Aug. 29, 1950 R. J. MILLER 2,520,808

GRIP FOR PLIERS

Filed Dec. 11, 1948

Fig. 1.

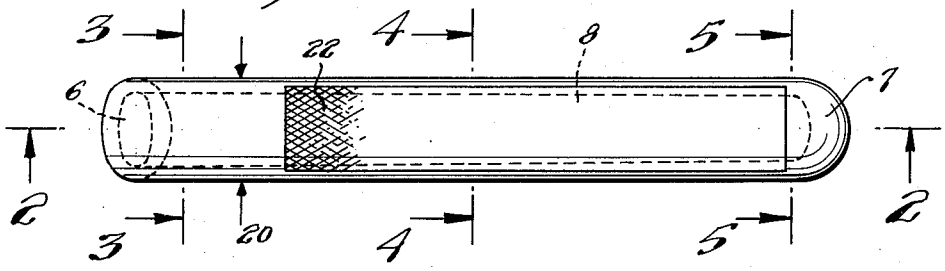


Fig. 2.

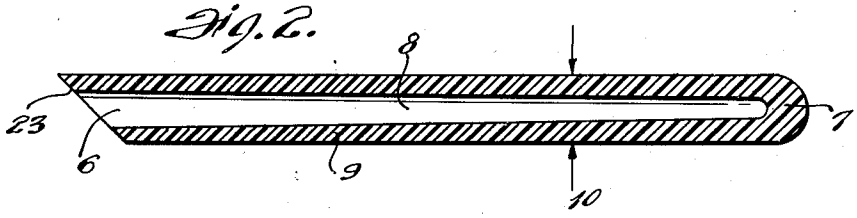


Fig. 3.

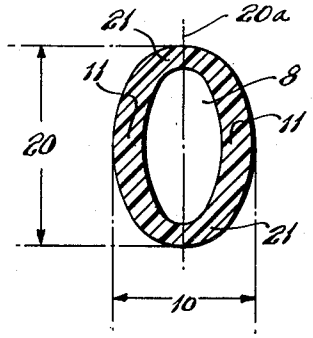


Fig. 4.

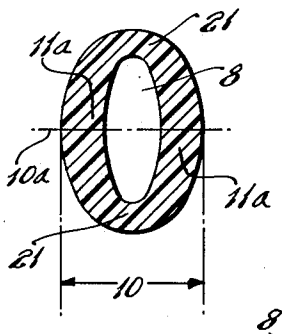
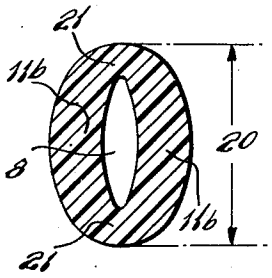


Fig. 5.



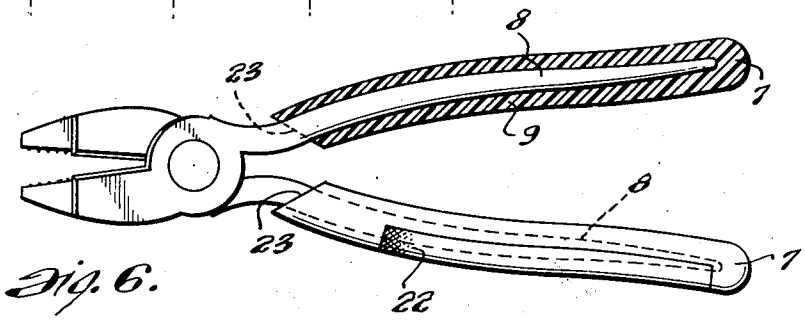


Fig. 6.

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GRIP FOR PLIERS

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1 Claim. (Cl. 16—116)

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This invention relates to a dielectric grip for electrician's or lineman's pliers and for the handles of other tools, especially those used in connection with low- and, particularly, high-tension work.

One important object of the invention is to provide a handle-grip or cover which will afford an improved and firmer hand grasp. The handles of pliers as universally made taper considerably towards their distal ends (for reasons based mainly on production requirements). Yet it will be observed that it is this distal portion of the plier handles which is grasped in the handle. Hand grips as heretofore marketed are made of substantially uniform thickness, so that the combined thickness of the tool handle together with its cover or grip still continues to diminish towards its distal ends. The improved hand-grip of this invention, on the other hand, is not made of uniform wall thickness. Nor is its outer shape tapered towards its distal end (as in a known prior art disclosure). On the contrary, the outer dimensions of the improved grip are constant throughout its entire length. As a result of its constant outer dimensions, the improved grip presents a portion to be gripped by the hand which is of uniform dimension. Additionally, the improved plier grip is of overall dimensions (i. e., in width and thickness) which are very appreciably greater than the uniform-wall thickness type of hand grips as heretofore made.

A second important object of this invention (which cooperates with the provisions pointed out above in connection with the first object, as will be seen) is to provide a hand grip which is more readily attached to the handles of pliers and other tools. This object is partly achieved by providing in the improved device—which, as pointed out above, is of constant outer dimensions throughout—an inner bore which, unlike the outer dimensions, varies uniformly throughout its length. More particularly, the inner bore decreases in cross-sectional area towards the distal end of the grips. The diminishment of cross-sectional area of the inner bore is in conformity with the decrease in dimension of the plier handle in the same direction. Accordingly, the improved grip may be readily attached to the plier handles.

Closely allied with this object is the third important object of the invention, viz., to provide a dielectric grip which will be more firmly secured on the plier handles. This is achieved by making the improved grip of a rigid material which in being attached onto the plier handle is deformed forcibly to the shape or configuration of the handle. I have found that this, and other results, may be achieved by making the improved grip of a plastic material.

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Stopping at this point to recount the provisions of the first three objects of the invention thus far pointed out, it will be seen that the improved grip takes the form of a plastic (rigid) shell having constant outer dimensions but an inner bore which increases in cross-sectional area towards its distal end, and that the tapered plier handle is inserted in the inner bore. The plastic shell is forced onto the plier handle by impact with a mallet or by knocking the end of the grip on a hard surface. The plastic grip is thus forced to deform itself to the configuration of the plier handle, and to bind itself thereto in unyielding securement.

Incidentally, this provides a facile manner of attaching the improved hand grip to the plier handle, which should be noted as an additional achievement of the second enumerated object, viz., ready attachment. Also, the character of the plastic material, which presents a solid hard surface, affords a firmer hand grip which factor should be noted together with the others mentioned above relative to the first object, viz., firmer hand grip.

Additionally, the use of the plastic material enables surface deformations to be provided which furnishes ideal hand gripping properties, as will be more fully described.

To continue with other objects, the fourth relates to the greater dielectric strength of the improved plier grip (which is capable of withstanding 30,000 volts as compared with the 1,200 volts of dielectric grips as heretofore made). This object is achieved chiefly because of these factors: The (plastic) material of which the improved hand grip is made; the increased over-all thickness of the improved hand grip as compared with those heretofore marketed. Additionally, it will be noted that the thickness of the shell constituting the improved device increases towards the distal end of the grip, so that at the distal portion thereof where it is grasped, the improved device presents the greatest dielectric value.

The fifth principal object is the increased strength of the improved grip which results not only from the (plastic) material used, and also from the increasing dimension of the shell wall towards its distal end. That end of the grip terminates in a rounded portion of increased thickness. The thickened end of the improved dielectric grips enters into consideration of the second object above, viz., the manner of attaching the

grip to plier handles, by accepting without ill effects either the impacts of a mallet in forcing the grip on the handle or the impacts of that end, against a hard blow-receiving surface. Incidentally, the increase of plastic material here assures greater dielectric safety at this vulnerable point.

The final principal object of the invention is the increased resistance to wear, due first, to the (plastic) material used, and second, to the increased and more ample dimensions of the improved grip.

For the attainment of the foregoing and such other objects as may appear or be pointed out, I have shown a preferred embodiment of my invention in the accompanying drawing, wherein:

Fig. 1 is a front view of an improved dielectric grip of the invention;

Fig. 2 is a longitudinal sectional view taken on the line 2—2 of Fig. 1;

Fig. 3 is a cross-sectional view taken near the open end of the improved grip, on the line 3—3 of Fig. 1;

Fig. 4 is a similar cross-sectional view but taken substantially at the middle point of the grip, on the line 4—4 of Fig. 1;

Fig. 5 is a third cross-sectional view but taken near the distal end of the grip, on the line 5—5 of Fig. 1; and

Fig. 6 is a front view of a pair of pliers with the improved dielectric grips attached thereto, one of the grips being shown in section.

It has already been explained in the statement of invention that the improved grip is made of a plastic material (for the special reasons mentioned above). I have found ideally suited for these purposes, a plastic material made under the trade-mark "Tenite-2" and comprising mixed cellulose of acetate and butyrate.

The improved plastic grip is of outer oval shape, as clearly seen in Figs. 3–5, and its outer dimensions are constant throughout the length thereof; more particularly, the major dimension 20 (Figs. 3, 5 and 1) and the minor dimension 10 (Figs. 3, 4 and 2) are constant throughout the length of the grip. The walls of the shell—generally designated 9—are of appreciable thickness, so that the outer dimensions 10, 20, are considerable (as, and for the reasons, set out in the foregoing statement of invention).

The inner bore 8, Fig. 2, increases in cross-sectional area from the closed end 7 of the grip towards the open end 6 thereof, so that the inner bore tapers towards the distal end (end 7) of the plier handle, as described in the foregoing statement. A comparison of Figs. 1 and 2, and better, Figs. 3, 4, 5, will reveal that this areal increase of the inner bore is in the minor axis 10A (Fig. 4) and not in the major axis (20A, Fig. 3), and results from an increase in thickness of the two walls 11, 11 in Fig. 3 on either side of the major axis 20A, which increase progressively, 11*a*, 11*a* (Fig. 4) and 11*b*, 11*b* (Fig. 5) towards the distal end (Fig. 5) of the grip.

On the other hand, the two walls 21, 21, Fig. 4, on either side of the minor axis 10A, are of uniform thickness, compared with walls 21, 21*a*, 21*b*, see also Fig. 2. (As a matter of fact, the walls 21, 21 do thicken slightly towards the distal end 7, Fig. 2, as exaggeratedly shown in that figure; the purpose of this is to permit withdrawal of the core in molding the plastic shell.)

It will be observed, from Fig. 3, that the major walls 21, 21 and minor walls 11, 11 are substantially of the same thickness. The reason for this is to present a substantially uniformly thick wall to initial force onto the end of the plier handle, to ease attachment of the improved grip and to avoid initial strains.

One of the broader (major) sides of the improved grip is provided with a knurled or other gripping surface 22, Fig. 1, which is on the outer side of the pliers, as indicated in Fig. 6.

As best seen in Fig. 2, the open end of the grip shell is cut on a bias to present a planar surface 23, in the direction of the major axis, but angularly inclined toward the longitudinal axis or length of the grip. The purpose of this inclined or biased end 23, see now Fig. 6, is that when the improved dielectric grip is driven on the plier handle, as in Fig. 6, more protection or coverage is provided on the outside of the handle, as far up towards the pivotal point as possible, yet allowing the plier to close (because of the absence of material on the inner facing surfaces near the pivot). Hence less metal is exposed, thus adding greater safety against the danger of shock.

I claim:

A dielectric grip to be driven over a plier handle comprising, an elongated shell of molded and hardened, resilient, insulating material, said shell having an outer surface which is oval in cross section, a closed end, and an open end, the length of the shell between said closed and open ends constituting a gripping portion, the major and minor axes of the oval outer surface of said gripping portion being both uniform throughout its length, said shell having an oval inner bore decreasing in cross-sectional area towards said closed end, to provide a shell wall of varying thickness whose thickness increases toward the closed end, said shell wall adjacent either end of the major axis of the bore progressively increasing in thickness toward said closed end, and the wall adjacent either end of the minor axis of the bore progressively increasing in thickness in the same direction but to a much greater degree, both said major and minor shell walls being of equal thickness at the open end of the shell; whereby a plier handle may be partially inserted into said shell bore and the grip driven by sharp blows against the closed end of the shell to a position with the handle fully inserted while deforming the shell to conform to the shape of the handle thereby securely fastening the grip thereon.

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