Jan. 14, 1958 D. W. CLARK 2,819,557

NON-LOCKING, TAPERED WALL, HOLLOW ARTICLE OF MANUFACTURE

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Fig. 1.

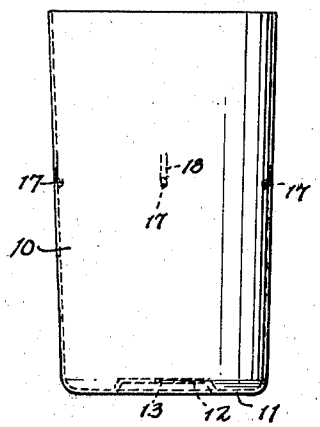


Fig. 4.

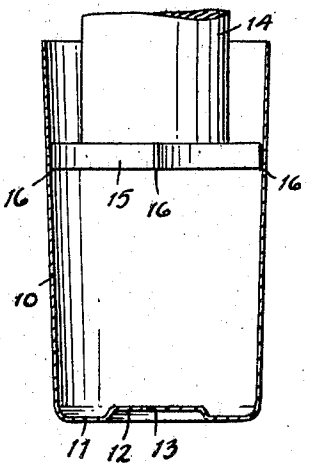


Fig. 5.

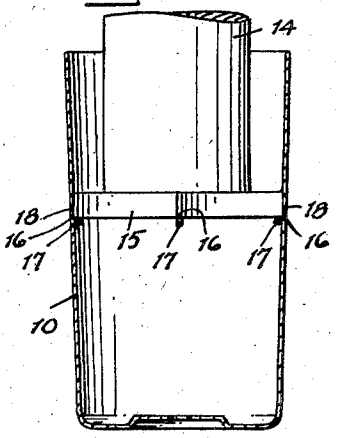


Fig. 2.

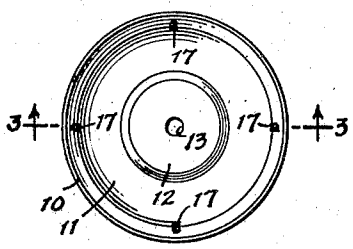


Fig. 6.

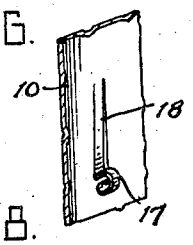


Fig. 7.

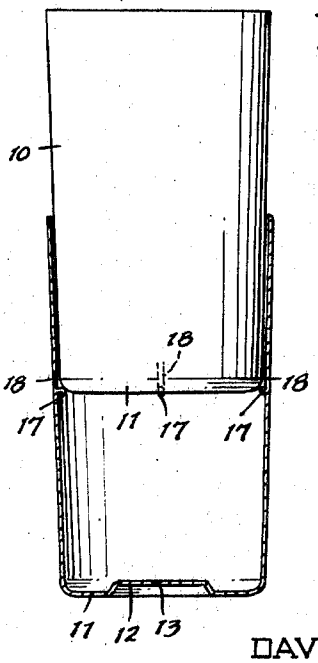


Fig. 8.

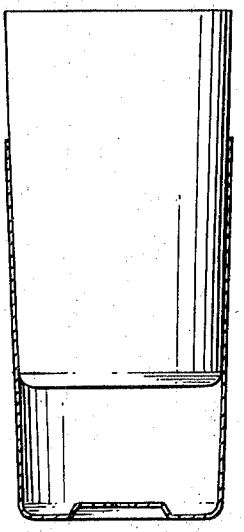
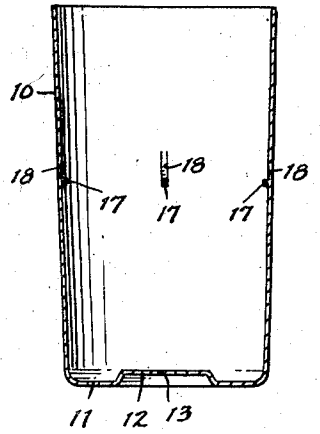


Fig. 3.



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NON-LOCKING, TAPERED WALL, HOLLOW ARTICLE OF MANUFACTURE

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1 Claim. (Cl. 45—137)

The present invention relates to a non-locking, tapered wall, hollow article of manufacture, an object of the invention being to provide an article of this character having means which will prevent a plurality of such articles from interlocking or tight frictional engagement with each other.

While the invention, as will appear from the following description, may be incorporated in various types of articles, the present disclosure is made in connection with a furniture leg ferrule formed of brass or other suitable metal, which is in the form of a cup open at its upper end and having a tubular wall tapered downwardly and inwardly from its open upper end to its lower closed end. This structure is such that normally a plurality of such ferrules will engage with each other in nested relation, the tapered wall being such that one ferrule will wedgingly engage within another in such tight relationship that it becomes necessary to forcibly pull them apart.

In the manufacture of such articles following their formation in a drawing and forming press, they are subjected to annealing, cleaning, buffing, bright dipping and other similar operations, usually carried out by placing a large quantity of the articles in a tumbling barrel or other type of receptacle where they are subject to becoming interlocked with each other, thus interfering with the thoroughness of the particular operation being performed thereon, as well as necessitating considerable labor in separating them upon removal from the tumbling barrel or other receptacle.

It is proposed, according to the present invention, to provide upon the interior of the tapered wall of the ferrule or other article, stop projections which will prevent one article from engaging within another to such an extent that it will be frictionally locked therewith.

A further object is to provide such stop projection means which may be produced as a step in the formation of the article in a drawing and forming press, without appreciable addition to the cost or time of manufacture. To this end it is proposed to provide such projection means in the form of a shaved and curled portion of the metal cut from the inner side of the wall, the cutting operation being conveniently performed by means of a vertically reciprocating cutter having a plurality of circumferentially spaced cutting edges, and which cutting edges are each adapted as the cutter is moved downwardly within the tapered wall to cut and curl a strip portion of the metal from the wall so that it remains as an inward projection upon the wall.

Another object is to provide stop projection means which will not interfere with the normal functioning of the article.

In the use of the ferrule upon a furniture leg or the like, the projections will not interfere with the normal function, as they will either be broken away upon the engagement of the ferrule with the leg end, or in the case of a wood leg end, they will embed into the wood and thus tend to hold the ferrule firmly upon the leg.

Other objects and advantages will become apparent from a consideration of the following detailed description taken in connection with the accompanying drawing wherein a satisfactory embodiment of the invention is shown. However, it will be understood that the invention is not limited to the details disclosed but includes all such variations and modifications as fall within the spirit of the invention and the scope of the appended claim .

In the drawings:

Fig. 1 is a side elevation of a ferrule according to the illustrated exemplary embodiment of the invention;

Fig. 2 is a top plan view;

Fig. 3 is a vertical sectional view taken along the line 3—3 of Fig. 2;

Fig. 4 is a vertical sectional view showing the ferrule with a reciprocating cutter engaged therein, and which is adapted to shave and curl the stop projections when move downwardly from the position as shown;

Fig. 5 is a view similar to Fig. 4, and showing the cutter moved down to the point where the projections are shaved and curled;

Fig. 6 is a fragmentary perspective view showing one of the shaved and curled projections;

Fig. 7 is a view partially in vertical section and partially in side elevation, showing one ferrule engaged within another in non-locking relation; and

Fig. 8 is a view similar to Fig. 7 and showing the heretofore known conventional type of ferrule, wherein one ferrule is engaged within another in frictionally interlocking relation.

Referring to the drawings, the ferrule is of generally cup shape and comprises a tubular wall **10** tapered downwardly and inwardly from its upper open end to its closed base **11**. The closed base, in the illustrated embodiment, is provided with an inwardly offset recess portion **12** having a nail receiving central hole **13**, by means of which the ferrule is adapted to be secured to a furniture leg or the like by a nail driven therein through the hole **13**, the head of the nail being seated in the recess **12**.

The ferrule is formed of brass or other suitable metal and the forming operation is usually carried out in an automatic forming, drawing and blanking press into which a strip of metal is fed, and which is shaped by means of a series of dies to form, draw and blank out the ferrule. As a final operation in the formation of the ferrule, a vertically reciprocating tool comprising a tool holder **14**, provided at its lower end with a cutting tool **15** of generally square outline and having four cutting edges **16** at the intersection of its corners with its lower surface, is moved downwardly within the wall of the ferrule. The cutting edges are so spaced that they engage the inner surface of the wall and upon further downward movement each shaves and curls a strip of the metal downwardly so that it projects inwardly from the wall to provide a stop projection **17**. As shown in Fig. 6, the stop projection **17** has been produced from a shaved and curled strip removed from a furrow **18** cut vertically into the wall, the degree of taper of the wall relatively to the vertical movement of the cutting edge being such that a strip of sufficient length and of gradually increasing thickness is shaved and curled without cutting through the wall, the strip being of greatest thickness at its end joined to the wall.

The four equally spaced projections **17** have their upper surfaces lying in a plane normal to the axis of the ferrule and are positioned intermediate the upper and lower ends of the ferrule at a point where the inside diameter of the wall is greater than the outside diameter of the lower end of the wall, while their inward projection from the wall is such that when the lower end of the wall of another

ferrule is inserted therein, it will be prevented from moving below the projections.

This arrangement is illustrated in Fig. 7 wherein one ferrule inserted within another is maintained in loose relationship through engagement with the projection 17. Thus when a quantity of ferrules are placed in a receptacle, such as a tumbling barrel, and one ferrule engages loosely within another, it is free to disengage itself as the ferrules are agitated through the tumbling action, so that there is no interference with the cleaning, annealing or other operation being carried out.

By way of comparison, Fig. 8 illustrates the condition encountered in connection with heretofore known conventional ferrules, one ferrule being engaged within another in tight frictional locking relation, the wedging engagement being such that any end pressure to which the interengaged ferrules may be subjected through agitation, will tend to more tightly engage them with each other.

What is claimed is:

A non-locking hollow article of manufacture, comprising a tubular downwardly tapered wall open at its large diameter upper end, the inner and outer sides of said wall being of corresponding taper and the wall thickness being such relative to the taper that the inside diameter of the upper end is greater than the outside diameter of the lower end, and stop projection means upon the inner side of said wall comprising a plurality of projection members integral with said wall and equally spaced circumferentially thereof, each of said members consisting of a shaved and curled strip cut from the tapered inner side of said wall by a downward vertical cut of downwardly increasing depth relative to said tapered inner side of said wall, whereby said strip is of gradually decreasing thickness from its point of connection with said wall to its free end, the upper surfaces of said projection members lying in a common plane normal to the axis of said wall at a point between its ends where the inside diameter is greater than the outside diameter of its lower end, and the lengths of said projection members being such that their projection from said wall is inwardly beyond a circumferential line of corresponding diameter to the outside diameter of its lower end, whereby the lower end of a similar article is prevented through engagement with said projection members from entering said open upper end beyond said projection members.

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