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INSERT SECURING TOOL

Erwin Eckener, New York, N. Y., assignor to Aircraft Screw Products Company, Inc., Long Island City, N. Y., a corporation of New York

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4 Claims. (Cl. 10—1)

The invention relates to a tool for securing the end of a wire coil in a tapped hole of a boss or nut member into which the coil is inserted as an interiorly threaded lining. A tool of the type here under consideration is disclosed in the application for U. S. Patent Serial No. 538,590, filed June 3, 1944. The tool serves the purpose of forcing the coil end provided with a sharp edge or serrations of its outer periphery into the material of the tapped thread groove in which the coil end is located. It also serves to widen the coil end after insertion in order to facilitate the grip of the first convolution of a stud which is to be secured into the wire coil thread. Furthermore, the tool may be combined with a staking punch to drive or compress from the outside the material of the boss or nut member in the range of the embedded coil end and also in the rear thereof. The tool described in the abovementioned application comprises a tubular member with a portion thereof externally threaded according to the internal threading constituted by the coil for which it is destined, and so slitted as to form a resilient and longitudinally extending tongue provided with a portion of one thread in continuation of said external threading to engage from the inside the coil end to be secured in the boss. The tool further comprises a driver to spread the tongue outward. In the combined structure the mentioned punch fits over the tubular member and is guided so that a toothed front portion of the punch is kept in registry with the tongue. The present invention is directed mainly to the structure of the tongue-provided member and the driver and aims to avoid certain drawbacks which have been experienced in connection with the earlier tool. In particular the invention aims to simplify the structure and the operation of the tool and consists mainly in that the tongue provided with a portion of one thread is made as a separate piece linked to the tubular member, and that the driver having a conical front end for cooperation with an inner conical face of the tongue is screwed into said tubular member, and can thus be advanced by rotation rather than by hammering it down as in the case of the earlier tool. Further objects and details of the invention will be apparent from the description hereinafter and the appended drawing illustrating an embodiment thereof by way of example.

In the drawing,

Fig. 1 is a side elevation partly in section of a tool according to the invention;

Fig. 2 is a longitudinal cross-section thereof, the punch part being omitted; and

Fig. 3 is a cross-section along line 3—3 of Fig. 2.

Referring now to the drawing, the tool comprises a substantially tubular member 10 which is interiorly threaded at its rear end 11. A portion of the wall at the other end is removed so as to form a substantially rectangular recess 12 extending in axial direction. Diametrically opposite, another recess 13 is provided in member 10 which recess may be of the same width but is of shorter length than the recess 12. The periphery of the portion provided with recess 12 is threaded at 14 and this threading is located closer to the inner end 15 of the recess 12 than to the front end 16 of the member 10. The threading 14 is of a diameter, shape and pitch according to the inner portion of a coil to which the tool is destined to be applied, and the portion 17 intermediate the threading 14 and the end face 16 of member 10 may have an outer diameter according to the inner coil diameter so as to serve as a pilot end. In order to allow for the application of a wrench or other gripping device when member 10 is to be screwed into a coil, a portion 18 intermediate the recess 12 and the internally threaded end may be provided with hexagonal faces. A tongue-like part 19 fits into the recess 12 and is so shaped as to complement with its outer face the periphery of the tubular member 10. The front end of the tongue has an extension 20 diagonal with respect to member 10 so as to engage into recess 13 the side walls of which constitute guide faces for the extension 20. However, it will be understood that the recess 13 may be omitted and the extension may be shorter than shown in Fig. 2 if the tongue is sufficiently safely guided by the side walls of the recess 12. A pivot pin 21 connects the parts in such a manner that the tongue 19 can be turned at least a small angle and the free end 22 of the tongue can be spread outward with respect to member 10 as indicated in dash lines in Fig. 2. A shoulder 22' of the tongue extension 22 may be provided in order to limit an inward movement of the tongue by abutting against the inner wall of member 10, whereas an outward turning may be limited by the extension 20 contacting the end wall of the recess 13. The free end 22 is provided with an internal inclined or conical face 23 and with a portion 24 of an external thread convolution in continuation of the aforementioned threading 14. Interiorly of member 10 a driver rod 25 is movable which has

a conical end portion 26 matching the cone 23 of tongue 13. The driver is cylindrical and of a diameter fitting the inner diameter of member 10 so as to be axially guided therein. Its rear portion 27 is threaded and fits the threading 11, and the driver end is so shaped, for instance as a square head 28, that a wrench may be applied thereto. Except for the threading 14 and the hexagonal portion 18, the whole member 10 may be of the same diameter as the pilot end 17.

In using the tool, the pilot end 17 will be inserted into a wire coil located in the threading of a boss member. Thereby, the tongue 19 will be automatically turned and/or held in its position shown in solid lines in Fig. 2 in which the thread portion 24 constitutes the exact continuation of the threading 14. The tool will then be screwed with threading 14 into the coil convolutions until the tongue thread 24 is in engagement with the end portion of the coil. In this position of member 10, and while the latter is held stationary, the driver 25 may be turned and advanced owing to the engagement of its portion 27 with the threading 11 so that the conical portion 26 bears against the conical tongue face 23. Further screwing in of the driver 25 will force the tongue end 22 outward, the tongue turning about pivot 21, and the coil end portion which then may be engaged by threading 24 will also be forced outward and firmly pressed into the groove in which it is seated. The tool can be removed by reversing the turning of the parts.

If it is desired to apply a punch in a manner similar to that described in the aforementioned patent application Serial No. 538,590, a hollow punch 29 teathed at 30 in its front face 31 may be fitted over the surface of member 10. In order to insure the desired registry of the teeth 30 with the threaded portion 24 of the tongue, member 10 may be provided with a guide pin 32 so as to engage a longitudinal slot 33 of the punch.

It will be apparent that the tool according to the invention is of very simple construction permitting also an exchange of the tongue 13 if the threading 24, which is the portion most exposed to injury, should be broken or otherwise damaged. If the tool is to be used without punch 29, another advantage consists in the fact that

its operation requires merely the application of torques. In consequence it lends particularly well to power drive.

Although I have described only one embodiment of the invention, it will be apparent to those skilled in the art that many alterations and modifications of the tool described and illustrated are possible within the spirit and essence of the invention which shall be limited, therefore, only by the scope of the appended claims.

I claim:

1. A tool of the type described, comprising a tubular member provided with a recess extending from the one end of the member a distance towards the other end, a tongue-like part fitting into said recess and being pivoted to said member near its first mentioned end so that the free end of the tongue can swing a limited angle outward with respect to said member, said member including an external threading in the range of said recess, said tongue including a portion of an external thread convolution in continuation of said external threading and near the free end of said tongue, and including also an internal face inclined in respect to the axis of said member, and a rod-like driver guided interiorly of said member, said driver including a tapering end adapted for engagement with said inclined face to force said free end of said tongue outward by a movement of said driver in an axial direction.

2. A tool as claimed in claim 1, said driver and said member including interengaging screw threadings and said driver including a head adapted for the application of a torque thereto in order to move said driver in axial direction by turning it in relation to said member.

3. A tool as claimed in claim 1, said member including a second recess opposite to said first recess and said tongue-like part including an extension in engagement with said second recess so as to be guided by the side walls of the said recess.

4. A tool as claimed in claim 1, said tongue-like part and said member including cooperative abutment faces to limit the possible movement of the tongue in relation to said member.

ERWIN ECKENER.