ABSTRACT OF THE DISCLOSURE

A fastener member for use with a feeding track having an octagon-shaped base flange from which are formed four prongs and a pair of support means. The flange has flat parallel front and back edges with two prongs at each of the front and back edges. The support means permit the fastener member to advance within the feeding track. The four prongs are positioned at the periphery of the base flange and extend out a centre opening of the feeding track. Flat buffer portions of the adjacent prongs and the flat front and back edges make contact with the associated edges and buffer portions of the adjacent fastener members in the feeding track and prevent them from riding up on one another in the feeding track.

This invention relates in general to fastener members and more particularly to an improved fastener member with prongs for nut and screw installation and adapted to be used with a nut fastening machine. The present application is a continuation in part of my co-pending application Ser. No. 616,661, filed Feb. 16, 1967, for Fastener Member, now abandoned.

An object of this invention is to provide a fastener member of the type indicated with support means to permit it to be advanced through the feeding track of a nut fastening machine.

In the manufacture of certain types of flanged fastener members, such as flanged nuts having a drawn threaded barrel, it has been found desirable to have a plurality of prongs projecting from the periphery of the flange of the nut, spaced equidistantly apart. The prongs penetrate the material of a workpiece and prevent rotation of the nut thereon until a screw member is tightened into engagement therewith. This type of fastener member is satisfactory for many applications, but not for use with my nut fastening machine, such as described in United States patent application No. 573,402. The prongs of the prior art fastener members will not permit them to pass through a feeding track and also no suitable means are available for supporting the fastener member with the prongs in the transverse slots of the feed track. My fastener member with prongs, in the preferred form, can be used with a feeding track of the nut fastening machine as it has support means integrally connected to the base flange for advancing the fastener member in the feeding track. The prongs are positioned in such a manner that they all extend through the center opening in the feeding track and will not bind on the lateral sides of the center opening of the track as the fastener member passes through.

The type of flanged fastener member in most common use presently with the nut fastening machine is provided with a flat rectangular or square shaped base flange with apertures therein instead of prongs mounted thereon. This type of fastener member is nailed to the workpiece to secure it thereto until the co-operating screw member is placed in threaded engagement therewith. The base flange with the apertures therein is used as the support means for the fastener member in the feeding track. When the fastener members are fed out of a hopper, down, for example, a gravity feed track one after the other, a problem often is created. The fastener members travelling in the feeding track are capable of a certain degree of vertical movement relative to one another. The front portion of a first fastener member tends to ride up onto the back portion of a second adjacent fastener member and jam in the feeding track stopping the movement of the fastener members in the feeding track.

This invention provides a novel flanged fastener member with buffer portions on prongs adjacent the front and back edges of the base flange. The buffer portions are of sufficient height and width to contact one another and prevent such overriding even though substantial vertical movement or displacement of the flanged fastener members in the feeding track occurs.

My fastener member is of a simple construction. In the preferred embodiment, the flanged fastener member has the prongs and support means formed from the material in the base flange. The flange has flat parallel front and back edges along its longitudinal axis at its periphery, spaced 180 degrees apart. A pair of prongs are mounted on the flange at each of the front and back edges and a buffer portion of the outer edge of each prong adjacent front and back edges is in the same plane as the front and back edges and presents a larger contact surface area where two adjacent fastener members make contact when in the feeding track. The flat front and back edges on the adjacent fastener members and the buffer portions of the prongs make contact and prevent the fastener members from rotating when travelling in the feed track. All the prongs are adapted to extend out the center opening of the feeding track so as not to bind on the sides of the center opening. Also, this embodiment provides nail-like prongs of a length greater than half the length of the barrel. However, the length of the prongs can be adjusted to suit the desired application by changing the dimensions of the base flange. Here a flanged fastener member is provided having a plurality of prongs of suitable length, and a pair of diametrically opposite support means formed from a minimum amount of material in the flange.

In carrying out this invention, a fastener member is provided for use in a feeding track comprising a central threaded fastener portion, a base flange disposed perpendicularly to and at one end of the fastener portion, flat, parallel front and back edges on said flange, a plurality of prongs integral with said base flange, buffer portions on said prongs adjacent said front and back edges adapted to contact corresponding buffer portions of adjacent fastener members when said fastener members are travelling in said feeding track and adapted to prevent the flange of one fastener member from riding up on the flange of the adjacent fastener member, and support means on said fastener member adapted to advance said fastener member within said feeding track.

Other objects and a fuller understanding of the invention may be had by referring to the following description and claims, taken in conjunction with the accompanying drawings, in which:

FIGURE 1 is a top plan view of a fastening member before the prongs are formed embodying the features of the invention;
FIGURE 2 is a top plan view of the fastening member with the prongs penetrating a workpiece;
FIGURE 3 is a perspective side elevation view, partly in section, showing the fastening member embodying the features of the invention associated with a nut feeding track;
FIGURE 4 is a cross section view along the line 4—4 of FIGURE 2 showing the fastening member with a workpiece with the screw attached therein; and
FIGURE 5 is a side elevation view of a portion of the fastener member showing a partly broken away section of the center fastener portion and the base flange and a lower portion of a prong greatly enlarged.

With reference to the drawings the invention is illustrated as being incorporated in a one piece fastener member, indicated generally by the reference character 10. As illustrated, the fastener member 10 comprises a center fastener portion 11 having an internal aperture 12 threaded to receive a co-operating threaded screw member 13, shown in FIGURE 4, and a base flange 14 disposed perpendicularly thereto and at one end of the fastener portion with a thickness t. The base flange 14 is an octagon-shaped flat sheet of steel or the like material, as shown in FIGURE 1, having an eight-sided periphery with a front edge 5, a back edge 6, and side edges 7 and 8. The front and back edges 5 and 6, are flat, parallel, and spaced apart along a longitudinal axis 9b. The side edges 7 and 8 are parallel and positioned along a transverse axis 9. Four prongs 15 are formed from material on diagonally opposite sides which join the side edges 7 and 8 to either the front edge 5 or the back edge 6. On each prong 15 adjacent either the front edge 5 or back edge 6 is a buffer portion 25 having a height T and a width the thickness of the prong 15. It should be noted that each of the four prongs 15a, 15b, 15c and 15d will be described as such only where it is necessary to more clearly describe the invention, otherwise the prongs will be referred to by the general character 15.

A pair of prongs 15a and 15c are located at the adjacent corners to the bottom edge 6 on the periphery of the base flange 14 and a pair of prongs 15a and 15d are located at the adjacent corners of the front edge 5 on the periphery of the base flange 14. Each prong is bent as shown in FIGURES 2 and 3, to extend substantially perpendicularly to the base flange 14. The buffer portion 25 of each prong 15 is substantially in the plane containing the front or back edges 5 and 6 respectively. The buffer portion 25 of each prong 15 is adapted to contact a corresponding buffer portion of an adjacent fastener member 10 as will be described later and is substantially normal to the flange 14. Support means 16 and 17 are formed from the material in the base flange 14 adjacent the side edges 7 and 8 respectively. Each prong 15 is isocela-shaped having two side edges, first an inner edge 18 and a junction 19 where the inner edge 18 joins the base flange 14 and second the diagonal edge of the periphery joining the side edges 7 and 8 and forming the upper or back edges 5 and 6 respectively and a base in the flange 14. The prong 15 has a tapered end portion 20 opposite the base. Serrations or notches 21 may be formed on any of the diagonal edges of the prongs 15, if desired. The notches present offset shoulders substantially parallel to the flange 14, as shown in FIGURES 3 and 4.

In FIGURE 3 is shown two fastener members 10 passing through a feeding track 30. The support means 16 and 17 of the fastener member 10 are supported in transverse slots 31 and 32 of arms 33 and 34 respectively of the feeding track 30. The prongs 15 and fastener portion 11 extend out an opening 35 between lateral sides 36 and 37 of the arms 33 and 34 respectively. The parallel side edges 7 and 8 in the slots 31 and 32 prevent rotation of the fastener member 10 in the feeding track 30. Also, the front and back edges 5 and 6 with buffer portions 25 of the adjacent prongs 15 are flat and parallel and make contact with corresponding buffer portions of the adjacent fastener member 10 to prevent overriding of adjacent flanges 14 in the feeding track 30.

FIGURE 4 shows a nut and screw installation with the fastener member 10 secured to a wooden workpiece 20 which has an aperture 24 therethrough to receive the center fastener portion 11.

As shown best in FIGURE 1, the prongs 15b and 15c are cut from the metal in the flange 14 laying between the back edge 6 and the side edges 7 and 8 along the shear lines 18 angled at an obtuse angle relative to both back and side edges and extending from the side edges 7 and 8 towards the back edge 6 in a converging manner. The prongs 15a and 15b are cut from the metal in the flange 14 laying between the front edge 5 and the side edges 7 and 8 along the shear lines 18 angled at an obtuse angle relative to both front edge 5 and side edges and extending from the side edges towards the front edge in a converging manner. Each prong 15 is bent, as shown best in FIGURES 2 and 3, to extend substantially perpendicular to the plane of the flange 14 along the fold lines in the flange 14 arranged in a generally vertical direction with respect to the center fastener portion 11. The prongs 15 lie in planes extending in substantially the same radial manner. The portion 25 of the outer edge of each prong 15 is cut or filed away to present a buffer substantially in the plane containing the front and back edges 5 and 6. The height of the apex of the buffer portion is T which is a distance equal to and not less than 1.5 t where t is the thickness of the flange 14 itself. This height of T has been found to be most suitable to prevent one edge 5 or 6 of the fastener member 10 from riding up over the next adjacent flange 14 of the next fastener member 10 in an even though substantial vertical movement or displacement of the fastener member 10 in the feeding track 30 may occur. This prevents jamming in the feeding track 30.

When the fastener members 10 are traveling in the feeding track 30 the flat back edge 6 of one fastener member 10 makes contact with the flat front edge 5 of the fastener member 10 ahead of it. The buffer portion 25 on prong 15a makes contact with the one on prong 15b as does the buffer portion 25 on prong 15d with the one on prong 15c. The support means 16 and 17 are in the transverse slots 31 and 32 respectively and the parallel side edges 7 and 8 in addition to the buffer portion 25 of the edges 5 and 6 of adjacent fastener members from rotating or turning in the feeding track 30.

In the preferred structure, support means 16 and 17 are a pair of diametrically opposite support portions formed from the material remaining adjacent to two side edges 7 and 8 respectively of the prongs 15 formed and bent. As shown the support means 16 and 17 have a trapezoidal shape which can be altered to be dependent on the desired shape of the prongs 15. However, if desired, the support means may be connected to the flange by connecting portions to be disposed in a plane parallel to or adjacent to the plane of the edges 5 and 6, as shown in FIGURE 11 intermediate the end connected to the flange and the free end. The construction of the feeding track 30 would be one of the controlling factors to consider in the design of the support means 16 and 17.

In the nut and screw installation with the fastener member secured in the workpiece 23, the fastener portion 11 is properly positioned in the aperture 24 when inserted by the transfer device of the nut fastening machine. No prong positioning grooves will be necessary on the surface of the workpiece for the proper location of the fastener member 10 thereon. The prongs 15 are nail-like in shape so they can easily be driven into the workpiece 23 and are arranged in a generally radial manner relative to the center fastener portion 11 so the adjacent prongs are in different radial planes to prevent splitting the workpiece 23 along its grain when the prongs 15 are driven therein for their full length. The serrations 21 on the prongs 15 assist to hold the fastener member 10 in the feeding track 30. The center fastener portion 11, intermediate the end connected to the flange and the free end, the workpiece 23 until the co-operating screw member 13 is tightened into the fastener portion 11. The prongs 15 are positioned at the periphery of the flange 14 to be the furthest possible distance from the aperture 24 in the workpiece 23 into which is placed the center fastener portion 11. When the prongs 15 are driven into the workpiece 23 they are not apt to split the wood along the grain towards the aperture 24 as they are arranged.
in different radial planes and are easily driven into the workpiece 23. In the furniture business coarse grained lumber is used quite often, and if the prongs 15 had wider bases adjacent the flange 14 and adjacent prongs 15 were in parallel planes the workpiece 23 would be more apt to split along the grain. Also the nail-like prongs 15 with the narrow base are not apt to shear off from the flange 14 as will the prongs with wider bases at the flange.

It should be noted that due to the necessity of providing some clearance in the width of the slots 31 and 32 of the track 30 all fastener members 10 are capable of a certain degree of vertical movement relative to one another. In some cases the distance of movement is equal to or greater than the thickness $t$. When this occurs the front edge 5 or the back edge 6 tends to ride up on the flange 14 of the next adjacent fastener member 10 and jam in the feeding track 10. This is avoided according to the invention by the provision of the buffer portions 25 on the prongs 15 which are of sufficient height $T$ and width to contact one another in the track 30 as previously described and prevent such overriding even though there may be substantial vertical movement or displacement of the novel fastener member 10 in the track 30. It will be obvious to those skilled in the art that the various changes may be made without departing from the scope and spirit of the invention.

What I claim is:

1. A one piece metal fastener member for use in a feeding track comprising:
   a threaded center fastener portion;
   a base flange of general octagon shape disposed perpendicular to and at one end of said fastener portion;
   front and back parallel edges on said base flange;
   parallel side edges normal to said front and back edges on said base flange;
   two prongs cut from metal lying between said front and side edges along shear lines angled at an obtuse angle relative to both front and side edges and extending from said side edges towards said front edge in a converging manner;

2. A fastener member as described in claim 1 wherein said base flange has a thickness $t$ and wherein the height of said buffer portion is a distance equal to or not less than 1.5 $t$.

References Cited

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EDWARD C. ALLEN, Primary Examiner