Jan. 1, 1935. R. B. HILL 1,986,061

LOCK THREAD FOR SCREW CAPS AND THE LIKE

Filed Nov. 5, 1932

Fig. 1.

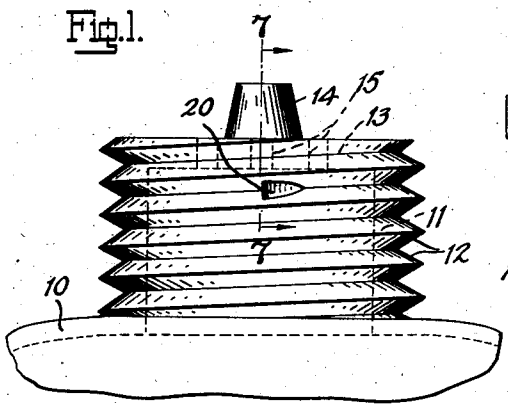


Fig. 2.

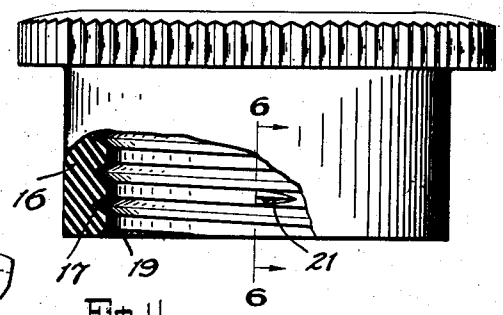


Fig. 3.

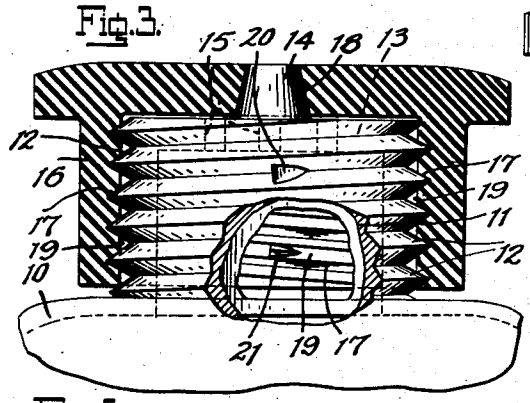


Fig. 4.

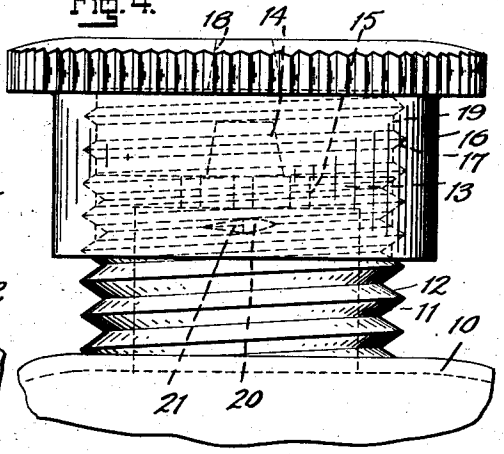


Fig. 5.

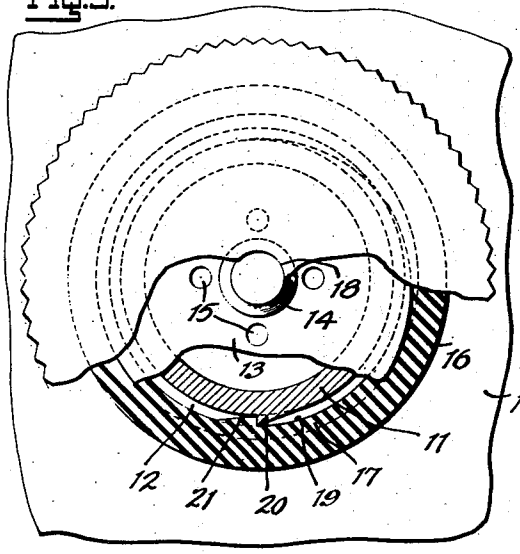


Fig. 6.

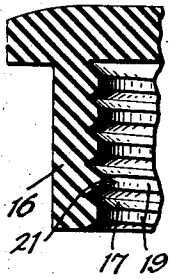
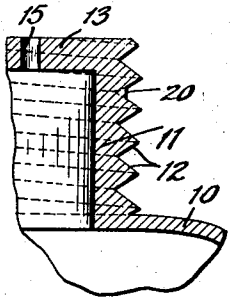


Fig. 7.



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LOCK THREAD FOR SCREW CAPS AND THE LIKE

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Application November 5, 1932, Serial No. 641,458

5 Claims. (Cl. 151—11)

The present invention relates to an improved lock thread for screw caps and the like, and has for an object to provide a thread structure which will permit of a predetermined number of complete turns and will then prevent further turning, to the end that the cap or the like will not become separated from the threads. Another object is to provide such a structure in which the locking means may be formed in the threads prior to assembly of the cap or the like and will permit the latter to be fully engaged merely by screwing it into place, whereupon the locking means will function to prevent removal. A further object is to provide a lock thread which will maintain uniform snug engagement at all points, and in which the cap or the like will at all times remain concentric to the threads.

With the above and other objects in view an embodiment of the invention is shown in the accompanying drawing, and this embodiment will be hereinafter more fully described with reference thereto and the invention will be finally pointed out in the claims.

In the drawing:

Fig. 1 is a side elevation of the neck end of a collapsible tube to which the invention is applied by way of example, the cap being removed.

Fig. 2 is a side elevation of the cap, a portion being broken away to show the interior construction.

Fig. 3 is a vertical sectional view showing the cap in fully engaged or closed position, and with parts broken away.

Fig. 4 is a side elevation showing the cap at the limit of its open position.

Fig. 5 is a plan view, partially in horizontal section and partially broken away, and with the cap in the open relation illustrated in Fig. 4.

Fig. 6 is a detail vertical sectional view taken along the line 6—6 of Fig. 2.

Fig. 7 is a detail vertical sectional view taken along the line 7—7 of Fig. 1.

Similar reference characters indicate corresponding parts throughout the several figures of the drawing.

Referring to the drawing the invention is shown as applied by way of example to a collapsible tube 10, such as is used for instance for tooth paste, shaving cream, and the like, although it will be understood that it is not limited to such use and may be incorporated in any suitable structure where the same relative action between a pair of threaded screw parts is desirable.

In the embodiment illustrated the neck 11 has an exterior screw thread 12, and is provided with a closure top plate 13 having a central upstanding truncated cone-shaped projection 14 surrounded by a series of outlet holes 15. The cap 16, which is preferably formed of a molded composition, as hard rubber, "Bakelite", or the like, is provided with an interior screw thread 17 adapted to screw upon the thread 12 of the neck 11, and in its upper end is provided with a tapered opening 18 adapted in the fully engaged or closed position to be tightly engaged by the projection 14 to close the tube. In the open position the projection 14 is disengaged from the opening 18 and the contents of the tube may be discharged through the outlet holes 15 and the opening 18.

The external thread 12 of the neck is preferably of V type. The internal thread 17 of the cap is of V form at the root and at the crest it is flattened, as at 19, so that while the engagement of the threads is snug and the cap is maintained in concentric relation with the neck a space or channel is provided between the root of the thread 12 and the crest of the thread 17. At a point near the upper end of the thread 12 a ratchet-tooth-like projection 20 is provided in the root of the thread of such size that it will move freely in the space or channel between the threads, this projection having an abutment surface at one end disposed in the direction opposed to the unscrewing movement of the cap, and being inclined from said abutment end to the surface of the thread root to provide a camming surface. A similar, but oppositely disposed, projection 21 is formed on the flat 19 of the thread 17 at a point near its lower end, and which also is adapted to move freely in the space or channel between the threads. The projections 20 and 21 are preferably rolled in, molded, pressed, or otherwise suitably formed integrally in the threads during their formation. The cap is preferably formed of a material which has a slight elasticity or resiliency, a suitable material for this purpose being hard rubber, "Bakelite", or the like.

In operation, the cap is screwed upon the neck and due to its slight resiliency or elasticity and the inclination of the camming surfaces of the projections they may with slightly increased turning pressure be forced past each other, whereupon the abutment ends are in opposed relation and will prevent unscrewing movement beyond the point at which the projections abut, and as clearly indicated in Figs. 4 and 5. Be-

tween this point and the fully engaged or closed position there may be any desired number of complete turns of the cap and any desired relative movement, depending of course on the length and pitch of the threads. In the embodiment illustrated the cap has approximately two and one-half turns between its closed and open positions.

I have illustrated and described a preferred and satisfactory embodiment of my invention, but it will be obvious that changes may be made therein, within the spirit and scope thereof, as defined in the appended claims.

Having thus described my invention what I claim and desire to secure by Letters Patent is:—

1. A pair of threaded screw parts having respectively an internal and an external thread adapted to be screwed relatively to each other, the two side surfaces of one of said threads contacting the two side surfaces of the other thread, there being a circumferentially uniform concentric space between said threads, and abutment means on said respective threads adapted to move in said space and to abut each other to limit the relative movement of said parts in one direction.

2. A pair of threaded screw parts having respectively an internal and an external thread adapted to be screwed relatively to each other, the two side surfaces of one of said threads contacting the two sides of the other thread, the crest of one thread being concentric to and spaced from the root of the other to provide a circumferentially uniform concentric space between said threads, and abutment means on said respective threads adapted to move in said space and to abut each other to limit the relative movement of said parts in one direction.

3. A pair of threaded screw parts having respectively an internal and an external thread adapted to be screwed relatively to each other, the two side surfaces of one of said threads contacting the two sides of the other thread, the crest of one thread being concentric to and spaced from the root of the other to provide a circumferentially uniform concentric space between said threads, abutment means on the crest of said one thread, and abutment means on the root of said other thread adapted to move in said space and to abut each other to limit the relative movement of said parts in one direction.

4. A pair of threaded screw parts having respectively an internal and an external thread adapted to be screwed relatively to each other, the two side surfaces of one of said threads contacting the two sides of the other thread, there being a circumferentially uniform concentric space between said threads, and abutment means on said respective threads adapted to move in said space and to abut each other to limit the realtive movement of said parts in one direction, said abutment means having camming surfaces adapted upon initial engaging movement of said parts in the other direction to move past each other.

5. A pair of threaded screw parts having respectively an internal and an external thread adapted to be screwed relatively to each other, the two side surfaces of one of said threads contacting the two sides of the other thread, there being a circumferentially uniform concentric space between said threads, and abutment means on said respective threads adapted to move in said space and to abut each other to limit the relative movement of said parts in one direction, said abutment means having camming surfaces adapted upon initial engaging movement of said parts in the other direction to move past each other, one of said parts being inherently yieldable to permit said abutment means to move past each other upon said initial engaging movement.

RALPH B. HILL.