June 19, 1951 G. E. BJÖRKMAN 2,557,593

OPERATING MECHANISM FOR SPRAY GUNS

Filed Nov. 28, 1945

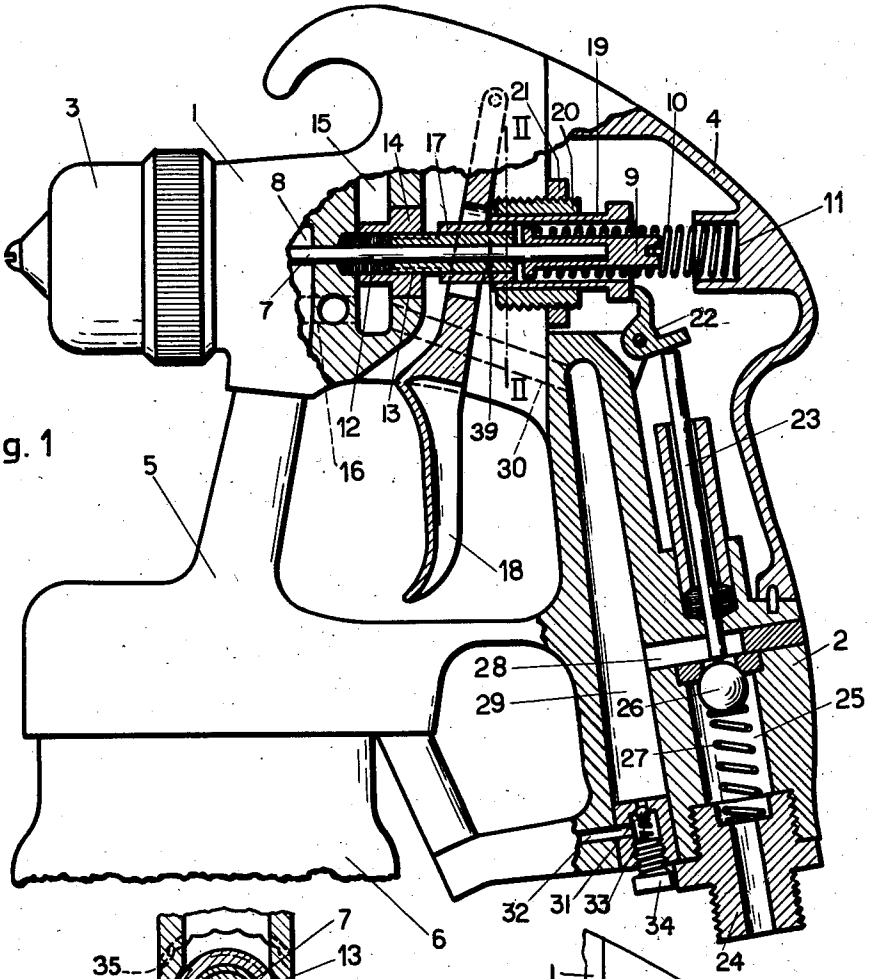


Fig. 1

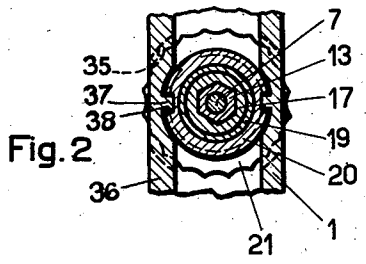


Fig. 2

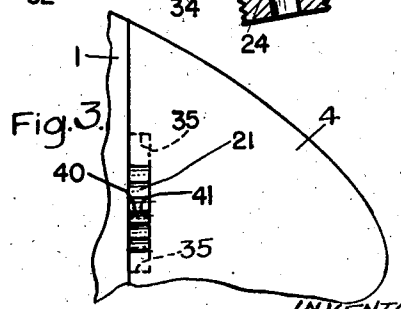


Fig. 3

INVENTOR
GUSTAVE ERIK BJÖRKMAN.
BY. Jarvis, Marsh
his Attorney

Patented June 19, 1951 2,557,593

UNITED STATES PATENT OFFICE

2,557,593

OPERATING MECHANISM FOR SPRAY GUNS

Gustaf Erik Björkman, Stockholm, Sweden, assignor to Aktiebolaget Atlas Diesel, Sickla, near Stockholm, Sweden, a corporation of Sweden

Application November 28, 1945, Serial No. 631,317
In Sweden April 26, 1944

6 Claims. (Cl. 299—140)

1

This invention relates to operating mechanism for spray guns of the type in which a spray stream of a material is obtained with the aid of a pressure medium and which comprises a gun body accommodating a discharge valve controlling spindle and a trigger for operating said spindle.

A principal object of the invention is to provide new and improved means for adjustably limiting the trigger movement to thereby control the movement of the valve spindle, the movement of which in turn controls the quantity of the material discharged by the gun. Another object is to provide new and improved means for tightening the packing around the valve spindle to prevent leakage of the material to be sprayed.

Other features of the invention together with the advantages to be derived from its use, will be apparent from the ensuing portion of this specification, taken in conjunction with the accompanying drawing.

In the accompanying drawing one embodiment of a spray gun for spraying paint or the like is illustrated by way of example it being understood, however, that the invention is not limited to paint spray guns but may be employed in spray guns for other liquids or materials in which the spraying material is sprayed with the aid of a pressure medium such as compressed air or the like.

In the drawing Fig. 1 is a side elevation and partial section of a spray gun, Fig. 2 a partial section on line II—II of Fig. 1, and Fig. 3 is a fragmentary side elevation of the rear upper portion of the spray gun illustrated in Fig. 1.

The illustrated spray gun comprises a relatively long gun body 1 and a handle 2, which extends downwardly substantially perpendicularly to the gun body. At the front end of the gun body a spray head 3 is provided, which may be of any form common to the art having discharge openings for the spraying material and the pressure medium. The rear portion of the gun body 1 and the upper rear portion of the handle 2 form a removable cover 4, which covers the mechanism for controlling the spraying material and the pressure medium such as compressed air. Underneath the front portion of the gun body a bracket 5 is formed which carries a container 6 for spraying material.

In order to control the discharge of spraying material from the spray gun a needle valve is provided in the gun body, the valve spindle 7 of which is axially displaceable in the gun body 1. The valve spindle 7 extends through a space 8

2

to which spraying material is admitted and rearwardly in the gun body and has a sleeve 9 secured on its rear end. Said sleeve is adjustable on the valve spindle in its axial direction and forms a seat and guiding means for a spring 10 serving to press the valve spindle towards closed position. The rear end of said spring is seated in a pocket 11 in the cover 4. The valve spindle 7 extends through a transverse wall in the gun body, which accommodates a packing 12 surrounding the valve spindle. This packing may be tightened by means of a hollow threaded packing screw 13 and prevents spraying material from leaking out around the valve spindle from the space 8. The packing screw 13 is screwed into a bushing 14 provided in the rear wall of the space 15 to which compressed air is admitted and from which preferably valve controlled ducts 16 lead to the spray head and the air nozzles arranged therein. The packing screw 13 has an extension at the rear end, which has hexagonal external cross section and forms a guiding means for a sleeve 17, which has a corresponding hexagonal internal section as obvious from Fig. 2.

A trigger 18 is journalled at the upper end in the top of the gun body. A sleeve 19 secured on the sleeve 17 forms together with the sleeve 9 an intermediate member, which is slideable in the axial direction of the gun body and the valve spindle 7, and which is guided on the extension of the packing screw 13, and which upon a certain displacement of the trigger rearwardly in the gun body from the position illustrated in the drawing abuts the inner end flange of the sleeve 9 and upon further movement rearwardly of the trigger displaces the valve spindle 7. When the sleeve 19 is turned clockwise the packing screw 13 is screwed into the bushing 14 and the packing 12 tightened. A trigger stop 20 is adjustable in the axial direction of the valve spindle 7 by means of an adjusting nut 21, which is rotatable in the gun body but which is prevented from displacement in axial direction of the gun body by engaging the transverse walls 40, 41 of openings in the side walls 36 of the gun body defined by walls 35 and said walls 40, 41. The adjusting nut 21 is screw-threaded on the trigger stop 20 which is secured against rotation by means of projections 37 engaging corresponding longitudinal grooves 38 in the trigger stop 20 to guide the stop when it is axially adjusted. The stop 20 may also be prevented from turning by other means, for instance by the provision of a forked extension at the front end of the stop embracing the trigger 18. The sleeve 20 forms an abutment for the trig-

ger 18, which limits the backward movement of the trigger.

In Fig. 1 the stop 20 is illustrated in its extreme forward position, in which movement of the trigger is prevented so that paint and air discharge through the spray head nozzles is prevented. The trigger 18 extends on both sides of the sleeve 17 with branches forming cam surfaces 39 on the rear side thereof engaging the front end of the sleeve 19.

In the rear portion of the gun body a bell crank member 22 is journalled on a pin extending transversely to the longitudinal centre plane of the spray gun. One arm of said bell crank member engages a flange formed at the rear end of the sleeve 19 and the other arm a stem 23 disposed and displaceable lengthwise of the handle 2. The lower portion of the handle 2 is provided with a hose connection 24 for an air hose. A duct in the hose connection 24 communicates with a space 25 in the handle 2 accommodating a ball valve 26. The ball valve may be opened by pushing the stem 23 downwardly in the handle and is closed by a spring 27 and the air pressure. A duct 28 leads from the space 25 to a space 29 in the handle 2, from which ducts 30 lead to the space 15 in the gun body. Furthermore a duct 32 controlled by a ball valve 31 leads to the spray material container 6 which is thereby submitted to pressure. The ball valve 31 is loaded by a spring 33 the tension of which may be adjusted by means of a set screw 34.

For operation of the spray gun the adjusting nut 21, which projects through the openings in the side walls 36 of the gun body 1, is turned so that the stop 20 is displaced rearwardly in the gun body thereby permitting the trigger to move a corresponding distance towards the handle 2. When the trigger 18 is pressed towards the handle the intermediate member 17, 19 is displaced rearwardly in the gun body causing the bell crank member 22 to swing backwardly and downwardly and to push the stem 23 towards the ball valve 26 so that compressed air is admitted to the spray head and the spraying material container. Upon further movement of the trigger 18 in the same direction the valve spindle 7 is displaced backwardly in the gun body by the sleeve 17, which engages the inner end of the sleeve 9. Spraying material and compressed air are then discharged through the spray head of the gun. Through adjustment of the nut 21 the opening movement of the trigger is limited and consequently also the quantity of spraying material which is discharged through the spray head. Through adjustment of the tension of the spring 33 by means of the screw 34 the pressure on the spraying material in the container 6 may be varied. The air supply to the different air nozzles in the spray head may be further controlled by valves or the like in the air ducts to and in the spray head in a manner known per se in the art.

The spray gun above described should only be considered as an example and may naturally be modified in several different ways within the scope of the claims. For instance, the stem 23 may be of adjustable length. A pressure reduction valve may be provided in the duct 16. Compressed gas or other suitable pressure mediums may be used instead of compressed air.

What I claim is:

1. In a spray gun of the type in which a spray stream of a material is discharged at one end of a gun body, a spray head at the discharge end

of the gun body, a material discharge valve spindle extending and displaceable in the gun body, a trigger, a rotatable intermediate sleeve member disposed coaxially with said valve spindle and operably cooperating with said trigger to move in the axial direction of the valve spindle relative to the gun body and the valve spindle upon movement of the trigger, a packing surrounding the valve spindle in the gun body, a packing screw coaxial with the valve spindle for tightening said packing, and an extension on said packing screw forming guiding means for said intermediate sleeve member coaxial with the valve spindle and cooperating with the intermediate member to permit displacement of the intermediate member in the axial direction of the valve spindle relative to said extension but preventing rotation of the intermediate member relative to the extension.

2. In a spray gun of the type in which a spray stream of a material and a pressure medium are discharged at one end of a gun body, a spray head at the discharge end of the gun body, a material discharge valve spindle extending and displaceable in the gun body, a trigger, an intermediate member disposed coaxially with said valve spindle and operably cooperating with said trigger to move in the axial direction of the valve spindle relative to the gun body and the valve spindle upon movement of the trigger, a trigger stop coaxial with the valve spindle, said trigger stop forming a guide for said intermediate member and permitting rotational and axial displacement of the intermediate member relative to said stop and forming an abutment for limiting the movement of the trigger, means for preventing rotational movement of the stop and permitting displacement of the stop in the axial direction of the valve spindle, an adjusting nut screw-threaded on the stop to be rotatable with respect to the gun body but prevented from displacement in the axial direction of the valve spindle and accessible for manipulation from the exterior of the gun body, an abutment on the valve spindle disposed in the path of the intermediate member so as to be displaced upon movement of the trigger and the intermediate member, and a pressure medium control valve operated to admit pressure medium to the gun body upon movement of the trigger.

3. A spray gun having a gun body and a valve controlled material discharge nozzle, a nozzle valve controlling spindle movable in said gun body, a trigger operably combined with said spindle for moving the spindle, an adjustable trigger stop for limiting the movement of the trigger rearwardly in the gun body, said trigger stop being displaceable in the direction of movement of the spindle but locked against rotation in the gun body, and means for adjusting said stop, said adjusting means being accessible from the outside of the gun body and engaging said stop for moving the stop and for holding the stop in positions of adjustment, said means being rotatable in the gun body but locked against displacement in the direction of movement of the spindle in the gun body.

4. A spray gun having a gun body and a valve controlled spray material nozzle, a nozzle valve controlling spindle movable in said gun body, a trigger operably combined with said spindle for moving the spindle, an adjustable trigger stop for limiting the movement of the trigger rearwardly in the gun body, said trigger stop being displaceable in the direction of movement of the spindle

but locked against rotation in the gun body, external screw threads on the trigger stop, and means for adjusting said stop, said adjusting means being accessible from the outside of the gun body and provided with screw threads engaging said screw threads on the stop for moving the stop and for holding the stop in positions of adjustment, said adjusting means furthermore being rotatable in the gun body but locked against displacement in the direction of movement of the spindle in the gun body.

5. A spray gun having a gun body and a valve controlled material discharge nozzle, a nozzle valve controlling spindle movable in said gun body, a trigger operably combined with said spindle for moving the spindle, an adjustable trigger stop for limiting the movement of the trigger rearwardly in the gun body, means for guiding said stop in the gun body to permit displacement of the stop in the direction of movement of the spindle but to prevent turning of the stop in the gun body, and means for adjusting said stop, said adjusting means being accessible from the outside of the gun body and engaging the stop for moving the stop in said guiding means and for holding the stop in positions of adjustment, said adjusting means furthermore being rotatable in the gun body but locked against displacement in the direction of movement of the spindle in the gun body.

6. A spray gun having a gun body and a valve controlled material discharge nozzle, a nozzle valve controlling spindle movable in said gun body, a trigger, an adjustable trigger stop of sleeve-like form for limiting the movement of the trigger rearwardly in the gun body, means for adjusting and engaging said stop, said adjustable means being accessible from the outside of the gun body for moving and holding the stop

in positions of adjustment in the gun body, an intermediate member guided coaxially with the valve spindle in the stop and operably cooperating with said trigger to move in the direction of the valve spindle relative to the stop and the valve spindle upon movement of the trigger, an abutment on the valve spindle disposed in the path of said intermediate member so as to be displaced upon movement of the trigger and the intermediate member, and a separate pressure medium control valve operably cooperating with the intermediate member so as to be opened upon movement of the trigger and the intermediate member.

GUSTAF ERIK BJÖRKMAN.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,650,686	Binks	Nov. 29, 1927
1,689,848	Anderson	Oct. 30, 1928
1,698,945	Driscoll	Jan. 15, 1929
1,762,282	Stephan	June 10, 1930
1,797,209	Bramsen et al.	Mar. 17, 1931
1,802,141	Downs	Apr. 21, 1931
1,940,268	Peterson	Dec. 19, 1933
1,958,730	Tracy	May 15, 1934
1,980,464	Yedd	Nov. 13, 1934
1,981,077	Shields	Nov. 20, 1934
1,987,248	Seizer	Jan. 8, 1935
2,005,776	Downs	June 25, 1935
2,027,103	Johnson et al.	Jan. 7, 1936
2,096,196	Newlin	Oct. 19, 1937
2,149,932	Zippel	Mar. 7, 1939
2,152,767	McKnight	Apr. 4, 1939

Certificate of Correction

Patent No. 2,557,593 June 19, 1951

GUSTAF ERIK BJÖRKMAN

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows:

Column 2, line 55, for "sleeve" read *stop*; column 5, lines 37 and 38, for "adjustable" read *adjusting*;

and that the said Letters Patent should be read as corrected above, so that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 11th day of September, A. D. 1951.

[SEAL]

THOMAS F. MURPHY,
Assistant Commissioner of Patents.