Aug. 10, 1954 A. G. FORD 2,685,874

SAFETY ATTACHMENT FOR PNEUMATIC DEVICES

Filed Nov. 8, 1951

Fig. 1

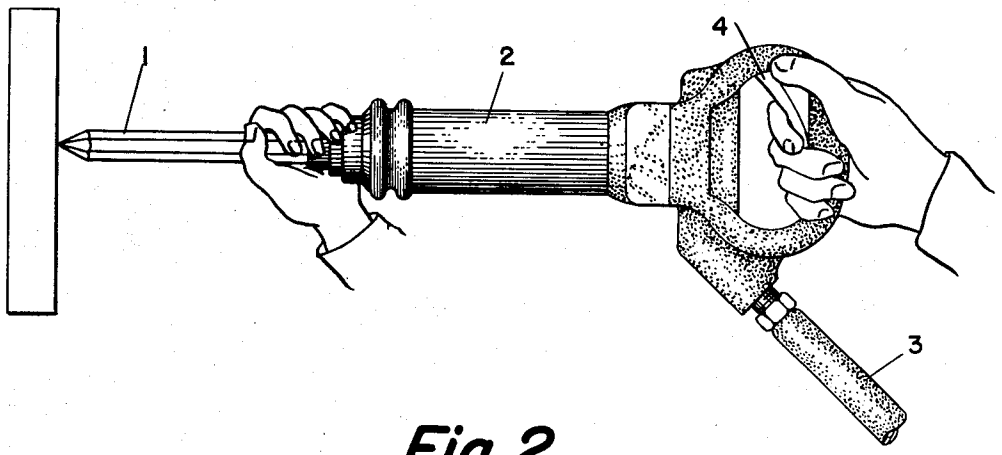
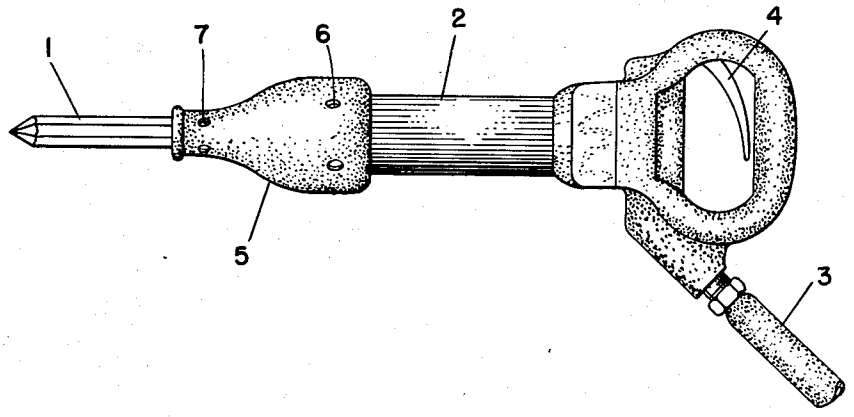


Fig. 2



INVENTOR.
ADRIAN G. FORD
BY Norbert E Birch
ATTORNEY

Patented Aug. 10, 1954

2,685,874

UNITED STATES PATENT OFFICE

2,685,874

SAFETY ATTACHMENT FOR PNEUMATIC DEVICES

Adrian G. Ford, Drexel Hill, Pa., assignor to The Atlantic Refining Company, Philadelphia, Pa., a corporation of Pennsylvania

Application November 8, 1951, Serial No. 255,479

3 Claims. (Cl. 125—33)

1

This invention relates generally to pneumatic devices and especially pneumatic tools such as pneumatic riveters, hammers, chisels, etc. More particularly, this invention relates to a safety attachment for pneumatic devices.

Pneumatic devices of many types are employed by nearly all industries. This invention is primarily concerned with those pneumatic devices which can be carried from place to place by the operator and which weigh between about 20 and 50 pounds. Such devices are employed when it is impractical or impossible to remove the object to be worked upon to a machine shop. These types of devices can be adapted to perform a variety of functions, such as riveting, hammering, chiseling, chipping, cutting, or gouging metal or refractory surfaces.

A pneumatic device of this general type is shown in Figure I and, although the instant invention is by no means limited to this specific tool, the invention can be aptly illustrated thereby. In Figure I, 1 is the tool shaft which is to directly perform the work upon a desired object and one end of this tool shaft extends within the housing chamber 2. A conventional motor mechanism (not shown) located within housing chamber 2 imparts periodic hammer-like blows to the end of the tool shaft 1, which is within the housing chamber 2. These blows are in turn transmitted to the opposite end of the tool shaft which is to perform the desired work. In operation, therefore, the tool shaft 1 is caused to move in and out of the housing chamber in a continuous pulsating manner. The motor mechanism is usually actuated by high pressure air admitted through line 3 when the operator manipulates the trigger switch 4. The tool shaft 1 can be easily inserted or withdrawn from housing chamber 2 at any time since this shaft is not rigidly fastened to any portion of the housing chamber.

Although pneumatic devices of the type discussed here are portable as opposed to being fastened in one particular location, they are nevertheless heavy enough that the operator needs to grasp the device with both hands in order to properly perform the desired work. For instance, as is illustrated in Figure I, when cutting or riveting a vertically disposed metal surface, the left hand is usually placed in the position shown to support part of the weight of the tool and to guide the tool shaft to the exact spot which is to be worked upon. The tool shaft itself is usually composed of a high quality metal or metallic alloy of the appropriate thickness,

2

but it occasionally happens that a severe or sudden stress upon the shaft will cause the shaft to break. Since the operator must necessarily exert some force upon the handle of the pneumatic device while it is in operation, a sudden unexpected break in the tool shaft will almost always result in an immediate uncontrollable lurch of the entire pneumatic device toward the metallic surface being worked upon. When this occurs, the operator's left hand will be crushed between the left hand extremity of the housing chamber and the metallic surface being worked upon. Such accidents are particularly dangerous if the tool shaft breaks at the point where the operator has placed his hand since there is a good possibility that the hand will be impaled between the broken end of the shaft and the area being worked upon.

Such a hazardous condition is highly undesirable and it is therefore an object of this invention to provide a safety attachment which will protect the hands of the operator in the event the tool shaft breaks during operation.

It is a further object of this invention to provide an attachment for a pneumatic device which will enable the operator to obtain a secure grip on the tool and at the same time maintain better control for guiding the tool to the desired work area. It is still a further object of this invention to provide an attachment which will have a tendency to retain the tool shaft and associated parts within the main housing chamber.

One embodiment of the safety attachment encompassed within the scope of the instant invention is shown in Figure II. In essence this safety attachment 5 comprises an envelope of elastomeric or rubber-like material, preferably oil resistant natural or synthetic rubber. The safety attachment may be cylindrical or conical in shape, or partially cylindrical and partially conical as is shown in Figure II. The safety attachment may be of any desired thickness, although it has been found that a $\frac{5}{16}$ inch thickness affords a good cushioning effect, long durability, and permits easy assemblage and removal from the pneumatic device. One end of this attachment fits snugly over one end of housing chamber 2 and the other end of the attachment fits snugly around a portion of the tool shaft 1. This safety attachment may be constructed so that it will cover any desired portion of the tool shaft 2, but it is only necessary to cover that portion of the tool shaft upon which the operator might place his hand. When the pneumatic device is being cleaned or repaired the safety at-

tachment can be quickly and easily removed since it is only retained in position by the elasticity which it possesses. Holes or perforations appropriately located in the safety attachment, such as those shown as 6 and 7 in Figure II, are highly desirable since they facilitate installation and removal of the safety attachment by avoiding suction and vacuum effects.

It has been found that when these safety attachments are employed in conjunction with pneumatic devices, accidents due to crushed fingers are entirely eliminated. When the tool shaft breaks, with the concomitant unavoidable lurch of the pneumatic device toward the area being worked upon, the rubber safety attachment absorbs the force of the forward movement of the device against the area being worked upon, so that at worst the operator's fingers are merely gently pinched between rubber safety attachment and the area being worked upon, rather than being mashed or crushed as was heretofore the case.

Although the drawings and the above specification disclose a highly suitable mode in which I have contemplated embodying my invention, I desire in no way to be limited to the specific details of such disclosure, for in the further practical application of my invention many changes in the shape and construction and configuration may be made by those skilled in the art as circumstances require or experience suggests without departing from the spirit of the invention within the scope of the appended claims.

I claim:

1. In a manually supportable pneumatic device comprising a tool shaft, a non-reciprocating housing chamber which contains one end of said shaft and a motor mechanism to motivate said shaft, the improvement consisting of a safety attachment comprising an envelope of elastomeric rubber-like material having an opening in one end thereof of about the same shape and cross-sectional area as the pneumatic tool shaft and an opening in the other end thereof of about the same shape and cross-sectional area as the housing chamber the latter mentioned end of said envelope being in much tighter engagement with the area it surrounds than is the first mentioned end of said envelope with the area which it surrounds.

2. In a manually supportable pneumatic device comprising a tool shaft, a non-reciprocating housing chamber which contains one end of said shaft, a motor mechanism to motivate said shaft, the improvement consisting of a safety attachment comprising an envelope of elastomeric rubber-like material which envelops an areas between an intermediate portion of the tool shaft and a portion of the housing chamber the end of said envelope which surrounds a portion of the housing chamber being in much tighter engagement than the end of said envelope which surrounds a portion of the tool shaft.

3. In a manually supportable pneumatic device comprising a tool shaft, a non-reciprocating housing chamber which contains one end of said shaft and a motor mechanism to motivate said shaft, the improvement consisting of a safety attachment comprising an envelope of elastomeric rubber-like material having an opening in one end thereof of about the same shape and cross-sectional area as the pneumatic tool shaft and an opening in the other end thereof of about the same shape and cross-sectional area as the housing chamber, the latter mentioned end of said envelope being in much tighter engagement with the area it surrounds than is the first mentioned end of said envelope with the area which it surrounds, and said safety attachment containing perforations intermediate the ends thereof to facilitate installation and removal from the pneumatic device.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
840,891	Adams	Jan. 8, 1907
1,853,128	Hysing	Apr. 12, 1932
2,117,880	Goddard	May 17, 1938