

June 20, 1961

A. DEL PESCO ET AL

2,989,102

SOFT FACED HAMMER

Filed Feb. 5, 1959

Fig. 1

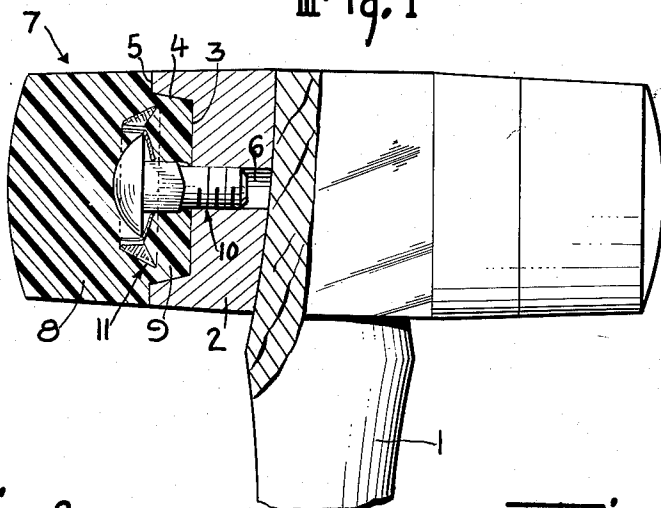


Fig. 2

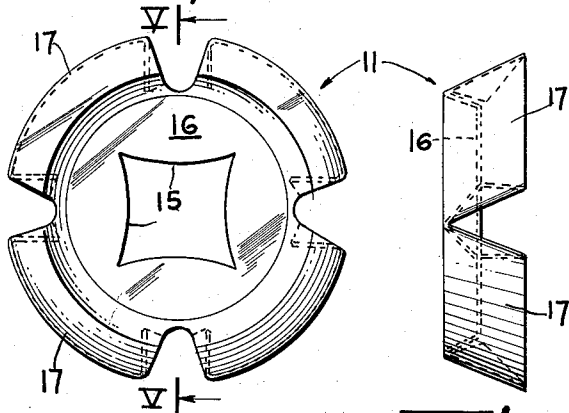


Fig. 4

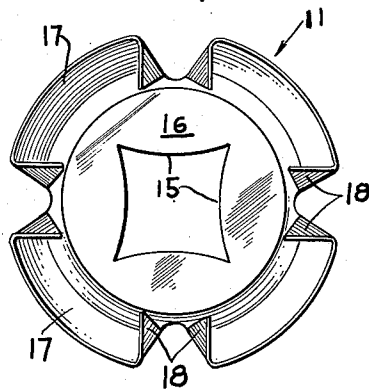


Fig. 3

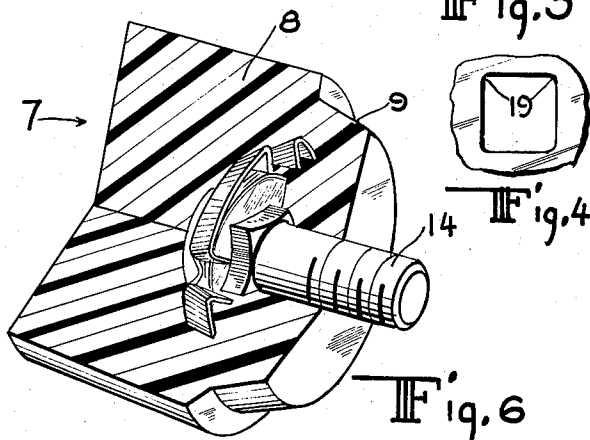
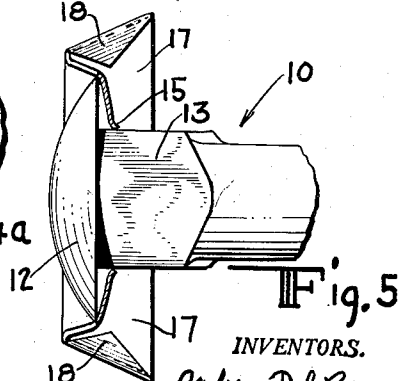


Fig. 6

Fig. 4a



INVENTORS.

BY Andrew Del Pesco
Robert B. Hopgood
Brown & Newland
ATTORNEYS

1

2,989,102

SOFT FACED HAMMER

Andrew Del Pesco, Killingly, Conn., and Robert B. Hopgood, Warwick, R.I., assignors to The Danielson Manufacturing Company, Danielson, Conn., a corporation of Rhode Island

Filed Feb. 5, 1959, Ser. No. 791,294

9 Claims. (Cl. 145—36)

This invention relates to a soft faced hammer, and particularly to the manner in which the percussion face material or "insert" is secured in its socket on the hammer head.

It is an object of the invention to provide securing means which includes a screw threaded stem projecting from the base of the insert and means for anchoring an end of said stem in the percussion face material so that the stem cannot pull out and so that relative rotation of the stem and insert is prevented.

A further object is to provide such means constituted in part by a common and readily available type of bolt and in part by a cooperating element which is simple and inexpensive to make, to assemble with the bolt and to mold into the percussion face material.

Another object is to provide certain improvements in the form, construction and arrangement to the several parts whereby the above named and other objects may effectively be attained.

A practical embodiment of the invention is represented in the accompanying drawings wherein:

FIG. 1 represents a side view of a hammer head, with part of the hammer handle, having percussion faces of relatively soft material inserted in and secured to the sockets thereof, parts being shown in section along the median plane of the hammer head and parts being broken away;

FIG. 2 represents a top plan view of the special washer constituting part of the securing means, on an enlarged scale;

FIG. 3 represents a side (or edge) view of the washer, as viewed from the right of FIG. 2;

FIG. 4 represents a bottom plan view of the washer;

FIG. 4a represents a detail plan view showing an alternative form of washer opening;

FIG. 5 represents a section, e.g., on the line V—V of FIG. 2, showing the washer assembled on a bolt; and

FIG. 6 represents, on a smaller scale, a perspective view of the bolt and washer embedded in the material of the percussion face, parts being cut away.

Referring to the drawings, the hammer is shown as comprising a handle 1 and a head 2 fixed thereon in any customary manner. The head of this type of hammer is normally provided with two oppositely located sockets, one of which is shown at the left of FIG. 1 as having a flat bottom surface 3 and a frusto-conical side surface 4 the top of which intersects a flat annular surface 5. The hammer head is of metal (e.g., ferrous, or an aluminum or zinc alloy) and the maximum diameter of the socket, in the plane of the surface 5, should be about $\frac{7}{8}$ to $\frac{1}{2}$ of the diameter of the head in the same plane to ensure adequate strength in the head around the zone of the socket. The taper of the socket may be about 15° from the axis of the head. In the center of the surface 3 is drilled a hole 6 of any suitable depth and threaded to receive the stem of the insert. A hammer head as just described is conventional.

The percussion face insert, designated generally by the numeral 7, comprises a body of molded plastic material 8 shaped at its base 9 to fit snugly against the surfaces 3, 4 and 5 of the head, and an attaching means which is constituted by the bolt 10 and washer 11. The bolt

2

10 is a "carriage bolt" of appropriate dimensions and materials having a round head 12 and having the stem adjacent the head squared, as shown at 13, the remainder of the stem 14 being threaded to fit the hole or bore 6 in the head.

The washer 11 is formed by stamping from a circular blank having a four-sided opening, the diagonals of which correspond approximately to the diagonals of the squared stem 13 of the bolt, while the sides 15 of the opening are slightly inwardly bowed so that they will be deflected and engage the bolt with an interference fit when the washer is mounted on the bolt (FIGS. 1 and 5) to prevent the washer from moving out of its proper position during the pouring and molding of the plastic material. The washer is centrally dished, as indicated at 16, permitting the bolt head 12 to be as near the base of the insert as possible, and thus leaving the maximum amount of usable percussion face material between the bolt head and the actual percussion face. Outwardly from the rim of the dished part of the washer it is divided into a plurality of downwardly slanting "petals" 17, here shown as being four, separated by radial cuts and having their ends 18 adjacent the cuts bent radially inwardly to lie in planes approximately parallel to the axis of the bolt and passing through or near it. The deviation from parallelism may be considerable so long as the radially inwardly bent ends are more nearly in such planes than in the plane of the washer perpendicular to the axis of the bolt.

An alternative form of washer opening is shown in FIG. 4a, wherein the opening has straight sides with one or more filleted corners 19, the dimensions and tolerances being such that the corner edges of the squared part 13 of the bolt will be forced to cut slightly into the fillets, thus providing an interference fit equivalent to that resulting from the inwardly bowed sides 15. The alternative form just described should be used particularly in cases where the maximum diameter of the bolt threads is such that it would exceed the minimum distances between opposite bowed sides 15; a washer with an opening so formed would tend to damage the threads when it is applied to the bolt, whereas the provision of a square opening with filleted corners overcomes this difficulty.

In the manufacture of the insert, the washer 11 is placed on the bolt 10, as shown in FIG. 5, the bolt and washer assembly being placed in a suitably shaped mold cavity with the threaded stem engaged in an opening thereof, and the cavity is filled with plastic material (e.g., nylon, polyvinyl chloride, rubber or other) in a fluid condition such that it may be caused to embed completely the washer and the head and squared stem of the bolt. The plastic material is then set and cured, according to its nature.

The bolt head and washer are preferably located as near the base of the insert as possible while still serving their purpose of holding the insert securely, yet removably, in the socket of the hammer head. The softness of the blow delivered during use of such a hammer is a function of the resiliency of the percussion face material and the depth of such material in the direction of the blow, hence it is desirable to have the bolt head as far as possible from the percussion face and also to use a relatively small headed bolt (e.g., the bolt head diameter should not substantially exceed one-half the maximum diameter of the insert, and may be nearer one-third in larger inserts). The outwardly extending "petals" or quadrants of the washer substantially increase the effective area of the bolt-washer assembly to resist axial forces tending to separate the plastic material from said assembly and the radially inwardly bent ends 18 firmly prevent relative rotation of the plastic material and the washer which, in turn, cannot rotate around the bolt because of the engagement of the bolt's squared stem 13

with the washer's squared opening 15. As the insert is screwed into the socket the downwardly inclined petals push downward and outward on the material in the base of the insert forcing it strongly against the bottom and sides of the socket. This force, coupled with the inherent resiliency of the percussion face material, frictionally engaging the surfaces 3 and 4, prevents accidental loosening of the insert. Since the maximum exterior diameter of the washer is less than the largest diameter of the socket, with the outer edges of the washer located near or below the level of the top of the socket 5, the downward and outward compressive forces are very effectively concentrated in the part of the insert which lies within the socket.

While the bowed sides 15 (or fillets 19) of the washer opening grip the bolt stem firmly enough so that the washer is retained against the bolt head during manufacture, the washer is thereafter free to move with the adjacent plastic material in response to any shock waves caused by impact of the percussion face on a work object during use, assuming that the impact is heavy enough to project a noticeable wave so deep into the percussion face material. Thus substantially the entire mass of said material, from the actual percussion face to the bottom surfaces engaging the socket, is available for the resilient response to, and dissipation of, shock waves resulting from impact in use.

It will be understood that various changes may be made in the form, construction, arrangement and materials of the several parts without departing from the spirit and scope of the invention.

What we claim is:

1. A hammer head of the character described comprising, a body of rigid material having a socket formed therein, means in said socket for engaging a part of an insert, and an insert of resilient material having engaging means in the insert comprising an element having a stem and a head, part of the stem being non-circular in cross-section, and a washer element fitted on said non-circular part of the stem adjacent to said head and extending laterally beyond the periphery of said head, the washer element and head and adjacent part of the stem being firmly embedded in the resilient material of the insert with the said washer element and head spaced both from the bottom surface of the insert and from the top surface thereof.

2. A hammer head according to claim 1 in which the socket is frusto-conic in shape, in which the base of the insert comprises a complementary frusto-conic extension and in which at least part of the washer element lies within said extension.

3. A hammer head according to claim 1 in which the washer element is dished to form a recess accommodating the head and surrounded by a ridge, in which the part of the washer radially outward of the ridge is divided into downwardly slanted petal-shaped segments and in which parts of said segments are bent toward axial planes, whereby relative rotation of the washer element and resilient material is inhibited.

4. A hammer head of the character described com-

prising, a body of rigid material having a tapering socket formed therein, a threaded hole centrally located in the bottom of said socket, and an insert of resilient material having a tapering base portion adapted to fit in the socket, the insert having a carriage bolt partially embedded in the resilient material with its threaded end projecting axially in a position to be screwed into the hole in the socket, and the insert also having a washer element fitted non-rotatably on the stem of the bolt adjacent the head thereof, said washer element extending laterally beyond the periphery of said head and said element and head being spaced both from the bottom surface of the insert and from the top surface thereof.

5. A hammer head according to claim 4 in which the washer element is dished to form a recess accommodating the head and surrounded by a ridge, in which the part of the washer radially outward of the ridge is divided into downwardly slanted petal-shaped segments and in which parts of said segments are bent toward axial planes, whereby relative rotation of the washer element and resilient material is inhibited.

6. A hammer head according to claim 5 in which the outer edges of the segments are spaced from the bottom of the insert by a distance not substantially greater than the axial depth of the tapering base portion.

7. A hammer head according to claim 4 in which the washer is prevented by the bolt head from moving axially outward with respect to the bolt and in which the washer is held only by frictional engagement with the bolt stem against forces tending to move it axially away from the bolt head.

8. A washer element adapted to fit on the squared stem part of a carriage bolt, the washer having a substantially square central hole at least one side of which is inwardly bowed to provide an interference fit with said squared stem part, the washer being centrally dished to form an upstanding annular wall having a diameter at its base at least as great as the diameter of the bolt head, the part of the washer radially outward of said wall being divided into downwardly slanted petal-shaped segments and parts of said segments being bent toward axial planes.

9. A washer element adapted to fit on the squared stem part of a carriage bolt, the washer having a substantially square central hole at least one corner of which is inwardly filleted to provide an interference fit with an edge of said squared stem part, the washer being centrally dished to form an upstanding annular wall having a diameter at its base at least as great as the diameter of the bolt head, the part of the washer radially outward of said wall being divided into downwardly slanted petal-shaped segments and parts of said segments being bent toward axial planes.

References Cited in the file of this patent

UNITED STATES PATENTS

2,596,780	Meyers et al.	May 13, 1952
2,601,294	Jahn et al.	June 24, 1952

FOREIGN PATENTS

721,679	Great Britain	Jan. 12, 1955
---------	---------------------	---------------