May 8, 1934. R. L. WILCOX 1,957,922

METHOD OF MAKING NUTS AND LIKE ARTICLES

Filed May 24, 1932

Fig. 1.

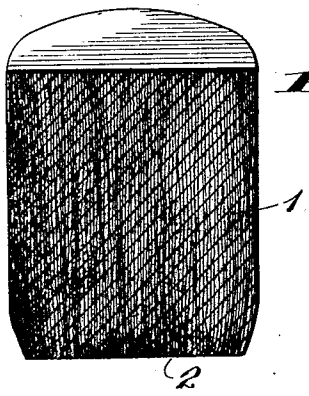
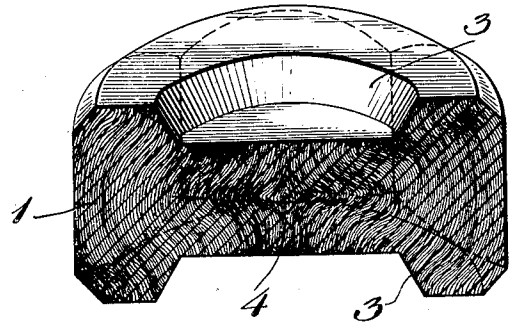


Fig. 3.



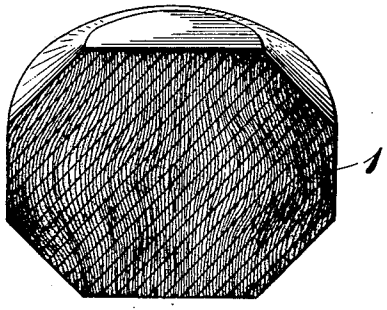


Fig. 2.

Fig. 4.

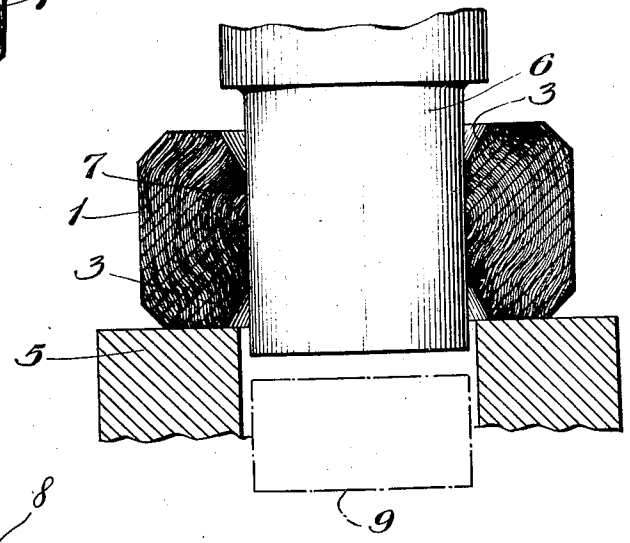
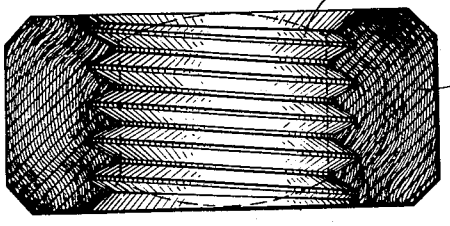


Fig. 5.



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METHOD OF MAKING NUTS AND LIKE ARTICLES

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Application May 24, 1932, Serial No. 613,208

2 Claims. (Cl. 10—86)

This invention relates to method of making nuts and like articles, and the primary object thereof is to provide a method whereby manufacture is not only facilitated, but wherein a much more homogeneous, stronger and tougher nut is produced, which will resist stripping of the threads.

I have discovered that by controlling the grain structure of the nut so that the same does not extend in straight lines either parallel to the axis of the blank or at a right angle thereto, stripping of the threads is resisted. This is due to the fact that the force exerted on the threads is at an angle to the axis of the nut, as distinguished from a nut having a grain structure, wherein the pull on the threads is parallel to the grain. I have further discovered that by having the grain extending axially of the nut, the present day practice of employing a piercing punch and piercing die of substantially the same diameter, and the attendant adjustment between the punch and die so as to effect registry thereof, can be eliminated, and consequently the opening in the die may be considerably larger than the punch, the elimination of which adjustment expedites manufacture; and further, that the pierced face may be held away from the face of the die instead of in contact therewith, as is usual.

The invention has still further and other objects which will be later set forth and manifested in the course of the following description.

Referring to the drawing, in which like numerals of reference indicate like parts in the several figures;

Figure 1 is a sectional view of a blank, illustrating the grain structure thereof;

Figure 2 is a similar sectional view of the blank after being shaped into substantially globular or similar form;

Figure 3 is a similar sectional view of the blank after a succeeding pressure operation and formed into its substantially finished shape with a countersunk depression in each of two opposite faces thereof;

Figure 4 is a view, partly in section, showing the blank at the completion of the piercing operation, with the tools therefor in their related position; and

Figure 5 is a sectional view of the completed threaded nut.

In proceeding in accordance with the present invention, a blank 1 as illustrated in Figure 1 is cut from a rod and subsequently, if deemed advisable, some of its corners may be relieved, as shown at the bottom in said figure. The grain of this blank is substantially parallel with the length thereof.

By compressing the blank 1 of Figure 1 into the substantially globular form or the like, as shown in Figure 2, the grain structure bulges outwardly to a pronounced degree from the longitudinal center of the blank. The blank, as so formed, is then subjected to further pressure and the article, in substantially its completed exterior form (Figure 3), is produced with depressions 3, or the like, in opposite faces thereof, with outwardly flared bounding walls. A relatively thin web 4 is thus produced at the center of the blank, with a grain so distorted as to produce a comparatively weak structure, while otherwise the grain structure of the globular form blank is definitely maintained. The blank is then placed on a die 5 and a piercing punch 6 is projected through the web 4 to form the hole 7. The slug 9 produced by this piercing operation, shown in broken lines in Figure 4, escapes from the die through the opening therein. The piercing punch 6 may be of less diameter than the bore of the die 5. The nut is completed by forming a thread 8 in the hole 7.

Through actual tests it has been demonstrated that nuts possessed of the grain structure of the present invention are stronger than nuts manufactured in accordance with the present day practice. The pull or force exerted on the threads by the threaded bolt tending to strip the nut thread is definitely and positively resisted by the angular relation between the grain and the lines of force.

What I claim as new, is:

1. The method of making untrimmed nuts or the like, which resides in compressing a blank having a grain structure, that extends substantially axially of the blank, whereby its height is reduced and a frustum of a cone is formed on the opposite ends thereof substantially equal in length, and the grain is caused to bulge outwardly at the center of the blank and extend in lines approximately parallel with the walls of the cones, then in applying pressure to the conical ends of the blank, to reduce the height thereof, enlarge its cross sectional area, form depressions in the opposite ends thereof, produce chamfer faces of less height than the cones, an outer wall that is polygonal in form and a web that is substantially midway between the ends of the blank, such pressure causing the grain to form in waves substantially parallel to the outer walls and chamfer faces of the blank, with the grain waves adjacent to the center of the blank formed in relatively short curves about a center substantially coincident to the center of the blank and approx-

imately parallel with each other, then removing the web to form a hole through the nut at the wall of which the opposite ends of the adjacent grain waves terminate, and finally forming threads in said hole, whereby the lines of force exerted on the threads are at an angle to the grain waves, thereby to resist stripping of the thread.

2. The method of making untrimmed nuts or the like, which resides in compressing a blank having a grain structure, that extends substantially axially of the blank, whereby its height is reduced and a frustum of a cone is formed on the opposite ends thereof substantially equal in length, and the grain is caused to bulge outwardly at the center of the blank and extend in lines approximately parallel with the walls of the cones, then in applying pressure to the conical ends of the blank, to reduce the height thereof, enlarge its cross sectional area, form depressions in the opposite ends thereof, produce chamfer faces of less height than the cones, an outer wall that is polygonal in form and substantially parallel with the axis of the blank throughout its length, and a web that is substantially midway between the ends of the blank, such pressure causing the grain to form in waves substantially parallel to the outer walls and chamfer faces of the blank, with the grain waves adjacent to the center of the blank formed in relatively short curves about a center substantially coincident to the center of the blank and approximately parallel with each other, then removing the web to form a hole through the nut at the wall of which the opposite ends of the adjacent grain waves terminate, and finally forming threads in said hole, whereby the lines of force exerted on the threads are at an angle to the grain waves, thereby to resist stripping of the thread.

RICHARD LESTER WILCOX.