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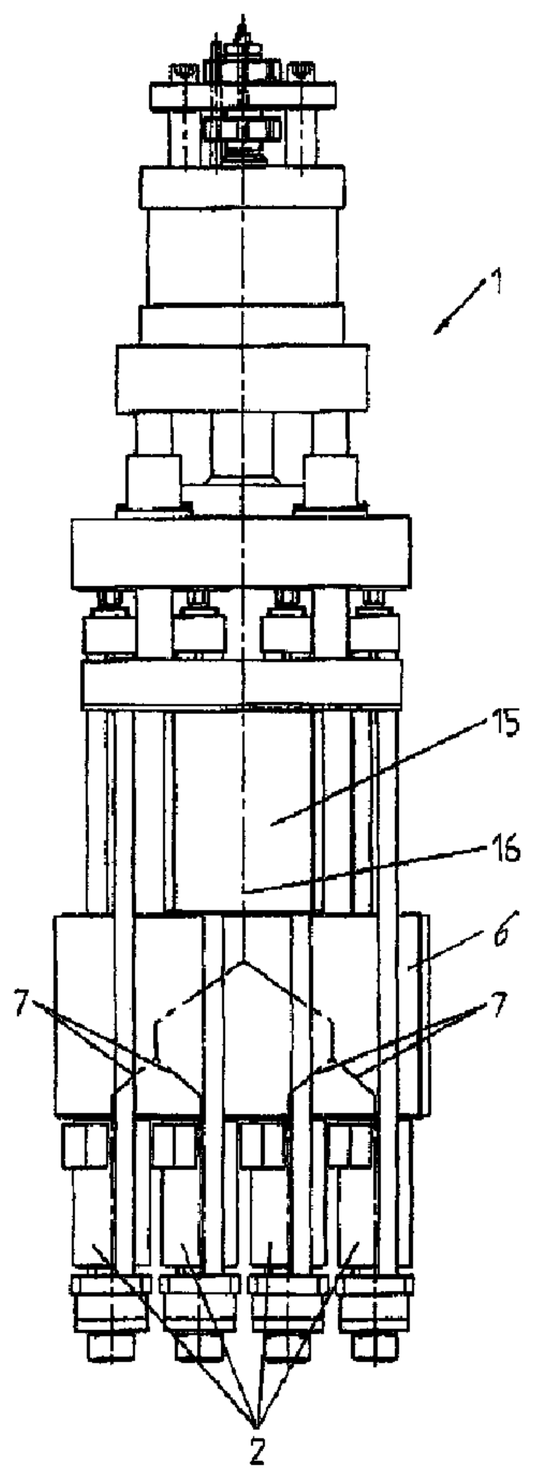
(54) Title: MULTIPLE EXTRUSION HEAD



(57) Abrégé/Abstract:
The invention relates to a multiple extrusion head 1 for extrusion blow moulding machines, comprising a plurality of first extrusion heads 2 which are fixedly arranged side by side in a first row forming a first plane 3, and a plurality of second extrusion heads 4

CA 2629980 A1 2009/01/02

(21) 2 629 980

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(57) Abrégé(suite)/Abstract(continued):
which are fixedly arranged side by side in a second row forming a second plane 5 which extends parallel to the first plane 3. Per row, there has been provided a distributing device 6, 6a, 6b with first distributing channels 7, 10 which are arranged in a first plane 3 and a second plane 5 respectively and each of which is connected to an extrusion head 2 and 4 respectively, comprising a joint first and, respectively, second mass entrance 9 and 12. The distributing devices 6a, 6b are separated in the region of the first plane 3 and second plane 5 respectively. Furthermore, there is provided a third distributing device 15 with third distributing channels 18 which are arranged in a third plane 16 extending at a right angle relative to the first plane 3 and to the second plane 5, wherein the two third distributing channels 18 start from a common third mass entrance 29. One of the two third distributing channels 18 is connected to the first mass entrance 9 and the further one is connected to the second mass entrance 12. The third distributing device 15 is separated in the third plane 16.

Abstract

The invention relates to a multiple extrusion head 1 for extrusion blow moulding machines, comprising a plurality of first extrusion heads 2 which are fixedly arranged side by side in a first row forming a first plane 3, and a plurality of second extrusion heads 4 which are fixedly arranged side by side in a second row forming a second plane 5 which extends parallel to the first plane 3. Per row, there has been provided a distributing device 6, 6a, 6b with first distributing channels 7, 10 which are arranged in a first plane 3 and a second plane 5 respectively and each of which is connected to an extrusion head 2 and 4 respectively, comprising a joint first and, respectively, second mass entrance 9 and 12. The distributing devices 6a, 6b are separated in the region of the first plane 3 and second plane 5 respectively. Furthermore, there is provided a third distributing device 15 with third distributing channels 18 which are arranged in a third plane 16 extending at a right angle relative to the first plane 3 and to the second plane 5, wherein the two third distributing channels 18 start from a common third mass entrance 29. One of the two third distributing channels 18 is connected to the first mass entrance 9 and the further one is connected to the second mass entrance 12. The third distributing device 15 is separated in the third plane 16.

Multiple extrusion head

Description

The invention relates to a multiple extrusion head for extrusion blow moulding machines, more particularly for distributing plastic masses to the individual extrusion heads which are fed by an extruder.

DE-OS 21 14 465 describes a device for uniformly distributing plasticized plastics from an extruder to a plurality of blow or injection heads, which devices comprises a distributor block in which there are arranged parallel channels arranged in one plane. A first channel is connected to two channels extending parallel to same and these each feed two further parallel channels each of which comprises two exits. The first channel is fed centrally. In the case of the example mentioned, it is possible to supply eight blow or injection heads arranged side by side in one plane. The difficulty in the case of this embodiment is that it is complicated to clean the distributing device during system stoppage time. It is also complicated to produce the block because the channels are manufactured in the form of bores which have to be closed by plugs. The embodiment only takes into account blow or injection heads positioned in one plane.

It is the object of the present invention to provide a multiple extrusion head wherein there is supplied a plurality of extrusion heads which are arranged in at least two parallel rows, starting from a mass entrance which is connected to an extruder wherein the extrusion head can be easily produced and maintained.

In accordance with the invention, the objective is achieved by providing a multiple extrusion head for extrusion blow moulding machines, comprising

- a plurality of first extrusion heads which are fixedly arranged side by side in a first row forming a first plane;
- a plurality of second extrusion heads which are fixedly arranged side by side in a second row forming a second plane extending parallel to the first plane;

- a first distributing device with
  first distributing channels which are arranged in a plane corresponding to the first plane and one of which is connected to a first extrusion head and all of which comprise a common first mass entrance;
- a second distributing device with
  second distributing channels which are arranged in a plane corresponding to the second plane and each of which is connected to a second extrusion head and all of which comprise a common second mass entrance;
  wherein the first distributing device is separated in the region of the first plane and the second distributing device is separated in the region of the second plane;
- a third distributing device with third distributing channels, which are arranged in a third plane extending at a right angle relative to the first plane and to the second plane, wherein
  two third distributing channels start from a third mass entrance, wherein one of the two third distributing channels is connected to the first mass entrance and the further one of the two third distributing channels is connected to the second mass entrance, and wherein
  the third distributing device is separated in the third plane.

The advantage of this embodiment is that the first and second distributing devices are divided in the planes which are formed by the rows and in which the channels are also positioned. The third distributing device, too, is separated in a plane which is arranged transversely thereto and which contains the distributing channels which supply the distributing channels associated with the rows. Such separation results in a simplified production procedure because the individual channels can be produced continuously and they can extend in a way which avoids abrupt subdivisions. This means that the direction in which the distributing channels extend can be selected to be such that the mass is uniformly distributed to the extrusion heads. However, a substantial advantage is that it is not only possible to supply a plurality of extrusion heads arranged side by side in one plane, but that it is also possible to distribute the mass to a plurality of planes and rows respectively, so that a plurality of extrusion

heads can be arranged one behind the other and also side by side. Such division also simplifies the cleaning process, and the cross-sectional shape of the channels is not limited to a cylindrical bore.

According to a further embodiment of the invention it is proposed that the third mass entrance forms a connection with an extruder.

It is advantageous if the first distributing channels and the second distributing channels are combined in pairs to form a main channel and if the main channels are each connected to the first mass entrance or to the second mass entrance. In this way the length of the distribution path becomes advantageous.

According to a preferred embodiment, it is proposed that per first plane and per second plane there are provided four or more extrusion heads.

The invention is not restricted to an arrangement in two planes, but it can also be applied to three or more planes, so that it is proposed that for the first plane and for the second plane, there is provided at least one further parallel plane in which there are arranged extrusion heads whose distributing devices each comprise distributing channels and mass entrances which are designed in accordance with the first distributing device and which are divided in the corresponding further planes.

It is also possible for the first distributing device and the second distributing device and, optionally, further distributing devices which divided in planes extending parallel relative to one another to be combined all together or in groups and form one unit.

A preferred embodiment of the invention is diagrammatically illustrated in the drawing wherein

Figure 1 is a front view of a multiple extrusion head with a plurality of extrusion heads arranged side by side in a first plane.

Figure 2 is a side view of Figure 1, also showing extrusion heads arranged side by

side in a second plane.

Figure 3 shows a first view of the distributing devices arranged as shown in Figure 1.

Figure 4 is a side view referring to Figure 3.

Figures 1 to 4 will be described jointly below. The illustrations in Figures 3 and 4 have been enlarged relative to Figures 1 and 2. In addition, the extension of the distributing channels has only been shown diagrammatically by dash-dotted lines in some areas. The cross-sectional shape of the individual distributing channels and the way in which it changes along the extension of the distributing channels have to be based on experimental know-how. However, the arrangement of the distributing channels in accordance with the invention permits a greater degree of freedom as regards the cross-sectional shape.

The multiple extrusion head 1 as shown in the Figures comprises first extrusion heads 2 which are arranged side by side in a first plane 3.

Figures 1 and 3 only show the first extrusion heads 2 arranged side by side in the first row along the first plane 3. Second extrusion heads 4 are located in a second plane 5 behind the first plane 3 shown in Figures 1 and 3. Said second plane 5 and the second extrusion heads 4 arranged grid-like therein relative to the first extrusion heads 2 can be seen in Figure 2, but it possible to see only the first one of the second extrusion heads 4 associated with the second plane 5.

For supplying the first extrusion heads 2 and the second extrusion heads 4 with a plasticized mass flow of plastics and for distributing same to the extrusion heads 2 and 4, there are provided a first distributing device 6a, a second distributing device 6b and a third distributing device 15.

The first distributing device 6a and the second distributing device 6b are identical in design, so that, below, only the first one will be described by way of example. The two distributing devices 6a and 6b can be combined to form a distributing device 6,

so that the channels for the two extend in a first and in a second row, i.e. comprise the first plane 3 and the second plane 5. As is particularly obvious from Figures 2 and 4, there is provided a first distributing device 6a and a second distributing device 6b which each comprise a plate-like structure, and in each case there are shown two individual plates which abut one another in the respective planes, i.e. in the first plane 3 and the second plane 5 extending parallel thereto. The faces of the first distributing device 6a which face one another comprise the first distributing channels 7 and those of the second distributing device 6b comprise the second distributing channels 10 which are associated with the second plane 5.

The first distributing channels 7 which are arranged in the first distributing device 6 end in a main channel 7a. The two main channels 7a are combined to form the first mass entrance 9 and the second distributing channels 10 arranged in accordance with the first distributing device 6a are combined to form a main channel 10a and a second mass entrance 12. The first mass entrance 9 and the second mass entrance 12 are located in planes which extend parallel relative to one another, which are offset relative to one another and which are formed by the first separating join 13 of the first distributing device 6a and of the second distributing device 6b.

Towards the associated first extrusion heads 2 and the second extrusion heads 4, the first distributing channels 7 and the second distributing channels 10 comprise a first exit 8 and a second exit 11.

The first mass entrance 9 and the second mass entrance 12 located at a distance therefrom are supplied via a third distributing device 15 with a mass flow. This is effected via two parallel third exits 19 which are combined to form a main channel 18a and are supplied by a common third mass entrance 20 which is connected to the extruder for example and from there, is supplied with a plasticized mass flow of plastics.

The third distributing channels 18 are positioned in a third plane 16 which extends at a right angle relative to the first plane 3 and to the second plane 5 in the third distributing device. In said third plane 16, the second distributing device 15, which also comprises a plate-like structure is divided by a third separating join 17. The third

distributing channels 18 and the main channel 18a are worked into the abutting faces of the plates forming the third distributing device 15.

List of reference numbers

1	multiple extrusion head
2	first extrusion heads
3	first plane
4	second extrusion heads
5	second plane
6	distributing device
6a	first distributing device
6b	second distributing device
7	first distributing channels
7a	main channel
8	first exit
9	first mass entrance
10	second distributing channels
10a	main channels
11	second exit
12	second mass entrance
13	first separating join
14	second separating join
15	third distributing device
16	second plane
17	third separating join
18	third distributing channels
18a	main channel
19	third exit
20	third mass entrance

Claims

1. A multiple extrusion head (1) for extrusion blow moulding machines, compri-sing

- a plurality of first extrusion heads (2) which are fixedly arranged side by side in a first row forming a first plane (3);
- a plurality of second extrusion heads (4) which are fixedly arranged side by side in a second row forming a second plane (5) extending parallel to the first plane (3);
- a first distributing device (6, 6a) with
  first distributing channels (7) which are arranged in a plane corresponding to the first plane (3) and each of which is connected to a first extrusion head (2) and all of which comprise a common first mass entrance (9);
- a second distributing device (6, 6b) with
  second distributing channels (10) which are arranged in a plane corresponding to the second plane (5) and each of which is connected to a second extrusion head (4) and all of which comprise a common second mass entrance (12);
  wherein the first distributing device (6a) is separated in the region of the first plane (3) and the second distributing device (6b) is separated in the region of the second plane (5);
- a third distributing device (15) with third distributing channels (18), which are arranged in a third plane (16) extending at a right angle relative to the first plane (3) and to the second plane (5), wherein
  two third distributing channels (18) start from a third mass entrance (29), wherein
  one of the two third distributing channels (17) is connected to the first mass entrance (9) and the further one of the two third distributing channels (17) is connected to the second mass entrance (12), and wherein
  the third distributing device (15) is separated in the third plane (16).

2. A multiple extrusion head according to claim 1,

characterised in

that the third mass entrance (29) forms a connection with an extruder.

3. A multiple extrusion head according to claim 1,

characterised in

that the first distributing channels (7) and the second distributing channels (10) are each combined in pairs to form a main channel (7a, 10a) and
that the main channels (7a, 10a) are each connected to the first mass entrance (8) or to the second mass entrance (12).

4. A multiple extrusion head according to any one of claims 1 to 3,

characterised in

that per first plane (3) and per second plane (5), there are provided four or more extrusion heads (2, 4).

5. A multiple extrusion head according to any one of claims 1 to 3,

characterised in

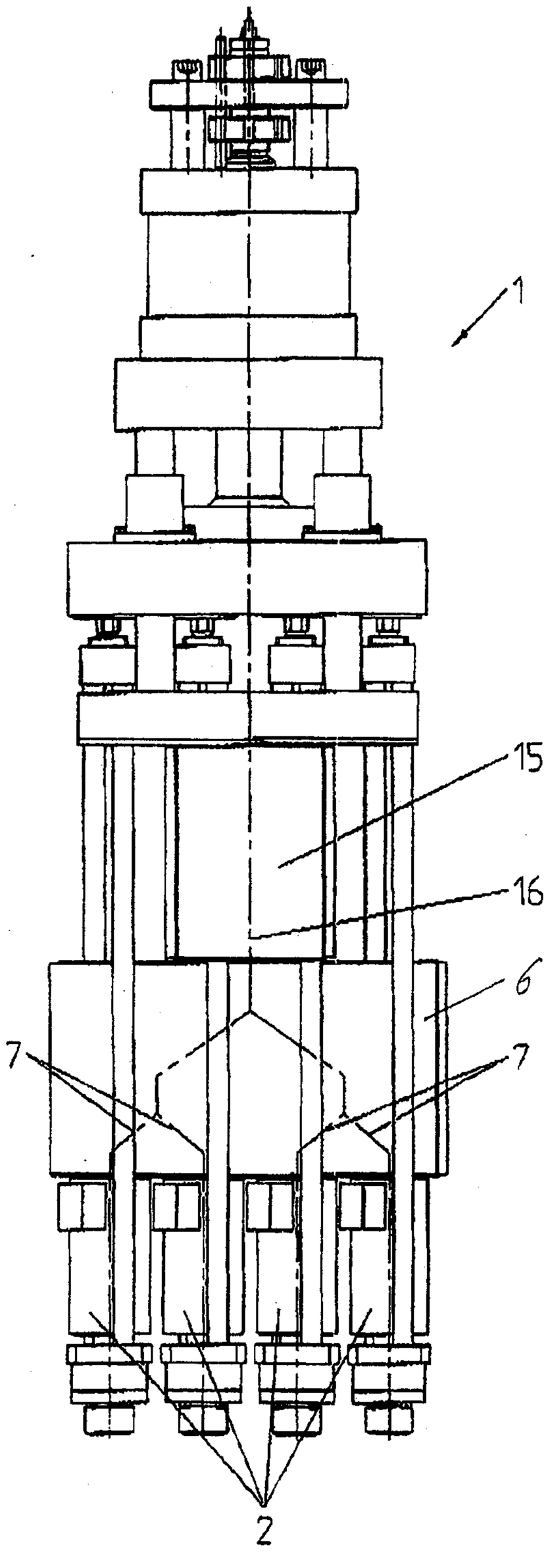
that for the first plane (3) and for the second plane (5), there is provided at least one further parallel plane in which there are arranged extrusion heads whose distributing devices each comprise distributing channels and mass entrances which are designed in accordance with the first distributing device and which are divided

in the respective further planes.

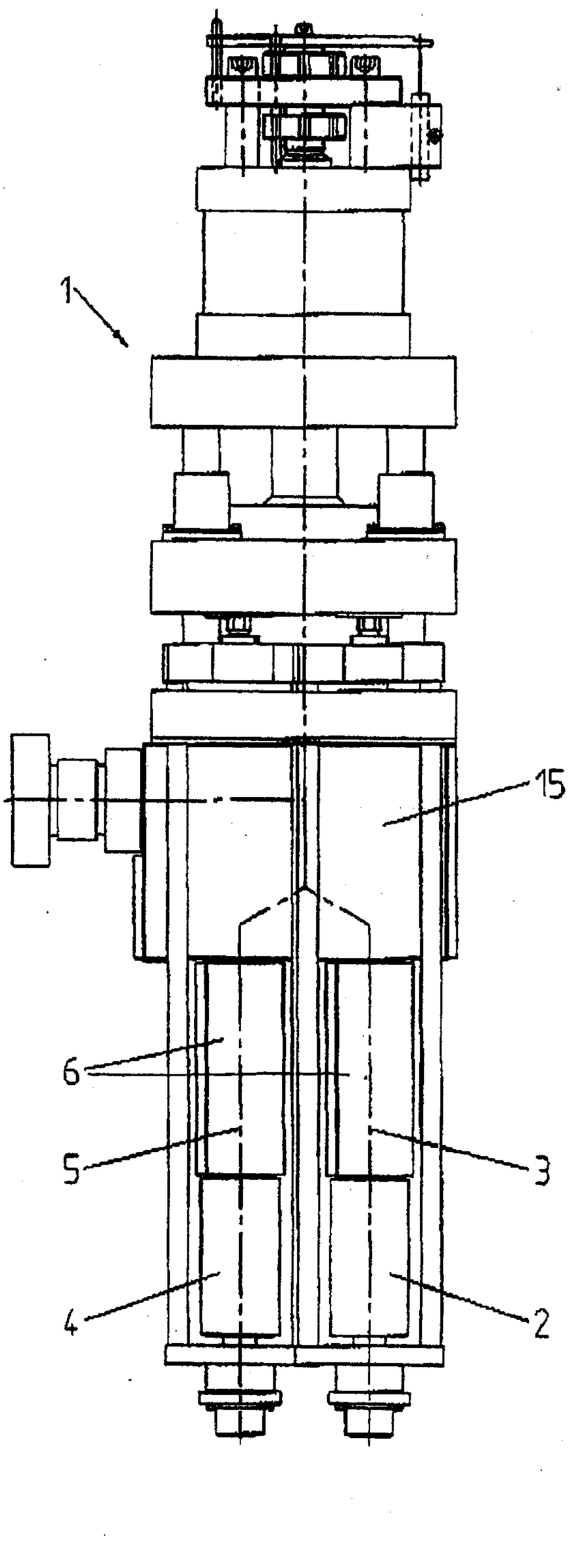
6. A multiple extrusion head according to any one of claims 1 or 5,

characterised in

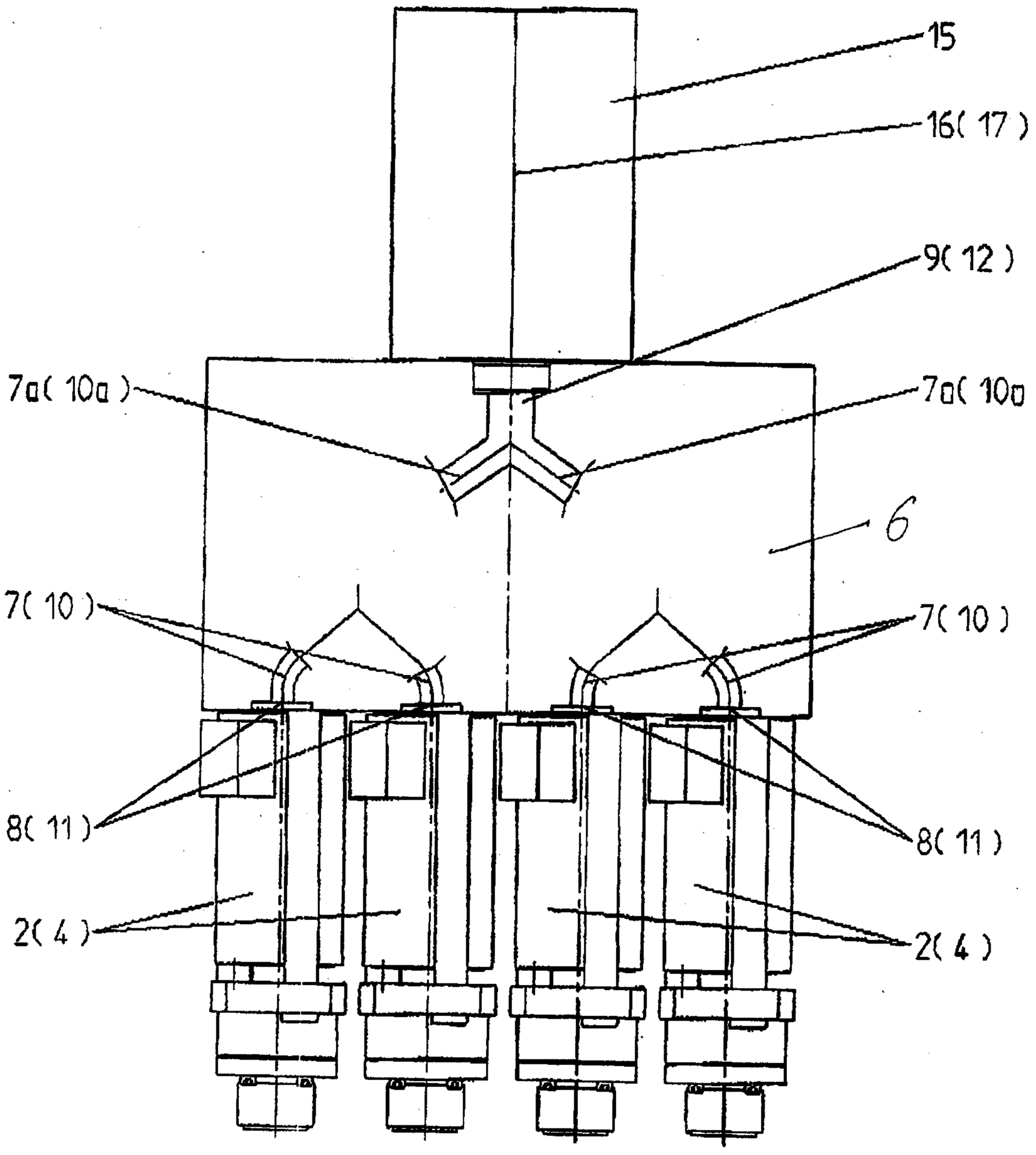
that the first distributing device (6a) and the second distributing device (6b) and, optionally, further distributing devices which are divided in planes extending parallel relative to one another are combined all together or in groups and form one unit.



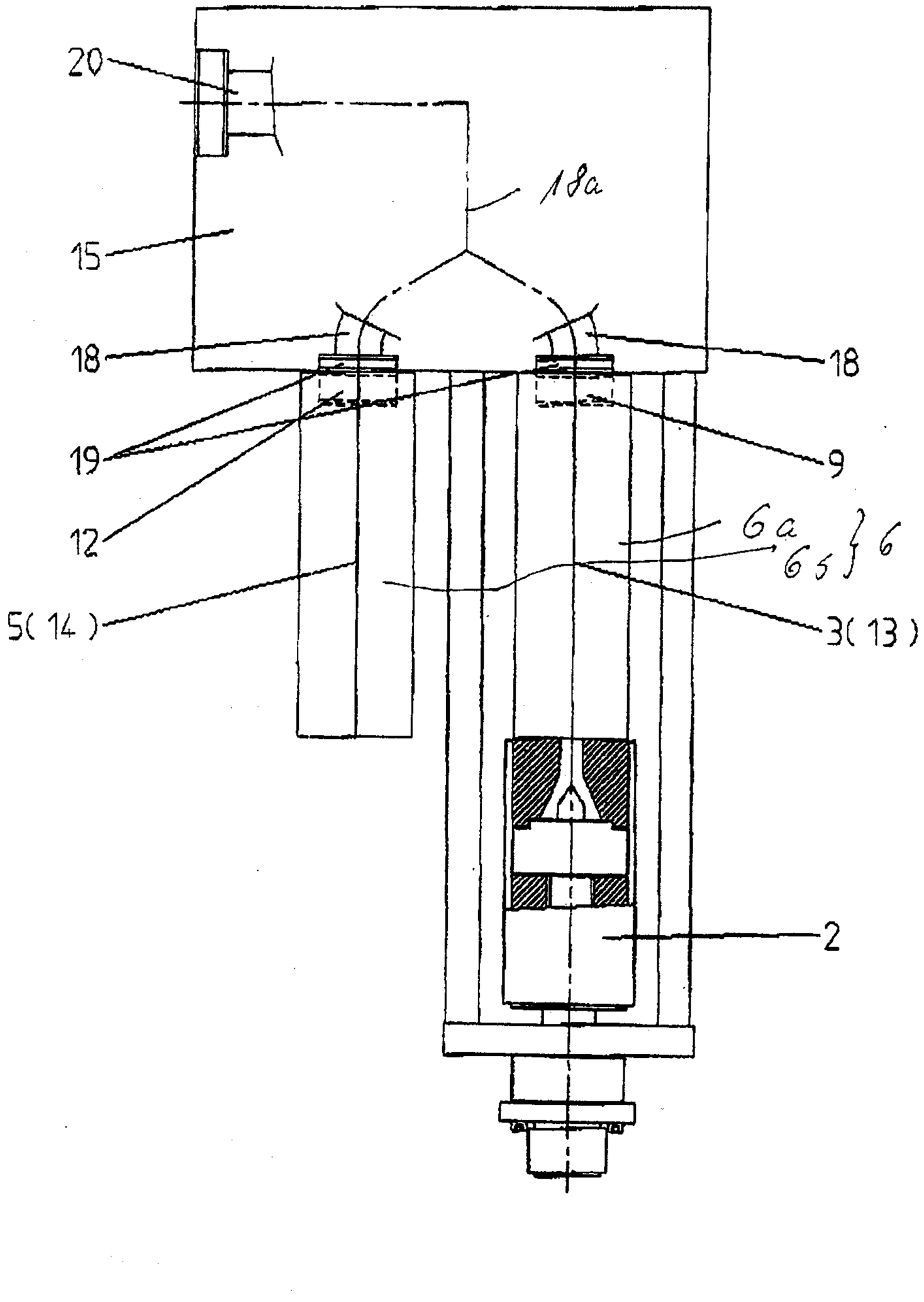
Figur 1



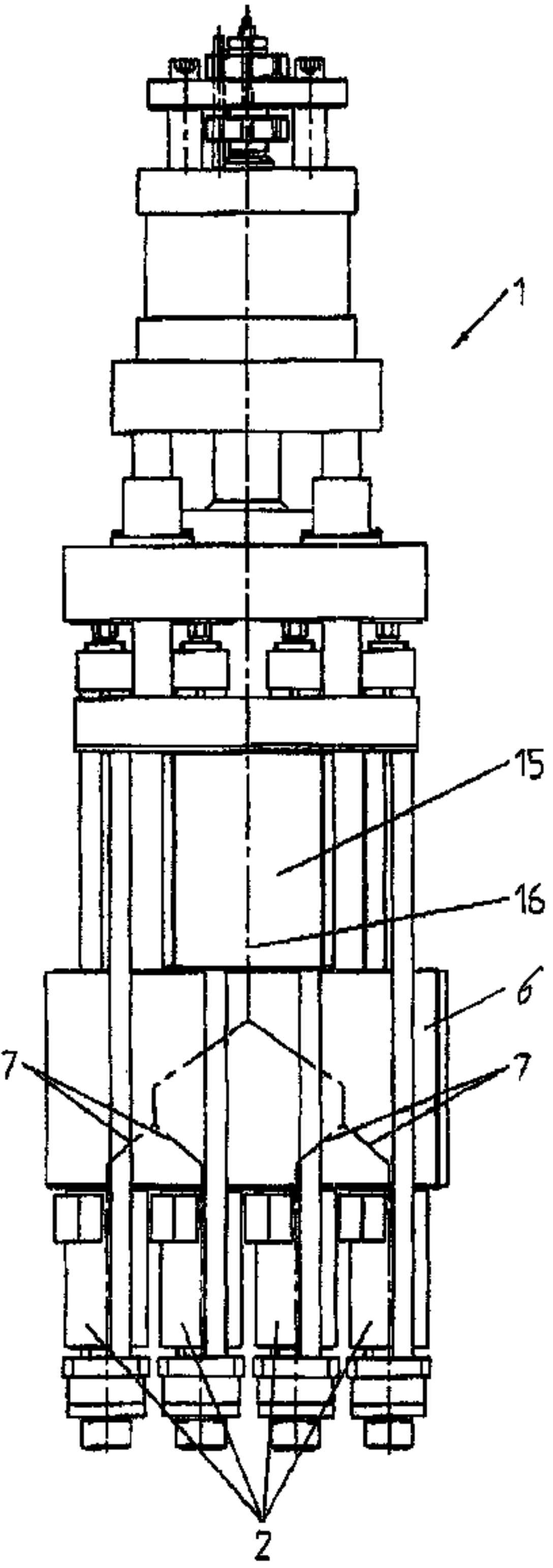
Figur 2



Figur 3



Figur 4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