United States Patent [19]

Krieger

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[54] **TOOL SILENCING MEANS**

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[52] **U.S. Cl.** ..... **181/33 K,** 181/36 A
[51] **Int. Cl.** **E04b 1/99,** G10k 11/04
[58] **Field of Search** ..... 181/33 K, 36 A, 60, 181/61; 173/90-93, 128-133

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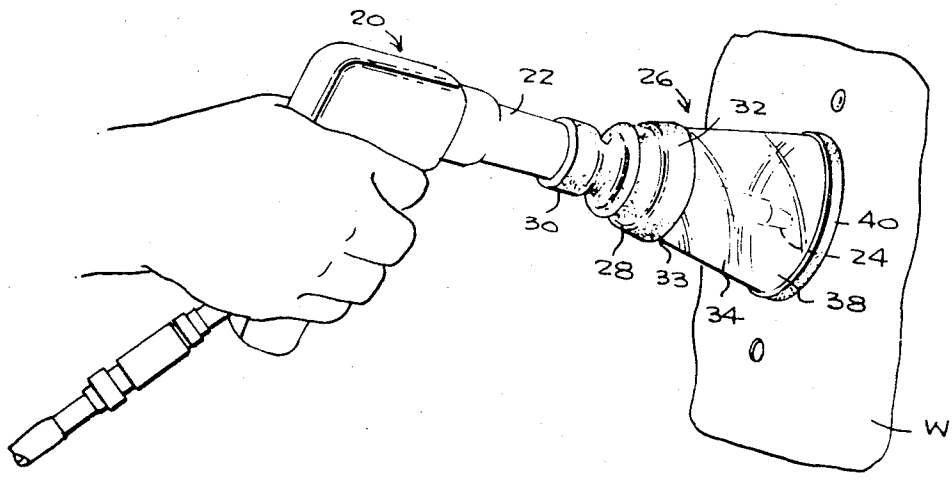
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[57] **ABSTRACT**

A noise inhibitor for a rivet gun is disclosed comprising a hollow flexible elastic coupling sleeve having one end stretchably fitted over a portion of the gun casing, a concial transparent body tube is received in the other end of the coupling sleeve and a cushion member in the form of a soft rubber tube is fitted over the opposite end of the conical body tube to engage the work being riveted with the impact member of the rivet gun being positioned in the transparent body tube so as to be visible by the user; in another embodiment, the conical body tube and rubber sleeve members are oblong conical configuration and are dimensioned to fit over a rivet bucking bar having an impact surface visible through the transparent body tube so that in both embodiments the working surface is visible; however, noise emanating from the working surface components is substantially dissipated.

15 Claims, 6 Drawing Figures



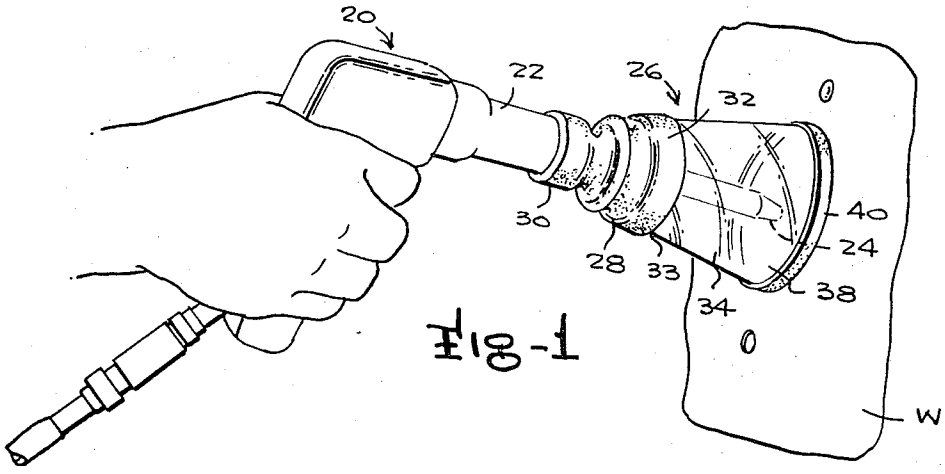


Fig-1

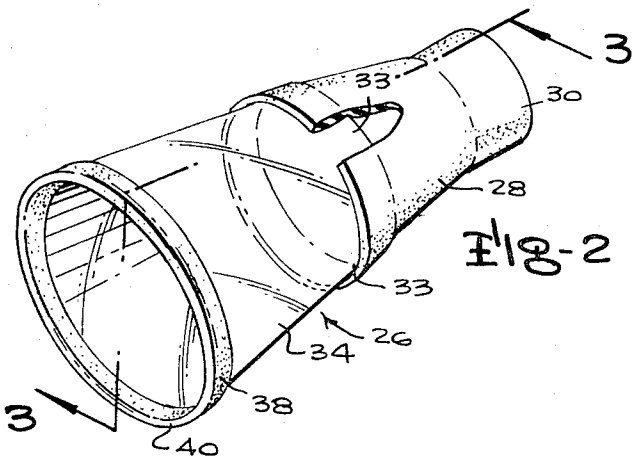


Fig-2

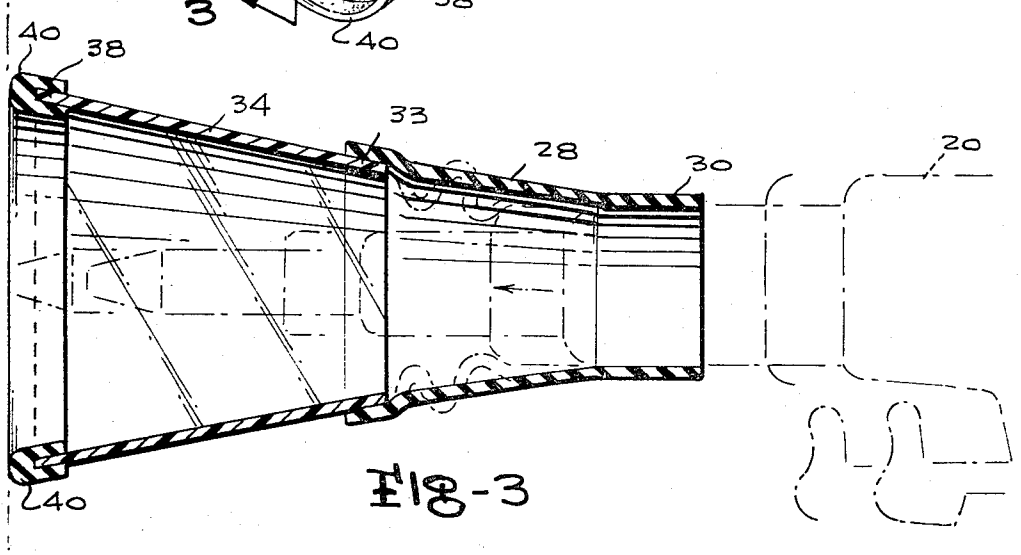
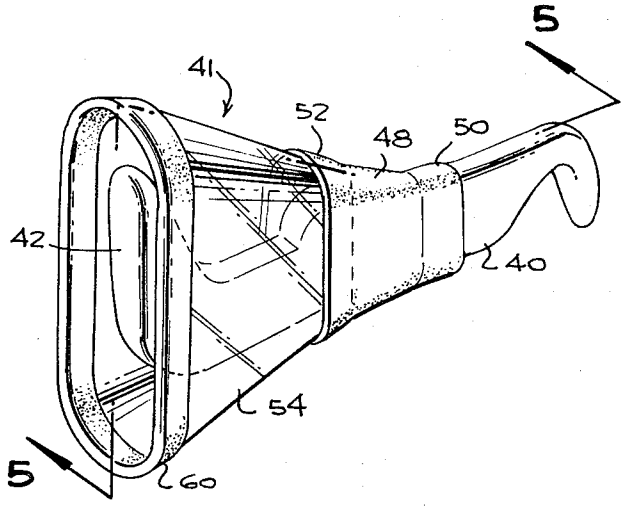


Fig-3

Fig-4



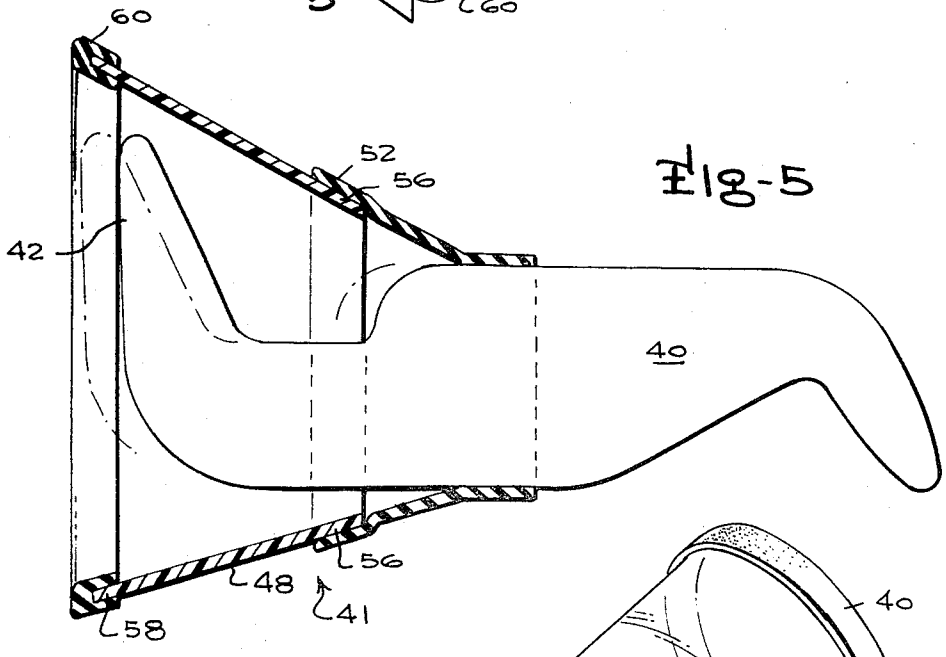


Fig-5

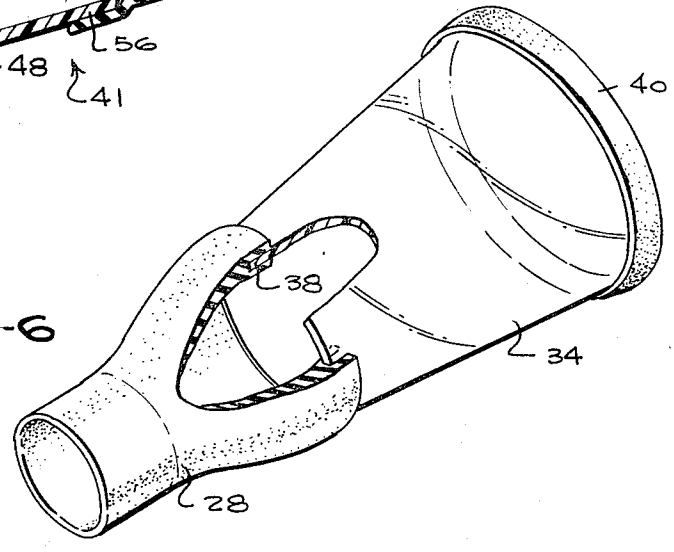


Fig-6

TOOL SILENCING MEANS

This invention is in the field of noise inhibiting and suppressing means and is specifically directed to means for substantially reducing the noise emanating from a hand-held tool such as a rivet gun or rivet bucking bar or the like.

That physical and emotional damage and strain are caused by high intensity noise of the type frequently inherent in manufacturing operations has been clearly established; consequently, numerous federal and state regulations have evolved requiring noise reduction and/or the wearing of protective noise reducing ear coverings and the like by persons subjected to high noise levels. Obviously, the wearing of protective ear coverings is quite inconvenient and there is an unfortunate, but understandable, human tendency to neglect to wear such incumberances. Moreover, the cost of protective ear coverings is substantial and is a recurring expense due to the nature of such items which are susceptable to loss, damage and general wear and tear. It is therefore much more desirable to achieve conformance with the state and federal noise level regulations by reducing the noise per se rather than through the provision of protective safety equipment to be worn by those subjected to high noise levels.

Manufacturing operations employing rivet guns and the like develop a very high noise level and, up until the present invention, no known device has evolved for satisfactorily reducing this noise level. The problem has remained unsolved notwithstanding the fact that substantial efforts have been exerted in an effort to reduce such high noise levels. One aspect of the problem resides in the fact that rivet guns come in various sizes and shapes and it is necessary for the operator of a rivet gun to be able to view the impact member portion of the gun during a riveting operation. Consequently, it is essential to any satisfactory solution of the noise reduction problem for rivet guns that any device constituting the solution be of substantial versatility in order to be usable with the wide variety of gun shapes and sizes presently employed and be capable of operating without interfering with the riveting function in all operations. Similar problems occur in connection with the operation of a rivet bucking bar which comprises a relatively large hand-held metal member which is subjected to substantial impact during a riveting operation. The bucking bar creates a substantial amount of noise and the reduction of this noise has been a substantial problem up until the time of the present invention. The problem is quite similar to that of noise reduction in rivet guns per se in that it is usually essential that the impact area of the bucking bar be visible by the user at all times during a riveting operation.

Therefore, it is the primary object of this invention to provide a new and improved means for reducing the noise emission level from a hand-held tool.

Another object of the invention is the provision of a new and improved means for reducing the noise emission from a rivet gun.

A further object of the invention is the provision of new and improved means for reducing noise emission from a rivet gun bucking bar.

Achievement of the objects of this invention is enabled through the provision of a noise inhibitor comprising a hollow flexible elastic coupling sleeve made up of flexible rubber or the like and dimensioned on one end to be matingly and stretchably received over the casing of a rivet gun. The other end of the elastic coupling sleeve is received over the end of a conical transparent plastic body tube flaring outwardly from the coupling and having a flexible rubber cushion in the form of an annular ring on its outermost end. The rubber cushion on the end of the body tube is engageable with the work with the impact member of the rivet gun being visible by the user within the confines of the transparent body tube.

In another embodiment, the elastic coupling is dimensioned to be received over the body portion of a rivet bucking bar with the main body tube being similarly formed of transparent plastic flaring outwardly in a conical manner and having a cushion means on its outermost end. However, in the last-mentioned embodiment, the body tube flairs outwardly in an oval conical configuration rather than a regular conical configuration.

A better understanding of the manner in which the preferred embodiment of the subject invention achieves the objects of the invention will be enabled when the following written description is read in conjunction with the appended drawings in which:

FIG. 1 is a perspective view of a hand-held rivet gun on which a noise inhibitor comprising the first embodiment of the invention is mounted;

FIG. 2 is a perspective view of the noise inhibitor of FIG. 1;

FIG. 3 is a sectional view taken along lines 3—3 of FIG. 2;

FIG. 4 is a perspective view of a noise inhibitor guard means comprising the second embodiment of the invention which is mounted on a rivet bucking bar;

FIG. 5 is a sectional view taken along lines 5—5 of FIG. 4; and

FIG. 6 is a side elevational view of an alternate form of the invention with parts broken away for clarity.

Turning first to FIG. 1, it will be seen that a hand-held rivet gun 20 is disclosed and includes a casing 22 and an impact or hammer member 24 which is power actuated by compressed air or the like in a conventional manner for effecting a riveting operation.

A first embodiment of the invention generally designated 26 is illustrated in conjunction with rivet gun 20 with the first embodiment being connected to the casing 22 of the rivet gun by means of a hollow flexible elastic coupling sleeve 28 having a first end 30 stretchingly fitted about the periphery of the casing 22 of the rivet gun rearwardly of the area of the gun from which the impact member 24 extends. The hollow flexible coupling sleeve 28 has a second end 32 stretchably engaged with a first or inner end 33 of a hollow body tube member 34. Hollow body tube member 34 is formed of transparent plastic material such as material marketed by the General Electric Company under the trademark LEXAN and is of conical shape flaring outwardly from its first or innermost end 33 to its outer or second end 38.

The outermost end 38 of the transparent hollow body tube 34 is provided with a ring-like cushion means in the form of an annular rubber tubular sleeve member 40 stretchably fitted over the outer end and positioned radially from the end of the impact tool member 24. In operation, the impact tool member is positioned to engage the rivet being riveted with the cushion member 40 engaging the surface of the work W adjacent the

rivet and with the impact tool member clearly visible through the transparent body tube **34**. Sleeve **28** is flexible as shown in FIGS. **1** and **3** so as to permit an easy manipulation of the impact member **24** into operative engagement with the rivet to be riveted. Noise inherent in the riveting operation is substantially muffled by the inventive device without impairing the speed or efficiency of the riveting operation.

Another embodiment of the invention generally designated **41** is illustrated in FIG. **4** in conjunction with a bucking bar **40** having a working surface comprising an impact receiving force absorbing anvil area **42**. The second embodiment **41** comprises a noise inhibitor quite similar to the first embodiment and which includes a hollow flexible coupling sleeve **48** with a first end **50** and a second end **52** with the first end **50** being stretchably received about the body of the bucking bar. A hollow body tube member **54** of oblong conical shape formed of transparent plastic identical to the material employed in the body tube **34** of the first embodiment has a first end **56** and a second end **58** with the first end **56** having the second end **52** of the coupling sleeve stretched about its periphery. The second or outer end **58** of the body tube is provided with a cushioning means in the form of a soft rubber sleeve **60** having an annular slot fitted over end **58** in a manner essentially identical to the cushioning member employed with the first embodument. The hollow body tube **54** and sleeve **60** are of oval conical configuration. Coupling sleeve **48** is formed of soft, flexible, live rubber as is coupling sleeve **28** of the first embodiment.

Either a circular conical configuration or oval conical configuration or other variations can be employed in forming the body tube, coupling sleeves and cushioning means of either of the embodiments.

In like manner, the manner in which the flexible coupling sleeve is connected to the plastic body tube can be varied so as to employ an inwardly extending annular groove on the end of the flexible member **28** in which the end **38** of body tube **34** extends as shown in FIG. **6**. Such a connection could obviously be employed with either the rivet gun or the bucking bar embodiment.

It is to be understood that numerous modifications of the disclosed embodiments of the subject invention will undoubtedly occur to those of skill in the art and the spirit and scope of the invention is to be limited solely in light of the appended claims.

I claim:

1. A noise inhibitor for a tool means comprising a hollow flexible elastic coupling sleeve formed of rubber-like material having first and second ends, said first end of said coupling sleeve being dimensioned so as to snugly fit over a portion of the tool means with which the noise inhibitor is associated, a hollow body tube formed of transparent plastic material and having first and second ends, said first end of said hollow body tube being connected to the second end of said coupling sleeve and flexible work engaging cushion means comprising a rubber sleeve member connected to said second end of the main body tube.

2. The invention of claim **1** wherein said hollow body tube is of conical shape flaring outwardly from its first end to its second end.

3. The invention of claim **2** wherein said second end of said coupling sleeve is stretchably extended about the periphery of the first end of said body tube.

4. The invention of claim **3** wherein said coupling sleeve is of conical shape when in its normal unstretched condition.

5. The invention of claim **2** wherein said coupling sleeve includes an annular groove in its second end into which said first end of the main body tube is received.

6. A noise inhibitor for a tool means comprising a hollow flexible elastic coupling sleeve having first and second ends, said first end of said coupling sleeve being dimensioned so as to snugly fit over a portion of the tool means with which the noise inhibitor is associated, a hollow body tube formed of transparent plastic material and having first and second ends, said first end of said hollow body tube being connected to the second end of said coupling sleeve and flexible work engaging cushion means connected to said second end of the main body tube.

7. The invention of claim **6** wherein said coupling sleeve is formed of rubber-like material.

8. The invention of claim **7** wherein said tool member comprises a rivet gun having a casing from which an impact member extends and said coupling sleeve is dimensioned to snugly fit over a portion of said casing for retention thereon.

9. The invention of claim **8** wherein said cushion means comprises a soft rubber sleeve member.

10. The invention of claim **8** wherein said impact means is positioned on the interior of said body tube so as to be visible by the user of the rivet gun during a riveting operation.

11. The invention of claim **7** wherein said tool member comprises a rivet bucking bar and said coupling sleeve is dimensioned to snugly fit over a portion of said rivet bucking bar for retention thereon.

12. The invention of claim **11** wherein said cushion means comprises a soft rubber sleeve member.

13. The invention of claim **11** wherein said rivet bucking bar includes a working surface which is positioned to be visible on the interior of said body tube by the user of the bucking bar.

14. The invention of claim **13** wherein said cushion means comprises a soft rubber sleeve member.

15. The invention of claim **14** wherein said body tube is of oblong conical configuration.

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