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(54) Fluid dispensing gun

Flüssigkeitsausgabepistole

Pistolet de distribution de fluide

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Description

[0001] The invention concerns a fluid dispensing gun comprising a dispensing tube with a dosing nozzle, a spring-loaded needle which is co-axially moveable in the dispensing tube for opening and closing the dosing nozzle, a trigger for actuating said needle in order to open the dosing nozzle and to dispense the fluid, regulating means for regulating the degree of opening of the outlet of the dosing nozzle and coupling means for coupling a pressurized can to the gun and means for visual feedback of the current degree of opening of the outlet of the dosing nozzle, wherein the means for visual feedback are designed as position indicators which show the current co-axial position of the needle within the dispensing tube.

[0002] Fluid dispensing guns are used for dispensing one or two component polyurethane (PU) foam systems, adhesives, sealants, etc.

[0003] A fluid dispensing gun for foams, adhesives and sealants comprising a dispensing tube and a trigger for actuating a gun needle able to open the end of said dispensing tube for dispensing the fluid which may be coupled to a pressurized can is known from EP 1 650 140 A1.

[0004] A major drawback of presently available fluid dispensing guns lies in the fact that the output rate cannot be very precisely regulated and controlled.

[0005] A dosage gun comprising a scale provided on a rear end of the housing for indicating the position of the dosage device in relation to the emission nozzle is known from US 4,955,544 A.

[0006] The object of the present invention is therefore to provide a better regulation and control of the output rate of the fluid dispensing gun.

[0007] This object is achieved according to the present invention in that the position indicators are in form of a window or a plurality of windows provided in the housing of the gun and the needle or a part linked to it is provided with markers which appear in the windows in function of the co-axial position of the needle within the dispensing tube.

[0008] This embodiment concerns the control of the output rate. In currently available fluid dispensing guns, the user can only consider the degree he has activated the regulating means for regulating the degree of opening of the dosing nozzle in order to have a vague idea of the current output rate. Combined with the fact that in current fluid dispensing guns a small needle travel leads to a high increase of the output rate, the output rate can hardly be adapted to the current needs. With a visual feedback, the user is able to see at any moment how the output rate is regulated.

[0009] Since the needle opens and closes the dosing nozzle and defines the output rate, optical means can be coupled to the needle or parts linked to it in order to show the current co-axial position of the needle within the dispensing tube.

[0010] The part linked to the needle can be e.g. the regulating means which is generally in form of a back screw. This back screw can be provided with a slope which appears in the window or the windows provided in the wall of the gun showing the degree of opening of the dosing nozzle. As alternative or complementary embodiment of the present invention, means for acoustic and/or haptic feedback of the current output rate are provided.

[0011] In this context, it is possible to have a snap fixed on the needle which provokes a snapping noise at each progression of the needle. This may help users in a dark environment to estimate the current dosing nozzle rate. It is also possible to fix on the needle a protrusion which can be felt at the outside of the gun by the user. In function of the position of the protrusion within a window, the user can estimate the current output rate.

[0012] In the following, execution examples of the invention are explained in detail with reference to the figures.

Fig. 1a a comparative representation of a dosing nozzle according to the invention and of a dosing nozzle according to the prior art with 0 mm needle travel,

Fig. 1b the visual feedback for the user corresponding to the position of Fig. 1a,

Fig. 2a a comparative representation of a dosing nozzle according to the invention and of a dosing nozzle according to the prior art with 1 mm needle travel,

Fig. 2b the visual feedback for the user corresponding to the position of Fig. 2a,

Fig. 3a a comparative representation of a dosing nozzle according to the invention and of a dosing nozzle according to the prior art with 2 mm needle travel,

Fig. 3b the visual feedback for the user corresponding to the position of Fig. 3a,

Fig. 4a a comparative representation of a dosing nozzle according to the invention and of a dosing nozzle according to the prior art with 3 mm needle travel,

Fig. 4b the visual feedback for the user corresponding to the position of Fig. 4a,

Fig. 5a a comparative representation of a dosing nozzle according to the invention and of a dosing nozzle according to the prior art with 4 mm needle travel,

Fig. 5b the visual feedback for the user corresponding to the position of Fig. 5a,

Fig. 6a an overview of the assembly,

Fig. 6b a detail view of the rear part of the needle and of the back screw,

Fig. 7a a perspective view of the back screw and

Fig. 7b a side view of the back screw.

[0013] As shown in Fig. 1a, 2a, 3a, 4a and 5a, the inside of the dosing nozzle (1) according to the present invention (upper view of the figures) has a first cylindrical area (2), followed by a first conical area (3), followed by a second cylindrical area (4), followed by a second conical area (5) and ends in the outlet (6) of the dosing nozzle (1) with a third cylindrical area (7). The dosing nozzle (1) of a current dispensing gun (lower view of the figures) has a first cylindrical area (8), followed by a conical area (9) and ends in the dosing nozzle (6) with a second cylindrical area (10). The design of the needle (11) is unchanged.

[0014] Tests have shown that the ratio between the needle travel and the foam output rate is much better with the design of the dosing nozzle (1) according to the present invention because the ratio between the needle travel and the output is less important and more linear. Therefore, it is easier to regulate the output rate of the fluid dispensing gun.

[0015] As shown in Fig. 1b, 2b, 3b, 4b and 5b, the current position of the needle defining the output rate is shown by position indicators are in form of a plurality of windows (12) provided in the housing (17) of the gun and the needle or a part linked to it is provided with markers which appear in the windows in function of the co-axial position of the needle within the dispensing tube. The four white windows of Fig. 1b correspond to the closed position, the one black window of Fig. 2b corresponds to low output, the two black windows of Fig. 3b correspond to middle output, the three black windows of Fig. 4b correspond to high output and the four black windows of Fig. 5b correspond to maximum output.

[0016] Of course, it is possible to provide more or less windows or to visualize the output rate of the fluid dispensing gun in any other way.

[0017] Fig. 6a shows an overview of the assembly and Fig. 6b shows a detail view of the rear part of the needle (11) and of the back screw (14). The needle (11) can be activated by pushing the trigger (13). The needle (11) has a front part (11a) and a rear part (11b) which are coupled together. The needle (11) is loaded by a spring (12) pushing on the rear part (11b) of the needle (11). A back screw (14) is linked to the rear part (11b) of the needle (11) and is provided with a thread (15) cooperating with a corresponding thread (16) of the housing (17) of the gun. Turning the end of the back screw (14) which is outside the housing of the fluid dispensing gun makes the needle travel co-axially within the housing (17) and regulates the degree of opening of the dosing nozzle (1). The lead or pitch on the back screw (14) is 3 mm which means that if the back screw (14) is turned slightly less than 360° (which is the maximum), a needle travel of 3 mm is achieved. Since a needle travel of about 4 mm is required for a satisfying regulation of the fluid output, a slope (19) is provided on the rear part (11b) of the needle (11) as shown in Fig. 6b.

[0018] A second slope (18) provided on the back screw (14) gives visual feedback of the current output rate since it appears in the windows (12) of the housing (17) as explained above concerning Figures 1b, 2b, 3b, 4b and 5b. The back screw (14) with the slope (18) at its end is shown in detail in Figures 7a and 7b.

Claims

1. Fluid dispensing gun comprising a dispensing tube with a dosing nozzle (1), a spring-loaded needle (11) which is co-axially moveable in the dispensing tube for opening and closing the dosing nozzle (1), a trigger (13) for actuating said needle (11) in order to open the dosing nozzle (1) and to dispense the fluid, regulating means (14) for regulating the degree of opening of the outlet (6) of the dosing nozzle (1) and coupling means for coupling a pressurized can to the gun and means for visual feedback of the current degree of opening of the outlet (6) of the dosing nozzle (1), wherein the means for visual feedback are designed as position indicators which show the current co-axial position of the needle (11) within the dispensing tube, **characterized in that** the position indicators are in form of a window (12) or a plurality of windows (12) provided in the housing (17) of the gun and the needle (11) or a part linked to it is provided with markers which appear in the windows (12) in function of the co-axial position of the needle (11) within the dispensing tube.

2. Fluid dispensing gun according to claim 1, **characterized in that** means for acoustic and/or haptic feedback of the current dosing nozzle rate are provided.

Patentansprüche

1. Fluidabgabepistole, umfassend ein Abgaberohr mit einer Dosierdüse (1), eine federbelastete Nadel (11), die in dem Abgaberohr koaxial beweglich ist, um die Dosierdüse (1) zu öffnen und zu schließen, einen Auslöser (13) zum Betätigen der Nadel (11), um die Dosierdüse (1) zu öffnen und das Fluid abzugeben, Reguliermittel (14) zum Regulieren des Öffnungsgrades des Auslasses (6) der Dosierdüse (1) und Kupplungsmittel zum Ankuppeln einer unter Druck stehenden Dose an die Pistole und Mittel zur visuellen Rückmeldung des aktuellen Öffnungsgrades des Auslasses (6) der Dosierdüse (1), wobei die Mit-

tel zur visuellen Rückmeldung als Positionsanzeiger ausgebildet sind, die die aktuelle koaxiale Position der Nadel (11) innerhalb des Abgaberöhrchens anzeigen, **dadurch gekennzeichnet, daß** die Positionsanzeiger die Form eines Fensters (12) oder einer Vielzahl von Fenstern (12) haben, die im Gehäuse (17) der Pistole vorgesehen sind, und die Nadel (11) oder ein mit ihr verbundenes Teil mit Markierungen versehen ist, die in den Fenstern (12) in Abhängigkeit von der koaxialen Position der Nadel (11) innerhalb des Abgaberohres erscheinen.

2. Fluidabgabepistole nach Anspruch 1, **dadurch gekennzeichnet, dass** Mittel zur akustischen und/oder haptischen Rückmeldung der aktuellen Abgaberate der Dosieröffnung vorgesehen sind.

Revendications

1. Pistolet distributeur de fluide comprenant un tube distributeur avec une buse de dosage (1), une aiguille (11) à ressort qui est mobile coaxialement dans le tube distributeur pour ouvrir et fermer la buse de dosage (1), une gâchette (13) pour actionner ladite aiguille (11) afin d'ouvrir la buse de dosage (1) et de distribuer le fluide, des moyens de régulation (14) pour réguler le degré d'ouverture de la sortie (6) de la buse de dosage (1) et des moyens de couplage pour coupler un boîtier sous pression au pistolet et des moyens de contrôle visuel du degré d'ouverture actuel de la sortie (6) de la buse de dosage (1), dans lequel les moyens de contrôle visuel sont conçus comme des indicateurs de position qui montrent la position coaxiale actuelle de l'aiguille (11) dans le tube de distribution, **caractérisé en ce que** les indicateurs de position sont sous la forme d'une fenêtre (12) ou de plusieurs fenêtres (12) prévues dans le boîtier (17) du pistolet et l'aiguille (11) ou une partie liée à celle-ci est munie de repères qui apparaissent dans les fenêtres (12) en fonction de la position coaxiale de l'aiguille (11) dans le tube de distribution.

2. Pistolet de distribution de fluide selon la revendication 1, **caractérisé en ce que** des moyens pour le contrôle acoustique et/ou haptique du débit actuel de la buse de dosage sont prévus.

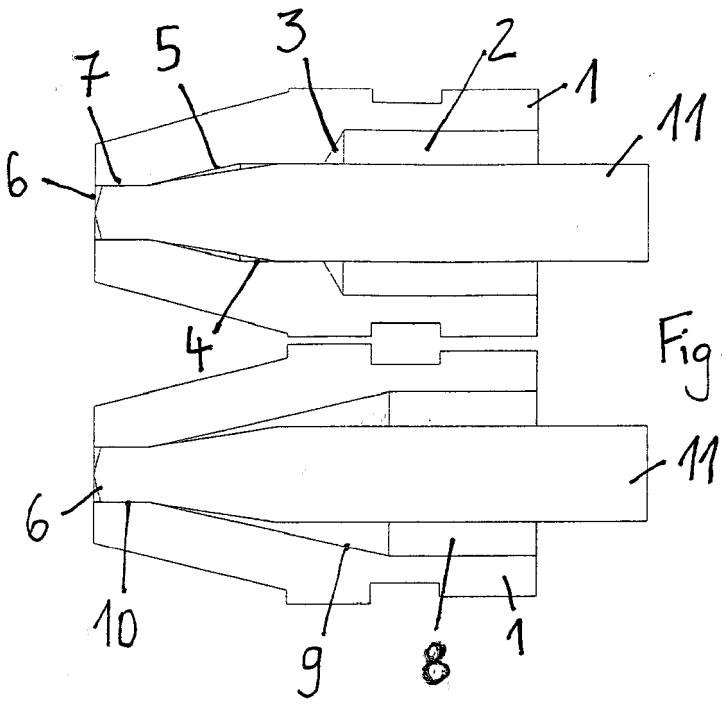


Fig. 1a

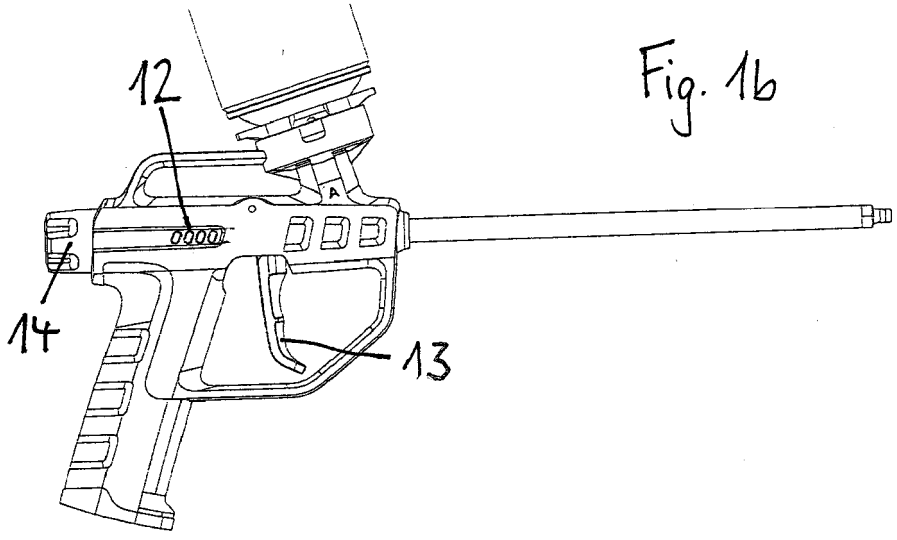


Fig. 1b

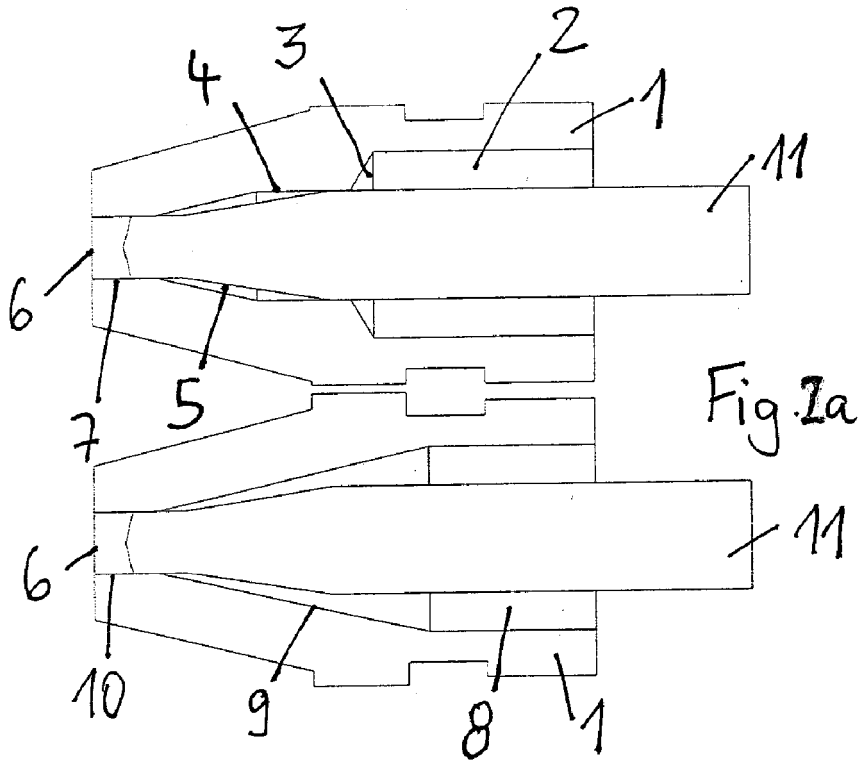


Fig. 1a

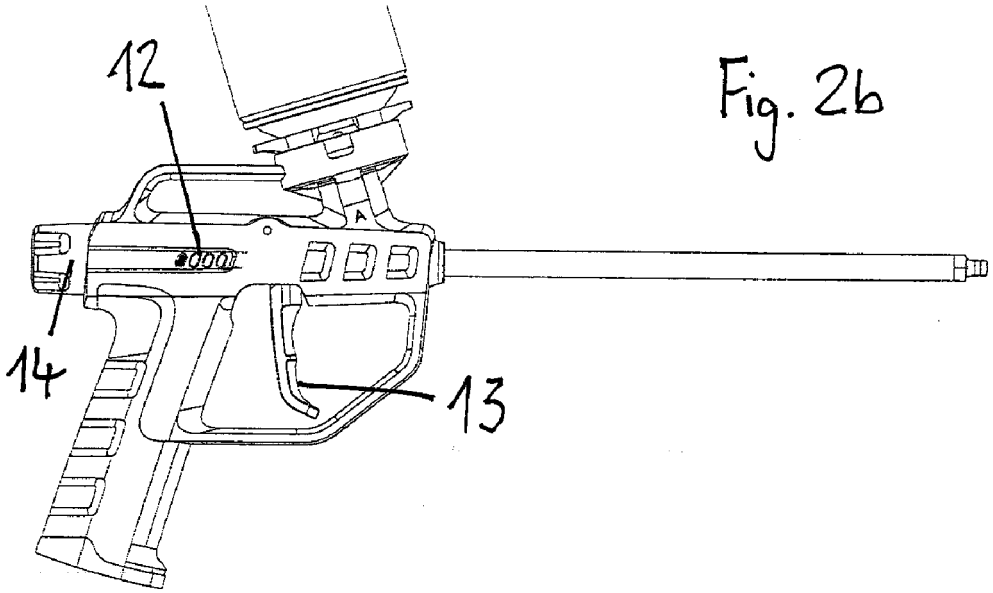


Fig. 2b

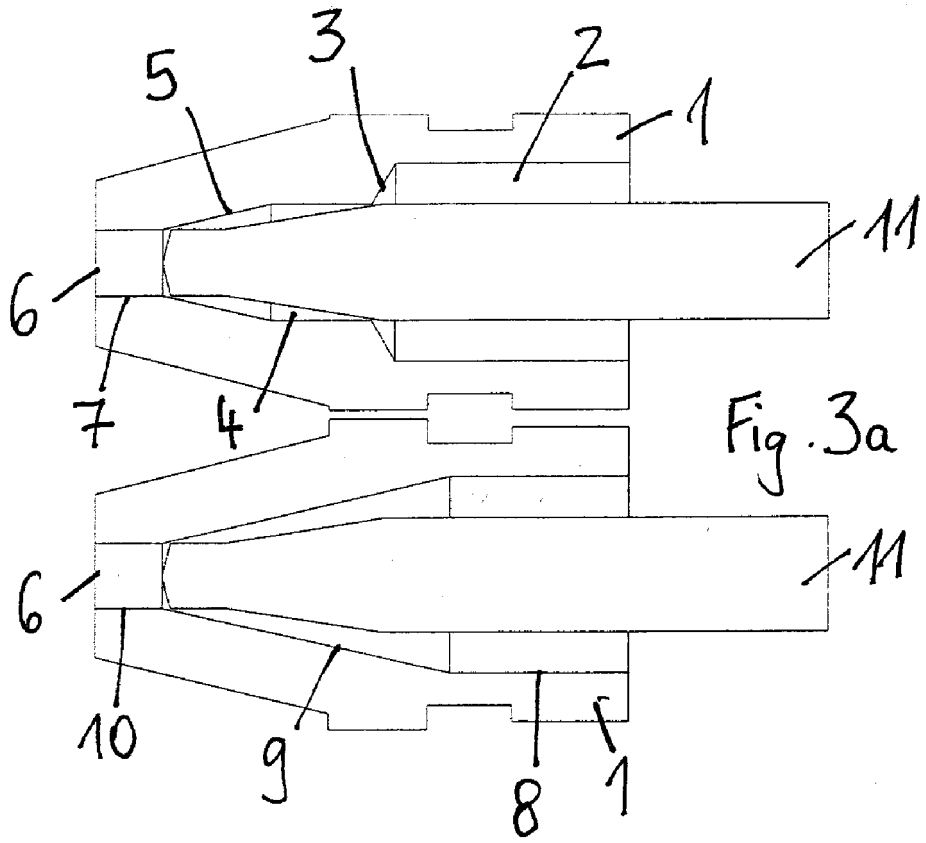


Fig. 3a

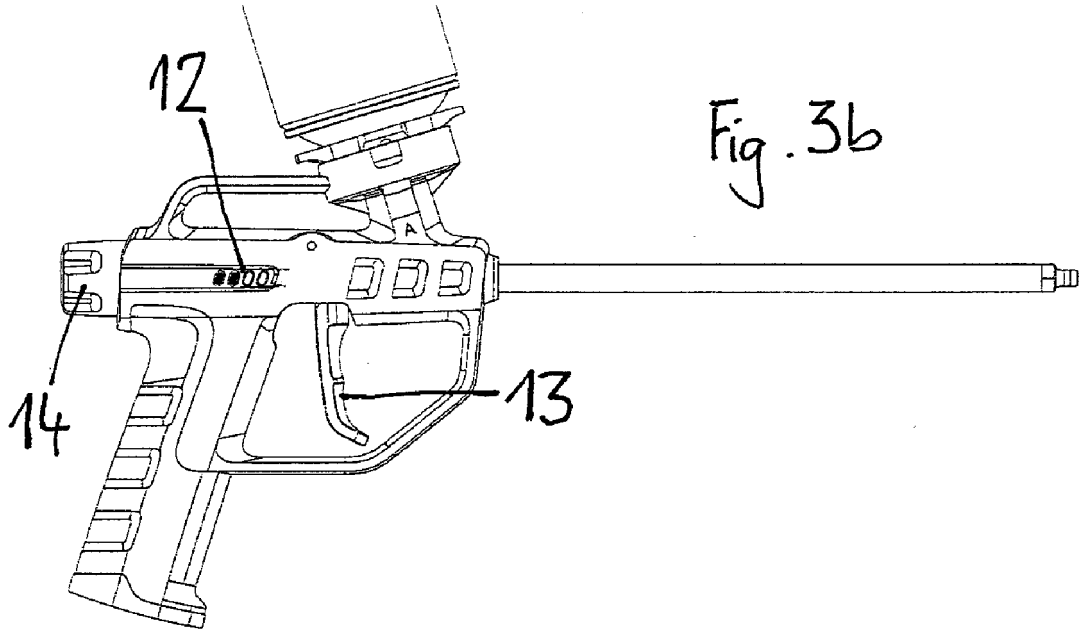


Fig. 3b

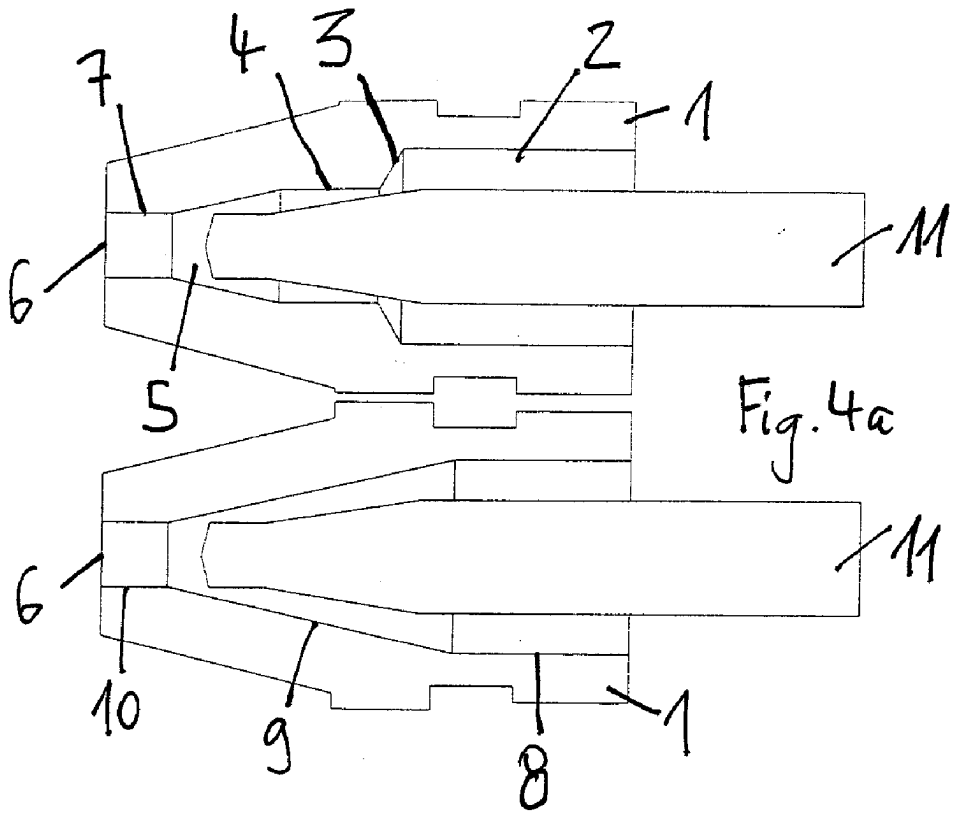


Fig. 4a

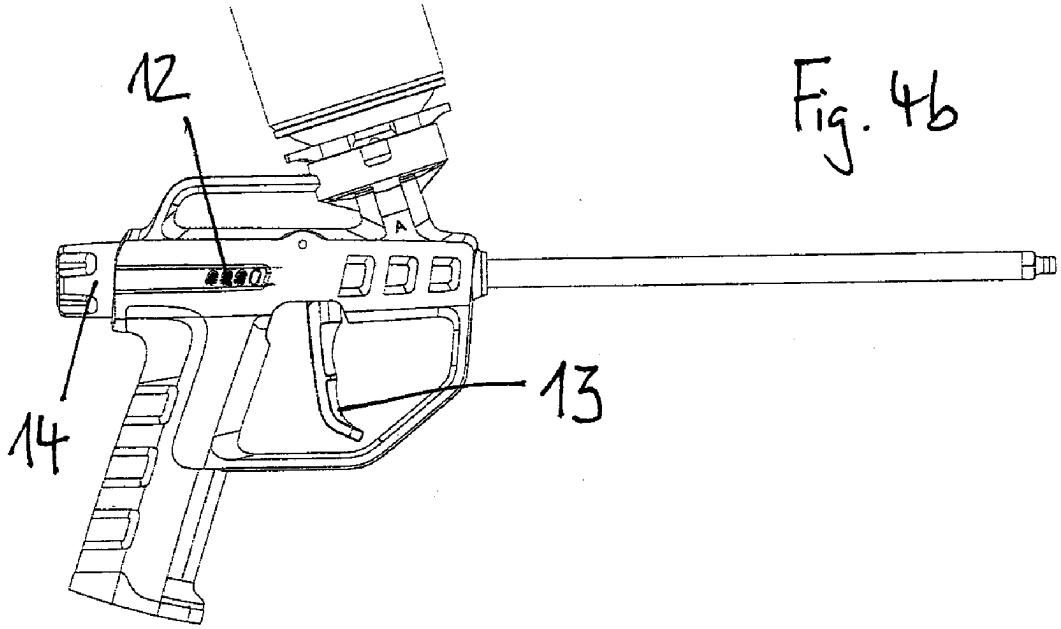


Fig. 4b

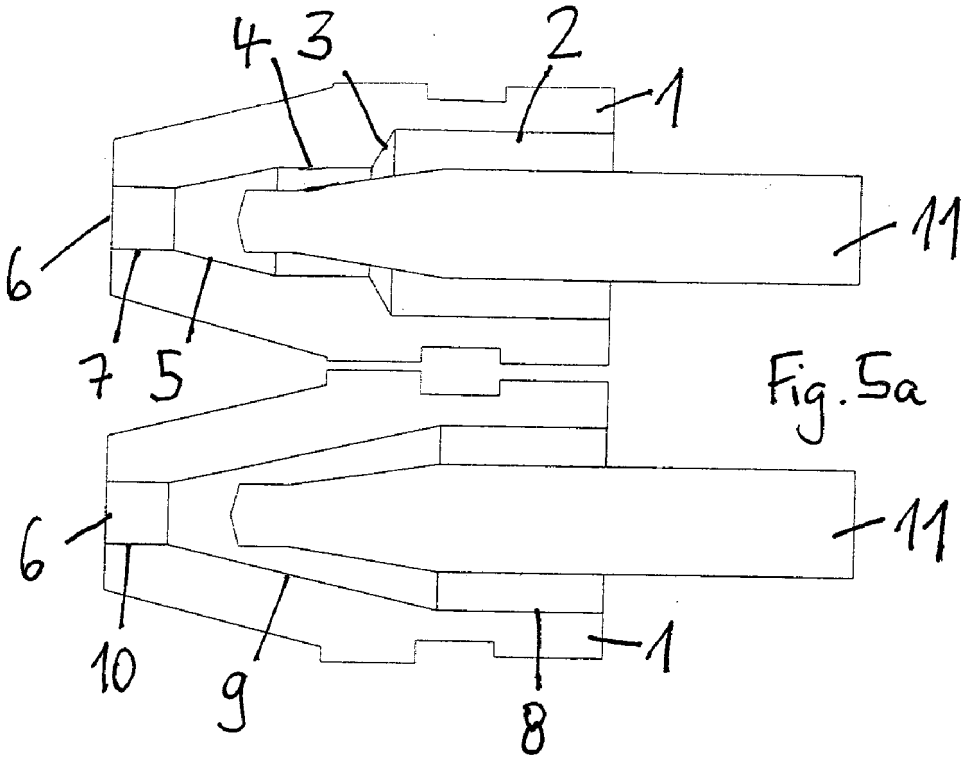


Fig. 5a

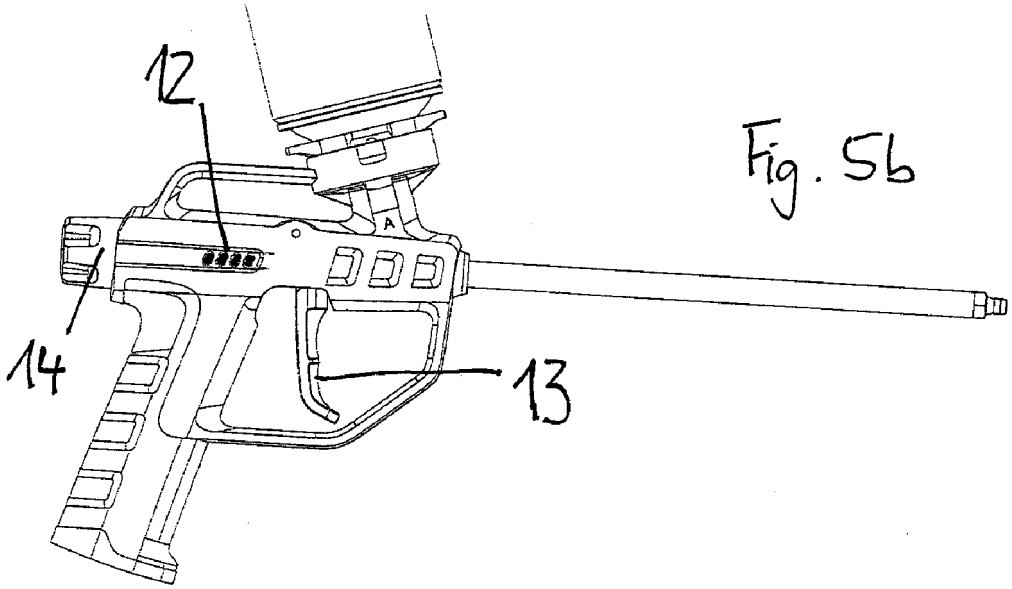


Fig. 5b

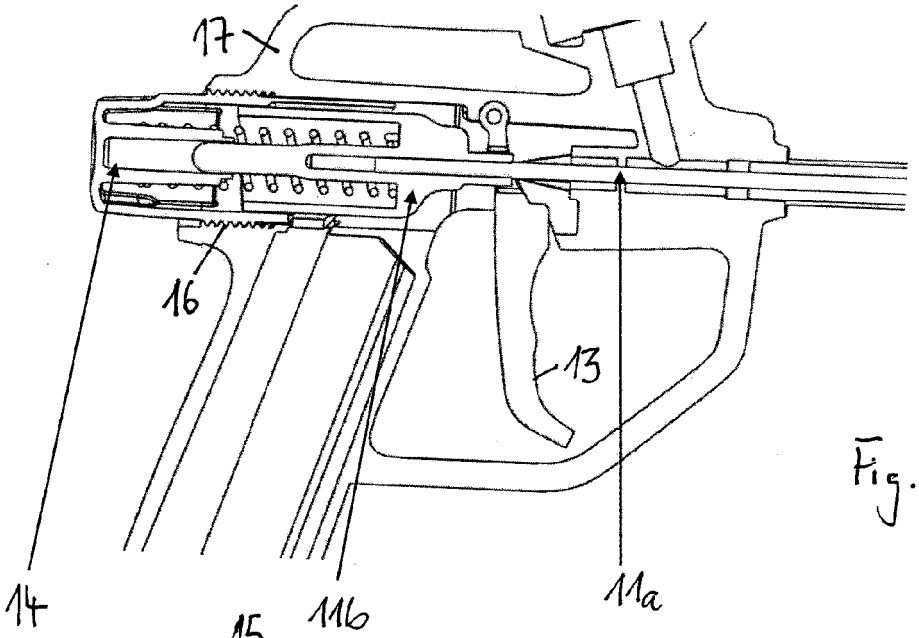


Fig. 6a

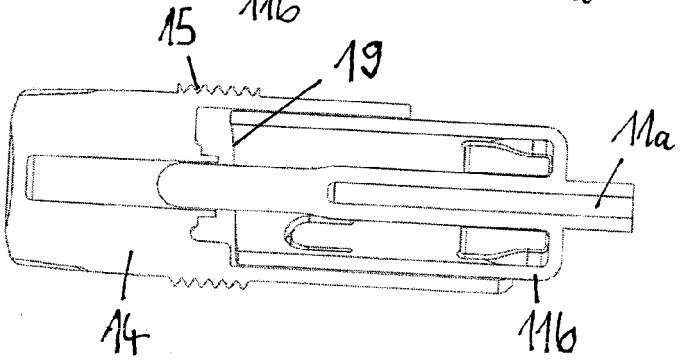


Fig. 6b

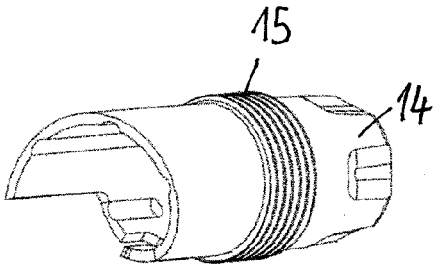
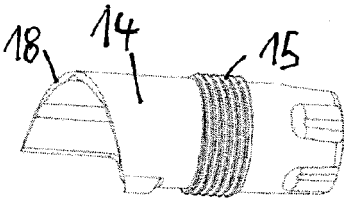


Fig. 7a

Fig. 7b



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