft in all rotative positions thereof. Then, depending on whether three or four feathers are desired, one of the plugs 48 or 51 is tightened to render the associated ball

operative, that is to press it against the nock holder for releasably holding the nock holder in selected positions of rotation determined by the registering recesses, and the other plug is backed off to render the associated ball inoperative. The clamp is then applied to the fixture, the portions 68 and 70 thereof being slidably received in respective slots 52 and 72. A feather is, of course, held by clamping members 58 and 60 with a portion of the feather projecting beyond the lower edges of the clamping members in position to press against the shaft and to be adhered thereto as by glue. After the feather is securely glued to the shaft, the clamp is removed and the nock holder 20 indexed to the next rotative position to turn the shaft to a position for the application of a second feather. The second feather is applied as the first and the process is repeated in applying one or more additional feathers.

The feathers will desirably be applied to the shaft at a slight angle to cause the shaft to spin in flight. To accomplish this, an initial adjustment in the lateral positioning of plate 74 is made, so that the slot 72 which receives the end of clamping member 58 is moved slightly to one side so as to move the clamp and feather slightly out of true alignment with the shaft. All of the feathers may then be applied to the shaft at a slight angle without further adjustment of plate 74.

If the fixture is set to turn out three-feathered arrows, that is with plug 48 tightened down and plug 51 backed off, the fixture may be readily converted to the manufacture of four-feathered arrows by tightening plug 51 and backing off plug 48. There is no need to substitute a new nock holder having provision of different indexing.

The nock holder having the indexing recesses therein is very inexpensively manufactured since the recesses may be formed by a simple drilling operation.

What I claim as my invention is:

1. An arrow fletching fixture comprising a frame for supporting the shaft of an arrow, means for rotating the arrow shaft about its axis including a nock holder rotatably supported on said frame and engageable with the nock of the arrow shaft for rotation of the arrow shaft as a unit with said nock holder, and means for releasably holding said nock holder in a plurality of different rotative positions including a first series of recesses in the outer surface of said nock holder arranged in equally spaced relation about the axis of rotation of said nock holder, detent means carried by said frame in position to engage said recesses in succession upon rotation of said nock holder, a second series of recesses in the outer surface of said nock holder arranged in equally spaced relation about the axis of rotation of said nock holder, said second series of recesses being spaced axially of said nock holder from said first series of recesses, second detent means carried by said frame in position to engage the recesses of said second series in succession upon rotation of said nock holder, the number of recesses in said second series being different from the number of recesses in said first series, and means associated with each detent means for selectively rendering the latter operative and inoperatively.

2. An arrow fletching fixture as defined in claim 1 in which each detent means comprises a spring pressed ball engageable in the recesses of the associated series and adapted to cam out of said recesses upon rotation of said nock holder under a sufficient turning force, and separate means independently operable for applying to and removing from each ball the spring pressure afore-said.

References Cited in the file of this patent

UNITED STATES PATENTS

860,446	Connally	July 16, 1907
2,286,574	Rohde	June 16, 1942
2,337,080	Bitzenburger	Dec. 21, 1943
2,731,992	Lozon	Jan. 24, 1956