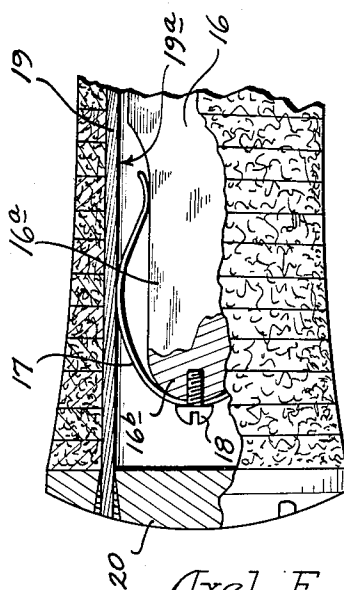
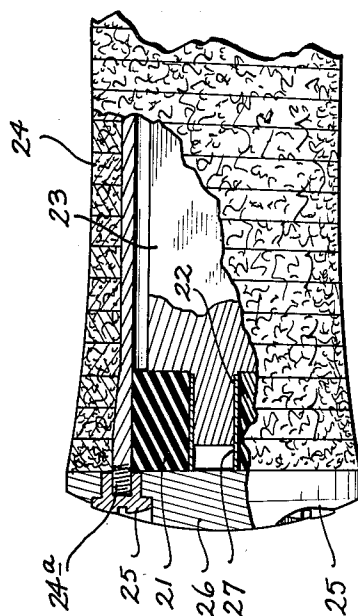
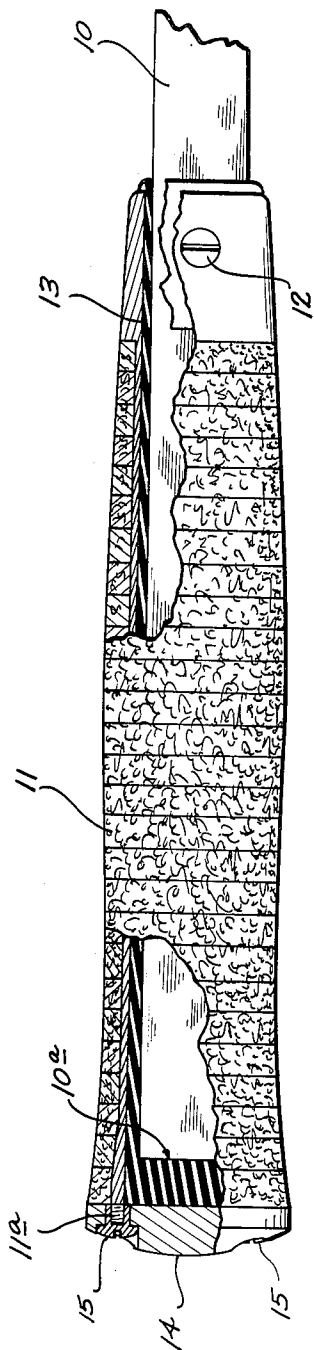


Filed Jan. 10, 1948

HAMMER HAVING SHOCK ABSORBING HANDLE

2 SHEETS--SHEET 2



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2,603,260

HAMMER HAVING SHOCK-ABSORBING
HANDLE

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Application January 10, 1948, Serial No. 1,555

4 Claims. (Cl. 145—29)

1

My invention relates to striking tools, and is illustrated as being incorporated in a hand hammer. The object of my invention is to reduce shock incident to the use of a steel shanked handle which is integral with the striking end of a hammer or other striking tool.

At the present time, hammers are on the market in which the handles or shanks are steel and integral with the hammer head, and they are provided with a grip made of some non-metallic substance such as leather. A workman, in using such a steel shanked hammer, however, becomes tired because of the strain on the workman's arm and the shock incident to resisting repeated blows struck by the hammer.

My invention is attained by making a hammer or other striking tool with a head and an integral steel shank and encompassing said shank with a tubular grip, which is pivotally joined to the shank at a point spaced substantially from the butt end of the latter so that said hammer has a fial-like action. Separating said tubular grip and the shank of said handle is an elastic medium, such, for example, as a tubular section of rubber, which bears tightly against the bore of said grip and the external surface of said shank. Preferably, said elastic spacing medium is made in a plurality of annular courses, spaced apart. One of said courses should be arranged adjacent the pivotal connection between the grip and the shank of the hammer, and another of said courses should be arranged adjacent the butt end of the grip. Said elastic media, thus separated, spaces said handle or shank of the hammer from said grip and absorb shock incident to the striking of the hammer. In this way, shock is absorbed and is not transmitted to the hand of the workman.

A further and more specific object of my invention is to provide a hammer of this character in which the parts are pivotally joined together, the butt end of said grip has an end cap removably secured to the grip, and an elastic bumper is compressibly arranged between said cap and the end of the shank or handle of said hammer to resist longitudinal movement of said shank or handle within said grip.

A further and more specific object of my invention is to provide a simple structure, in a device of this character, in which the parts may easily be replaced if worn, broken or impaired in their function.

Further and other details of my invention, and the mode of construction and operation thereof, are hereinafter described with reference to the accompanying drawings, in which:

Fig. 1 is an elevation of a hand hammer embodying my invention, portions of the grip and end cap thereof being shown broken away to disclose details of construction;

Fig. 2 is a sectional view taken on the line 2—2

2

in Fig. 1, with other portions shown broken away to illustrate the manner in which the grip and the shank or handle of the hammer are joined together by a pivotal connection, said parts being spaced apart by an annular, elastic spacing element;

Fig. 3 is an end elevation of the end cap for a hammer embodying my invention, shown detached from the grip and the handle of said hammer;

Fig. 4 is a transverse view taken on the line 4—4 in Fig. 1, illustrating the manner in which the butt end of the hammer shank or handle is constructed;

Fig. 5 is a fragmentary elevation of a hammer handle with a modified type of grip and spacing member separating said grip from the handle or shank of a hammer or other striking tool;

Fig. 6 is a smaller fragmentary section of the butt end of a still further modification of my invention, illustrating the manner in which a flexible steel spring may be substituted for rubber or other elastic material, as in the previous modifications; and

Fig. 7 is a fragmentary elevation, with portions shown broken away, of a still further modification of my invention, in which the end cap may be detachably secured to the butt end of the hammer handle and the encompassing grip therefor.

Referring, first, to the embodiment of my invention illustrated in Figs. 1 to 4, inclusive:

A striking tool embodying my invention is illustrated as a hammer having a striking head 1, comprising a striking face 1a and claws 1b. The shape or form of the striking head is of little importance. It may be a carpenter's hammer, a machinist's hammer, a hatchet, axe, or any other type of striking tool. In any event, said striking head is usually elongated so that the mass thereof may be utilized efficiently to drive a nail, strike an object, or to cut material, depending upon the shape and use to which said head is put. That is to say, the plane of the striking action extends normal to the face 1a, and said plane would lie parallel with the plane of the drawing, as is shown in Fig. 1.

Integral therewith or securely attached to said head is a shank or handle 2. Said shank or handle is elongated and usually is made of small cross-sectional area, compared to that of the head, so as to give the latter good striking qualities. Encompassing said shank or handle is a tubular grip 3 extending from the butt end 2a of the shank or handle a substantial distance. Usually the portion of the shank or handle immediately adjacent the head is not sheathed by said tubular grip. The length of said grip is dictated by convenience and by the balance of said hammer. Said grip comprises a metallic tube 3a, with a nonmetallic gripping surface pref-

3

erably provided by a series of abutting leather annuli 3b secured thereto. The forward end 3c of said metallic tube preferably is uncovered by said annuli and is of substantially thicker section, as is shown in Fig. 1. Extending through said forward end is a bolt 4, or other connection, which provides a pivotal connection between said grip at its end adjacent the striking head 1 of the hammer and the shank or handle. As is shown in Fig. 2, this connection may be made by an interthreaded machine screw, which provides a secure joint but one which may easily be replaced or removed to permit repair or replacement of the parts secured to each other by said bolt.

The bore of said tubular grip is larger than the cross-sectional periphery of the shank or handle, although said parts conform more or less in outline. Lying between said shank or handle and said grip is an annular elastic member or first resilient spacer 5. Rubber is a very desirable material of which to make said member, but any material having similar characteristics may be used. It is to be noted that said elastic member extends beyond the forward end 3c of the tubular grip, and said elastic member is compressed substantially when the parts are fitted together. This tends to provide the necessary cushion between the shank and said grip, and also tends to provide a dirt and water seal so as to prevent water or foreign material from moving down said shank and into the bore of said grip. The bore of said grip is tapered, diverging toward the butt end thereof, as is shown in Fig. 1. That is to say, there is greater space between the bore of said grip and the periphery of the shank at the butt end of the handle or shank than at the forward end 3c of said grip. Said taper permits the parts to become separated more easily when the bolt 4 is removed for repair or replacement of the parts of said striking tool.

The butt end 2a of the shank or handle is relieved and an annular bumper or second resilient spacer 6 is fitted thereon. The periphery of said bumper engages the bore of the tubular grip, and it is desirable that said bumper be fitted tightly in place and be subject to substantial compression when fitted in place. Over the butt end 3d of the grip, I provide a metallic cap 7. The metallic tube is extended at 8—8a to form two projecting nibs, and registering slots 7a are adapted to register therewith and to slide thereover. Said nibs may then be upset, riveted or welded therein, as is shown in Fig. 1, so that said cap fits tightly against the butt end of the grip and against the outer annulus secured thereto.

It is preferable that the bumper 6 be of such length as to be subject to longitudinal compression when the cap is fitted as is shown in Fig. 1. This crowds said bumper and compresses it, and causes it to fill the entire space about the reduced butt end and to lie closely within the bore of the metallic tube 3a and against the inner face of said cap 7. The compression of said bumper serves, also, as a seal to prevent moisture and foreign matter from passing from the butt end into the space between the shank and the bore of the tube. It performs another valuable function: It serves as an elastic bumper to absorb end play of the shank or handle within the tubular grip 3. Also, the butt end of the grip is frequently used by carpenters and other workers for tamping. Said rubber bumper serves to prevent the parts from separating or becoming loose, if said tamping action tends to distort or loosen the parts.

4

I preferably provide a ferrule 9, surrounding the reduced butt end of the shank or handle and lying within the bore of the bumper 6 which is annular, conforming in peripheral outline to that of the bore of the tubular grip 3. Said ferrule tends to prevent the bumper from crushing down about the reduced end, which does not extend to the inner face of the cap, as is shown in Fig. 1.

Next, referring to the modification shown in Fig. 5:

In this modification, the shank or handle 10 of a hammer or other striking tool is the same as in the first embodiment, as is the grip 11 and the pivotally mounted fastening bolt 12. In this modification, however, I provide an annular elastic sheathing member or resilient spacer 13, which extends completely about the bore of the grip 11 and about the underlying portion of the shank or handle. Said annular elastic sheathing member extends from a point slightly forward of the grip 11, and extends completely about the shank or handle, even about the butt end 10a thereof. In this modification, I have illustrated how the end cap 14 may more easily be removed from the grip. This is provided by extending nibs or tongues 11a outwardly from the grip and threading them. Hollow shank machine screws 15 may be threaded on to said nibs or tongues to hold said end cap tightly against and in compressive relationship with that portion of the annular elastic sheathing member which lies rearwardly of the butt end of the shank or handle 10. This induces compression in said portion of the sheathing member to resist end thrusts between the shank and said grip.

Referring, next, to the modification shown in Fig. 6:

In this modification, the butt end 16a of the shank or handle of a striking tool is relieved and provided with a rounded end 16b. A U-shaped, flexible steel spring 17 encircles said reduced end and is secured thereto by a screw 18. The legs of said spring are bowed outwardly and bear against the bore 19a of the tubular grip 19. Said flexible steel spring serves to absorb shock and, elastically, to space the end of said shank or handle from the grip thereof in a manner similar to the bumper 6 in the first embodiment and the annular elastic sheathing member 13 in the modification shown in Fig. 5. It is not, however, susceptible of resisting end play, as are said elastic members previously described, nor does it seal the butt end of said shank or handle within the overlying portions of the grip or with the end cap 20.

In the modification illustrated in Fig. 7, I illustrate a bumper 21, similar to the bumper 6 in Fig. 1, mounted upon the reduced portion 22 of the butt end of the shank or handle 23. The grip 24 has threaded extensions 24a formed thereon for receiving hollow shanked machine screws 25 for holding end cap 26 upon the tubular grip 24. Said machine screws and their threaded connections with extensions 24a tend to cause the end cap to be pulled tightly against the grip and to compress said bumper between the butt end of the shank and the inner face of the end cap 26. A ferrule 27, similar to the ferrule 9 in Figs. 1 to 4, tends to prevent said bumper from collapsing about the reduced portion 22 of the shank, which is spaced from the inner face of the end cap 26.

A striking tool embodying my invention operates as follows:

As has been pointed out, a hammer is adapted to be swung in a plane parallel to the plane of Fig. 1 of the drawings, and because of the pivoted

connection between the shank and the grip, it has a limited, flail-like action. That is to say, the pivoted connection between said shank and said grip is adapted to permit limited angular movement between said shank and said grip upon an axis extending through the pivoted connection. Said axis extends normal to the plane of the striking action. The pivot axis extends crosswise through said shank normal to, but spaced from, the longitudinal dimension of the elongated striking head 1. As is noted in Fig. 2, the connection between the bolt 4 and the grip 3 is somewhat loose, and, in any event, is freely journaled. Thus, when the face of the striking head strikes a nail or other object, it is abruptly stopped, and, where it not for the elastic and pivoted arrangement of the parts, it would send a shock wave through the shank or handle into the hand of the workman wielding said striking tool. The articulation about the pivot absorbs part of this shock, and a substantial part of the remainder is absorbed by the elastic sheathing lying between the shank or handle and the bore of the grip. Said elastic sheathing is wedged quite tightly in place, and thus there is no feeling of looseness between the shank and said grip, but yet the elasticity or compressibility of said sheathing absorbs and dampens said shock wave. Because of the elasticity of said sheathing, the shank or handle is centered in the bore of the grip, and after absorbing said shock, it is returned to its normal position. The rubber bumper 6 likewise absorbs any end play or endwise shock, and returns the shank to the position shown in Fig. 1 when shock or pressure has subsided. I have found that if two of said annular shock absorbing elements are provided, one adjacent the axis of the bolt 4 and another adjacent the butt end of the grip and handle, said materials are efficiently disposed, and if made of rubber or similar material, they are adequate for the purpose of absorbing shock and centering said shank.

In resisting heavier shocks and to provide a tighter fit between the shank and the grip, I provide the continuous sleeve-type annular elastic sheathing member, as in Fig. 5. Said continuous sheathing also prevents any foreign material seeping into and lodging between the external surface of the shank and the bore of the grip, because said sheathing occupies the entire space between said parts. If sealing is unimportant, shock may be absorbed by flexible leaf springs, as is shown in Fig. 6, and if it is necessary to replace the shock absorbing bumper 21, this may be accomplished by the provision of a screw joint, as is shown in Fig. 7. The provision of screws, as in Fig. 7, may permit the bumper 21 to be replaced by removing the end cap 26, while the replacement of the elastic sheathing and shock absorbing members in Figs. 1 and 5 requires the grip to be removed to replace said parts.

As I have pointed out, my invention is adapted to be used with any type striking tool, whether it is for hammering, chipping, cutting, abrading, or any other function involving the striking of a blow by a tool, which shock may be transmitted from the head, through the handle or shank thereof, to the hand of the workman using said tool, and a hammer is shown only for the purpose of illustration.

I claim:

1. A striking tool, comprising an elongated handle having a butt end and a striking end, an elongated striking head carried by said striking end and defining therewith a striking plane, a resilient spacer girding said striking end but spaced from said head, a hollow grip member encompassing said spacer and said handle but spaced from the latter, and a pivotal connection lying perpendicular to said striking plane and piercing said grip, spacer, and handle.

2. A striking tool, comprising an elongated handle having a butt end and a striking end, an elongated striking head carried by said striking end and defining therewith a striking plane, a resilient spacer girding the entire length of said handle from said butt end to said striking end but terminating at a point short of and spaced from said head, a hollow grip member encompassing said spacer and said handle but spaced from the latter, and a pivotal connection lying perpendicular to said striking plane and piercing said grip, said spacer, and the striking end of said handle.

3. A striking tool, comprising an elongated handle having a butt end and a striking end, an elongated striking head carried by said striking end and defining therewith a striking plane, a first resilient spacer girding said striking end but spaced from said head, a second resilient spacer girding said butt end, a hollow grip member encompassing both of said spacers and said handle but spaced from the latter, and a pivotal connection lying perpendicular to said striking plane and piercing said grip, first spacer, and handle.

4. A striking tool, comprising an elongated handle having a butt end and a striking end, an elongated striking head carried by said striking end and defining therewith a striking plane, a first resilient spacer girding said striking end but spaced from said head, a second resilient spacer girding said butt end and extending longitudinally therebeyond in a direction away from said striking end, a hollow grip member encompassing both of said spacers and said handle but spaced from the latter, an end cap detachably secured to that end of said grip which encompasses said second resilient spacer, said end cap being spaced from the butt end of said handle but being in abutment with said second resilient spacer, and a pivotal connection lying perpendicular to said striking plane and piercing said grip, first spacer, and handle.

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