United States Patent [19]

Brown

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[54] **REGULATABLE TRIGGERS FOR PNEUMATIC DEVICES**

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[52] **U.S. Cl.** **137/637.4**, 137/614.17, 137/614.19

[51] **Int. Cl.**.....**F16k 1/00**

[58] **Field of Search** 137/614.17; 415/203; 137/614.16, 614.19, 625.49, 637, 637.5, 637.4, 637.3; 251/309

[56] **References Cited**

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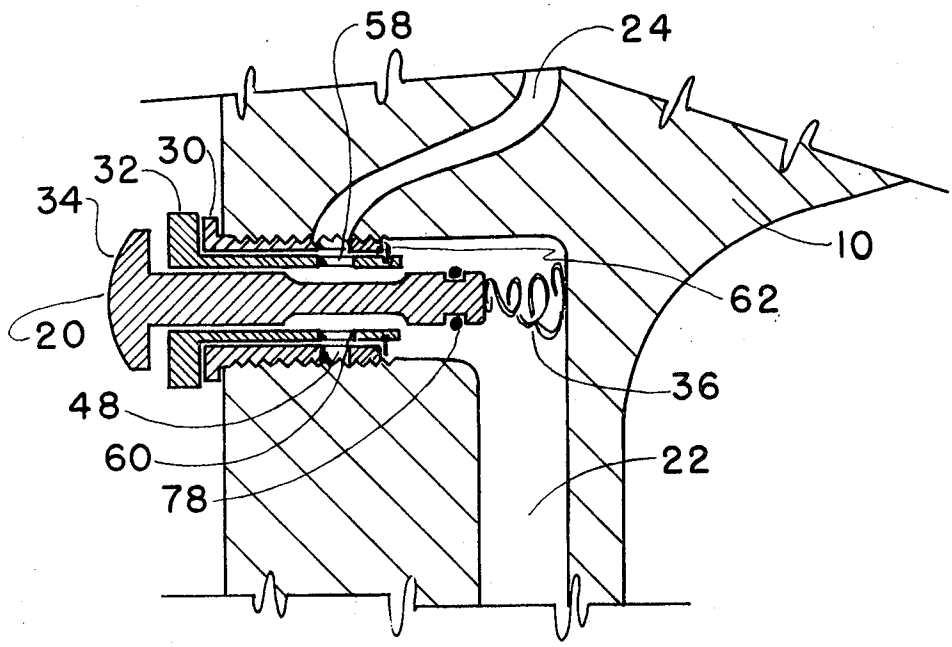
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Assistant Examiner—R. G. Nilson
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[57] **ABSTRACT**

This invention relates to a regulatable air supply device for use with pneumatic tools and provides a trigger slidably mounted in a sleeve which is rotatably mounted within a shell, the sleeve being provided with at least one bore which may be overlapped in varying degrees with a complementary bore in the shell by manual rotation of the sleeve within the shell, whereby to vary selectively the size of the orifice formed by the overlapping bores.

2 Claims, 4 Drawing Figures



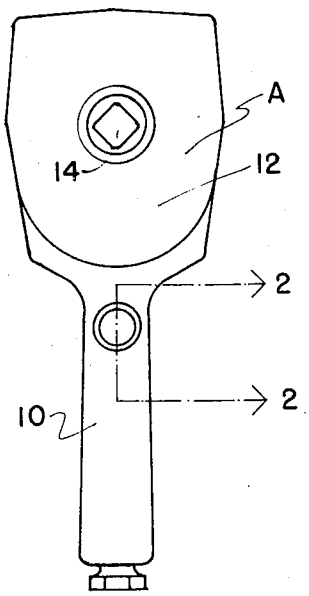


FIG. 1

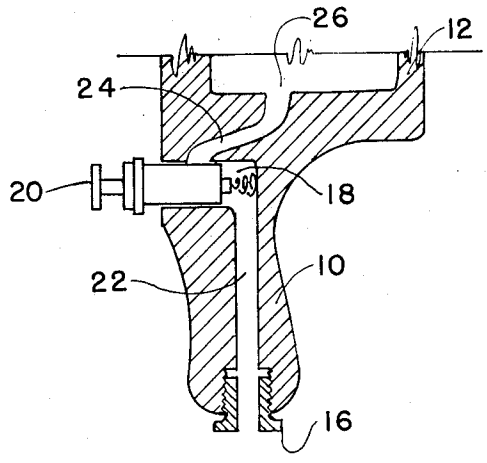


FIG. 2

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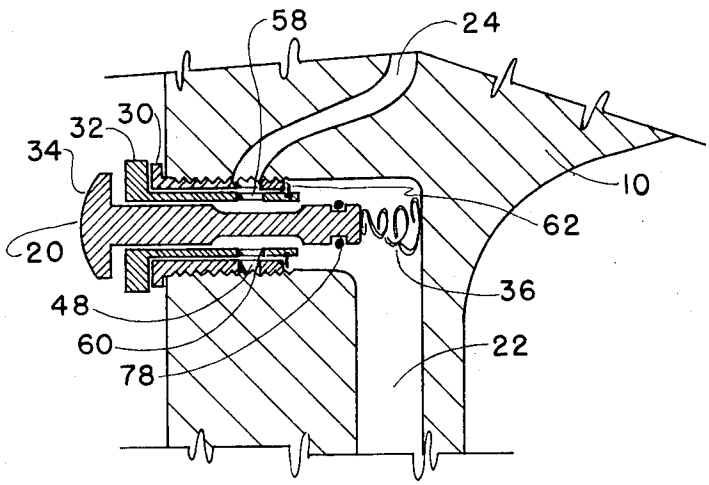

58
24
32
30
34
10
62
20
36
48
60
22
78

FIG. 3

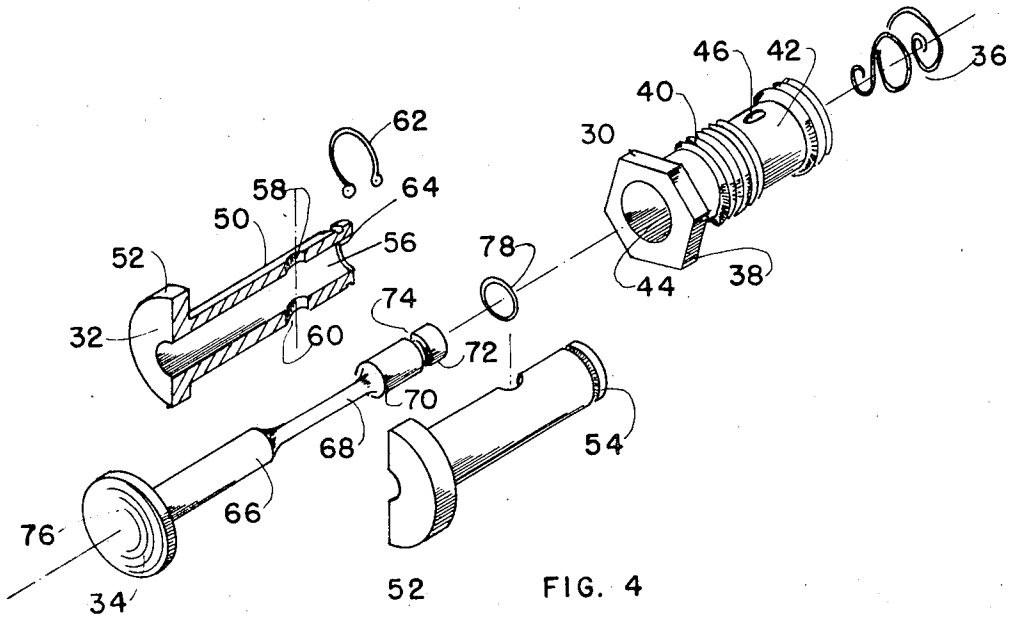

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34
52

FIG. 4

REGULATABLE TRIGGERS FOR PNEUMATIC DEVICES

It is the object of this invention to provide a simple means for quickly and manually regulating the amount of air delivered to the air driven members of pneumatic tools.

With the above and other objects in view, which will become immediately apparent upon reading the specifications, my invention resides in the unique and novel form, arrangement, construction and combination of parts shown in the drawings, explained in the specifications, and claimed in the claims.

In the drawings:

FIG. 1 is a side elevational view of a pneumatic tool which is provided with a preferred embodiment of my invention;

FIG. 2 is a fragmentary sectional view taken along lines 2—2 of FIG. 1;

FIG. 3 is an enlarged fragmentary sectional view taken along the same aspect as FIG. 2;

FIG. 4 is an exploded view of the trigger valve mechanism with the shell shown in section for clarity.

CONSTRUCTION

Referring now in more detail and by reference character to the drawings, which illustrate a preferred embodiment of my invention, A designates a pneumatic tool including a handle **10** and a main body **12** provided with a driven end **14**. Since my invention is combinable with all pneumatic tools, it suffices to say for the purpose of this specification that the contents of the body **12** comprise a conventional impact wrench and the end **14** comprises a conventional socket attachment. Mounted on the handle **10** is a hose attachment plug **16** which receives one end (not shown) of a pneumatic supply hose (also not shown). Also mounted in a threaded bore **18** in the handle **10** is a manually adjustable trigger valve **20**. A first passageway **22** establishes pneumatic communication between the attachment plug **16** and the bore **18**, and a second passageway **24** establishes pneumatic communication between the bore **18** and the air inlet **26** to the main body **12**.

The trigger valve **20** comprises a shell **30**, an inner sleeve **32**, a plunger **34**, and a biasing spring **36**. The shell **30** includes a hexagonal head **38**, a set of external threads **40**, an external annular recess **42**, a reamed axially extending inner bore **44** and a pair of diametrally opposed radial bores **46, 48** which provide communication between the inner bore **44** and the annular recess **42**. The threads **40** are sized for mating with the threads of the bore **18**, the recess **42** is located at the juncture of the bore **18** and the passageway **24**, and the bores **46, 48** are located in the approximate center of the recess **42**, all as best seen in FIGS. **3** and **4**.

The inner sleeve **32** (shown in section in FIG. **4** for purposes of clarity) comprises an elongated cylindrical portion **50** sized for snug fitting disposition in the inner bore **44**, an annular flange **52** located at one end, an annular recess **54** located at the other end, an inner bore **56** which extends axially from front to back, and a pair of diametrally opposed radially extending bores **58, 60**, which provide communication between the inner bore **56** and the external portion **50**, as shown. The recess **54** is sized for accepting a spring clip **62** which retains the sleeve **32** within the shell **30**, and the bores **58, 60**, are located for axial registration with the bores **46, 48**, when the sleeve **32** is disposed within the shell **30**, and an O-ring seat **64** is provided at the inner end of the inner bore **56**, all for purposes presently more fully to appear.

The plunger **34** includes a cylindrical stem **66** sized for snug-fitting disposition in the inner bore **56**, a centrally located neck **68**, an intermediate cylindrical element **70** which is diametrally larger than the neck **68** but diametrally smaller than the stem **66**, an end portion **72** which is the same diametral size as the stem **66**, and an O-ring seat **74** located between the element **70** and the end **72**. On the outer end the plunger is provided with an enlarged button **76**.

When the plunger **34** is installed in the inner bore **56**, and an O-ring **78** is disposed in the seat **74**, the radial projection of the O-ring **78** cooperates with the O-ring seat **64** in the sleeve **32** to provide a fluid seal and to hold the plunger **34** in the sleeve **32** as shown. The biasing spring **36** which is conventionally disposed between the back wall of the bore **18** normally biases the O-ring **78** against the seat **64** to keep the trigger valve **20** normally closed.

OPERATION

Air under pressure is provided to the back of the bore **18** through the attachment plug **16** and the passageway **22**. The trigger valve **20** is held in the normally closed position by the biasing spring **36**.

The trigger valve **20** provides for air regulation to the air supplied to the air inlet **26** of the main body **12**. It will be noted that the position of the shell **30** always remains fixed with respect to the handle **10**. It should also be noted, however, that the sleeve **32** is rotatable with respect to the shell **30**. By rotating the sleeve **32** in the shell **30**, the degree of overlap of the bores **46, 48** in the shell **30** and the bores **58, 60** in the sleeve **32** may be selectively varied, and the amount of air which passes from the back of the bore **18** into the air inlet **26** when the plunger **34** is urged inwardly may thus be regulated. Indicia means on the head **38** of the shell **30** (not shown) and cooperating indicia means on the flange **52** of the sleeve **32** (also not shown) may be utilized to advise the operator of the relative degree of overlap of the bores **46, 48, 58, 60**, if desired.

It should be understood that changes, alterations and modifications in the form, construction, arrangement, combination of various parts of my invention herein shown may be made and substituted without departing from the nature and principle of my invention.

Having thus described my invention what I claim and desire to secure by Letters Patent is recited in the specifications, shown in the drawings and claimed in the claims.

I claim:

1. A pneumatic tool control device comprising means for supplying air under pressure from an external source to a work chamber within a housing, and a regulatable trigger valve mounted in a bore within said housing,

said housing including a first passageway establishing pneumatic communication between the bore and the work chamber and a second passageway establishing pneumatic communication between the bore and the external source, and said trigger

valve including a cylindrical shell removably secured to the housing and being provided with a diametrally reduced annular neck portion at the intersection of the first passageway and the bore,

a first radially extending port located in the annular neck portion of the shell, a coaxial cylindrical sleeve rotatably mounted in the shell and being provided with a second radially extending port, and a plunger slidably mounted in the sleeve and spring biased against the housing to a normally closed position between the first passageway and second passageway,

said first and second ports being substantially the same size and being located at substantially the same axial position on the common axis of the shell and the sleeve, whereby as the sleeve is rotated within the shell the degrees of overlap between the first and second ports may be selectively varied and the size of the resultant aperture between the external source and the work chamber may be selectively varied.

2. The device of claim 1 wherein the sleeve is rotatably secured to the shell.

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