Sept. 24, 1963 J. A. BADALI 3,104,430

LOCK PIN

Filed Aug. 23, 1961

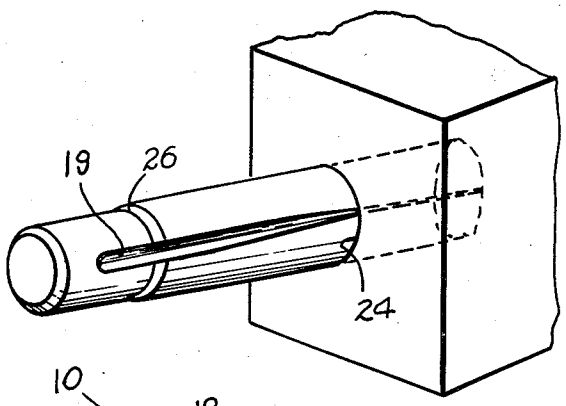


FIG - 1

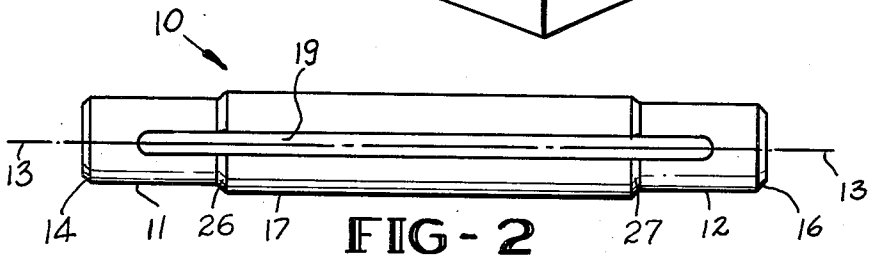


FIG - 2

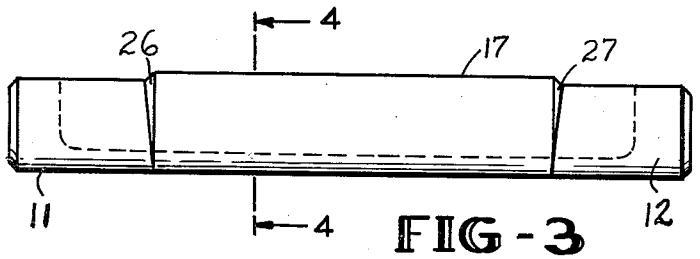


FIG - 3

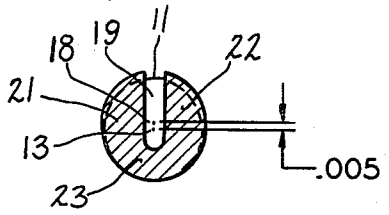


FIG - 4

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United States Patent Office 3,104,430 Patented Sept. 24, 1963

3,104,430
LOCK PIN

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Filed Aug. 23, 1961, Ser. No. 133,523
2 Claims. (Cl. 20—92)

The present invention relates to cylindrical lock pins of the type which are retained frictionally within an aperture.

It is a particular feature of the present invention to provide a lock pin fabricated entirely of plastic.

It is a further feature of the invention to provide a plastic lock pin having a novel structure.

It is a further feature of the invention to provide a lock pin which, because of its plastic structure, is deformable and operative to generate high frictional components when placed in snug engagement with a mating aperture.

A lock pin embracing certain features of the present invention may comprise a generally cylindrical plastic body having opposed end portions which are generally symmetrical and disposed about a common longitudinal axis, an intermediate portion of said pin being generally cylindrical and having a longitudinal axis which is offset relative to the common axis of said end portions, said plastic body having a longitudinal slot formed therein so disposed relative to the intermediate portion of the pin so as to divide said intermediate portion into two semi-cylindrical bodies joined by a web.

Other features and advantages of the present invention will become more apparent from an examination of the succeeding specification when read in conjunction with the appended drawings in which:

FIG. 1 shows a perspective view of a bored block with the lock pin of the present invention positioned in locking relationship therewith;

FIG. 2 is a plan view of the plastic lock pin;

FIG. 3 is a side view of the illustration of FIG. 1, and,

FIG. 4 is a sectional view of FIG. 3.

Referring now to the drawings, reference numeral 10 indicates a plastic lock pin fabricated of a resin material currently manufactured by E. I. du Pont de Nemours and sold under the tradename "Delrin."

The pin 10 is formed with two opposed cylindrical ends 11 and 12 having a common longitudinal axis 13 and each formed with a chamfer 14 and 16, respectively. Intermediate the cylindrical ends 11 and 12 there is a cylindrical body 17 symmetrically disposed about a longitudinal axis 18 offset from the axis 13 by a predetermined amount as is apparent in FIG. 4.

In the present embodiment of the invention, axis 18 is offset relative to axis 13 by about .005 of an inch.

Obviously the factor by which one axis is offset relative to the other is a matter which may vary depending upon the overall diameter of the lock pin and the particular plastic material utilized.

For purposes of the present description the value of .005 of an inch should be termed merely as an exemplary dimension.

The central portion of the pin 10 is formed with an elongated slot or recess which runs generally longitudinally of the body of the pin and divides the offset cylinder portion 17 into two generally semi-cylindrical wings or spring elements 21 and 22 connected by a common web 23.

Obviously, the length and depth of the slot 19 may vary, the only critical limitations thereto being that the depth and length thereof be of sufficient magnitude to render the semi-cylindrical portions 21 and 22 movable or resilient relative to one another.

Obviously, another factor to be considered in the design of the slot is the elasticity or resilient characteristics of the particular plastic utilized.

In operation the plastic lock pin is inserted into an opening having a diameter of such a size which provides a reasonable snug sliding fit for either cylinder end 11 or 12 depending upon the end which is first inserted into the aperture.

After one end 11 or 12 is started into the pin hole, such as the hole 24 in FIG. 1, the cylinder body 17 is grasped in such a way that pressure is exerted upon the resilient semi-cylindrical bodies 21 and 22 squeezing them radially inwardly toward one another about the connecting web 23 until the diameter or exterior conformation thereof has been reduced or has been brought in conformance with the diameter of the adjacent ends 11 and 12.

Next the pin is thrust fully within the apertured block or at least beyond the chamfer referenced 26 or 27, as the case may be.

Thereafter the pin may be driven home until it is disposed in the desired final position.

With the semi-cylindrical portions 21 and 22 restrained or pressed inwardly in the manner just described, it is obvious that there is an equal and opposite force tending to urge the members 21 and 22 outwardly.

This radially directed force sets up friction between the cylinder body 17 and the interior surface of the pin hole to develop a very substantial frictional component operative to retain the pin in place.

Obviously, the pin may be removed with an appropriate punch and hammer, striking the pin with sufficient force to overcome the friction developed by the body 17.

While the present embodiment of the invention has been described as being fabricated from a plastic material known in the trade as Delrin, it is perfectly obvious that a wide variety of similar resin materials may be utilized such as Cycolac manufactured by Borg-Warner and Lexan manufactured by General Electric Company.

What is claimed is:

1. A resilient resinous plastic locking pin having two spaced cylindrical ends arranged symmetrically about a common longitudinal axis and an intermediate body portion of enlarged cylindrical conformation and disposed symmetrically about a second longitudinal axis offset toward one side from the first axis, said body being partially bifurcated into two generally semi-cylindrical elements by a slot in said one side extending the full length of said body and intersecting the ends over part of the length of each end, said body being readily deformable by virtue of said web to the extent that its axis and conformation becomes coaxial with the axis of said end.

2. A resilient resinous plastic locking pin having two spaced cylindrical ends arranged symmetrically about a common longitudinal axis and an intermediate body portion of enlarged cylindrical conformation and disposed symmetrically about a second longitudinal axis offset toward one side from the first axis, said body being partially bifurcated into two generally semi-cylindrical elements by a slot in said one side extending the full length of said body and intersecting the ends over part of the length of each end, said body being readily deformable by virtue of said web to the extent that its axis and conformation becomes coaxial with the axis of said end wherein each end has a circumferential chamfer continuously around the pin without interruption by the slot.

References Cited in the file of this patent

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,104,430 September 24, 1963

Joseph A. Badali

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 2, lines 50 and 62, for "web", each occurrence, read -- slot --.

Signed and sealed this 14th day of April 1964.

(SEAL)
Attest:
ERNEST W. SWIDER

Attesting Officer

EDWARD J. BRENNER

Commissioner of Patents