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MULTIPLE NOZZLE BODY

Description

- 5 The invention relates to a multiple nozzle body according to the preamble of Patent Claim 1.

Such a multiple nozzle body is described in WO 2014/067785 A1. This multiple nozzle body is provided for arranging on a spray boom of an agricultural field
10 sprayer extending transversely to the travelling direction of the field sprayer. At least one feed line formed as liquid line is arranged on the spray boom. In the region of the arrangement of the multiple nozzle body, an inflow line with a delivery port branches off the feed line in each case in the region of the arrangement of the multiple nozzle body. The multiple nozzle body is connected
15 to the feed line via the delivery port. On the underside of the main housing, a dispensing-element carrier that is freely rotatable about its central axis of rotation and is settable in different positions is arranged. The dispensing-element carrier has a plurality of connecting lines that are selectively connectable to the delivery port of the inflow line for the respective dispensing position and each have a
20 receiving port. The connecting lines each open out at the free ends of coupling connectors arranged on the underside of the dispensing-element carrier for arranging dispensing elements. These dispensing elements can be for example spray nozzles with different dispensing characteristics.

- 25 Usually, the multiple nozzle bodies are arranged at a distance of 50 cm relative to one another on the spray boom. For many application cases, this distance of 50 cm of the dispensing elements activated on the respective multiple nozzle body formed as spray boom is sufficient. However in some cases it is necessary that the dispensing elements are arranged at a distance of 25 cm relative to one
30 another in order to be able to dispense the dispensing liquids on the cultivation surface with suitable special dispensing elements in the desired manner. With the multiple nozzle body proposed here this is only possible when these are also arranged on the spray boom at a distance of 25 cm. However, the relatively

expensive multiple nozzle bodies have to be arranged on the spray boom in twice the number.

- By way of EP 2 570 027 A2, multiple nozzle bodies are proposed which are arranged on a spray boom at a distance of 50 cm relative to one another. These multiple nozzle bodies have at least one centrally arranged dispensing element and laterally next to the multiple nozzle body additional dispensing elements arranged at a distance of 25 cm. This multiple nozzle body is assigned valve elements arranged in the main housing and actuated by a motorically rotatable cam disc. By way of these valve elements, the liquid feed to the various dispensing elements assigned to the multiple nozzle body can be optionally activated or deactivated. On the multiple nozzle body, the dispensing elements are arranged at various distances relative to one another so that dispensing elements at a distance of 25 cm relative to one another can also be activated. However, because of its configuration, this multiple nozzle body is very elaborate and relatively expensive. In addition, the number of the dispensing elements assigned to a multiple nozzle body, which are arranged at a distance of 50 cm relative to one another, is very limited.
- The invention is based on the object of having a multiple nozzle body with a dispensing-element carrier that is freely rotatable about a central axis of rotation and adjustable in different positions having a plurality of dispensing elements with additional dispensing elements arranged at a greater distance relative to one another created, wherein the different dispensing elements can be activated or deactivated by rotating the dispensing-element carrier.

- According to the invention, this object is solved in that in the dispensing-element carrier a bypass line comprising an inlet opening and outlet opening is arranged, in that in the main housing an auxiliary outlet opening with auxiliary outlet lines following thereon and branching into two branch lines facing in diametrically opposite direction is arranged, in that on the free ends of the respective auxiliary outlet line at least one coupling connector for arrangement of dispensing elements is arranged, in that the coupling connectors are each arranged at a distance of 12.5

cm from the axis of rotation of the rotatable dispensing-element carrier.

As a consequence of these measures, a multiple nozzle body is created which is arranged on the spray boom at a distance of 50 cm from the adjacent multiple
5 nozzle body and in addition to the dispensing elements arranged on the multiple nozzle body comprises dispensing elements arranged on the multiple nozzle body at a distance of 25 cm. These additional lateral dispensing elements can be easily activated by way of the bypass line arranged in the dispensing-element carrier, in that the bypass line with the feed line and the auxiliary outlet opening in the main
10 housing is connected to these lateral dispensing elements so that these lateral dispensing elements can be supplied with the liquid to be dispensed.

In an arrangement of multiple nozzle bodies at a distance of 50 cm relative to one another on the spray boom, a short adjacent distance of active dispensing
15 elements, via which the liquid to be dispensed is dispensed, can be realized in a simple manner in that the coupling connectors assigned to the auxiliary outlet lines of a multiple nozzle body have a distance of at least 25 cm relative to one another.

20 A simple configuration and arrangement of the receiving ports and their activation and deactivation for activating and deactivating the liquid feed to the various dispensing elements arranged on the multiple nozzle bodies is realized in a simple and advantageous manner in that four coupling connectors and the connecting lines having the assigned receiving ports are at least approximately
25 evenly arranged on a circle on the dispensing-element carrier, that the inlet opening and the outlet opening of the bypass line likewise lie on the circle on which the receiving ports for the connecting lines for the coupling connectors lie, and that the delivery port and the auxiliary outflow opening are likewise arranged on the circle on which the receiving ports of the connecting lines for the coupling
30 connectors lie.

A particularly advantageous arrangement of the different line and delivery elements for the feed line from the liquid to be dispensed to the respective

dispensing elements is achieved in that the delivery port and the auxiliary outflow opening of the bypass line are each arranged diametrically opposite one another in a manner lying on a straight line extending through the axis of rotation of the dispensing-element carrier and at the same distance from this axis of rotation.

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A simple arrangement of the different lines in the multiple nozzle body is achieved in that the auxiliary outflow lines that branch into branch line and extend in diametrically opposite directions are combined to form a line housing and the branch line has a connecting piece to be connected to the auxiliary outflow opening of the main housing.

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In order to be able to have the dispensing-element carrier securely and specifically brought into the correct position for the respective activation and/or deactivation of the different dispensing elements manually by the operator by rotating the dispensing-element carrier it is provided that on the outside wall of the main housing a marking is arranged on a straight line extending through the axis of rotation of the dispensing-element carrier and of the delivery port. Because of this provided marking, the operator can easily determine visually if the dispensing-element carrier has been brought into the correct position for the respective activation or deactivation of the respective dispensing element for the respective operation.

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In order to bring the dispensing-element carrier easily and securely into the correct position for activating the further dispensing elements arranged laterally and spaced from the dispensing-element carrier by way of the bypass line by manual rotating by the operator, it is provided that on the lower surface of the dispensing-element carrier congruently with the inlet opening and/or the outlet opening of the bypass line at least one marking element indicating the position of these openings is arranged.

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In a multiple nozzle body, which in the installation position of the multiple nozzle body on the spray boom is arranged so that the axis of rotation of the dispensing-element carrier is inclined in a direction relative to the perpendicular by an angle

- between 10° and 30° , preferentially approximately 20° , it is provided that the axis of rotation extends in a plane extending transversely to the travelling direction and extending perpendicularly through the spray boom and is orientated in this plane inclined towards the side. By way of this, an improved orientation and
- 5 arrangement of the respective active dispensing element formed as spray nozzle is achieved, so that the spray fan of the supplied liquid generated by the spray nozzle can form unhindered by the remaining dispensing elements arranged on the dispensing-element carrier.
- 10 The unhindered formation of the spray fan generated by a spray nozzle is additionally improved in that the coupling connectors are arranged in the radial direction relative to the lower plane of the dispensing-element carrier at an angle of at least approximately 90° to the lower plane of the dispensing-element carrier, and that the respective coupling connector, when its receiving port is connected to
- 15 the delivery port of the main housing, is arranged in the tangential direction to the lower plane of the dispensing-element carrier at an angle corresponding at least approximately to the inclination, inclined against the inclination of the axis of rotation.
- 20 In particular in the case of short spray nozzle designs the unhindered formation of the spray fan, without these being disturbed by the adjacent dispensing elements, can still be improved in that at least one of the coupling connectors has a length, measured between the lower plane of the dispensing-element carrier and its free end, that is distinct from the remaining coupling connectors. Through the
- 25 extended configuration of the coupling connector, previously separate additional bridging pieces between the spray nozzle and the coupling connector can be advantageously and cost-effectively dispensed with. In addition to this it is avoided that the previously required additional bridging pieces can be lost so that an optimized arrangement even of short-design dispensing elements, for example
- 30 spray nozzles, is ensured.

Further details of the invention can be taken from the example description and the drawings. In the drawings

Fig. 1 shows an agricultural field sprayer with a spray boom situated in working position with dispensing elements formed as spray nozzles in a perspective and schematic representation,

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Fig. 2 shows the right outer part region of the spray boom with multiple nozzle bodies according to Fig. 1 arranged thereon in the same representation but to an enlarged scale,

10 Fig. 3 shows a part region of the spray boom with multiple nozzle bodies according to the invention as per Fig. 2, however in a perspective view obliquely from below and to an enlarged scale,

15 Fig. 4 shows the multiple nozzle body according to the invention as per Fig. 3 at an enlarged scale and in the view from behind,

Fig. 5 shows the multiple nozzle body according to the invention as per Fig. 3 at an enlarged scale and in the lateral view from the left,

20 Fig. 6 shows the multiple nozzle body in a sectional and simplified schematic representation, wherein the middle lower region is connected to the rotatable dispensing-element carrier in the section VIA-VIA, the respective two outer regions in the section VIB-VIB and valve region in the section VIC-VIC, wherein the dispensing-element carrier is rotated
25 into a position in which the feed line of the liquid to be dispensed is connected to an outlet line in the rotatable dispensing-element carrier and a dispensing element arranged on the coupling connector of the dispensing-element carrier, with drawn-in liquid flow pattern,

30 Fig. 7 shows the multiple nozzle body in the view according to Fig. 4 and in a partially exploded representation,

Fig. 8 shows the outer housing part for the rotatable dispensing-element carrier

of the multiple nozzle body in a perspective representation,

Fig. 9 shows the rotatable dispensing-element carrier in a perspective view with the dispensing elements formed as spray nozzles arranged thereon,

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Fig. 10 shows the rotatable dispensing-element carrier without dispensing elements arranged thereon in an exploded representation and in a perspective view,

10 Fig. 11 shows the rotatable dispensing-element carrier in a perspective view with the dispensing elements formed as spray nozzles arranged thereon with drawn-in liquid flow pattern,

15 Fig. 12 shows the multiple nozzle body in a clearly arranged sectional representation, wherein for the sake of clarity the outer housing part for the rotatable dispensing-element carrier is not shown, wherein the middle lower region is connected to the rotatable dispensing-element carrier in the section VIA-VIA, the respective two outer regions in the section VIB-VIB and valve region in the section VIC-VIC, wherein the dispensing-element carrier is rotated into position in which the feed line of the liquid to be
20 dispensed is connected to an auxiliary outlet line and a dispensing element arranged on the coupling connector of the dispensing-element carrier, with drawn-in liquid flow pattern, are shown.

25 Fig. 13 shows the multiple nozzle body in a partly exploded representation in a perspective representation, wherein the upper and lower part in the view are shown from different view angles for better and understandable representation of the course of the liquid,

30 Fig. 14 shows the rotatable dispensing-element carrier in the section XIV-XIV,

Fig. 15 shows the rotatable dispensing element in the section XV-XV,

Fig. 16 shows the dispensing-element carrier in the view XVI-XVI,

5 Fig. 17 shows the agricultural field sprayer with a spray boom in working position with dispensing elements formed as drag hoses in a perspective and schematic representation,

10 Fig. 18 shows the right outer part region of the spray boom with drag hoses according to Fig. 17 arranged on the multiple nozzle bodies in the same kind of representation but to an enlarged scale,

15 Fig. 19 shows a part region of the spray boom with drag hoses according to Fig. 17 arranged on the multiple nozzle bodies, however in the perspective view obliquely from below and to an enlarged scale and

Fig. 20 shows the multiple nozzle body according to the invention with the drag hoses according to Fig. 19 arranged thereon to an enlarged scale and in the view from behind.

20 The drawn agricultural field sprayer 1 is coupled to the field tractor 3 by way of the drawbar 2. The field sprayer comprises the spray boom formed as spreader boom 4, the chassis 5 and the storage container 7 arranged on the frame 6. On the spray boom 4, the connecting elements for the multiple nozzle bodies 9 with coupling connectors 10 and 10.1 for connecting dispensing elements designed as
25 spray nozzles 11 are arranged at regular distances on the liquid feed line 8 arranged on the spray boom 4. The liquid feed line 8 is supplied in adjustable quantities with the spraying liquid present in the storage container 7 by way of a pump and metering devices which are not shown.

30 The nozzle body housings are formed as multiple nozzle bodies 9 with multiple coupling connectors 10 and 10.1 for arranging the spray nozzles 11. In the multiple nozzle bodies 9, deactivation elements with remotely controllable switching elements 13 each formed as valve arrangement 12 are arranged. By

way of these deactivation elements, the liquid feed to the respective coupling connectors 10 and 10.1 and the spray nozzles 11 arranged thereon can be activated or deactivated. The remotely controllable switching elements 13 of the deactivation elements are activated by way of an operating device with associated control device, which can be formed as on-board computer arranged on the field tractor 3. Thus, the deactivation elements can each be switched separately via the control device for activating and deactivating the liquid feed to the spray nozzles 11.

The multiple nozzle bodies 9 are arranged on the spray boom 4 at a distance A of 50 cm from one another. The two outer coupling connectors 10.1 with the dispensing elements of the multiple nozzle body 9 formed as spray nozzles 11 are arranged at a distance B of 25 cm relative to one another. Furthermore, the respective outer coupling connectors 10.1 of adjacent multiple nozzle bodies 9 adjacent to one another are likewise arranged at a distance B of 25 cm relative to one another. Thus, the outer coupling connectors 10.1 are each arranged at a distance C of 12.5 cm relative to the axis of rotation 18 of the rotatable dispensing-element carrier 19.

Each multiple nozzle body 9 comprises a main housing 14 connected to the liquid feed line 8 via the feed line 8.1, wherein the feed line 8.1 in each case forms a part of the liquid feed line 8. In the region of the main housing 14, an inflow line 8.2 with a delivery port 15 branches off the feed line 8.1. On the underside, the main housing 14 has a circular recess 16 with a circumferential circular edge 17, wherein in the Figures 12 and 13 the lower region of the main housing 14 with the circumferential circular edge 17, which is shown in Fig. 8, has been omitted in the representation for the sake of clarity.

In the circular recess 16 of the main housing 14, a dispensing-element carrier 19 that is freely rotatable about its central axis of rotation 18 and settable in different positions is arranged. The dispensing-element carrier 19 comprises multiple connecting lines 20 which are optionally connectable to the delivery port 15 of the feed line 8.1 for the respective dispensing position and each comprises a

receiving port 20.1. In the region of each connecting line 20, coupling connectors 10 for arrangement as dispensing elements formed as spray nozzles 11 are arranged on the lower plane 19.1 of the dispensing-element carrier 19. Then, the connecting lines 20 open out at the free ends of the coupling connectors 10. On
5 the free ends of the coupling connectors 10, dispensing elements in the form of spray nozzles 11 are arranged preferentially with a bayonet closure. The dispensing-element carrier 19 is rotatable in different positions so that depending on the position of the dispensing-element carrier 19 a different connecting line 20 is connected to the delivery port 15 of the feed line 8.2 so that the respective
10 desired spray nozzle 11 can be supplied with the spray liquid and the same dispensed via the said spray nozzle 11.

In the dispensing-element carrier 19, a further bypass line 21 comprising inlet opening 21.1 and outlet opening 21.2 is arranged. The bypass line 21 with the
15 inlet opening 21.1 and the outlet opening 21.2 are arranged in the exemplary embodiment in a section 19.3 that is insertable into a recess 19.2 of the dispensing-element carrier 19.

In addition to this, an auxiliary outlet opening 22.1 with auxiliary outlet lines 22
20 following thereon and branching into two branch lines 22.2 facing in diametrically opposite directions are arranged in the main housing 14. The auxiliary outlet lines 22 are located in connecting arms 9.1 connected to the main housing. On the free ends of the respective auxiliary outlet line 22, at least one coupling connector 10.1 each for arranging of dispensing elements 11 is arranged.
25 The coupling connectors 10.1 are each arranged at a distance of 12.5 cm from the axis of rotation 18 of the rotatable dispensing-element carrier 18. The coupling connectors 10 assigned to the auxiliary outlet lines 22 of a multiple nozzle body 9 have at least a distance of 25 cm relative to one another.

30 On the rotatable dispensing-element carrier 19 of a multiple nozzle body 9, four coupling connectors 10 are arranged. The four coupling connectors 10 and the associated connecting lines 20 comprising receiving ports 20.1 are arranged on the dispensing-element carrier 19 at least approximately evenly distributed on a

circle. The inlet opening 21.1 and the outlet opening 21.2 of the bypass line 21 are likewise arranged on the circle on which the receiving ports 20.1 of the connecting lines 20 for the coupling connectors 10 lie. The delivery port 15 and the auxiliary outlet opening 22.1 are likewise arranged on the circle on which the receiving ports 20.1 of the connecting lines 20 for the coupling connectors 10 lie. The delivery port 15 and the auxiliary outlet opening 22.1 are arranged in the main housing 14 and the inlet opening 21.1 and the outlet opening 21.2 of the bypass line 21 arranged in each case lying diametrically opposite a straight line extending through the axis of rotation 18 of the dispensing-element carrier 19 and at the same distance from this axis of rotation 18.

The auxiliary outlet lines 22 with the connecting arms 9.1 branching into branch lines 22.2 and extending in diametrically opposite direction are combined into a line housing 23 and the branch line 22.2 comprises a connecting piece 22.3 that is connectable to the auxiliary outlet opening 22.1 of the main housing 14.

On the outside wall 17.1 of the main housing 14, a marking formed in the exemplary embodiment as a first arrow 24 pointing downwards is arranged on a straight line extending through the axis of rotation 18 of the dispensing-element carrier 19 and of the delivery port 15. On the outsides of the coupling connectors 10, a marking each formed as a first arrow 24 facing downwards and marking formed as second arrow 25 facing downwards is provided. When by rotating the dispensing-element carrier 19 the respective second arrow 25 of the respective coupling connector 10 with the respective spray nozzle 11 employed faces towards the first arrow 24, the respective connecting line 20 of the coupling connector 10 is connected to the delivery port 15 so that in the desired manner the spray nozzle 11 employed is supplied with the spray liquid to be dispensed. The course of the liquid is schematically shown in a simplified manner by the arrows 21.3 in Figure 13.

On the lower face 19.1 of the dispensing-element carrier 19, congruently with the inlet opening 21.1 and/or the outlet opening 21.2 of the bypass line 21, marking elements 26 indicating the position of these openings 21.1 and 21.2 formed as

third arrows in the exemplary embodiment are arranged. When by rotating the dispensing-element carrier 19 one of the third arrows 26 of the respective coupling connector 10 points to the first arrow 24, the inlet opening 21.1 of the bypass line 21 is connected to the delivery port 15 and the outlet line 21.2 of the
5 bypass line 21 to the auxiliary outlet opening 22.1 and the auxiliary outlet lines 22 leading to the outer coupling connectors 10.1 and branch lines 22.2, so that in the desired manner the spray nozzle 11 employed at the outer coupling connectors 10.1 or the drag hose 28 arranged there is supplied with the spray liquid to be dispensed.

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In the installation position of the multiple nozzle body 9 on the spray boom formed as spreader boom 4, the axis of rotation 18 of the dispensing-element carrier 19 is inclined in a longitudinal direction of the boom 4 in an upright surface extending in a perpendicular plane and in a direction relative to the
15 perpendicular inclined by an angle between 10° and 30° preferentially approximately 20° . The axis of rotation 18 extends in a plane extending transversely to the travelling direction 27 and extending through the spray boom 4 and is orientated in this plane inclined towards the side. The axis of rotation 18 and the lower plane 19.1 of the dispensing-element carrier 19 extend at a right
20 angle to the axis of rotation 18 of the dispensing-element carrier 19.

The coupling connectors 10 arranged on the lower plane 19.1 of the dispensing-element carrier 19 are arranged in the radial direction relative to the lower plane 19.1 of the dispensing-element carrier 19 at an angle of at least approximately 90°
25 to the lower plane 19.1 of the dispensing-element carrier 19. The respective coupling connector 10, when its receiving port 20.1 is connected to the delivery port 15 of the main housing 14, is arranged in the tangential direction inclined to the lower plane 19.1 of the dispensing-element carrier 19 at an angle corresponding at least approximately to the inclination of the axis of rotation 18
30 inclined against the inclination of the axis of rotation 18. By way of this it is ensured that the respective active dispensing element 11 and the associated coupling connector 10 are orientated perpendicularly downwards.

One of the coupling connectors 10, in the exemplary embodiment the coupling connectors 10.2, has a length, measured between the lower plane 19.1 of the dispensing-element carrier 19 and its free end, that is distinct from that of the remaining coupling connectors 10. Particularly short-design dispensing elements
5 are generally arranged thereon.

According to the exemplary embodiment according to Fig. 17 to 20, so-called drag hoses 28 are arranged on the two outer coupling connectors 10.1 of a multiple nozzle body 9, so that the drag hoses 28 are arranged at a distance B of
10 25 cm relative to one another. On the rotatable dispensing-element carrier 19 located in the middle of the multiple nozzle body 9, spray nozzles 11 are arranged.

Thus it can be easily noticed that in the exemplary embodiment spray nozzles 11
15 or drag hoses 28 can be optionally arranged on the outer coupling connectors 10.1.

PATENTKRAV

1. Flerdysselegeme (9) til anbringelse på en landbrugsmarksprøjtes (1) sprøjtebom (4), der strækker sig på tværs af marksprøjtes (1) køreretning (27), med et hovedhus (14),
 5 som er forbundet til en tilførselsledning (8.1), hvorved der fra tilførselsledningen (8.1) afgrenes mindst en tilstrømningsledning (8.2) med en leveringsport (15), hvorved der på hovedhusets (14) underside er anbragt en dispenserelement-bærer (19), som frit kan drejes omkring sin centrale omdrejningsakse (18) og kan indstilles i forskellige positioner, hvorved dispenserelement-bæreren (19) omfatter et antal forbindelsesledninger
 10 (20), der selektivt kan forbindes til leveringsporten (15) på tilførselsledningen (8.2) for den respektive afgivningsposition og hver for sig omfatter en modtageport (20.1), hvorved hver af forbindelsesledningerne (20) udmunder ved de frie ender af koblingskonnektorer (10), som er placeret i det nedre plan (19.1) for dispenserelement-bæreren (19) med henblik på placering af dispenserelementerne (10), **kendetegnet ved, at en**
 15 **bypass-ledning (21) med en indgangsåbning (21.1) og en udgangsåbning (21.2) er anbragt i dispenserelement-bæreren og ved, at en hjælpeudstrømningsåbning (22.1) med tilslutningsledninger (22.1), som forgrenes til to grenledninger (22.2) og vender diametralt modsat, er anbragt i hovedhuset (14), og ved, at** der på den respektive tilslutnings-afgangslednings (22.1) frie ender er anbragt mindst én koblingskonnektor
 20 (10.1) med henblik på anbringelse af dispenserelementer (11, 28), og **ved, at** de respektive koblingskonnektorer (10.1) er placeret i en afstand (C) på 12,5 cm fra rotationsaksen (18) for den roterbare dispenserelement-bærer (19).

2. Flerdysselegeme (9) ifølge krav 1, **kendetegnet ved, at** koblingskonnektorerne (10.1), som er tilordnet hjælpeudstrømningsledningerne (22.1) på et flerdyselegeme
 25 (9), i det mindste har en indbyrdes afstand (B) på 25 cm.

3. Flerdysselegeme (9) ifølge mindst et af de foregående krav, **kendetegnet ved, at** fire forbindelsesledninger med koblingskonnektorer (10) og de tilordnede modtageporte
 30 (20.1) er anbragt på dispenserelement-bæreren (19) på en måde, så de i det mindste med tilnærmelse er jævnt fordelt på en cirkel, og **ved, at** indgangsåbningen (21.1) og udgangsåbningen (21.2) for bypassledningen (21) ligeledes er placeret på cirklen, på hvilken modtageportene (20.1) for forbindelsesledningerne (20) til koblingskonnektorerne (10) ligger, og **ved, at** leveringsporten (15) og hjælpeudstrømningsåbningen

(22.1) ligeledes er anbragt på cirklen, på hvilken forbindelsesledningernes (20) modtageporte (20.1) for koblingskonnektorerne (10) ligger.

5 4. Flerdyselegeme (9) ifølge krav 3, **kendetegnet ved, at** leveringsporten (15) og hjælpeudstrømningsåbningen (22.1) i hovedhuset (14), samt henholdsvis indgangsåbningen (21.1) og udgangsåbningen (21.2) for bypassledningen (21) er placeret diametralt modsat hinanden på en måde, så de ligger på en ret linje, der strækker sig gennem rotations-aksen (18) for dispenserelement-bæreren (19) og med samme afstand til denne rotationsakse (18).

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5. Flerdyselegeme (9) ifølge mindst et af de foregående krav, **kendetegnet ved, at** hjælpeudstrømnings-ledningerne (22), der forgrener sig ind i forgreningsledningerne (22.2) og strækker sig i diametralt modsat retning, er kombineret til dannelse af et ledningshus (23), og forgreningsledningen (22.2) omfatter et forbindelseselement
15 (22.3), som skal forbindes til hjælpeudstrømningsåbningen (22.1) for hovedhuset (14).

6. Flerdyselegeme (9) ifølge mindst et af de foregående krav, **kendetegnet ved, at** en markering (24) er anbragt på hovedhusets (14) ydervæg (17.1) på en ret linje, der strækker sig gennem rotationsaksen (18) for dispenserelementet-bæreren (19) og leveringsporten (15).
20

7. Flerdyselegeme (9) ifølge mindst et af de foregående krav, **kendetegnet ved, at** mindst eet markeringselement (26) på dispenserelement-bærerens (19) nedre plan (19.1) er anbragt kongruent med indgangsåbningen (21.1) og/eller udgangsåbningen (21.2) for bypassledningen (21), hvilket markeringselement (26) indikerer orienteringen og/eller positionen af disse åbninger.
25

8. Flerdyselegeme (9) ifølge mindst et af de foregående krav, hvorved, i en installationsposition for flerdyselegemet (9) på sprøjtebommen (4), dispenserelement-bærerens (19) rotationsakse (18) er skråtstillet i en vinkel i intervallet 10° og 30° , fortrinsvis cirka 20° , i en retning i forhold til lodret, **kendetegnet ved, at** rotationsaksen (18) strækker sig i et vinkelret plan, som strækker sig på tværs af køreretningen (27) og gennem sprøjtebommen (4) og er orienteret, så den hælder til siden i dette plan.
30

9. Flerdyselegeme (9) ifølge krav 8, **kendetegnet ved, at** koblingskonnektorerne (10) er anbragt under en vinkel på mindst 90° i forhold til det nedre plan (19.1) for dispensererelementbæreren (19) i en radial retning i forhold til det nedre plan (19.1) for dispensererelementbæreren (19), og **ved, at** den respektive koblingskonnektor (10), når
- 5 dens modtageport (20.1) er forbundet til leveringsporten (15) for hovedhuset (14), er arrangeret på en måde, skråtstillet i forhold til rotationsaksens (18) hældning under en vinkel, som i det mindste cirka svarer til hældningen af rotationsaksen (18), i en tangentiel retning i forhold til det nedre plan (19.1) for dispensererelement-bæreren (19).
- 10 10. Flerdyselegeme (9) ifølge mindst et af de foregående krav, **kendetegnet ved, at** mindst én af koblingskonnektorerne (10. 2) har en anden længde, målt mellem dispensererelement-bærerens (19) nedre plan og dens frie ende, end de andre koblingskonnektorer (10).

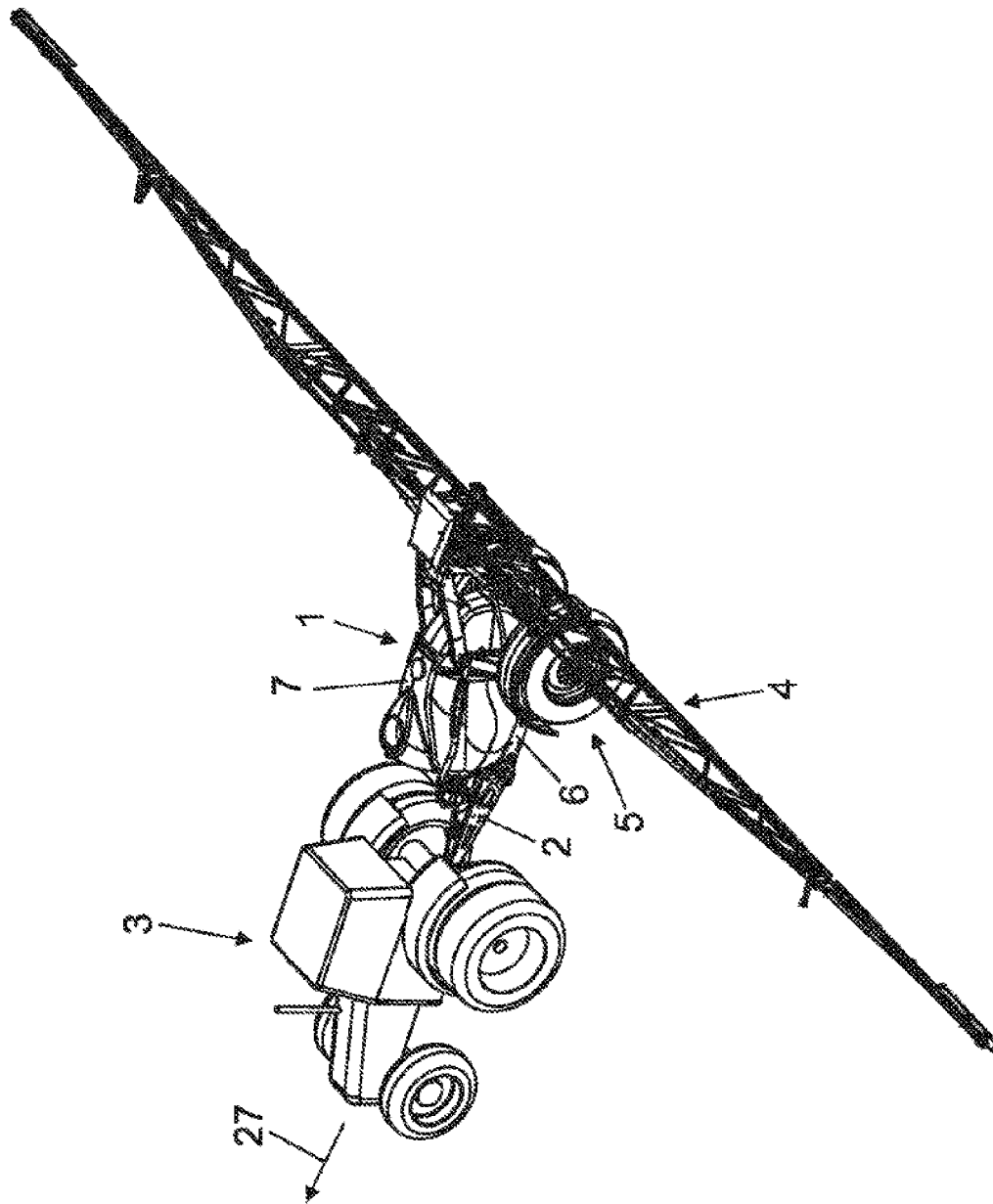


Fig. 1

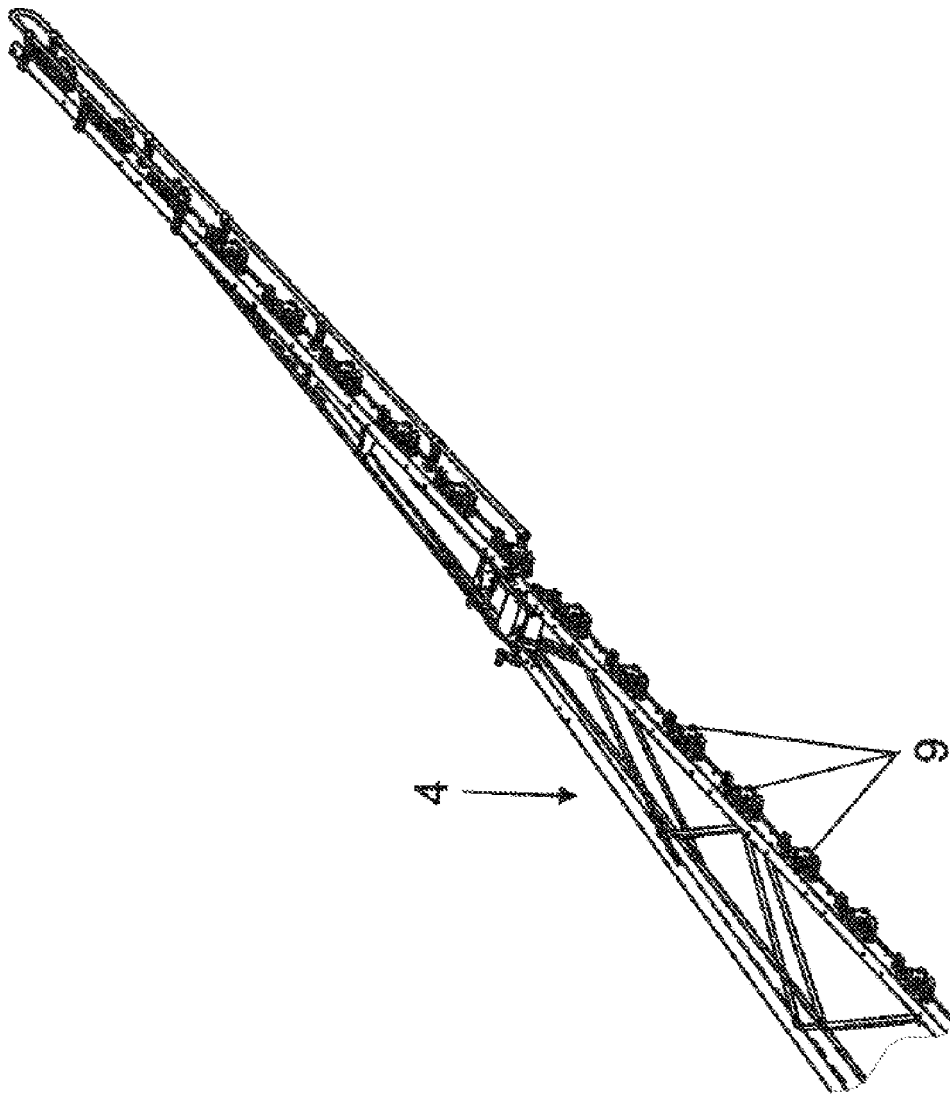


Fig. 2

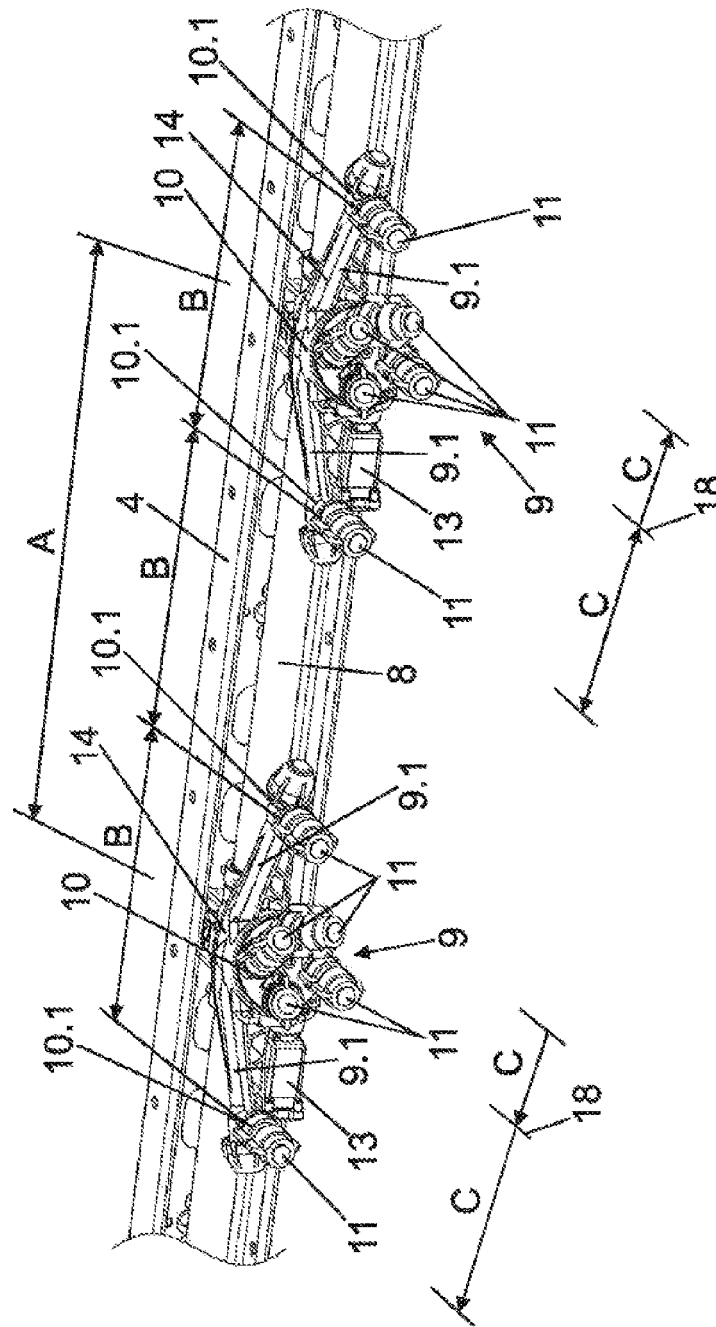
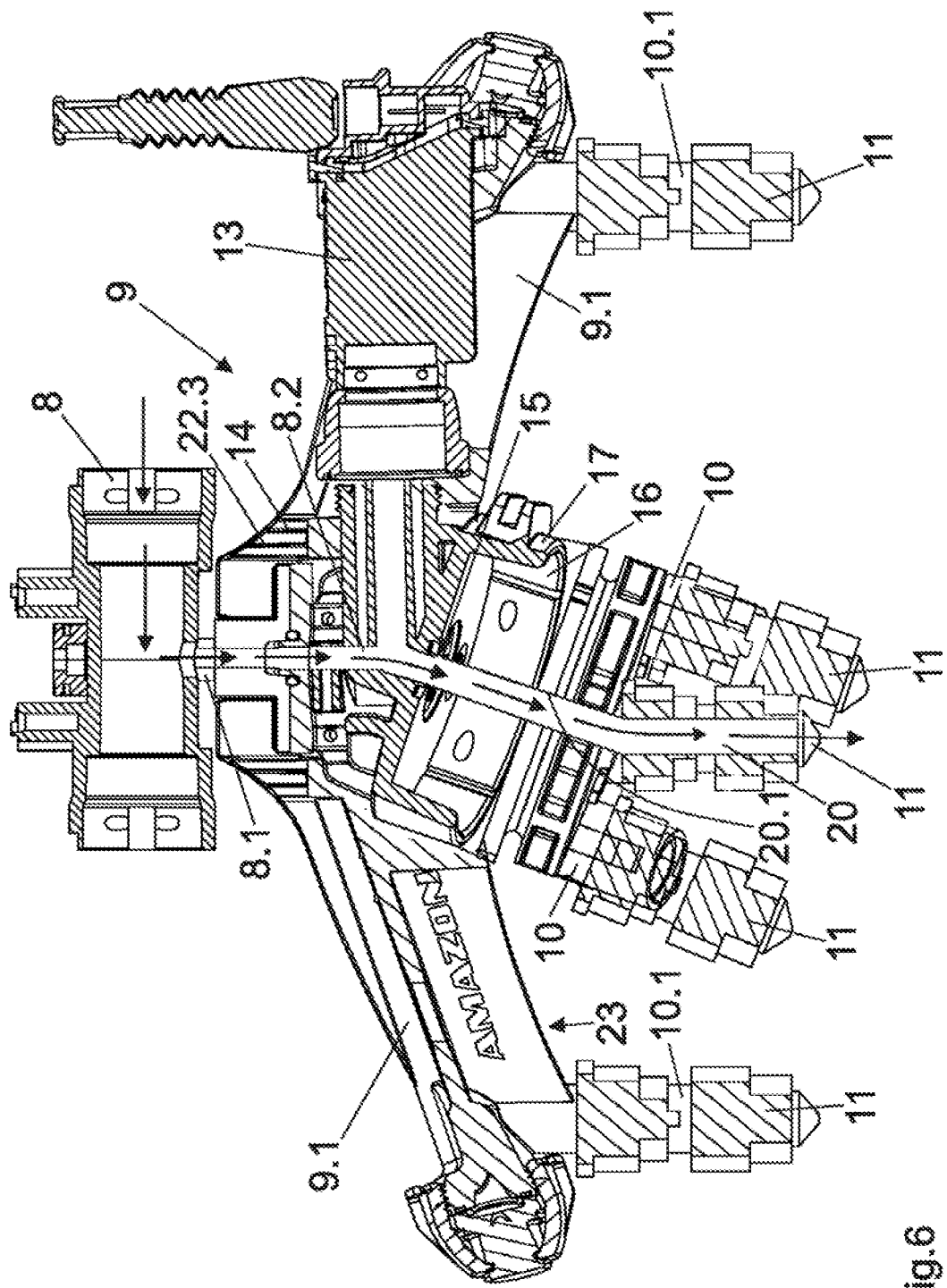


Fig.3



60

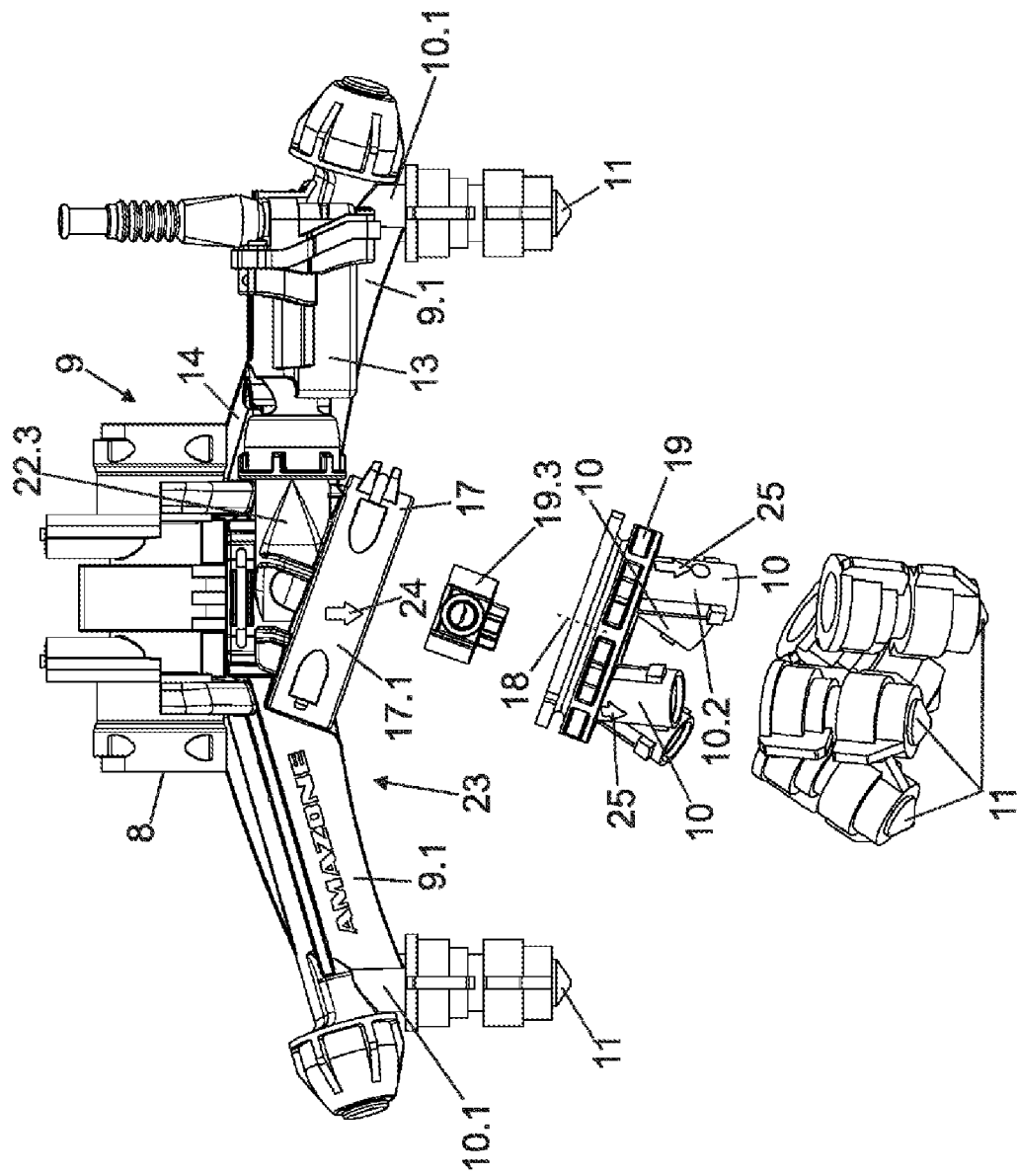


Fig.7

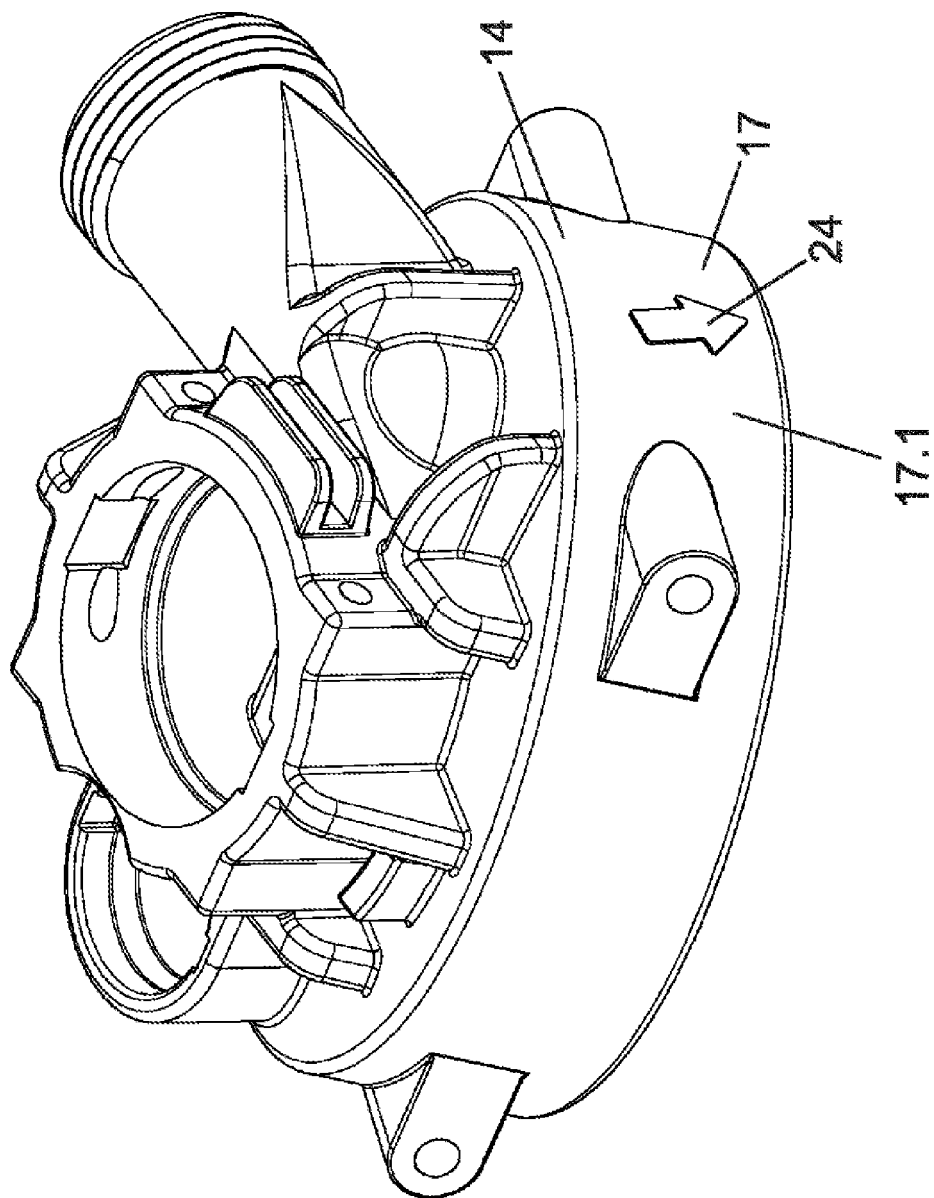


Fig. 8

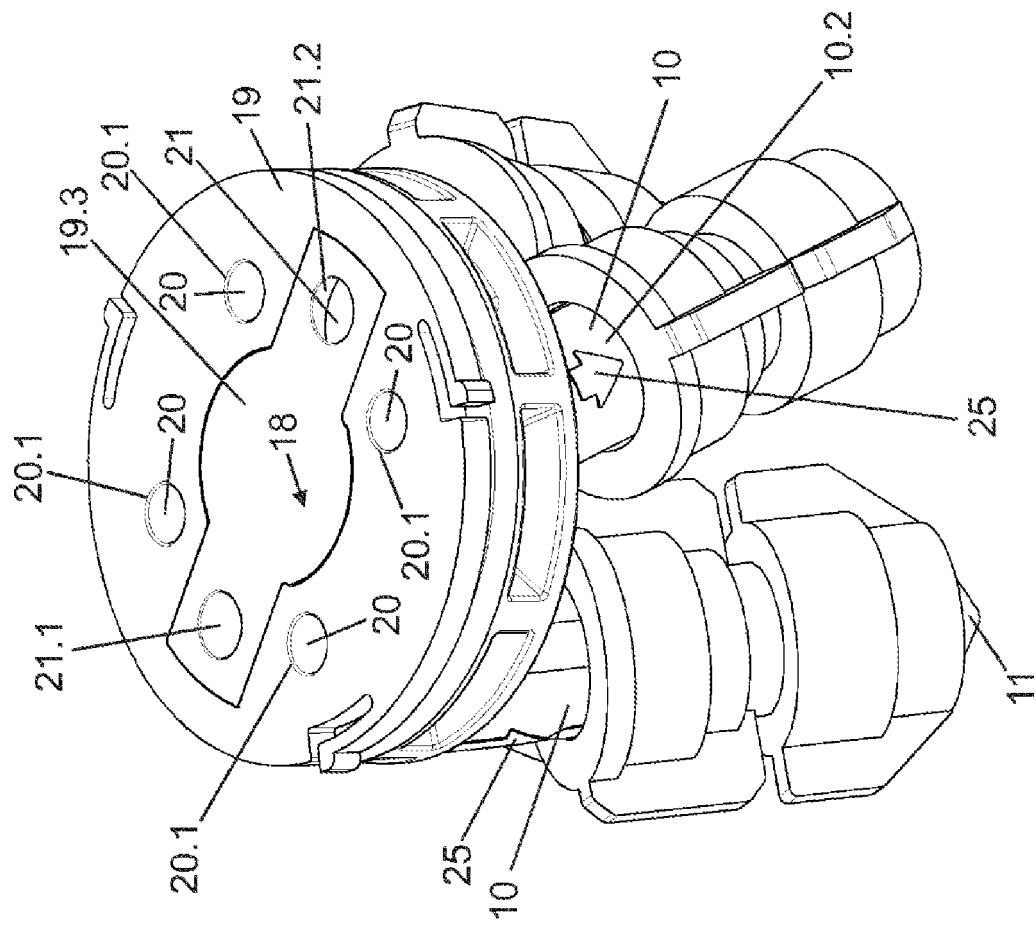


Fig.9

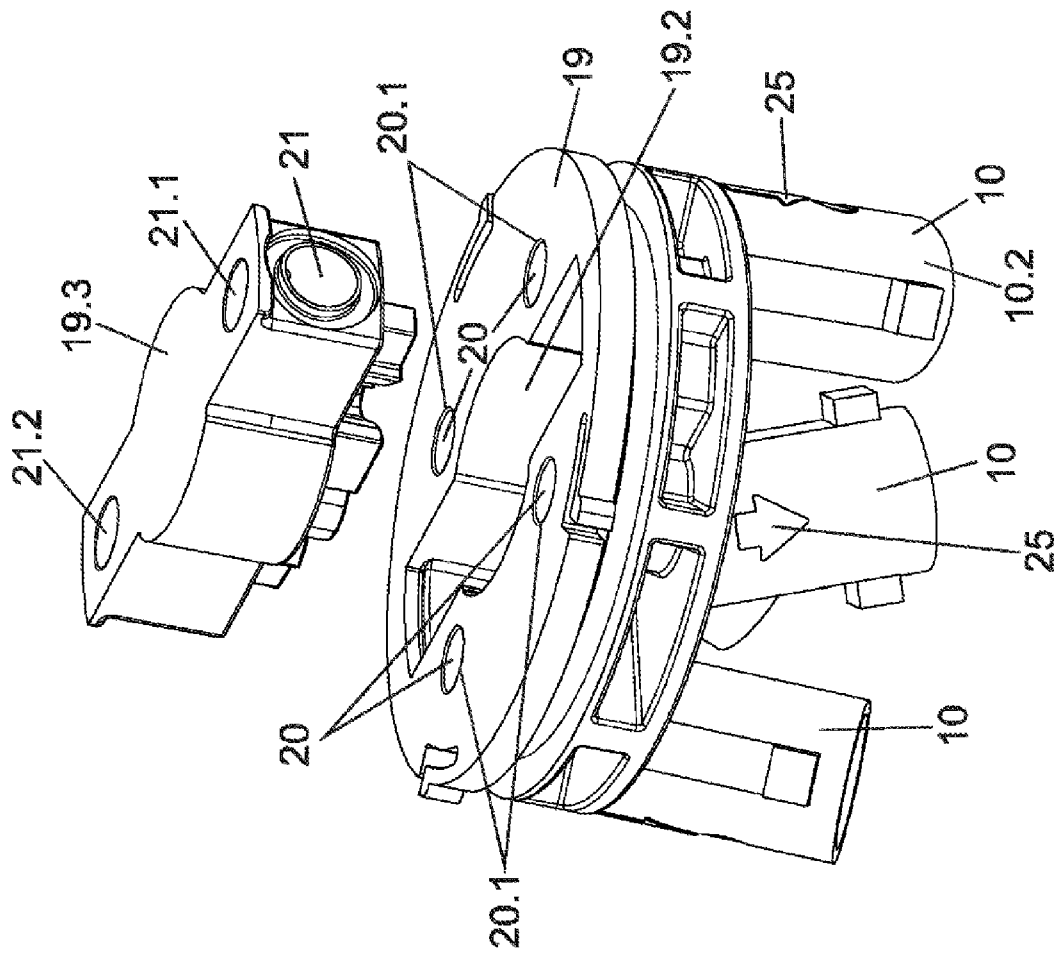


Fig.10

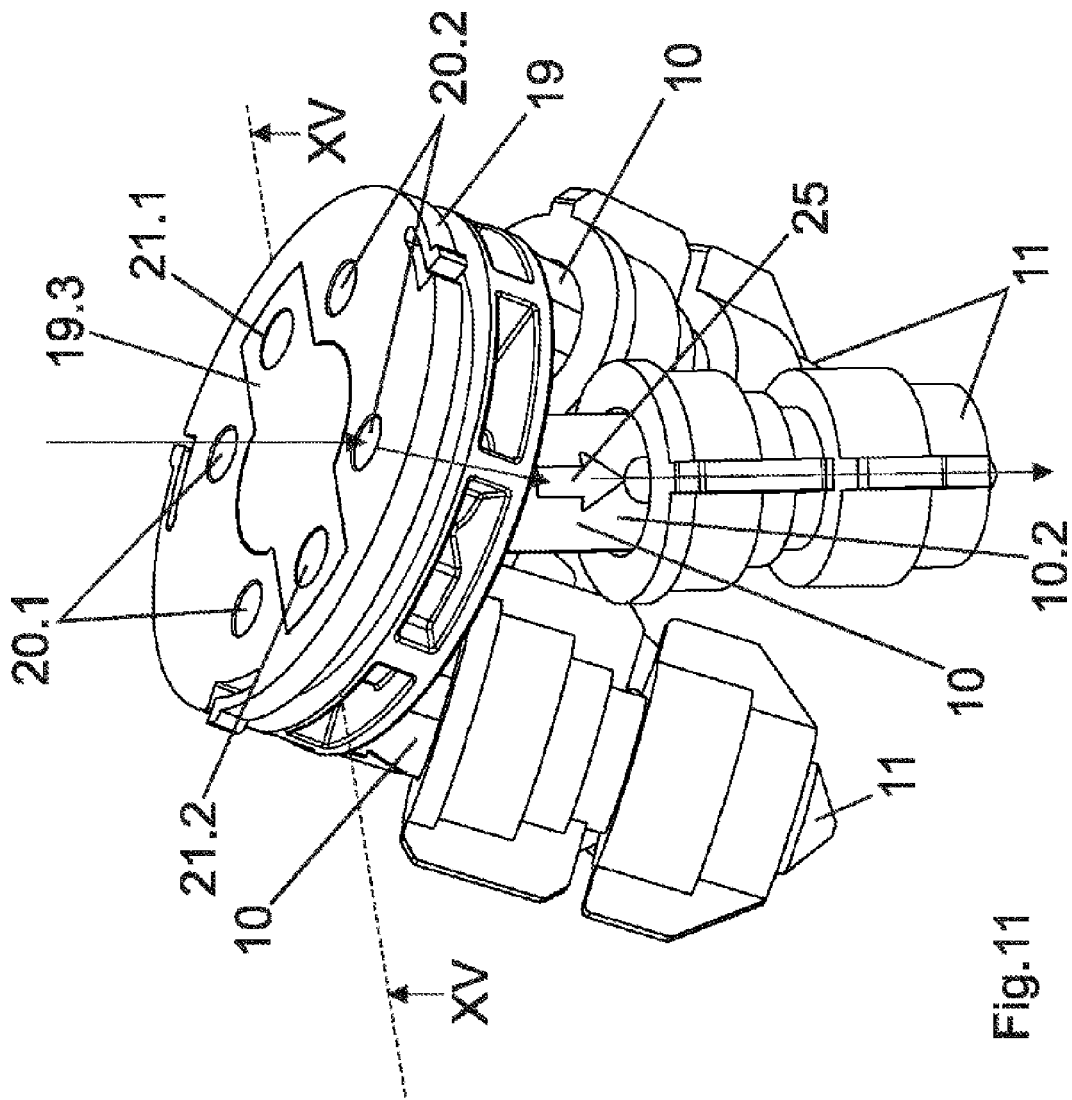
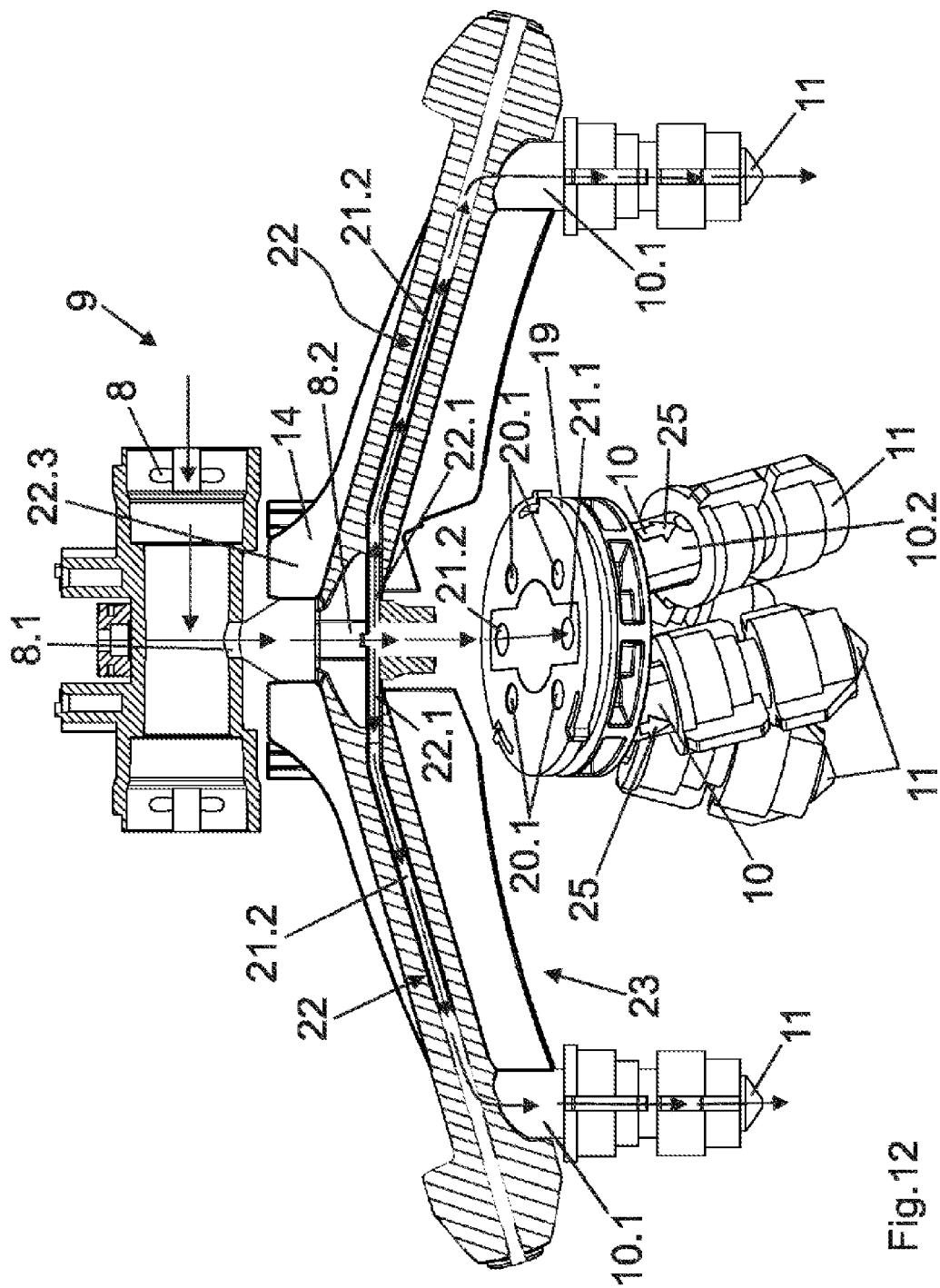


Fig.11



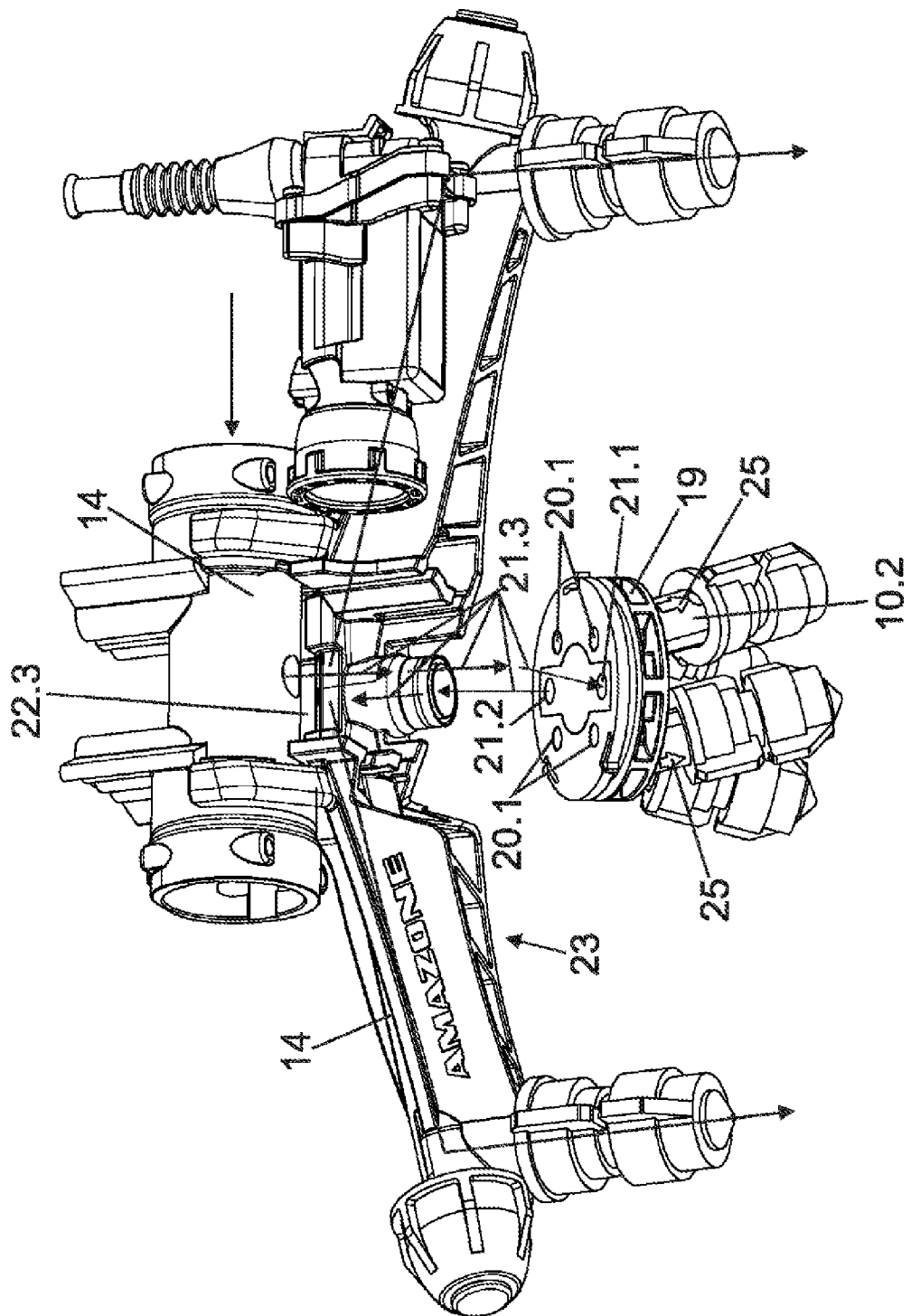


Fig.13

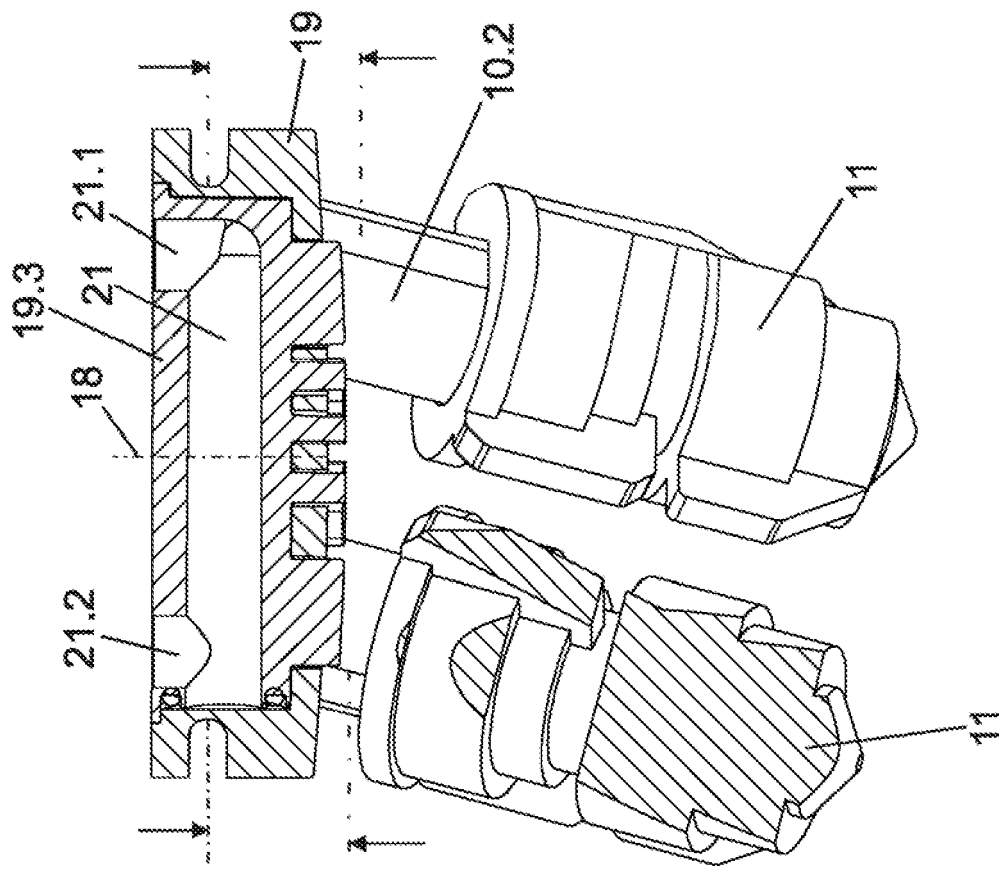


Fig.15

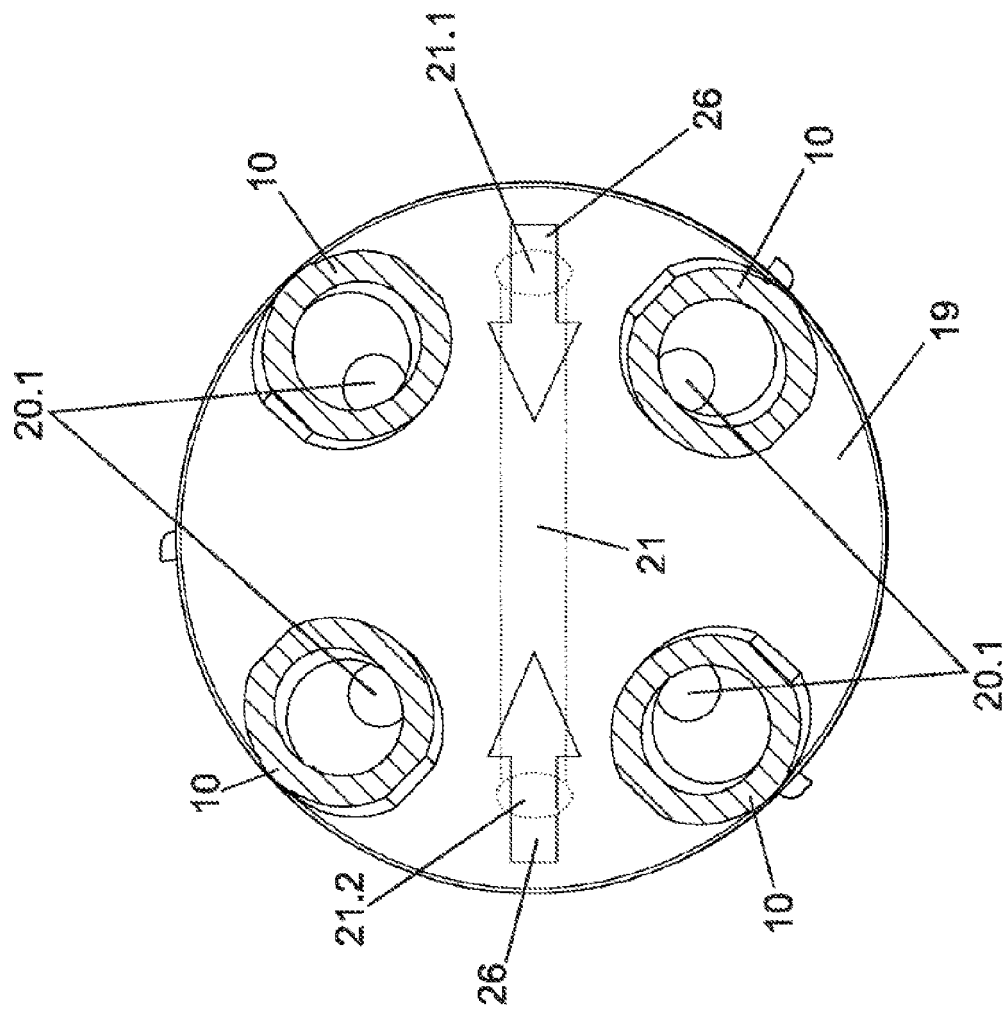


Fig.16

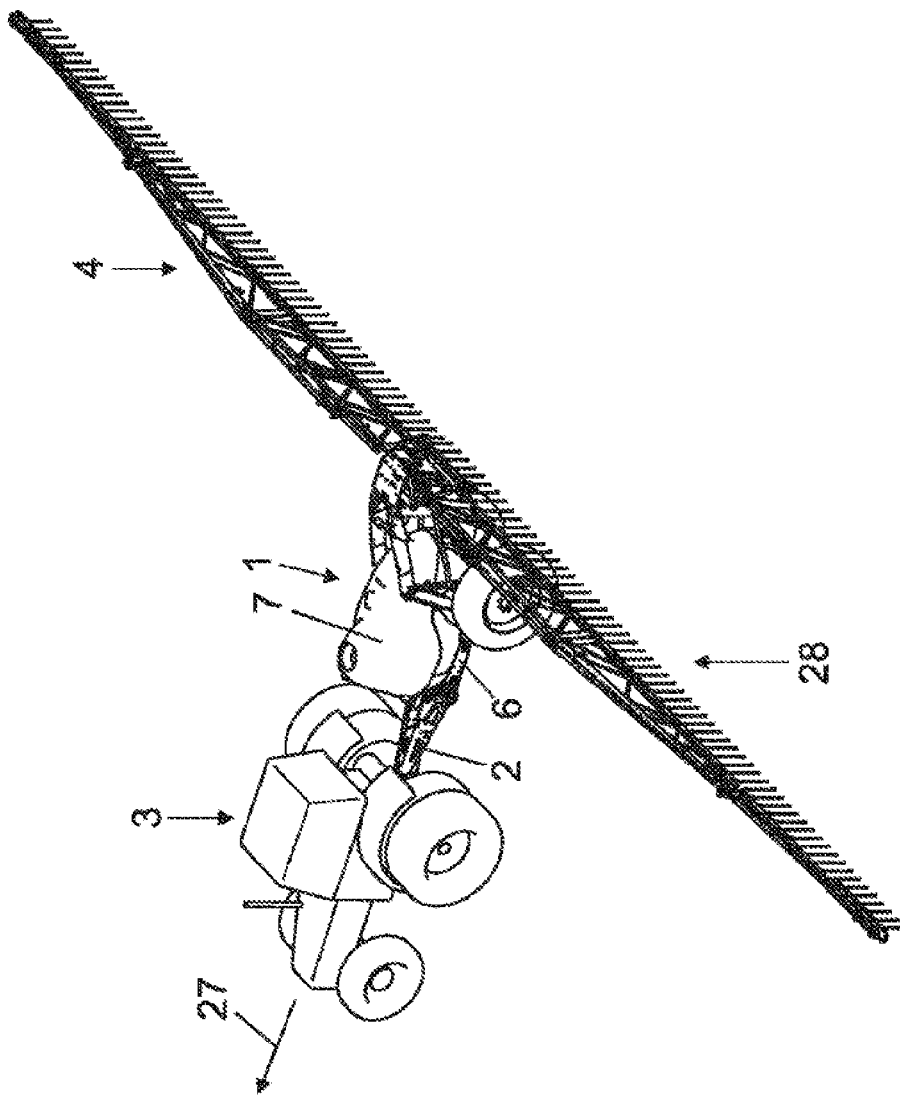


Fig. 17

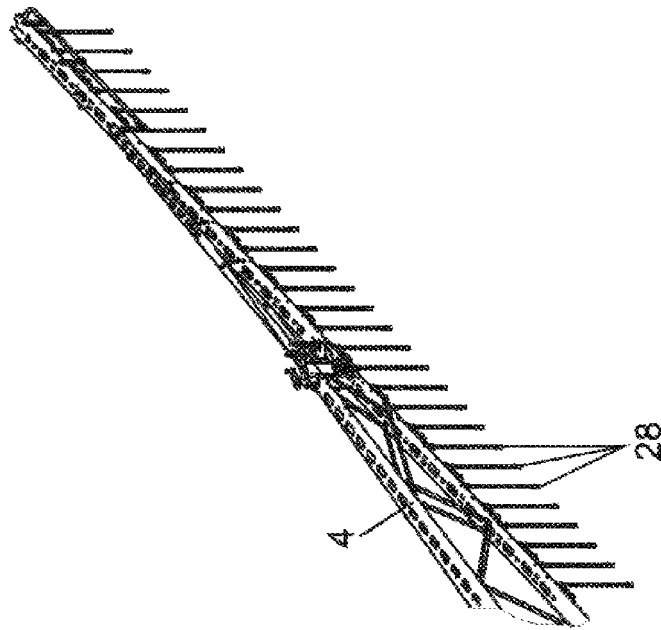


Fig. 18

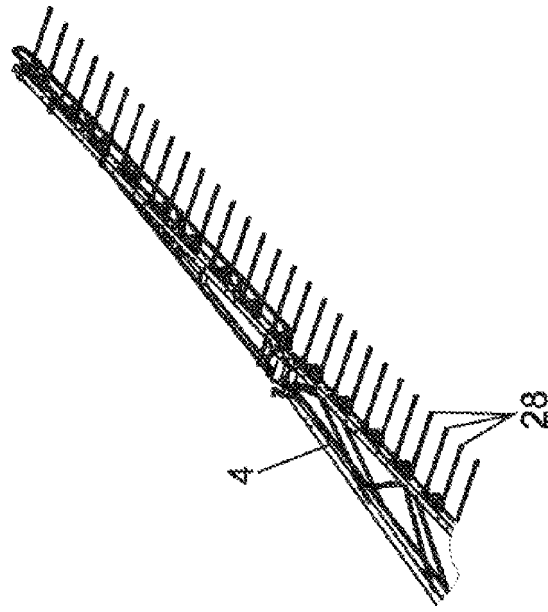


Fig. 19

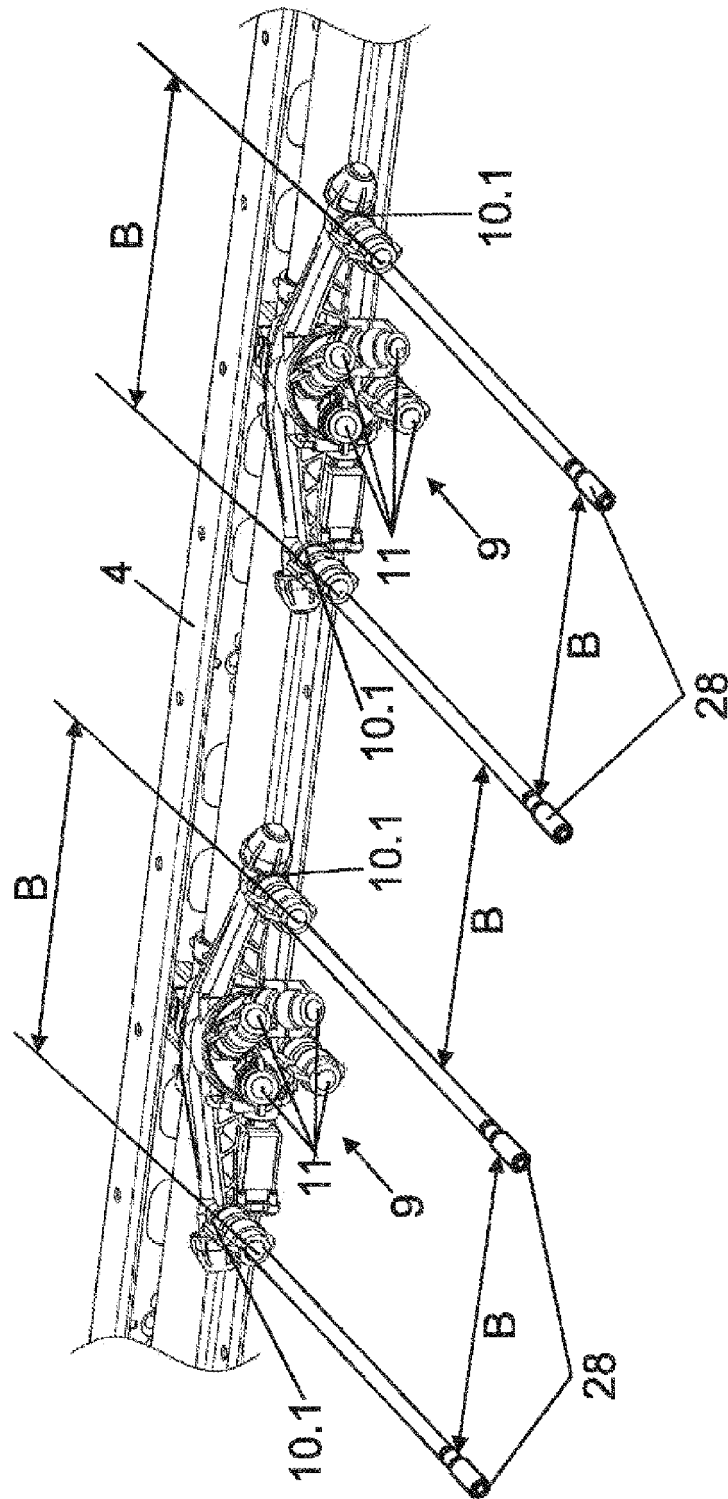


Fig.20