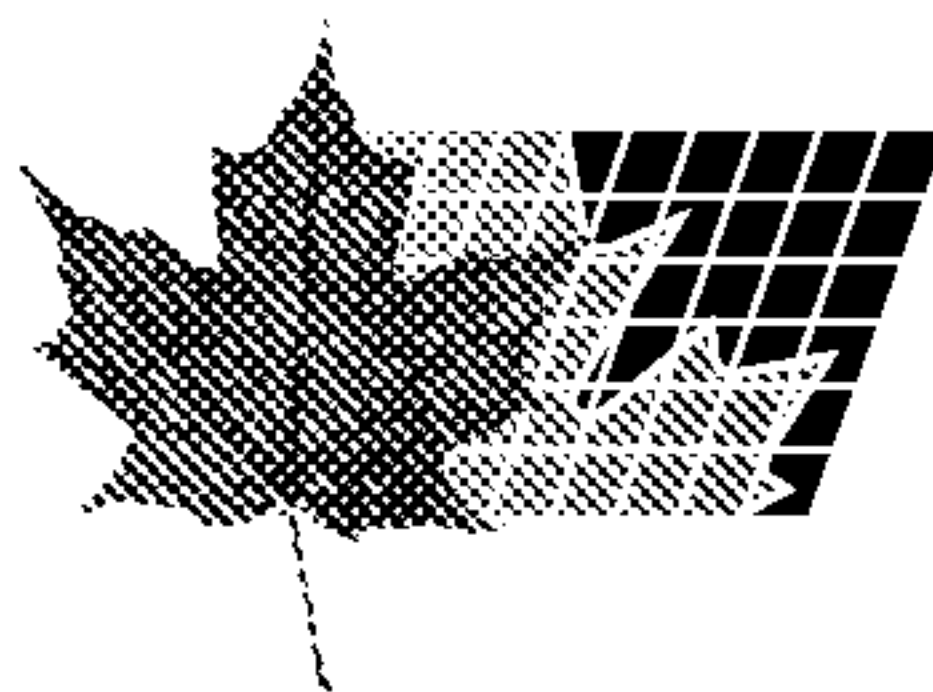




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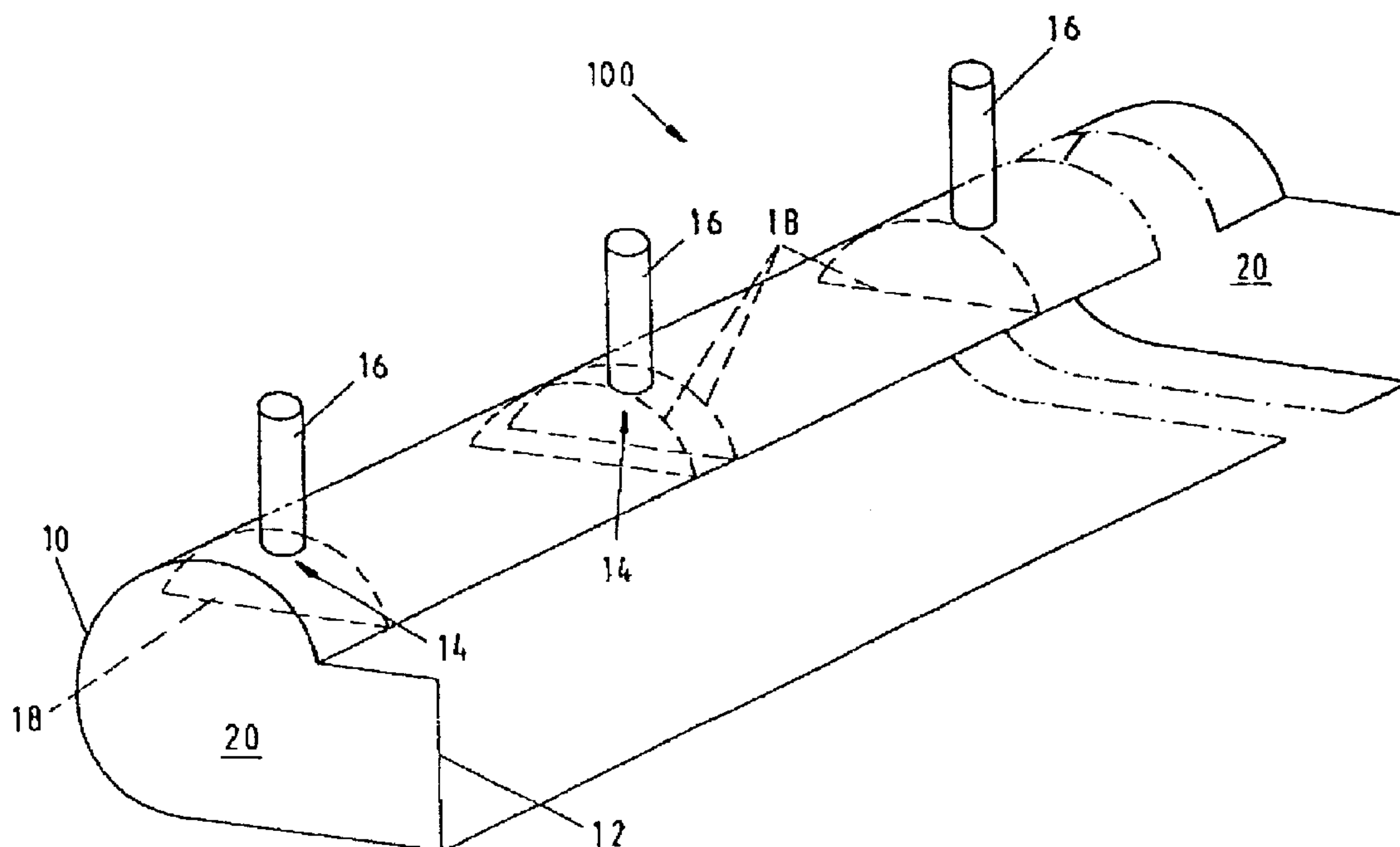
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(51) Int.Cl.⁶ B08B 15/00, F24F 13/02, F24F 7/00

(30) 1998/11/06 (298 19 896.7) DE

(54) **DISPOSITIF POUR LE CAPTAGE ET L'ASPIRATION DE
FLUIDES**

(54) **DEVICE FOR COLLECTING AND SUCKING OFF FLUIDS**



(57) In order to make available a device (100, 200, 300, 400) for collecting and sucking off fluids, especially air and/or other gas, with a casing (10) at least partially enclosing a stabilized twist flow and guiding this twist flow, device which shows an incoming opening (12) extending in axial direction relative to the casing (10) and with several suction openings (14) which are connected with the suction system, device which eliminates the above mentioned disadvantages and achieves an improved suction with a simple construction, it is proposed that the suction openings (14) are placed tangentially to the twist flow, whereby each suction opening (14) is connected over a suction conduit (16) with the suction system.



Abstract

In order to make available a device (100, 200, 300, 400) for collecting and sucking off fluids, especially air and/or other gas, with a casing (10) at least partially enclosing a stabilized twist flow and guiding this twist flow, device which shows an incoming opening (12) extending in axial direction relative to the casing (10) and with several suction openings (14) which are connected with the suction system, device which eliminates the above mentioned disadvantages and achieves an improved suction with a simple construction, it is proposed that the suction openings (14) are placed tangentially to the twist flow, whereby each suction opening (14) is connected over a suction conduit (16) with the suction system.

DEVICE FOR COLLECTING AND SUCKING OFF FLUIDS**Specification**

The invention relates to a device for collecting and sucking off fluids, especially air and/or other gas with a casing at least partially enclosing a stabilized twist flow and guiding it, device which shows an incoming opening extending in axial direction relative to the casing and with several suction openings which are connected with the suction system according to the preamble of claim 1.

An exhaust gas collecting hood according to the genus is known from DE 42 43 834 A1 which shows sink pipes which penetrate radially to the casing surface into the hood and which show sink openings placed at their ends coaxially to the casing surface. The sink openings take over drawing-off air in the center of the exhaust gas collecting hood and thus spin-off a twist flow. However, the manufacturing of sink pipes penetrating into the hood which support sink openings orientated exactly coaxially to the casing surface is complicated and expensive. Moreover, it is difficult after a certain running time to free the sink openings from dirt or impurities choking them since the sink openings are inaccessible for mechanical tools inside the casing surface.

From DE 39 01 895 C2, we know a device for generating a suction flow, whereby the suction takes places coaxially to a casing surface and a dust hopper is provided for radially relative to the casing surface in direction of gravitation. Deposited dust can be drawn off by the dust hopper over an usual lock. This arrangement is however disadvantageous as far as the dust

hopper has a negative influence on a stabilization of a twist flow inside the casing surface. Moreover, the resulting operation requires much personnel and is thus expensive since the dust hopper has to be emptied at regular intervals. Furthermore, when emptying the dust hopper, an operating person is subject to materials which are eventually detrimental to health, which is not desired nowadays in times of increased sensibilization for protection of labour.

The WO 88/09227 describes a suction hood which is swivelling around several axes. This suction hood functions with a turbulent flow driven by a blast stream in a casing element. This supplementary blast stream is however expensive. Moreover, a window is indeed provided for in the casing element but a collecting element is used in this window, collecting element which sucks off inside the casing element on both sides in axial direction and which deflects the drawing off air at right angles to the casing element and to the turbulent flow generated therein.

The aim of this invention is to make available a device of the above mentioned type which eliminates the above mentioned disadvantages and which achieves an improved suction with a simple construction.

This aim is reached by a device of the above mentioned type with the characteristics indicated in claim 1.

For this purpose, the invention provides for that the suction openings are placed tangentially to the twist flow, whereby each suction opening is connected with the suction system over a suction conduit.

This offers the advantage that a tangential suction is available, whereby heavier floating particles are preferably and quickly sucked off in the sucked fluid, since these particles flow to the outside in direction of the casing surface because of centrifugal forces in the twist flow.

Here it is essential that it appeared surprisingly that the casing surface has not to be configured as a continuously bent surface but that it can also be configured as a body with a section with one angle or with a polygonal section. Therefore, the casing surface can also be made through a wall and/or a ceiling surface of a building, especially in relation with a stepped section, for example with a shade, a lintel, a frame or the like without leaving the configuration according to the invention or without the effect according to the invention being impaired.

Preferable further developments of the device are described in the claims 2 to 11.

Thus there results a particularly simple and effective arrangement if the one suction opening which at least exists is configured in the casing and if the suction conduit or the suction conduits are configured so that their longitudinal axis is orientated in the area of the suction opening tangentially and/or radially to the twist flow or to the casing. Hereby the suction conduits have a round or a polygonal cross section, particularly have a rectangular cross section.

A stabilized axial guiding of the twist flow inside the casing is obtained by the fact that at least one separating element is placed adjacent to each suction opening parallel to the twist flow so that an axial division of the volume inside the casing is configured over a predetermined cross section surface which is

smaller than the whole cross section surface of the casing. In an appropriate way, the predetermined cross section surface is smaller than half the cross section surface of the casing and the separating elements are particularly advantageously placed so that a free side thereof constitutes an extension of a wall of the incoming opening into the volume inside the casing.

In a preferred embodiment, a unique suction conduit is configured overlapping the whole axial length of the casing and all suction openings, whereby the suction conduit has a cross-section which is preferably enlarged funnel-shaped away from the suction openings.

The casing is configured for example as a half shell which further simplifies eventually necessary maintenance and cleaning operations of the suction openings as well as the assembly of the device itself.

In an appropriate way the casing is closed at its axial ends with side walls.

The invention will be explained in detail below with reference to the attached drawings.

Fig. 1 shows a first preferred embodiment of a device according to the invention in a perspective view.

Fig. 2 shows the first embodiment of the device in a cross section.

Fig. 3 shows the first embodiment of the device in a longitudinal section.

Fig. 4 shows a second preferred embodiment of a device according to the invention in a perspective view.

Fig. 5 shows the second embodiment of the device in a cross section.

Fig. 6 shows the second embodiment of the device in a longitudinal section.

Fig. 7 shows a third preferred embodiment of a device according to the invention in a perspective view.

Fig. 8 shows the third embodiment of the device in a cross section.

Fig. 9 shows the third embodiment of the device in a longitudinal section.

Fig. 10 shows a fourth preferred embodiment of a device according to the invention in a perspective view.

Fig. 11 shows the fourth embodiment of the device in a cross section.

Fig. 12 shows the fourth embodiment of the device in a longitudinal section.

Fig. 13 shows the fourth embodiment of the device in a section along the line A-A of fig. 11.

The first preferred embodiment of a device according to the invention 100 for collecting and sucking off fluids which is represented in the figures 1 to 3 comprises a casing 10 which is

substantially partially cylindrical with an incoming conduit 12 and suction openings 14. The suction openings 14 are made in the casing 10. A suction conduit 16 which connects the respective suction opening 14 with a non represented suction system corresponds to each suction conduit 14. An upper area of the inner volume of the casing 10 in the figure is separated in axial direction by separating elements 18 so that an axial guiding of a twist flow stabilized in the casing 10 is realized in this upper area. The separating elements 18 are placed adjacent to the suction openings 14. The casing is closed by side walls 20 at axial ends of the casing 10. The suction conduits are configured with a round cross section and are orientated radially to the casing 10. The tangential arrangement of the suction opening to the twist flow is preferably obtained by the fact that the suction conduit 16 is also extended with a small part through the casing surface into the casing which encloses the twist flow, whereby this part may not extend up to the middle axis of the casing or up to the middle of the twist flow. As can be especially seen in fig. 2, a free edge of the separating elements 18 constitutes an extension of one side of the incoming conduit 12.

An ambient fluid, such as for example air loaded with contaminants, flows over the incoming conduit 12 constituting an incoming opening in the casing 10 into the inner volume of the casing 10 and generates the twist flow which substantially follows a casing surface of the casing 10. Fluid is then removed by the suction openings 14 and the suction conduits 16 from this twist flow tangentially at the extreme tangential edge of the twist flow, namely on the casing surface and is led for example to a cleaning or filtering process in the suction system or is simply only transported off the place of the device according to the invention 100. Since the suction takes place tangentially,

preferably heavier floating particles are drawn off and flow or are pushed in flow direction to the outside in direction of the casing surface because of occurring centrifugal forces or centripetal forces.

It appeared in a surprising unpredictable way that a twist flow can also be stabilized by means of the tangential suction openings inside the casing 10.

The second preferred embodiment of a device according to the invention 200 according to fig. 4 to 6 substantially corresponds to parts of the first embodiment 100 with the same references so that reference is made to the description above of fig. 1 to 3. Unlike the first preferred embodiment 100 the second preferred embodiment 200 shows suction conduits 16 with a square angled section.

The third preferred embodiment of a device according to the invention 300 according to fig. 7 to 9 substantially corresponds to parts of the first embodiment 100 with the same references so that reference is made to the description above of fig. 1 to 3. Unlike the first and the second preferred embodiment 100 or 200, the third preferred embodiment 300 shows suction conduits 16 orientated tangentially to the casing 10 or to the twist flow and the suction openings 14 are placed in the casing 10 opposite the incoming conduit 12.

The fourth preferred embodiment of a device according to the invention 400 for sucking off fluids represented in the fig. 10 to 13 comprises a casing 10 configured as a cylindric half shell at one end of which a recess 22 constitutes respective suction openings 14. A unique suction conduit 16 which covers all suction openings 14 is placed over the whole axial length of the

casing 10. The suction opening 16 enlarges with a funnel-shaped cross section away from the suction openings 16.

LIST OF REFERENCE NUMERALS

100, 200, 300, 400	Device for collecting and sucking off fluids
10	Casing
12	Incoming conduit
14	Suction openings
16	Suction conduit
18	Separating elements
20	Side walls
22	Recess

Claims

1. A device (100, 200, 300, 400) for collecting and sucking off fluids, especially air and/or other gas, with a casing (10) at least partially enclosing a stabilized twist flow and guiding it, device which shows an incoming opening (12) extending in axial direction relative to the casing (10) and with several suction openings (14) which are connected with the suction system, characterized in
that the suction openings (14) are placed tangentially to the twist flow, whereby each suction opening (14) is connected over a suction conduit (16) with the suction system.
2. A device (100, 200, 300) according to claim 1, characterized in
that at least one suction opening (14) is configured in the casing (10).
3. A device (100, 200, 300) according to claim 1 or 2, characterized in
that the suction conduit or the suction conduits (16) are configured in such a way that their longitudinal axis is orientated in the area of the suction opening (14) tangentially and/or radially to the twist flow or to the casing (10).
4. A device (100, 200, 300) according to any of the preceding claims, characterized in
that the suction conduits (16) are configured with a round or a tetragonal cross section, especially with a rectangular section.
5. A device (100, 200, 300) according to any of the preceding claims,

characterized in

that adjacent to each suction opening (14) at least one separating element (18) is placed parallel to the twist flow so that an axial division of the volume inside the casing (10) is made over a predetermined cross section surface which is smaller than the whole cross section surface of the casing (10).

6. A device (100, 200, 300) according to claim 5, characterized in that the predetermined cross section surface is smaller than half the cross section surface of the casing (10).
7. A device (100, 200, 300) according to claim 5 or 6, characterized in that the separating elements (18) are placed in such a way that a free side of these elements constitutes an extension of a wall of the incoming opening (12) into the volume inside the casing (10).
8. A device (400) according to any of the preceding claims, characterized in that an unique suction conduit (16) is configured overlapping over the whole axial length of the casing (10) and all suction openings (14).
9. A device (400) according to claim 8, characterized in that the suction conduit (16) is enlarged with a funnel-shaped cross section away from the suction openings (14).
10. A device (400) according to claim 8 or 9, characterized in that the casing (10) is configured as a half shell.

11. A device (100, 200, 300, 400) according to any of the preceding claims,
characterized in
that the casing (10) is closed at its axial ends with side walls
(20).

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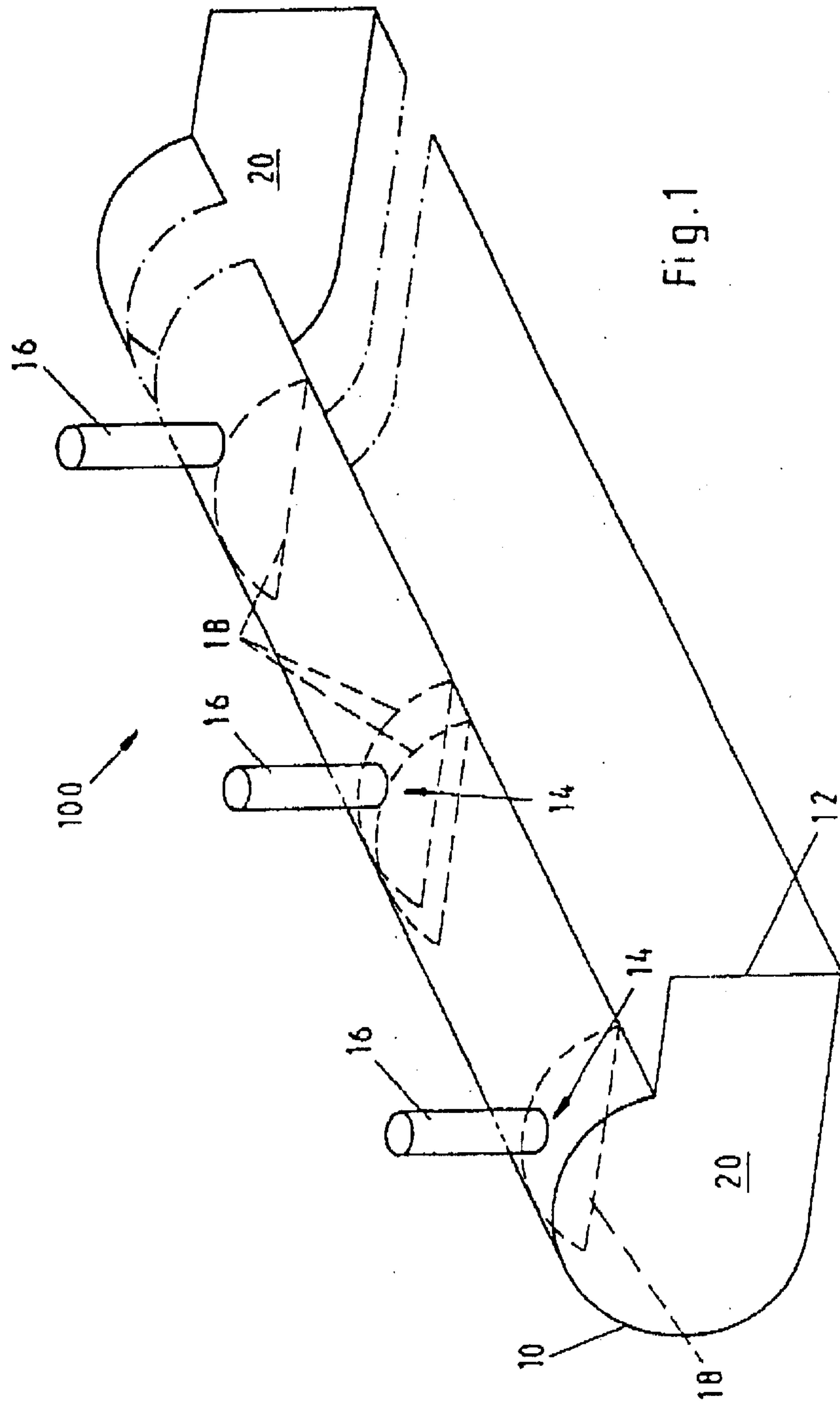


Fig. 2

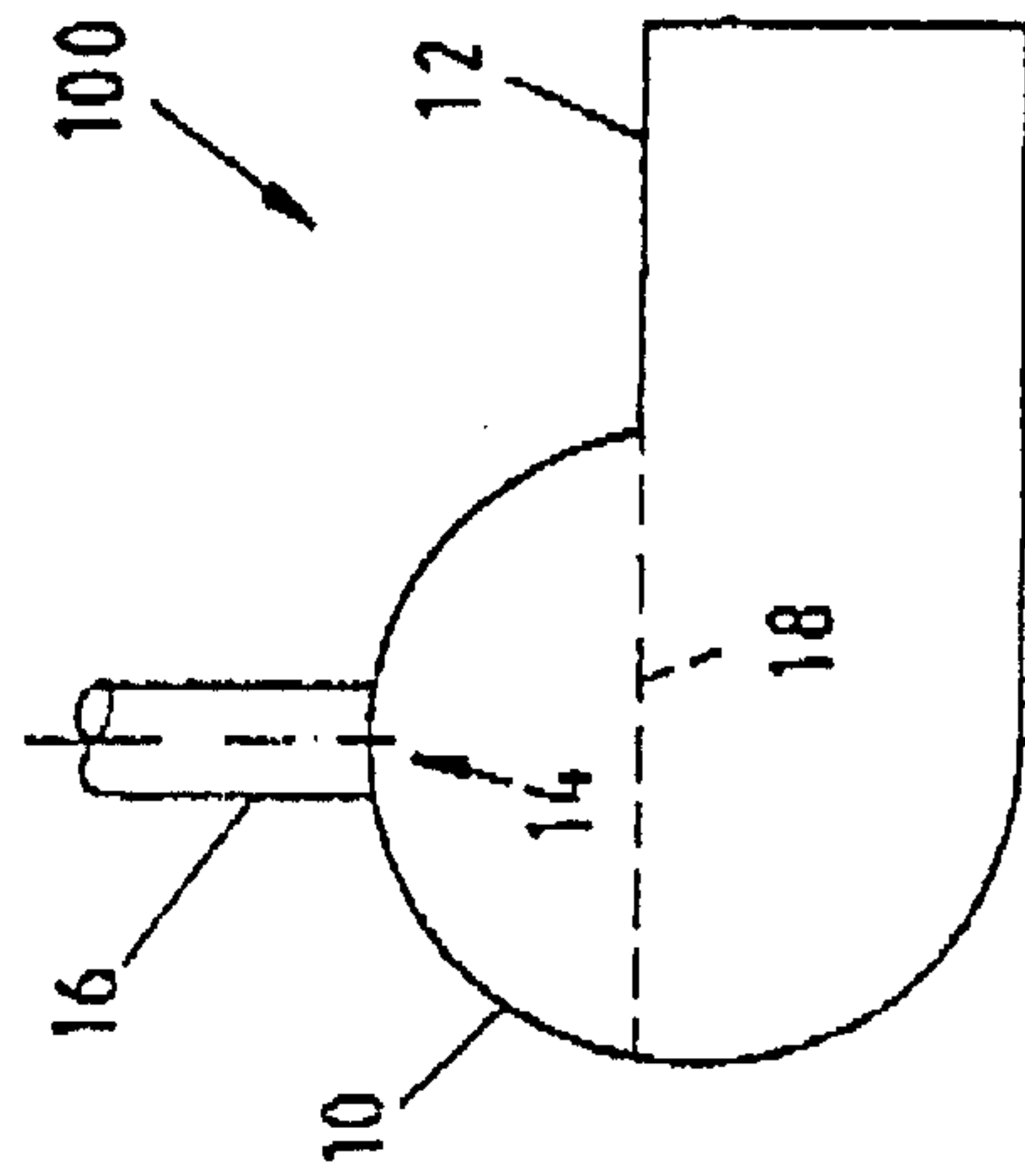
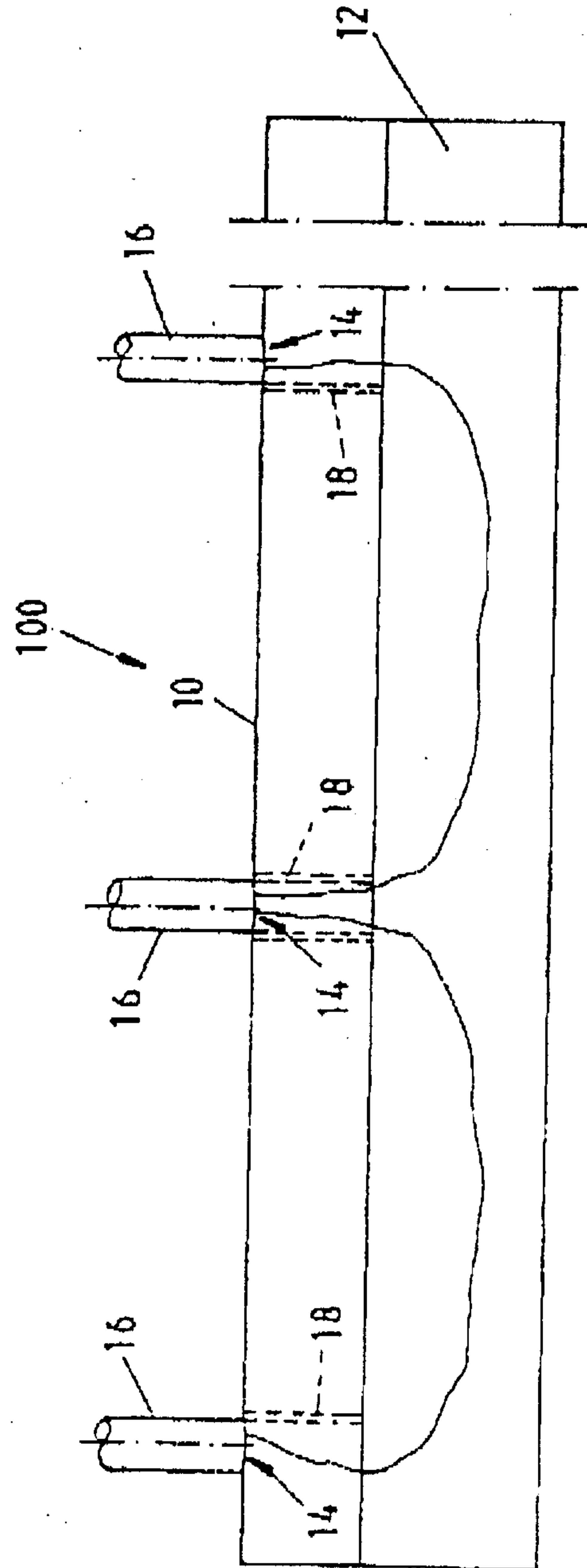


Fig. 3



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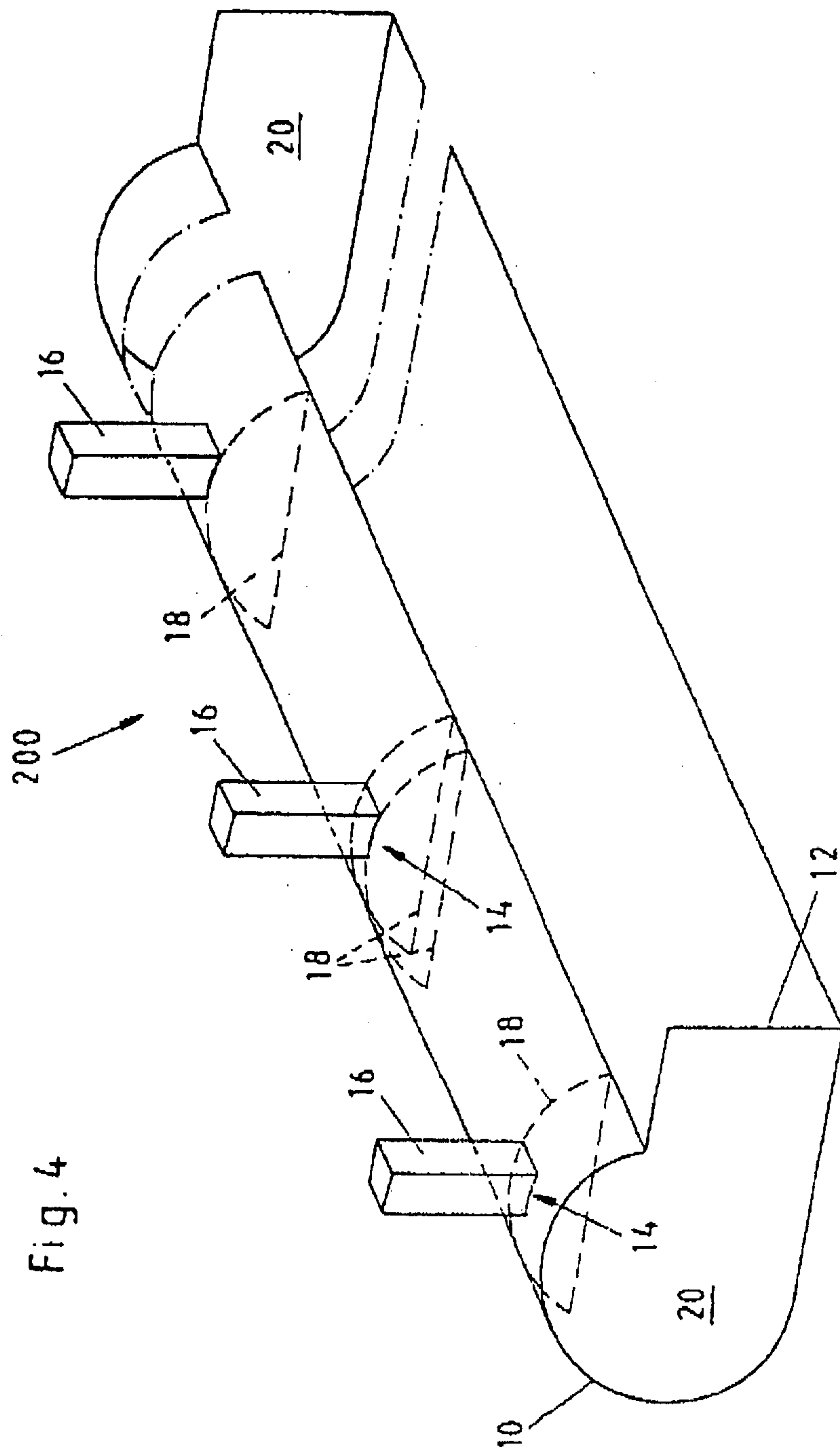


Fig.5

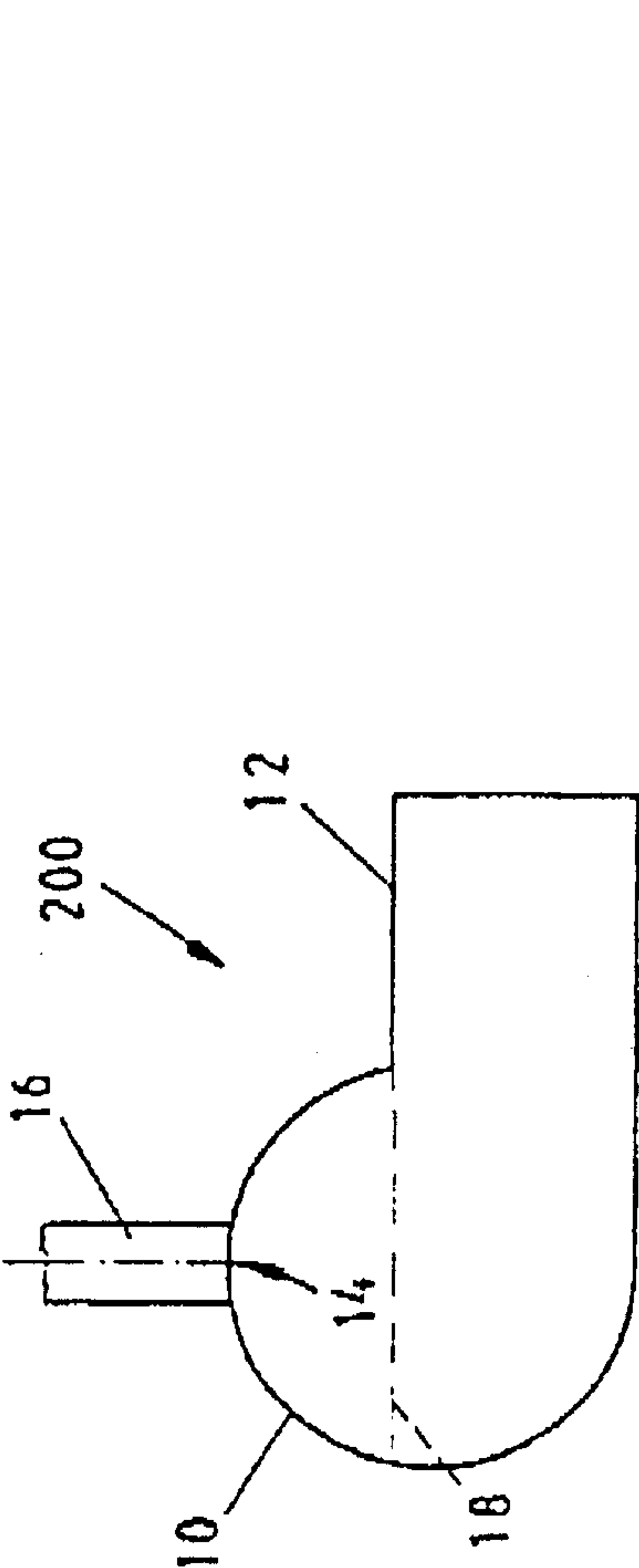
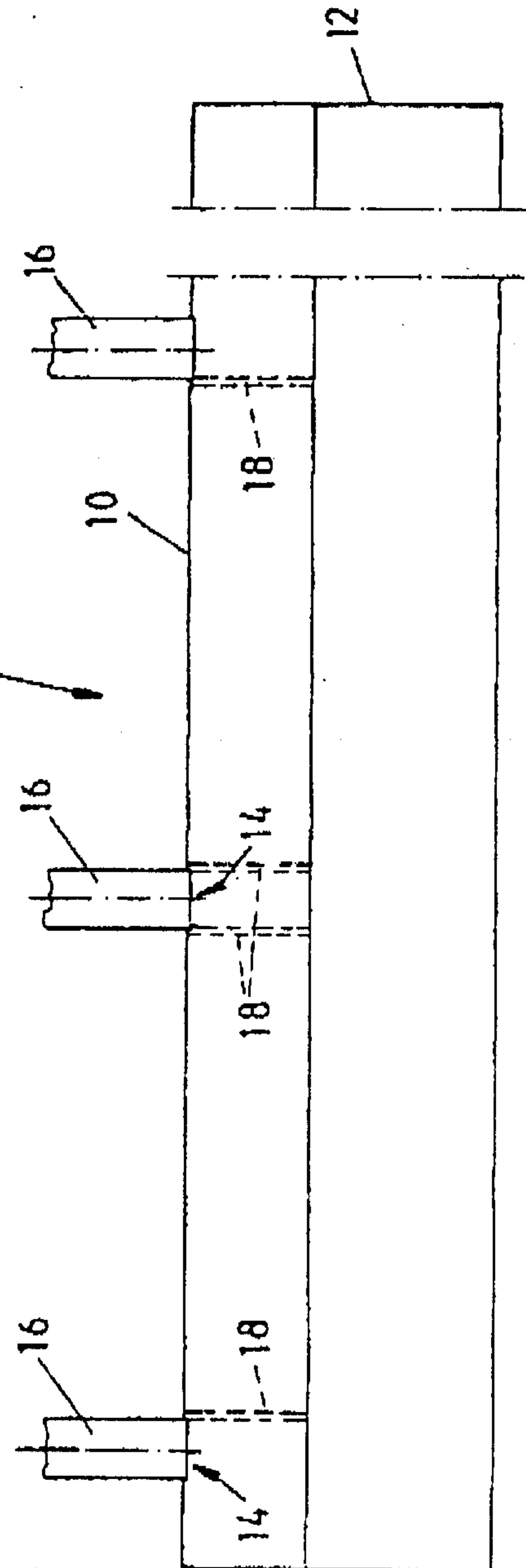
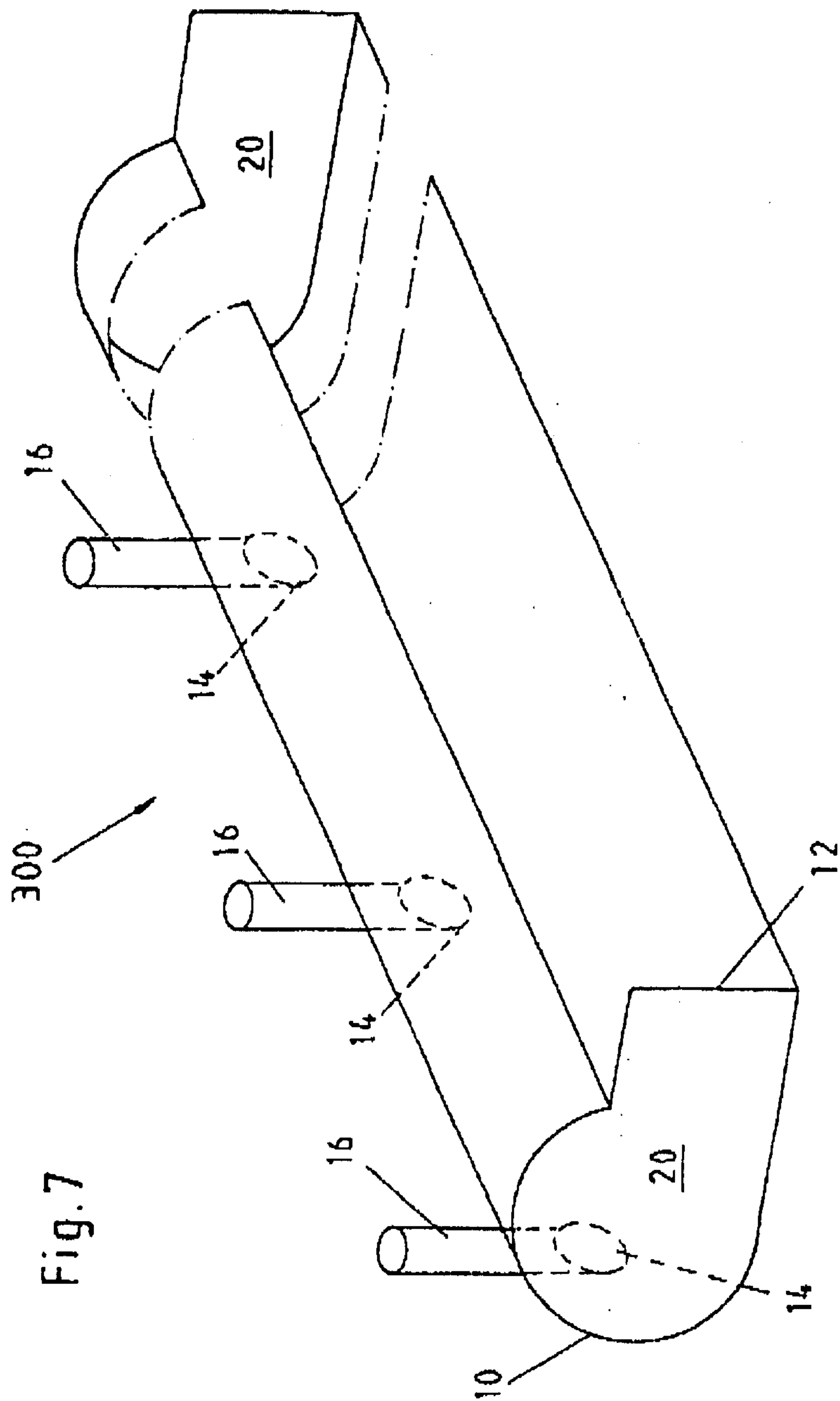


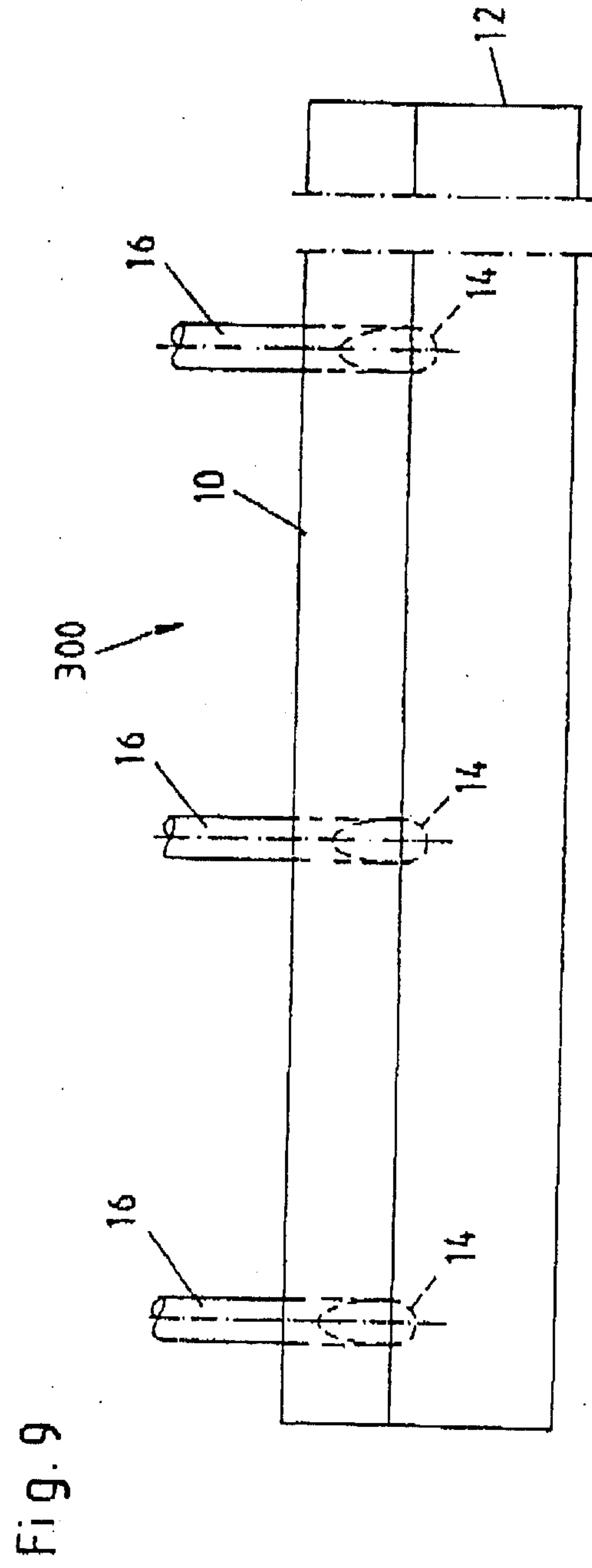
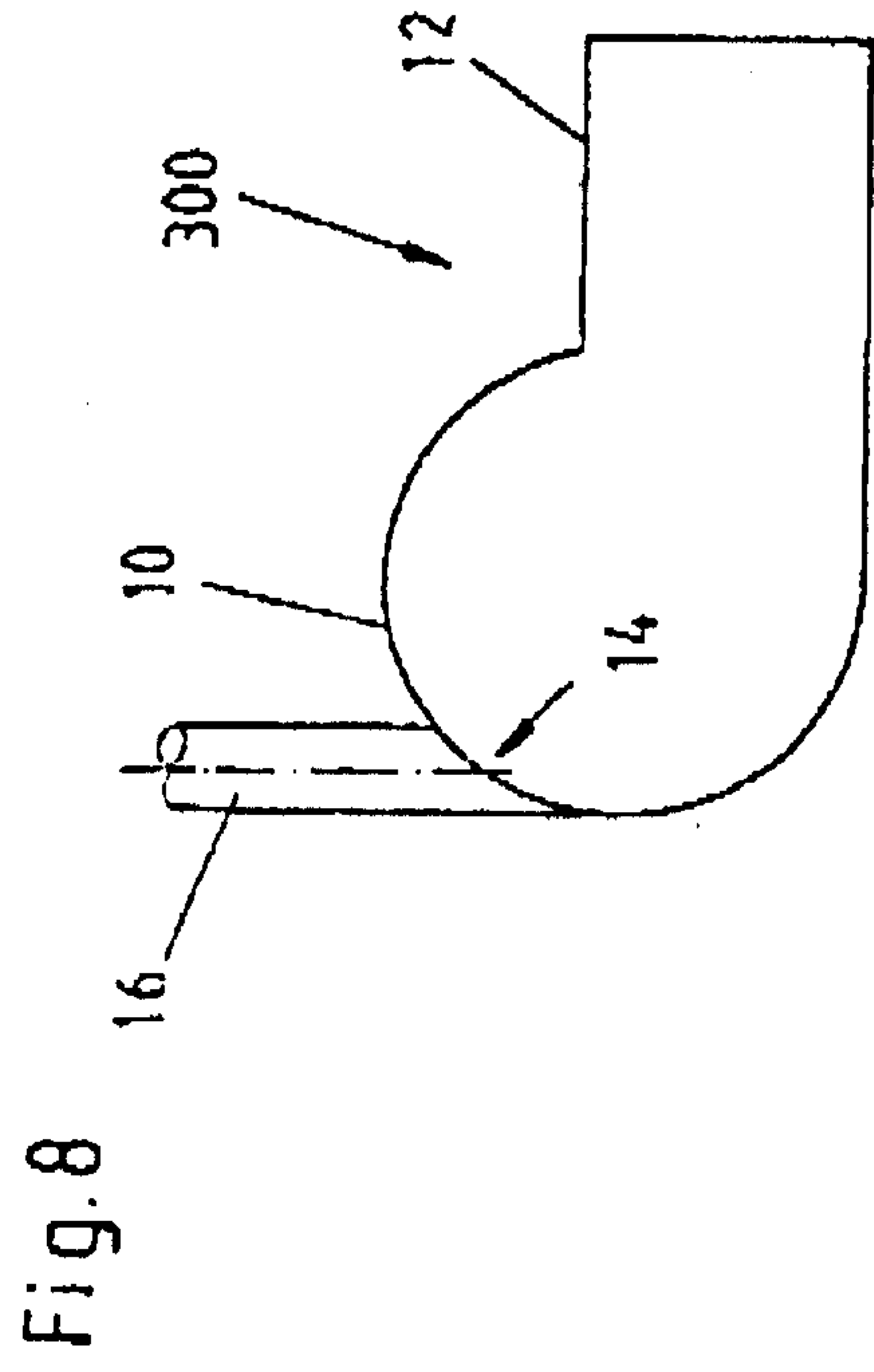
Fig.6



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Fig.10

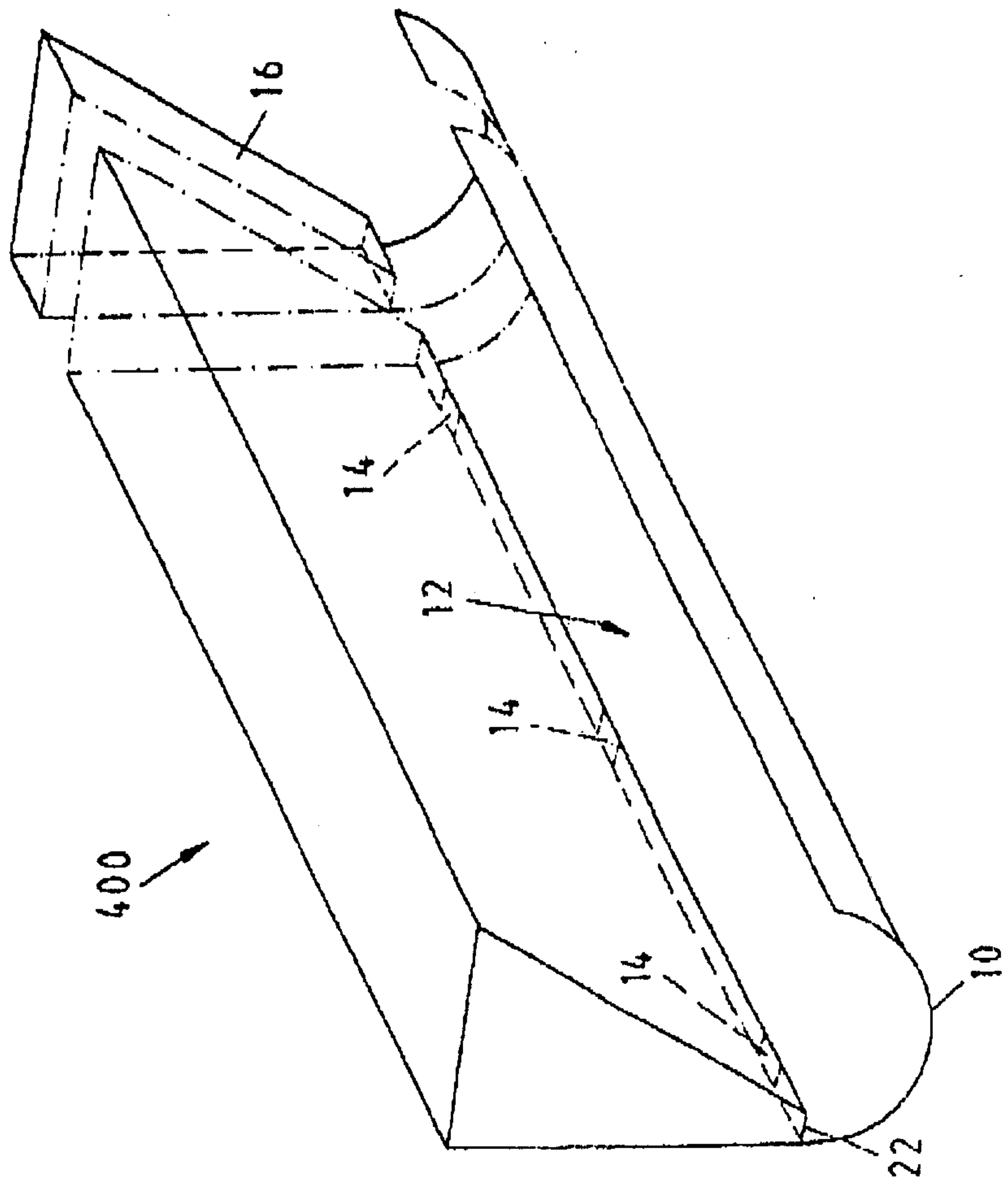
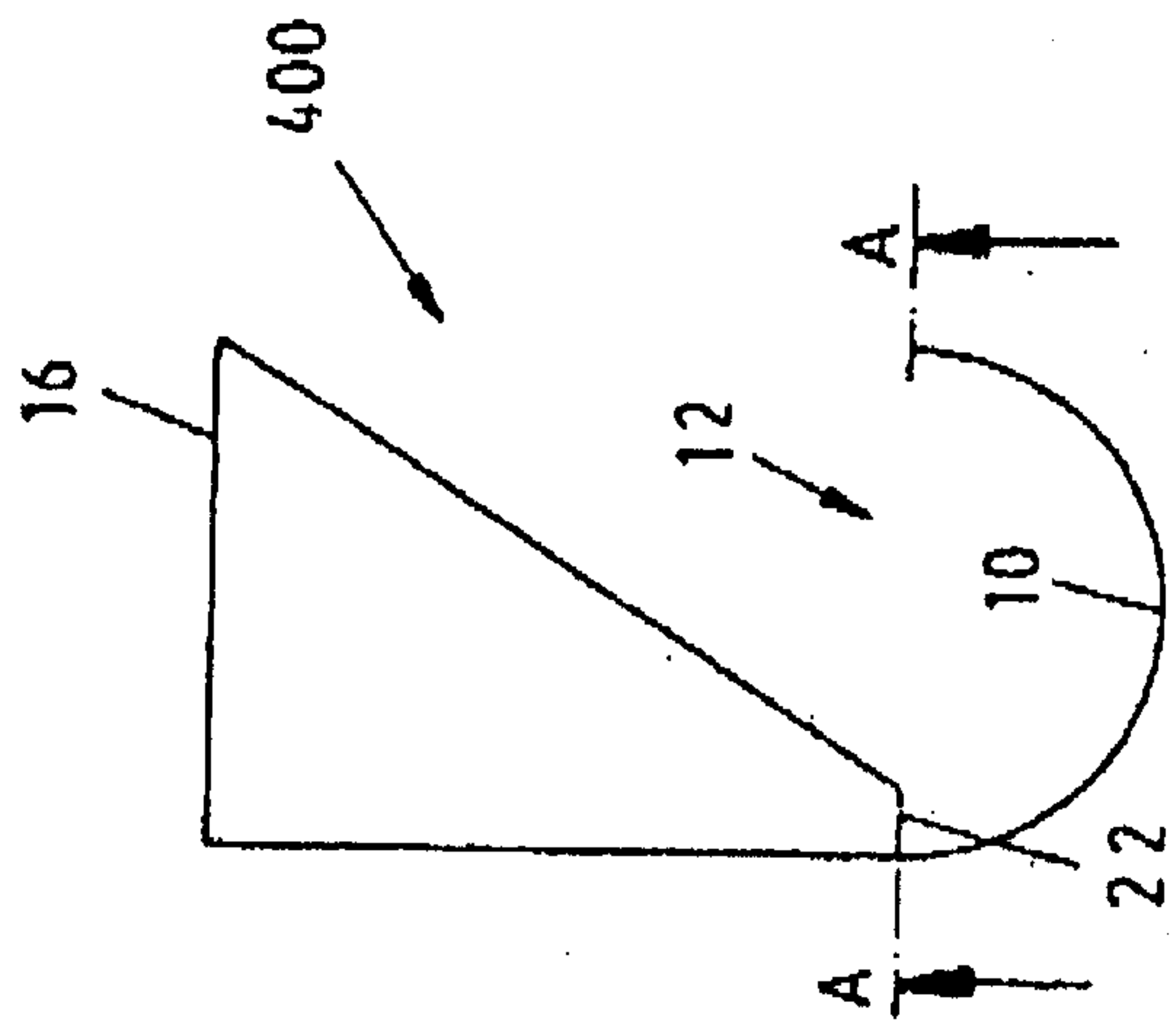


Fig.11



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