June 12, 1934. H. A. ROSELUND 1,962,911

SPRAY GUN

Filed Sept. 6, 1932 2 Sheets-Sheet 1

Fig. 1.

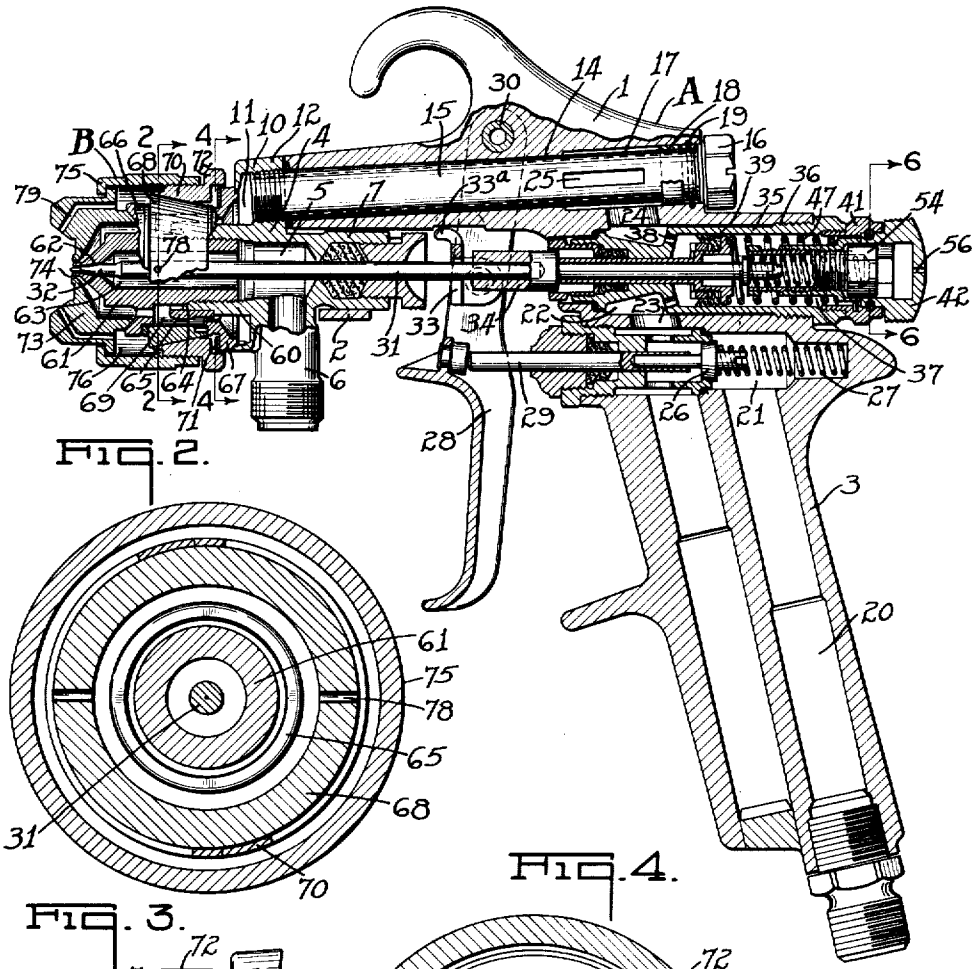


Fig. 2.

Fig. 4.

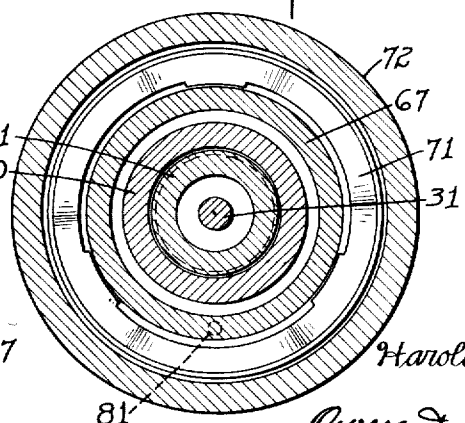
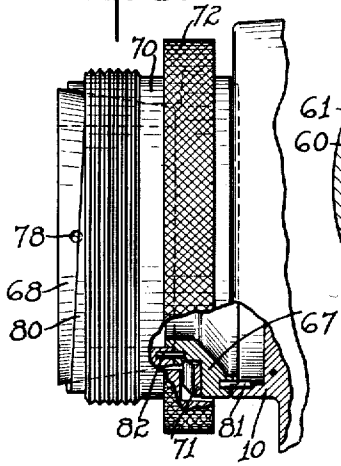


Fig. 3.



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Fig. 5

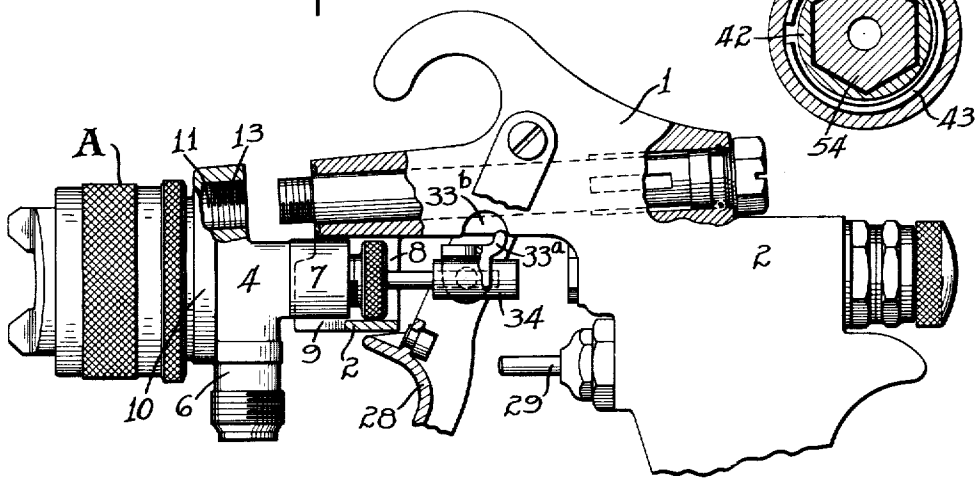


Fig. 6

Fig. 7

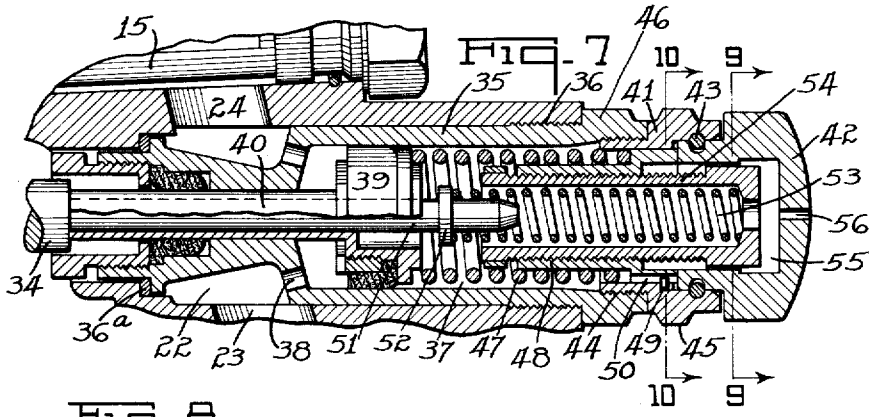


Fig. 8

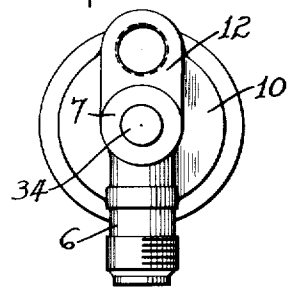


Fig. 9

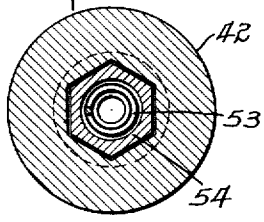
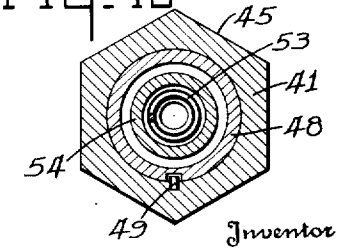


Fig. 10



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Patented June 12, 1934 1,962,911

UNITED STATES PATENT OFFICE

1,962,911

SPRAY GUN

Harold A. Roselund, Toledo, Ohio, assignor to The De Vilbiss Company, Toledo, Ohio, a corporation of Ohio

Application September 6, 1932, Serial No. 631,876

11 Claims. (Cl. 91—45)

This invention relates to spray guns or air brushes of the type particularly adapted for spraying surface coating materials such as paints, lacquers, varnishes, etc., and has for its primary object the provision of certain improvements on devices of this character, whereby to enhance its commercial value, increase its usefulness and facilitate the handling and adjustment thereof.

The invention is fully described in the following specification, and a gun including one embodiment of each of the different features of improvement is illustrated in the accompanying drawings, in which—

Figure 1 is a central vertical longitudinal section of a gun embodying the invention, with parts in full and with the valves in closed position. Fig. 2 is an enlarged cross-section of the spray head on the line 2—2 in Fig. 1. Fig. 3 is an enlarged fragmentary side elevation of a portion of the spray head assembly. Fig. 4 is an enlarged cross-section of the spray head on the line 4—4 in Fig. 1. Fig. 5 is a side elevation of the spray gun with parts broken away, and with the spray head partially removed from the gun body. Fig. 6 is an enlarged cross-section on the line 6—6 in Fig. 1. Fig. 7 is an enlarged fragmentary sectional detail of the closing means for the control valve for the material discharge. Fig. 8 is a rear end elevation of the spray head unit removed from the gun, and Figs. 9 and 10 are cross-sections respectively on the lines 9—9 and 10—10 in Fig. 7.

Referring to the drawings, A designates the stock unit and B the spray-head unit of a spray gun embodying the invention, the latter being detachably carried by the former.

The stock unit A includes the horizontally disposed body portion 1, the boss 2 at the under side of the forward end thereof, and the handle 3 projecting down from the under side of the rear end portion thereof.

The spray head unit B includes the body portion 4 forming the main throat passage 5 adapted to communicate through a downwardly projecting nipple 6 and attached communications (customarily flexible hose) with a source of supply of material to be sprayed. The rear end of the body 4 forms a cylindrical shank 7, which extends to the rear of the nipple 6 and is adapted to fit into and project through a horizontally disposed bore 8 in the boss 2, while the nipple 6 fits rearwardly into a notch 9 in the lower forward end portion of the boss. The body 4 has a flange 10 cooperating with other parts, as hereinafter described, to form an annular air chamber 11 around the throat portion of the body, and this flange has a boss portion 12 at its rear side above the body 5 for seating against the forward end of the stock body 1. An air inlet passage 13 is provided in the boss 12 and communicates at its inner end with the air chamber 11.

The stock body 1 is provided entirely therethrough from one end to the other with a cylindrical passage or bore 14, adapted to receive a tube 15, which is provided at its rear end with a head 16 adapted to seat against the rear end of the body 1 and close such end of the bore 14, and also being shaped to permit the engagement of a wrench or screw-driver, or both, therewith, to facilitate turning. The forward end of the tube 15 projects beyond the forward end of the body 1 and is adapted to enter the air inlet 13 of the spray head and to have threaded engagement with its wall. It is thus apparent that a turning of the tube 15 in one direction with its forward end in engagement with the spray-head unit will cause such unit to be drawn tightly against the forward end of the stock body 1, a gasket being preferably disposed between the seating surfaces to provide a tight joint at such point.

The rear end of the bore 14 is slightly enlarged, as shown at 17, and the tube 15 is provided in the rear end portion of this enlargement with a flange or collar 18 fitting therein and spaced slightly from the head 16. A wire locking ring 19 is sprung into a groove in the outer end portion of the bore enlargement 17 between the tube head 16 and collar 18 and serves to retain the tube in the stock body while at the same time permitting free turning movements thereof.

The handle 3 has an air supply passage 20 adapted to have suitable connection at its outer end with a source of air pressure supply, as well understood in the art, and having its upper or inner end in communication with the bore 14 through a valve chamber 21, bore 22 and parts 23 and 24, the latter opening into the bore enlargement 17 forward of the collar 18. The bore enlargement 17 has communication with the interior of the tube 15 through one or more passages 25 in the tube wall.

A check-valve 26 is provided in the valve chamber 21, being normally held seated in closed position by a spring 27 and being opened by the rearward movement of a trigger member 28 acting against the valve stem 29, which projects forwardly from the valve and without the valve chamber through a stuffing box in its forward

end in position to be engaged by the trigger member, as well understood in the art.

The trigger member 28 has its upper end forked and straddling the stock body 1 with the ends of its fork arms fulcrumed on the ends of a cross-pin or screw 30 projecting through the body. The bore 22, through the forward end portion of which the air pressure supply is adapted, in the present instance, to pass from the valve chamber 21 to the tube 15, is disposed in horizontal position between the upper end of the handle and the rear end portion of the stock body 1 with its axis aligned with the axis of the spray head nipple 7 and throat bore 5 when attached to the stock body, thus also aligning it with the stem 31 of the control valve 32 for the material discharge from the spray-head throat, which stem projects rearwardly from the throat through a stuffing gland provided in the shank 7, as well understood in the art. The rear end of the stem 31 projects through the fork opening of the trigger member 28 and is moved rearwardly to open position by engagement of a dog 33 with an enlargement or shoulder 34 on the stem when the trigger is moved rearwardly from normal position. The engagement of the trigger with the air valve stem 29 and the material control valve stem 31 is such that the air valve is opened slightly in advance of the opening of the material valve.

The dog 33 is of U-form with its legs pivoted to the trigger 28 within its fork and in substantially the line of movement of the valve stem 31, and its web portion is notched to adapt it to straddle the valve stem in advance of the enlargement 34 so that a rearward movement of the trigger from normal position will cause the web portion of the dog to have a direct rearward thrust against the stem enlargement to effect an opening of the valve. When the trigger 28 is swung forward a predetermined extent from normal position, which is only permitted by a forward detaching movement of the spray-head A with respect to the stock B, the dog 33 is swung up out of engaging relation to the valve stem enlargement by a camming coaction of ears 33^a on the upper end of its web with registering recesses 33^b in the stock body, as shown in Fig. 5. This permits a complete withdrawal of the spray-head from the stock unit. This manner of releasably engaging the trigger and valve stem forms no part of the present invention and is, therefore, not claimed herein.

The means for cooperating with the trigger member 28 to control the movements of the valve stem 31 and to normally retain said stem in closed position is mounted, in the present instance, in a shell 35 which is removably mounted in the bore 22, being threaded near its rear end into the rear end portion of the bore, as shown at 36. The shell 35 has shouldered engagement with the forward end of the bore wall, as at 36^a, to close such end of the bore when the shell is in position therein.

The shell 35 forms a cylindrical chamber 37, closed at its rear end by a removable cap means hereinafter described, and open at its forward end, through one or more ports 38, to the inner end of the bore 22 through which the air passes from the valve chamber 21 to the tube 15. A piston 39 is mounted in the shell chamber 37 in rear of the ports 38 and has a hollow or tubular stem 40 projecting therefrom through a packing gland in the inner end portion of the shell and into position to have contact at its forward end with the rear end of the enlargement 34 on the valve stem 31.

The outer or rear end of the cylinder 37 is closed by a suitable closure means, which, in the present instance, is of two-part construction and comprises the collar 41 and the plug member 42, which is rotatably mounted in the collar 41 and prevented from axial movements relative thereto by an anchoring ring 43 mounted in cooperating circumferential recesses in the two members. The collar 41 has threaded engagement with the outer end of the shell 35, as at 44, and has a portion provided with a wrench-engaging surface 45 to facilitate turning the collar into firm engagement with the shell. The shell 35 also preferably has a wrench-engaging surface 46 to facilitate a firm turning of the shell into engagement with the wall of the bore 22 in which inserted.

A coiled compression spring 47 is disposed in the cylinder 37 with one end bearing against the rear side of the piston 39 and with its opposite end encircling a sleeve 48 and bearing against the shouldered or enlarged rear end portion of such sleeve which has its outer or rear end thrust against the inner end of the closure member 42. The enlarged end portion of the sleeve 48 projects into the collar member 41 and is prevented from turning relative to said collar by a pin 49 projecting from one into a registering slot 50 in the other.

A second stem or pressure rod 51 extends entirely through the piston 39 and stem 40 axially thereof, such parts being hollow for such purpose, and its forward end is adapted to bear against the valve stem enlargement 34 while its rear end is provided at the rear of the piston 39 with a shoulder 52 for receiving the forward end thrust of a coiled compression spring 53 that is of considerably less tension than the spring 47.

The spring 53 extends into a cylindrical plug 54, and has its rear end thrust against an internal shoulder or flange at the rear end of such plug. The plug 54 is threaded in the sleeve 48 and has its rear end fitting into the cup or hollow of the closure member 42 for turning movements therewith and free axial sliding movements relative thereto, whereby a turning of the member 42 relative to the member 41, will impart axial adjusting movements to the plug 54 due to its turning in threaded engagement with the sleeve 48. The rear end of the plug 54 is slightly enlarged relative to its threaded portion and is of hexagonal or other suitable form in cross-section to adapt it to fit into a correspondingly shaped socket or cupped portion 55 of the member 42 to turn therewith and have free axial movements relative thereto. The plug 54 in addition to acting as a means for receiving the thrust of the spring 53, also serves as an adjustable stop for coaction with the piston 39 to limiting the opening movements of the valve 32.

A vent 56 is provided in the closure member 42, so as to place the adjacent end of the cylinder 37 in communication with the atmosphere.

When the trigger 28 is retracted from normal position, it first acts on the stem 29 of the air valve 26 to partially open the latter before the dog 33 engages the enlargement 34 on the material valve stem. This permits air under pressure to be admitted to the bore 22 and cylinder 37, and also to the spray-head, before the material valve 32 is opened to permit a discharge of material from the spray-head. The air pressure admitted to the forward end of the cylinder

37 acts against the piston 39 and moves it rearward against the tension of the spring 47, thereby entirely relieving the valve of the closing pressure of such spring, the only pressure then acting on the valve to resist an opening thereof being that of the light pressure spring 53, which acts on the valve stem through the pressure rod 51.

In practice, it is desirable for most work to have a closing pressure of approximately eleven pounds against the valve 32 when the trigger is free, and this is divided between the spring 47 and 53 so that the former has a closing pressure of approximately eight pounds and the latter of approximately three pounds. It is thus evident that when the trigger is operated to open the air control valve 26, the air pressure within the cylinder 37 acts to relieve the trigger, in the present instance, of approximately eight pounds of the valve-closing pressure normally employed, and to make it necessary for the operator to only overcome a valve-closing pressure of approximately three pounds in opening the material valve 32 and maintaining it open during a spraying operation. This effects a very material easing of the strain and support heretofore necessary on the part of the operator to operate the trigger during a spraying operation and enables a considerably longer continued use of the gun without tiring the operator than would otherwise be possible.

It is apparent that the valve-closing means and stop comprising the shell 35 and parts carried thereby constitutes a unit which is removable as an entirety from the stock unit B. This feature, broadly, and the provision of the separate spring-pressed parts for acting against the material valve stem, as well as the relieving of the closing pressure of one spring-pressed part on the valve when the trigger is operated, forms no part of the present invention, and will not, therefore, be claimed herein. The feature, however, of this control unit which forms a part of this invention resides in the shell closure means shown and in the spring thrust parts carried thereby, and particularly in the feature which enables the stop plug 54 to be adjusted without axial movement of the control member 42.

It is apparent that to separate the stock and spray-head units of the gun for cleaning, inspection or other purpose, it is only necessary to turn the tube 15 to release the threaded connection of its forward end with the spray-head, after which the spray-head may be withdrawn forwardly from the stock except that it is necessary during the initial portion of such movement to move the trigger 28 forwardly therewith from normal position to effect a throwing of the dog 33 to released position with respect to the valve stem enlargement 34, as shown in Fig. 5. When the spray-head is in attached relation to the stock, the rear end of the shank 7 of the former projects into position to coact with and prevent a sufficient forward movement of the trigger 28 to move the dog 33 to released position.

It is also apparent that the valve 32 is normally acted on by the full tension of both springs 47 and 53, so as to insure a firm seating of the material valve to prevent escape of the material from the spray-head. Upon a rearward movement of the trigger 28 to effect a spraying operation, the air valve 26 is first opened due to the lost motion connection between the dog 33 and valve stem enlargement 34, thus permitting air under pressure to enter the cylinder of the control unit C, where it acts on the enclosed piston to release the entire closing pressure of the spring 47 on the valve.

The spray-head unit B is similar to that of United States Patent No. 1,732,691 dated October 22, 1929, except that it has been improved in certain respects to overcome objections incident to the use of the spray-head of said patent. In the present spray-head, the body 4 is provided centrally at its forward side with an internally threaded nipple 60 forming an extension of the throat bore 5 of the head and being surrounded by the annular air chamber 11 formed in part by the body flange 10. The material discharge nozzle 61, which is of substantially cylindrical form, except at its forward restricted end is threaded at its rear end into the nipple 60, and has its forward end reduced to provide the restricted material discharge orifice 62 in communication at its rear end with the throat passage 5 through the throat passage 63 of the nozzle. The outer end of the nipple 60 has tapered seating coaction with the corresponding portion of the nozzle, as shown at 64, to provide a fluid-tight joint therebetween when the nozzle is screwed home in the nipple. A reinforcing collar 65 is mounted on the outer end portion of the nipple 62 to strengthen it against expansion or splitting. The nozzle 61 is provided with a surrounding annular flange 66 in forwardly spaced relation to the nipple 60 and its collar 65 for the purpose hereinafter described.

A ring member 67 of angle-form in cross-section has its outwardly projecting flange seated at its rear edge against the forward edge of the head flange 10, whereby the ring cooperates therewith to form the air chamber 11, and the forwardly projecting flange of the ring is disposed at its inner edge portion in surrounding spaced relation to the nipple 60 to permit the passage of air therethrough entirely around the nipple. A second ring 68 seats rearwardly against the inner flange of the ring 67 in centered spaced relation to the nipple 60 and its collar 65, and has its forward end projecting beyond the nipple and engaged by the aligned gasket-faced surface of the nozzle flange 66, whereby the ring 68 is held closely to its seat against the ring 67 when the nozzle 60 is screwed firmly into the nipple 60. The collar 68 cooperates with the coacting and enclosed parts to form an air passage 69 in surrounding relation to the nozzle at the rear of the flange 66. The internal surface of the ring 68 is of cylindrical form, while its external surface is of conical form, being enlarged forwardly from its rear end and this conical surface is engaged by a collar 70 having a conical internal portion seating thereon, and having its rear end in spring thrust coaction with the forward side of the ring 67 through the medium of a spring ring 71. The rear end of the collar 70 is also provided with an annular flange 72, which is exposed externally of the spray-head to facilitate manual turning of the same.

The outer or air discharge nozzle 73 of the spray-head encircles the forward end portion of the inner nozzle 61 in spaced relation thereto and has a tapered seat at its rear end against the forward side of the nozzle flange 66 which centers one nozzle with respect to the other, as well understood in the art. The nozzle 73 cooperates with the discharge end portion of the nozzle 61 to form the restricted annular air discharge orifice 74 around the discharge end of the inner nozzle. The nozzle 73 is held in assembled relation to the

inner nozzle by the customary union nut 75, which is threaded at its rear end on the collar 70 and has flanged engagement at its forward end with such nozzle. A supplemental air chamber 76 is provided around the nozzle members by the nut 75, and this has communication with the air supply passage 69 through one or more orifices 78 provided radially through the outer end portion of the ring 68. The discharge from the chamber 76 is through supplemental air discharge passages 79 in the air nozzle 73. The collar 70 is provided at its forward edge with tapered or inclined flanges 80, which are adapted, by a turning of the collar 70, to entirely close the air passages 78 or to open the same to the desired extent, as described in said former patent. The ring 67 is pinned to both the head flange 10 and to the ring 68 by pins 81 and 82, respectively, as best shown in Fig. 3, to prevent relative turning of said parts.

I wish it understood that my invention is not limited to any specific arrangement, construction or form of the parts, as it is capable of numerous modifications and changes without departing from the spirit of the claims.

Having thus described my invention, what I claim as new, and desire to secure by United States Letters Patent, is:

1. In a spray gun, a stock body having a longitudinally extending bore therein open at both ends of the body and having an air pressure supply passage in communication with said bore, a spray-head having a part for abutment against the forward end of the body and having an air passage in communication through said part with said bore, and a screw member operable through said bore to thread into said head passage and rigidly connect the body and head and also to open communication between said passages through the screw, said screw member being accessible at the rear end portion of the stock body for manual operation.

2. In a spray gun, a stock body having a longitudinally extending passage therethrough adapted to have communication with a source of air pressure supply, said body having its forward end provided with a seat around said passage, a spray-head having a part for abutment against said seat and having an air discharge passage with an inlet opening adapted to register with said body passage, and means projecting through said body passage and manually operable to engage within said inlet opening to draw the head to its seat against said body, said body and head having parts which interengage to assist said means in rigidly connecting the body and head.

3. In a spray gun, a stock body having a longitudinally extending passage therethrough adapted to have communication with a source of air pressure supply, said body having a seat at its forward end in surrounding relation to the forward end of said passage and having a portion below the forward end portion of said passage forming a longitudinally extending opening therethrough, a spray-head adapted to seat rearwardly against said body seat and having a rearwardly projecting shank portion for fitting into said opening, said head having an air chamber therein with its inlet in communication with the forward end of said body passage, and manually operable means rotatably mounted in said body passage and operable to engage within said spray-head inlet and draw the head to its seat against said body and also to open communication between said inlet and a portion of the body passage.

4. In a spray gun, a spray-head having a body part forming a material supply throat and having a surrounding flange, a material discharge nozzle threaded into said throat and having a close fluid-tight seat therewith, said nozzle having an annular flange in advance of said body part, a ring seating rearwardly against said body flange and cooperating therewith to form an annular air supply chamber in surrounding relation to said body and having an inlet, a second ring seating rearwardly against said first ring and having a tapered outer surface, said rings cooperating to form an annular air passage around said body and a portion of the inner nozzle and held to their seats by coaction of the nozzle flange with the second ring, said second ring having radial openings in communication with said passage, an adjusting collar mounted on said tapered ring and operable to regulate the quantity of discharge of air through said ring openings, an air discharge nozzle mounted rearwardly against the flange of said first nozzle and forming an air discharge place around said first nozzle in communication through the nozzle flange with said air passage, means connecting said collar and air nozzle to hold them to their respective seats, said air nozzle having supplemental discharge passages in communication with the openings in said second ring.

5. In a spray gun, a spray-head having a body portion with a forward extension forming a material discharge throat, said body having a surrounding flange short of its forward end, a material discharge nozzle threaded into said body extension, with its bore in communication with the body throat, said nozzle having a close seat against said extension, said extension being reinforced at its forward end in advance of said extension, an angled ring and a tapered ring seating one against the other in spaced surrounding relation to said extension and nozzle with the former abutting against said body flange, whereby an annular air passage is provided around the body extension and nozzle, said passage having an inlet through said flange, said nozzle having a surrounding flange near its forward end abutting against the forward end of said tapered ring to hold it and the companion ring in seated relation, said tapered ring having discharge openings therethrough in communication with said air passage, a collar mounted on said tapered ring and operable to adjust the discharge of air through said ring openings, an outer nozzle seating rearwardly against said first nozzle flange and forming a discharge passage around the forward end of said first nozzle in communication with said first air passage through said nozzle flange, said outer nozzle having supplemental discharge passages in communication with said adjustable openings, and means connecting said outer nozzle and collar to hold them in opposed relation to their respective seats.

6. In a spray gun, a spray-head including a body with a surrounding flange and a cylindrical extension in advance of the flange forming a throat passage for the material discharge, said flange having an inlet opening for communication with a source of air pressure supply, an inner nozzle threaded into said extension and having a conical seat thereagainst, said nozzle having an annular flange, means intermediate said flanges and cooperating therewith to form an air chamber surrounding said extension and a

portion of said nozzle and having communication with said inlet opening, an outer nozzle seated rearwardly against said nozzle flange and cooperating with the outer end portion of the inner nozzle to form a surrounding air discharge passage in communication with said chamber through said nozzle flange, a collar rotatably mounted on said means, and a union member operable to cause an opposed seating of said collar and outer nozzle on the respective seating parts.

7. In a spray gun, a body member having an opening therein, a control valve, a manually operable tensioning member connected to said body at the rear end of said opening for rotary nonaxial movements relative to the body, a compression spring disposed in said opening and connected at its forward end to said valve to normally maintain it seated, and means receiving the rear end thrust of said spring and axially movable to vary the tension of the spring when the control member is turned.

8. In a spray gun, a body member having an opening therein, a control valve, a manually operable tensioning member connected to said body at the rear end of said opening for rotary nonaxial movements relative to the body, a tubular plug mounted within said opening for axial movements therein when turned and having a part in sliding interengagement with said tensioning member to cause one to turn with the other, and a compression spring having its rear end thrust exerted against said plug and its forward end thrust exerted against said valve to normally maintain the latter seated.

9. In a spray gun, a body member having an opening therein, a control valve, two independently movable thrust parts acting against said valve and projecting in said opening, separate compression springs acting against said parts to exert valve-closing movements thereon, said springs being disposed one within the other and the outer having an outer end thrust within said opening, a manually operable control member rotatably attached to the body member at the rear end of said bore, and a plug receiving the outer end thrust of said other spring and mounted to have axial movements in the bore when rotated, said plug having interengaging sliding connection with the control member, whereby a rotation of said member effects rotation of the plug and permits it to move axially relative to the control member, said plug serving as an adjustable stop for the rearward movements of one of said thrust parts.

10. In a spray gun, a body member having an opening therein, a control valve, two independently movable thrust parts operable to impart closing movements to said valve, separate compression springs acting respectively against said thrust parts to exert yielding valve-closing movements thereto, said springs mounted in said opening, a sleeve mounted in said opening and forming an outer end thrust for one of said springs, a hollow plug threaded in said sleeve and adapted to enclose at least a portion of said other spring and to receive its outer end thrust and also to serve as a stop for the rearward movements of one of said thrust parts, and means rotatably mounted at the rear end portion of said opening and operable to impart turning movements to said plug, and means operable to retract the valve against the pressure of said thrust part.

11. In a spray gun, a spray-head, a control valve for the material discharge projecting rearwardly from said head, a shell carried by said body, a control unit, a closing unit for the valve removably carried by the body, and manual means operable to open the valve, said unit including a shell, two thrust members reciprocably movable in the shell one within the other and having parts projecting from the forward end of the shell in thrust engagement with the valve, a closure means for the outer end of the shell including a manually rotatable member mounted for rotary movements in the shell and held against axial movements relative thereto, a sleeve anchored against turning movements in the shell, a coiled compression spring having its forward end thrust against one of said thrust parts and its rear end thrust against a portion of said sleeve, a hollow plug threaded in said sleeve for adjusting movements axially of the shell and serving as a stop for limiting the rearward movements of said last-mentioned thrust part, said control part having turning engagement with said plug, and a compression spring interposed between a portion of said plug and said other thrust part.

HAROLD A. ROSELUND.

CERTIFICATE OF CORRECTION.

Patent No. 1,962,911. June 12, 1934.

HAROLD A. ROSELUND.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 5, line 22, claim 7, for "control" read tensioning; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 24th day of July, A. D. 1934.

Bryan M. Battey

(Seal) Acting Commissioner of Patents.

portion of said nozzle and having communication with said inlet opening, an outer nozzle seated rearwardly against said nozzle flange and cooperating with the outer end portion of the inner nozzle to form a surrounding air discharge passage in communication with said chamber through said nozzle flange, a collar rotatably mounted on said means, and a union member operable to cause an opposed seating of said collar and outer nozzle on the respective seating parts.

7. In a spray gun, a body member having an opening therein, a control valve, a manually operable tensioning member connected to said body at the rear end of said opening for rotary nonaxial movements relative to the body, a compression spring disposed in said opening and connected at its forward end to said valve to normally maintain it seated, and means receiving the rear end thrust of said spring and axially movable to vary the tension of the spring when the control member is turned.

8. In a spray gun, a body member having an opening therein, a control valve, a manually operable tensioning member connected to said body at the rear end of said opening for rotary nonaxial movements relative to the body, a tubular plug mounted within said opening for axial movements therein when turned and having a part in sliding interengagement with said tensioning member to cause one to turn with the other, and a compression spring having its rear end thrust exerted against said plug and its forward end thrust exerted against said valve to normally maintain the latter seated.

9. In a spray gun, a body member having an opening therein, a control valve, two independently movable thrust parts acting against said valve and projecting in said opening, separate compression springs acting against said parts to exert valve-closing movements thereon, said springs being disposed one within the other and the outer having an outer end thrust within said opening, a manually operable control member rotatably attached to the body member at the rear end of said bore, and a plug receiving the outer end thrust of said other spring and mounted to have axial movements in the bore when rotated, said plug having interengaging sliding connection with the control member, whereby a rotation of said member effects rotation of the plug and permits it to move axially relative to the control member, said plug serving as an adjustable stop for the rearward movements of one of said thrust parts.

10. In a spray gun, a body member having an opening therein, a control valve, two independently movable thrust parts operable to impart closing movements to said valve, separate compression springs acting respectively against said thrust parts to exert yielding valve-closing movements thereto, said springs mounted in said opening, a sleeve mounted in said opening and forming an outer end thrust for one of said springs, a hollow plug threaded in said sleeve and adapted to enclose at least a portion of said other spring and to receive its outer end thrust and also to serve as a stop for the rearward movements of one of said thrust parts, and means rotatably mounted at the rear end portion of said opening and operable to impart turning movements to said plug, and means operable to retract the valve against the pressure of said thrust part.

11. In a spray gun, a spray-head, a control valve for the material discharge projecting rearwardly from said head, a shell carried by said body, a control unit, a closing unit for the valve removably carried by the body, and manual means operable to open the valve, said unit including a shell, two thrust members reciprocably movable in the shell one within the other and having parts projecting from the forward end of the shell in thrust engagement with the valve, a closure means for the outer end of the shell including a manually rotatable member mounted for rotary movements in the shell and held against axial movements relative thereto, a sleeve anchored against turning movements in the shell, a coiled compression spring having its forward end thrust against one of said thrust parts and its rear end thrust against a portion of said sleeve, a hollow plug threaded in said sleeve for adjusting movements axially of the shell and serving as a stop for limiting the rearward movements of said last-mentioned thrust part, said control part having turning engagement with said plug, and a compression spring interposed between a portion of said plug and said other thrust part.

HAROLD A. ROSELUND.

CERTIFICATE OF CORRECTION.

Patent No. 1,962,911. June 12, 1934.

HAROLD A. ROSELUND.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 5, line 22, claim 7, for "control" read tensioning; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 24th day of July, A. D. 1934.

Bryan M. Battey

(Seal) Acting Commissioner of Patents.