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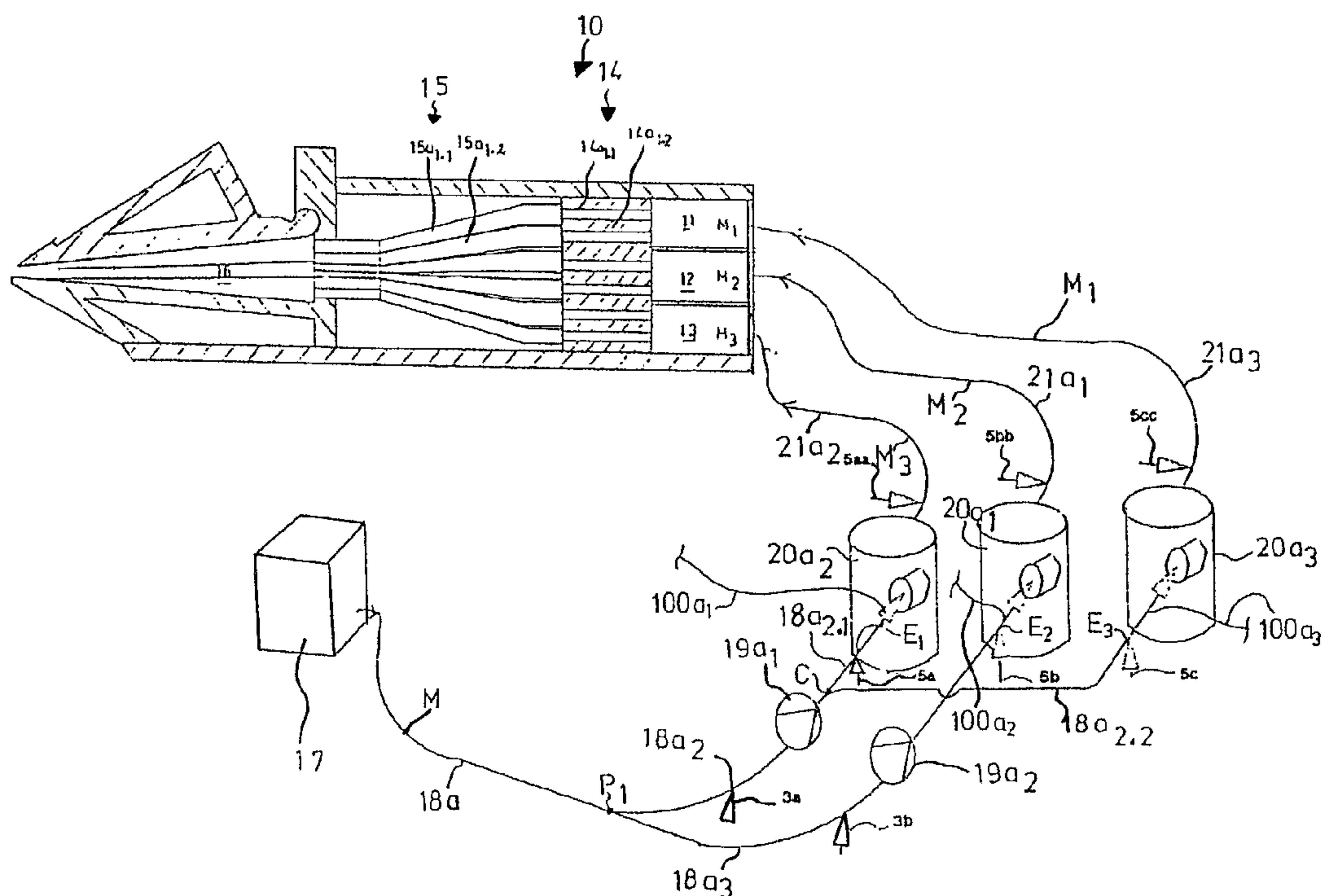
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(57) Abrégé/Abstract:

A stock feed system for a multi-layer headbox and a method in the operation of a multi-layer headbox in which into each inlet header of the multi-layer headbox; a stock concept is passed which has been produced out of the same fresh stock by adding the necessary chemicals and fillers to separated portions of the fresh stock. Into the stock feed system of the multi-layer headbox, at least one dilution-water line is passed.

ABSTRACT

5 A stock feed system for a multi-layer headbox and a method in the operation of a multi-layer headbox in which into each inlet header of the multi-layer headbox, a stock concept is passed which has been produced out of the same fresh stock by adding the necessary chemicals and fillers to separated portions of the fresh stock. Into the stock feed system of the multi-layer headbox, at least one dilution-water line is passed.

**STOCK FEED SYSTEM FOR A MULTI-LAYER HEADBOX AND
METHOD IN THE OPERATION OF A MULTI-LAYER HEADBOX**

The present invention relates to a stock feed system for a multi-layer headbox
5 and a method in the operation of a multi-layer headbox.

In the prior art, systems for the operation of multi-layer headboxes are known
in which there are separate fresh stocks for the surface layers of a pulp flow discharged
from the headbox and for the middle layers thereof. Thus, in the prior art systems, there
have been at least double fresh-stock systems for the formation of the different pulp
10 layers. In the prior art equipment, the stocks introduced along at least two separate
fresh stock lines have been processed in vortex cleaning and in de-aeration tanks, and
feeds of fillers or starch complying with the required paper grade have been passed into
the at least two fresh-stock lines.

With the prior art technology, a paper machine into whose headbox stock is fed
15 at different consistencies requires a complete short circulation which comprises more
than one stock systems. This is also the case when the stock in the different layers is in
the other respects the same, but the consistencies are different.

Increased consistency of layers may be necessary, for example, in order that an
improved purity of the layers can be achieved. When the middle layer is thicker than
20 the surface layers, water of the middle layer is drained through the surface layers to a
relatively limited extent. In such a case, particles of the middle layer are not carried
along with the water into the surface layer, and the purity of the layers remains good.

A very thick middle layer is highly flocculated, in which case it has a high
bulk. Then, the structure of the paper results in a bulky paper of good bending stiffness,
25 in which the formation of the middle layer is poor but the formation of the surface
layers is good, which secures good printing properties.

The present invention is directed towards the provision of a new and improved stock feed system for a multi-layer headbox and a method in the operation of a multi-layer headbox in which each layer of a multi-layer pulp web discharged from the headbox can be diluted separately and/or simultaneously, in which case, e.g., the stocks
5 passed into the inlet headers of a multi-layer headbox can be given the desired consistencies.

In the present invention, the stock for one or several layers in the feed pipe systems for the inlet headers of the headbox are diluted. The diluting can take place before screens in the feed path through the feed pipe system if each layer has a
10 screen of its own, or after the stock has been divided to be fed into the different layers.

In the present invention, in a paper machine that comprises a multi-layer headbox and therein at least two separate inlet headers or equivalent, for the inlet headers, separate stocks are prepared out of the same fresh stock, and they are passed into the inlet headers from the same stock tank. According to the invention, the fresh
15 stock passed out of the stock tank is divided into two or more component flows. Into these component flows to be fed into the multi-layer headbox, chemicals and/or additives purposeful for the quality or the economy of production of different paper grades are passed.

Further, according to the invention, the system also includes dilution-water
20 lines passing to the stock system of the headbox. Preferably, the dilution lines are arranged to pass from a dilution-water header through valves and to join the stock line connected with the inlet header for each stock layer. Thus, according to the invention, in the stock feed system, each layer can be diluted separately and/or simultaneously, in which case, e.g., the stocks passed into the inlet headers of a multi-layer headbox can
25 be given the desired consistencies. When certain additives are added to the stock flow,

it may be the case that the stock has a low dry solids content before mixing of the additive.

Thus, before the additive is passed into the stock, the stock may be diluted to the desired dry solids content to add the additive concerned into the fresh stock in an
5 optimal manner.

In the stock system in accordance with the present invention for a multi-layer headbox, into each inlet header of the multi-layer headbox, a stock concept is passed which has been produced out of the same fresh stock by adding the necessary chemicals and fillers to the fresh stock. The stock feed system in accordance with the present
10 invention for a multi-layer headbox thus comprises at least one dilution-water line.

Accordingly, in one aspect of the present invention, there is provided a combination of a multi-layer headbox including inlet headers situated vertically one above another and a stock feed system for feeding stock to the inlet headers of the multi-layer headbox, the stock feed system comprising a single fresh stock tank for
15 retaining stock, a branching member, a first flow line having first and second opposed ends, said first end of said first flow line being connected to said single fresh stock tank and said second end of said first flow line being connected to said branching member, a single flow of fresh stock being passed through said first flow line from said single fresh stock tank to said branching member and being divided in said branching member
20 into a plurality of stock flows without storing said single flow of fresh stock between said single fresh stock tank and said branching member, at least second and third flow lines each having first and second opposed ends and through each of which a respective one of said divided stock flows passes, said first ends of said second and third flow lines being connected to said branching member and said second ends of said second
25 and third flow lines leading to a respective one of said inlet headers of said headbox, a

respective one of said divided stock flows being passed through each of said second and third flow lines from said branching member without storing said divided stock flows between said branching member and said inlet headers, means for independently adding chemicals and/or fillers to each of said divided stock flows during the flow of said divided stock flows through a respective one of said at least second and third flow lines after said branching member and before entry of said divided stock flows into said inlet headers such that stock in each inlet header has an independently controllable chemical and/or filler characteristic, and diluting means for adjusting the consistency of at least one of said divided stock flows such that said at least one of said divided stock flows has a consistency independently adjustable with respect to the consistency of other of said divided stock flows, said diluting means comprising conduit means for passing a diluting-water flow into said at least one of said divided stock flows as said at least one of said divided stock flows is passing through a respective one of said at least second and third flow lines prior to entry of said at least one of said divided stock flows into the respective one of said inlet headers of said headbox.

In the method in accordance with the invention, the stock for each inlet header is prepared out of a single fresh stock by adding the necessary chemicals and fillers to the fresh stock. Dilution water is passed into at least one stock line that passes into an inlet header of the multi-layer headbox. Thus, in one embodiment, the method is used in the operation of a multi-layer headbox having at least two inlet headers into which a respective stock concept is passed, the stock flowing from the inlet headers through a system of distributor pipes into a turbulence generator and further into a slice cone. A single flow of fresh stock is provided and then divided into a plurality of stock flows. Chemicals and/or fillers are independently added to each of the stock flows. Each of the stock flows is then passed after the chemicals and/or fillers have been added thereto

into a respective one of the inlet headers, and a diluting-water flow is passed into at least one of the stock flows. Preferably, the diluting-water flow is passed into individual ones of the stock flows which form outer layers of a web discharged from the headbox.

5 Accordingly, in a further aspect of the invention, there is provided a method for supplying stock to a multi-layer headbox having at least two inlet headers situated vertically one above another and into which stock having respective stock characteristics is passed, the stock flowing from said inlet headers through a system of tubes and further into a slice cone, comprising the steps of retaining stock in a single
10 fresh stock tank, continuously passing said single flow of fresh stock from said single fresh stock tank to a branching point at which said single flow of fresh stock is divided into a plurality of stock flows without storing said single flow of fresh stock between said single fresh stock tank and said branching point, continuously passing each of said divided stock flows from said branching point into a respective one of said inlet headers
15 without storing said divided stock flows between said branching point and said inlet headers, independently adding chemicals and/or fillers to each of said divided stock flows during the flow of said divided stock flows after said branching point and before entry of said divided stock flows into said inlet headers such that stock in each inlet header has an independently controllable chemical and/or filler characteristic, and
20 adjusting the consistency of at least one of said plurality of divided stock flows such that said at least one of said plurality of divided stock flows has a consistency independently adjustable with respect to the consistency of other of said divided stock flows, said consistency adjusting step comprising the step of passing a diluting-water flow into said at least one of said divided stock flows prior to entry of said at least one
25 of said divided stock flows into the respective one of said inlet headers.

The invention will be described in the following with reference to some preferred embodiments of the invention illustrated in the figures in the accompanying drawings. However, the invention is not confined to the illustrated embodiments alone.

5 The following drawings are illustrative of embodiments of the invention and are not meant to limit the scope of the invention as encompassed by the claims. In the drawings:

Figure 1 shows an embodiment of the invention in which the stock flow passed out of the fresh-stock tank is divided into three component flows which are passed
10 further, after feeds of chemicals and fillers, into the different inlet headers in the multi-layer headbox, and in which system a dilution-water line is connected with each line passing into an inlet header;

Figure 2 shows a second embodiment related to the stock feed system in accordance with the invention for a multi-layer headbox;

15 Figure 3 shows the arrangement of introduction of dilution water with the inlet header and the regulation valves;

Figure 4A is a side view of a multi-layer headbox in accordance with the invention;

Figure 4B is a top view of the multi-layer headbox as shown in 25 Fig. 4A;

20 Figure 5A shows a first preferred embodiment of the supply of dilution water into the stock;

Figure 5B shows a second preferred embodiment of the supply of dilution water;

Figure 5C shows a third preferred embodiment of the supply of dilution water;
25 and

Figure 5D shows a fourth preferred embodiment of the supply of dilution water.

Referring to the accompanying drawings wherein like reference numerals refer to the same or similar elements, Fig. 1 is a schematic illustration of a first preferred embodiment of the invention, which is favorably suitable for the production of SC-
 5 paper. As shown in the figure, a multi-layer headbox denoted generally by reference numeral 10 comprises three inlet headers, i.e., the inlet headers 11, 12 and 13. From the inlet header 11, a stock M_1 is passed through a distribution manifold having distribution pipes $14_{a1.1}$, $14_{a1.2}$,... to a turbulence generator 15 into turbulence tubes $15_{a1.1}$, $15_{a1.2}$...
 10 therein and further from the turbulence tubes to a slice cone 16. From the inlet header 12, a stock M_2 is passed through respective distribution pipes $14_{a2.1}$, $14_{a2.2}$... of the distributor manifold 14 to the turbulence generator 15 into respective turbulence tubes $15_{a2.1}$, $15_{a2.2}$,... further into the slice cone 16. Similarly, from the inlet header 13, a stock M_3 is passed through distribution pipes $14_{a3.1}$, $14_{a3.2}$,...

of the distributor manifold 14 to the turbulence generator 15 into
 respective turbulence tubes $15a_{1,1}, 15a_{1,2}, \dots$ and further into the
 slice cone 16. Thus, by means of the multi-layer headbox shown in
 Fig. 1, a paper web is formed out of three stocks or stock concepts
 M_1, M_2 and M_3 .

In the present invention, the system comprises a single stock
 system, the stocks M_1, M_2 and M_3 being formed out of the same fresh
 stock M which is passed out of a single fresh-stock tank 17. As
 shown in Fig. 1, the fresh stock M is passed out of the fresh-stock
 tank 17 along a flow line 18a and branched at a branching point P1
 into two branch lines $18a_2$ and $18a_3$. In the embodiment of Fig. 1,
 in the branch line $18a_2$, a chemical solution 3a is added to the
 stock M, and in the branch line $18a_3$, a chemical solution 3b is
 added. The chemical solutions may be a filler or starch. In the
 lines $18a_2, 18a_3$, the stocks are made to flow further by means of
 pumps $19a_1$ and $19a_2$ so that, along the line $18a_3$, the stock is
 passed into a machine screen $20a_1$. A retention agent 5b is fed
 into the stock before the machine screen $20a_1$, and a retention
 agent 5bb is fed into the stock after the machine screen in a flow
 line $21a_1$ therefrom. In this manner, a good mixing of the
 retention agent and the stock is achieved. Along the line $21a_1$,
 the stock M_2 that was formed is passed into the middle inlet header
 12 of the multi-layer headbox.

From the line $18a_2$ after the pump $19a_1$, from a branch point C,
 a line $18a_{2,1}$ passes to a machine screen $20a_2$, and from the machine
 screen $20a_2$, the line $21a_2$ passes to the multi-layer headbox. At

the front side of the machine screen 20a₂, a retention agent 5a is fed into the line 18a_{2,1}, and after the machine screen 20a₂, a retention agent 5aa is fed into a line 21a₂ therefrom. Along the line 21a₂, the stock flow M₃ is passed into the inlet header 13 of the multi-layer headbox.

Also from the branch point C, a line 18a_{2,2} passes to a machine screen 20a₃ and further into the multi-layer headbox. Into the line 18a_{2,2}, before the machine screen 20a₃, a retention agent 5c is fed, and after the machine screen 20a₃, a retention agent 5cc is fed into a flow line 21a₃ therefrom. Along the line 21a₃, the stock flow M₁ is passed into the inlet header 11 of the multi-layer headbox.

Thus, in view of the above-described construction, the stock will comprise three layers composed of different stock concepts. In Fig. 1, reference arrows 100a₁, 100a₂, 100a₃ represent the feed ducts for dilution water and is a preferred embodiment of the invention wherein the dilution water is passed to the front side of the screens 20a₁, 20a₂, 20a₃, seen in the flow direction of the stock flow, after feed points E₁, E₂, E₃ of the retention agents 5a, 5b, 5c, respectively. The invention is, however, not restricted to these favorable location of the point of introduction of the dilution-water alone. According to the invention, the desired consistency of the stock flow can be obtained by adding the desired amount of dilution water to each layer. For example, the purity of the layers can be promoted so that the uppermost web layers and the bottommost web layers in relation to the middle layer of the web

are kept more dilute, in which case, less water is drained from the middle layer through the surface layers and, thus, the surface layers remain therefore pure. In such a case, out of the middle layer, particles are not removed along with drainage to the same extent as in an embodiment in which a large amount of water is also drained from the middle layer. In the present application, dilution water is understood as a substance in general that is made to flow and by whose means the consistency of the stock can be diluted. For example, clean water may be used a dilution flow or, for example, a water that has a low content of fibers.

Fig. 2 shows an embodiment of the invention in which one unified stock flow M is passed out of the stock tank 17 along a line 22a₁ to a branch point D₁. After the branch point D₁, a chemical 3a' is added to the fresh stock M into a line 220a₁ branching therefrom.

By means of the pump 19a₁', the stock is made to flow further into a machine screen 23a₁, and before the machine screen 23a₁, a retention agent 5a' is added, and after the machine screen 23a₁, a retention agent 5aa' is added to flow line 24a₁. The stock M₃' flow is passed along the line 24a₁ into the inlet header 13 of the multi-layer headbox.

From the branch point D₁, the stock M which does not flow into flow line 220a₁ is made to flow along a line 22a', to a branch point D₂, from which the stock M is branched into the lines 220a₂ and 220a₃. Into the line 220a₂, a chemical 3b', such as filler or starch, is added into the stock M before a pump 19a₂' associated

with the flow line. By means of the pump 19a₂', the stock concept is passed further into a machine screen 23a₂. Before the machine screen 23a₂, a retention agent 5b', such as some suitable chemical, is added to the stock, and after the machine screen 23a₂, the retention agent 5bb' is added to the stock. The stock concept M₂' produced in this manner is passed further along a line 24a₂ into the multi-layer headbox, and more particularly into its middle inlet header 12.

Similarly, from the branch point D₂ the stock M is passed along the line 220a₃ into the machine screen 23a₃ after the feed of chemical 3c' thereto, by means of the circulation produced by a pump 19a₃'. Before the machine screen 23a₃, a retention agent 5c' is added, and after the machine screen 23a₃, a retention agent 5cc' is added, and the concept M₁' thereby produced is passed further along a line 24a₃ into the inlet header 11 of the multi-layer headbox 10.

Thus, in the concept in accordance with the invention, just a single circulation of stock is used, in which there is just one starting fresh stock M. The fresh stock M is processed further by to it adding chemicals and fillers, whereby out of one fresh stock M all the necessary different stock concepts M₁', M₂' and M₃' are obtained for the different inlet headers 11, 12 and 13 of the multi-layer headbox.

In Fig. 2, an embodiment is shown in which the dilution-water lines 100a₁, 100a₂, 100a₃ are passed to the inlet side of the stock screens 23a₁, 23a₂, 23a₃, respectively, and to the outlet side of the

pumps 19a₁', 19a₂', 19a₃'. The dilution water is passed to the lines 220a₁, 220a₂, 220a₃, preferably to the rear side of the feed points E₁, E₂ and E₃ of the retention agents 5a', 5b', 5c', seen in the flow direction. The figure shows an embodiment in which three pump devices 19a₁', 19a₂', 19a₃' are employed. Within the scope of the invention, an embodiment is, of course, possible in which one pump device only is used, for example, in the line 22a₁. Thus, it is also possible to make the stock flow out of the tank 17 by means of one pump into the stock lines 220a₁, 220a₂ and 220a₃.

Fig. 3 illustrates the passing of the dilution water out of an inlet header J₁ into the lines 100a₁, 100a₂ and 100a₃. Each of the lines 100a₁, 100a₂ and 100a₃ comprise a regulation valve V₁, V₂ and V₃, respectively, by whose means the dilution-water flow can be regulated into stock lines 18a_{2.1}, 18a₃ and 18a_{2.2}. In the embodiment of Fig. 3, the dilution water is introduced after the points E₁, E₂, E₃ of addition of retention agents 5a', 5b', 5c' to the stock line. The dilution water is introduced before machine screens 23a₁, 23a₂ and 23a₃, so that the dilution water is mixed efficiently with the stock M, which has been passed out of the common stock tank 17 of the system. Thus, in the stock circulation system in accordance with the invention exemplified by this embodiment, the fresh stock M is passed from one common tank 17 and branched into one or several branch lines, in which the necessary fillers/additives are added and, moreover, the necessary diluting of the fresh stock is also carried out.

Fig. 4A is a side view of a multi-layer headbox used in the system in accordance with the invention, it being understood that the system can be used in any number of headbox having similar or different constructions. In the illustrated embodiment, a fresh stock M is passed out of the same stock tank 17 through the points for addition of additives and further into the inlet header 11, 12 and 13 of each of the individual layers in the multi-layer headbox 10. As shown in Fig. 4A, the construction is in the other respects similar to those shown in the embodiments of Figs. 1 and 2, except that, after the tube bank or distribution manifold 14 related to each of the inlet headers 11, 12, 13, the headbox comprises intermediate chambers T_1 , T_2 and T_3 . Thus, the fresh stock is introduced from the stock tank 17 and branched into the branch lines and passed, after possible additions of additives and dilution water, into the respective inlet headers 11, 12, 13. From the inlet headers, the stock concepts M_1 , M_2 , M_3 are passed into the tube bank 14, into the intermediate chambers T_1 , T_2 and T_3 , respectively, and further, through the turbulence tubes in the turbulence generator 15, into the slice cone 16. The slice cone 16 comprises aprons f_1 , f_2 . The aprons f_1 , f_2 are arranged at least between each of the stock concepts M_1 , M_2 and M_3 to provide separation for the same in the slice cone 16.

Fig. 4B is a top view of the system shown in Fig. 4A. In this figure, the dilution-water line 100a₁ for dilution water connected with the inlet header 11 is shown.

Fig. 5A shows an embodiment of the invention in which the dilution water is passed at an acute angle α_1 along the line 100a₁ into the stock flow, into the stock line 220a₁.

5 Fig. 5B shows an embodiment of the invention in which the dilution-water line 100a₁ is passed centrally into the stock line 220a₁ through a tube portion extending into the stock flow. The dilution flow is discharged from the dilution-water line 100a₁ in the direction of the stock flow into the stock line 220a₁.

10 Fig. 5C shows an embodiment of the invention in which the dilution water is passed along the line 100a₁ into the stock line 220a₁ and at an acute angle α_2 against the stock flow.

15 Fig. 5D shows an embodiment of the invention in which the dilution water is passed along the line 100a₁ centrally into the stock line 220a₁ which has a L-shaped portion, i.e., two portions perpendicular to one another. The dilution water is passed into one of the portions of stock line 220a₁ in the direction of flow of the stock flow.

The examples provided above are not meant to be exclusive. Many other variations of the present invention would be obvious to those skilled in the art, and are contemplated to be within the scope of the appended claims. For example, the dilution water may be passed into each of the flow lines 18a_{2,1}, 18a_{2,2}, 18a₃ in Fig. 1 or 220a₁, 220a₂, 220a₃ in Fig. 2 in any of the ways shown in Figs. 5A, 5B, 5C and 5D.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A combination of a multi-layer headbox including inlet headers situated vertically one above another and a stock feed system for feeding stock to the inlet headers of the multi-layer headbox, the stock feed system comprising

a single fresh stock tank for retaining stock,

a branching member,

a first flow line having first and second opposed ends, said first end of said first flow line being connected to said single fresh stock tank and said second end of said first flow line being connected to said branching member, a single flow of fresh stock being passed through said first flow line from said single fresh stock tank to said branching member and being divided in said branching member into a plurality of stock flows without storing said single flow of fresh stock between said single fresh stock tank and said branching member,

at least second and third flow lines each having first and second opposed ends and through each of which a respective one of said divided stock flows passes, said first ends of said second and third flow lines being connected to said branching member and said second ends of said second and third flow lines leading to a respective one of said inlet headers of said headbox, a respective one of said divided stock flows being passed through each of said second and third flow lines from said branching member without storing said divided stock flows between said branching member and said inlet headers,

means for independently adding chemicals and/or fillers to each of said divided stock flows during the flow of said divided stock flows through a respective one of said at least second and third flow lines after said branching member and before entry of said divided stock flows into said inlet headers such that stock in each inlet header has an independently controllable chemical and/or filler characteristic, and

diluting means for adjusting the consistency of at least one of said divided stock flows such that said at least one of said divided stock flows has a consistency independently adjustable with respect to the consistency of other of said divided stock flows, said diluting means comprising conduit means for passing a diluting-water flow into said at least one of said divided stock flows as said at least one of said divided stock flows is passing through a respective one of said at least second and third flow lines prior to entry of said at least one of said divided stock flows into the respective one of said inlet headers of said headbox.

2. The combination of claim 1, wherein said conduit means comprise a diluting-water flow line connected to the respective one of said at least second and third flow lines through which said at least one of said divided stock flows is passing and through which the diluting-water flow is passed.

3. The combination of claim 2, wherein said diluting-water flow line has an outlet end extending into a central region of the respective one of said at least second and third flow lines through which said at least one of said divided stock flows is passing, the flow out of said dilution-water flow line substantially coinciding with a flow direction of the stock in the respective

one of said at least second and third flow lines through which said at least one of said divided stock flows is passing.

4. The combination of claim 1, wherein said conduit means comprise a diluting-water flow line connected to each of said at least second and third flow lines, at least one of said dilution-water flow lines being connected to a respective one of said at least second and third flow lines at an oblique angle such that the directional component of the flow out of said at least one dilution-water flow line parallel to a direction of the stock flow in the respective one of said at least second and third flow lines substantially coincides with the flow direction of the stock flow in the respective one of said at least second and third flow lines.

5. The combination of claim 1, wherein said conduit means comprise a diluting-water flow line connected to each of said at least second and third flow lines, at least one of said dilution-water flow lines being connected to a respective one of said at least second and third flow lines at an acute angle such that the directional component of the flow out of said at least one dilution-water flow line parallel to a direction of the stock flow in the respective one of said at least second and third flow lines is in a direction opposite to the flow direction of the stock flow in the respective one of said at least second and third flow lines.

6. The combination of claim 1, wherein said conduit means comprise a diluting-water flow line connected to each of said at least second and third flow lines, at least one of said at least second and third flow lines having a substantially L-shaped portion, one of said dilution-water flow lines being connected to and extending into an interior of said L-shaped portion of said at least one flow line such that the flow out of said dilution-water flow line substantially coincides with a flow direction of the stock flow in said L-shaped portion.

7. The combination of claim 1, wherein said diluting means comprise a single diluting water inlet header, said conduit means comprise dilution-water flow lines each having a first end connected to said single diluting water inlet header and a second end connected to a respective one of said at least second and third flow lines, and said dilution means further comprise regulation valves arranged in association with said dilution-water flow lines, said regulation valves regulating the flow of dilution water into said at least second and third flow lines.

8. The combination of claim 1, further comprising pumps coupled to a respective one of said at least second and third flow lines for pumping said stock flows through said at least second and third flow lines.

9. The combination of claim 8, further comprising a machine screen coupled to each of said at least second and third flow lines and arranged after said pumps in a flow direction, said means for independently adding chemicals and/or fillers to said stock flows being structured and arranged to add chemicals and/or fillers before said pumps, after said pumps and before said

machine screens and after said machine screens.

10. Method for supplying stock to a multi-layer headbox having at least two inlet headers situated vertically one above another and into which stock having respective stock characteristics is passed, the stock flowing from said inlet headers through a system of tubes and further into a slice cone, comprising the steps of:

retaining stock in a single fresh stock tank,

continuously passing said single flow of fresh stock from said single fresh stock tank to a branching point at which said single flow of fresh stock is divided into a plurality of stock flows without storing said single flow of fresh stock between said single fresh stock tank and said branching point,

continuously passing each of said divided stock flows from said branching point into a respective one of said inlet headers without storing said divided stock flows between said branching point and said inlet headers,

independently adding chemicals and/or fillers to each of said divided stock flows during the flow of said divided stock flows after said branching point and before entry of said divided stock flows into said inlet headers such that stock in each inlet header has an independently controllable chemical and/or filler characteristic, and

adjusting the consistency of at least one of said plurality of divided stock flows such that said at least one of said plurality of divided stock flows has a consistency independently adjustable with respect to the consistency of other of said divided stock flows, said consistency adjusting step comprising the step of passing a diluting-water flow into said at least one of said divided

stock flows prior to entry of said at least one of said divided stock flows into the respective one of said inlet headers.

11. The method of claim 10, wherein the diluting-water flow is passed into individual stock flows of said divided stock flows which form outer layers of a web discharged from the headbox.

12. The method of claim 10, wherein each of said divided stock flows is passed through a separate line after said branching point, further comprising the step of:

adding a chemical solution into each of said lines to formulate a particular stock concept to be fed into the respective inlet header of the multi-layer headbox.

13. The method of claim 12, further comprising the step of pumping said divided stock flows through said lines via pumps.

14. The method of claim 13, further comprising the steps of
coupling a machine screen to each of said lines after said pumps in a flow direction, and
adding said chemicals and/or fillers before said pumps, after said pumps and before said machine screens and after said machine screens.

15. The method of claim 10, further comprising the steps of
dividing said single flow of fresh stock into only two separate flows,
passing said two flows through branch lines,
dividing said branch line of a first one of said two flows to provide stock concept for an
uppermost and lowermost inlet header in the headbox, and
passing a second one of said two flows into a middle inlet header arranged between the
uppermost inlet header and the lowermost inlet header.

16. In a combination of a multi-layer headbox and a stock feed system for the multi-layer headbox, including a single fresh stock tank for retaining stock, means for forming a plurality of stock flows from said single flow of fresh stock from said single fresh stock tank, a plurality of inlet headers arranged in said headbox vertically one above another, and means for continuously passing each of said plurality of stock flows into a respective one of all of said inlet headers of said headbox without storing stock between said single fresh stock tank and said inlet headers, the improvement comprising

diluting means for adjusting the consistency of at least one of said plurality of stock flows such that said at least one of said plurality of stock flows has a consistency independently adjustable with respect to the consistency of other of said plurality of stock flows, said diluting means comprising conduit means for passing a diluting-water flow into said at least one of said plurality of stock flows prior to entry of said at least one of said plurality of stock flows into the respective one of said inlet headers of said headbox.

17. The combination of claim 16, further comprising means for independently adding chemicals and/or fillers to each of said plurality of stock flows, and said plurality of stock flows being passed into said headbox after said chemicals and/or fillers have been added thereto.

18. The combination of claim 17, wherein said diluting-water flow is added after said chemicals and/or fillers have been added.

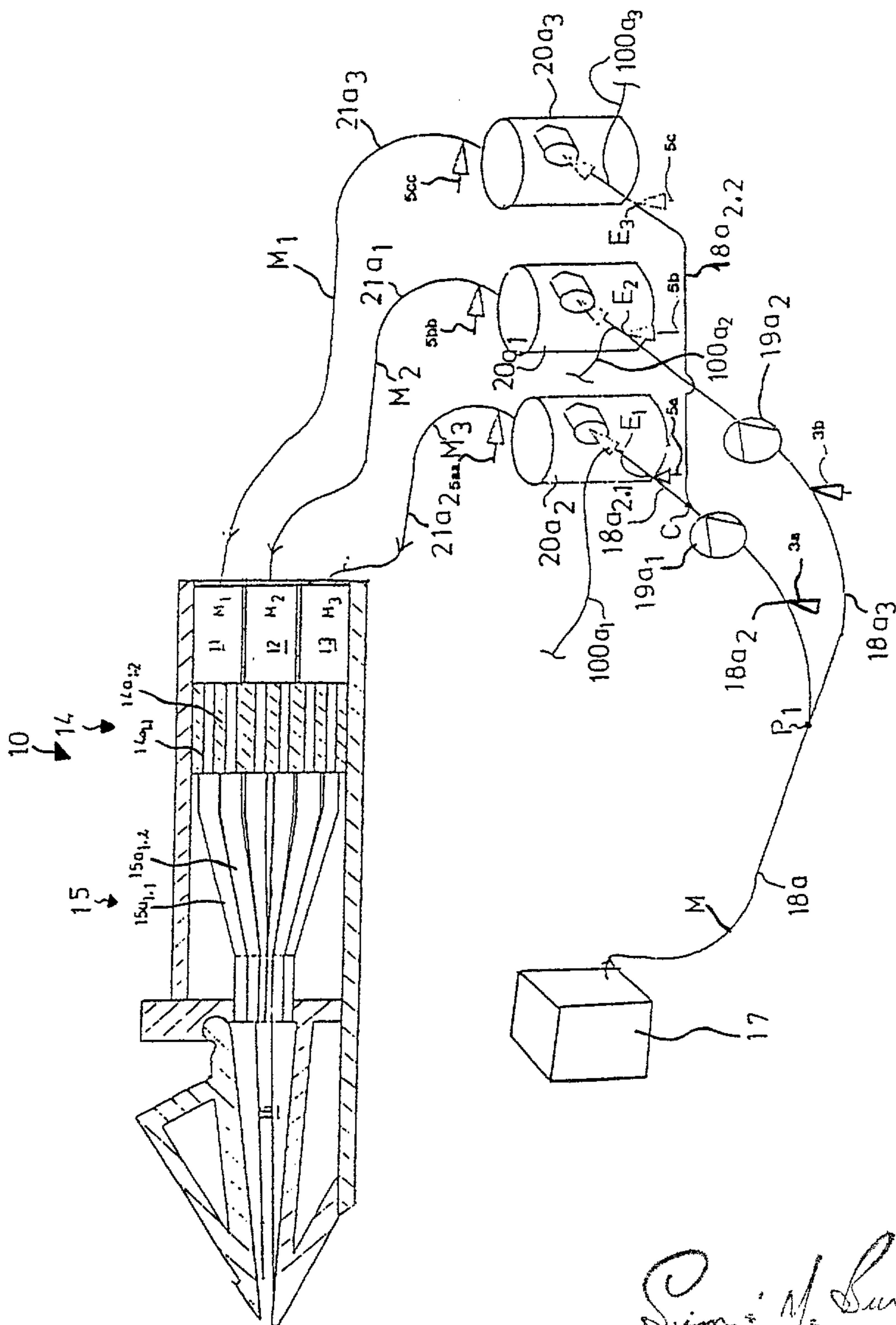
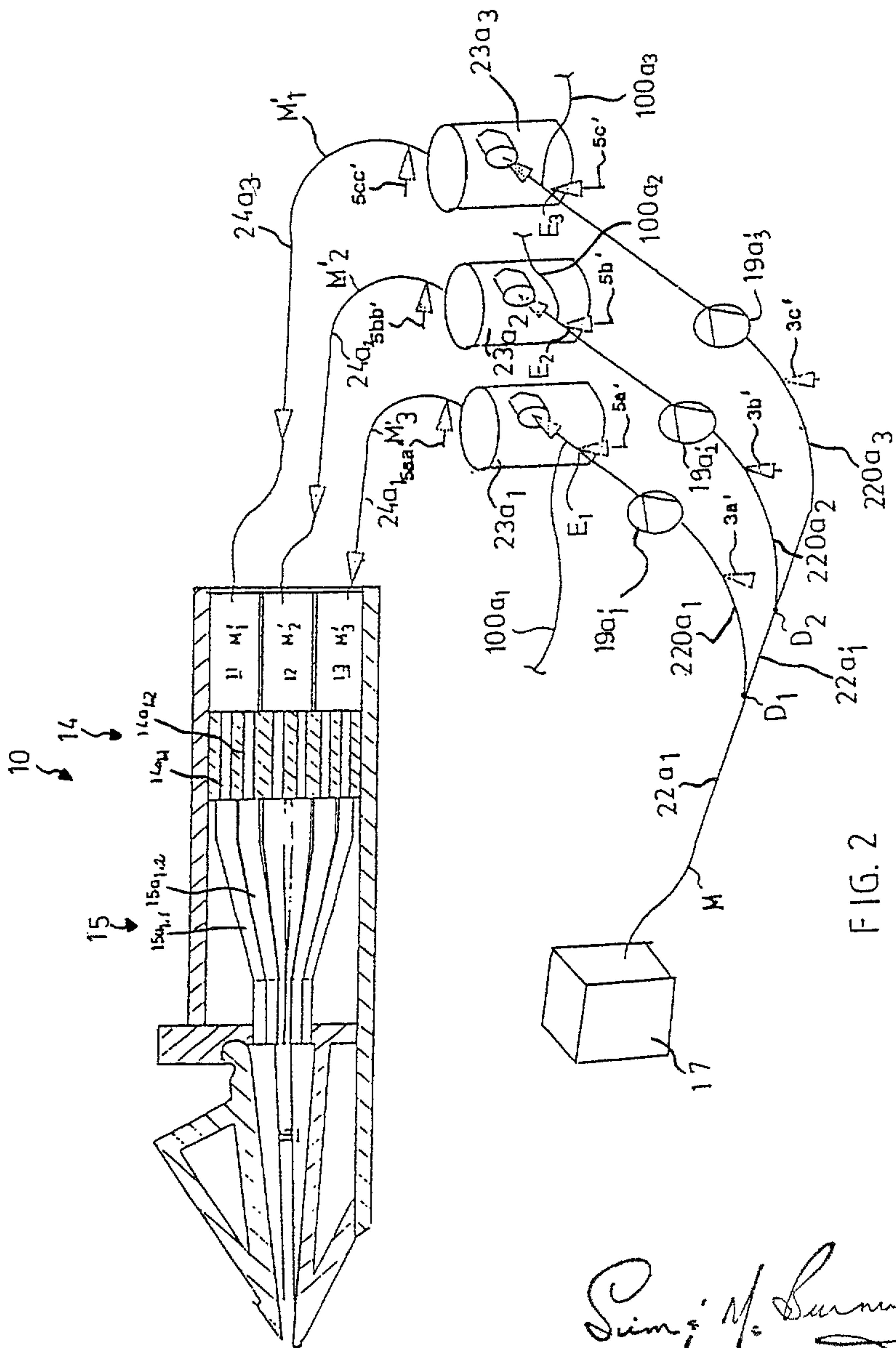


FIG. 1

Sim: 1/2 Luning



Sim: M. Luning

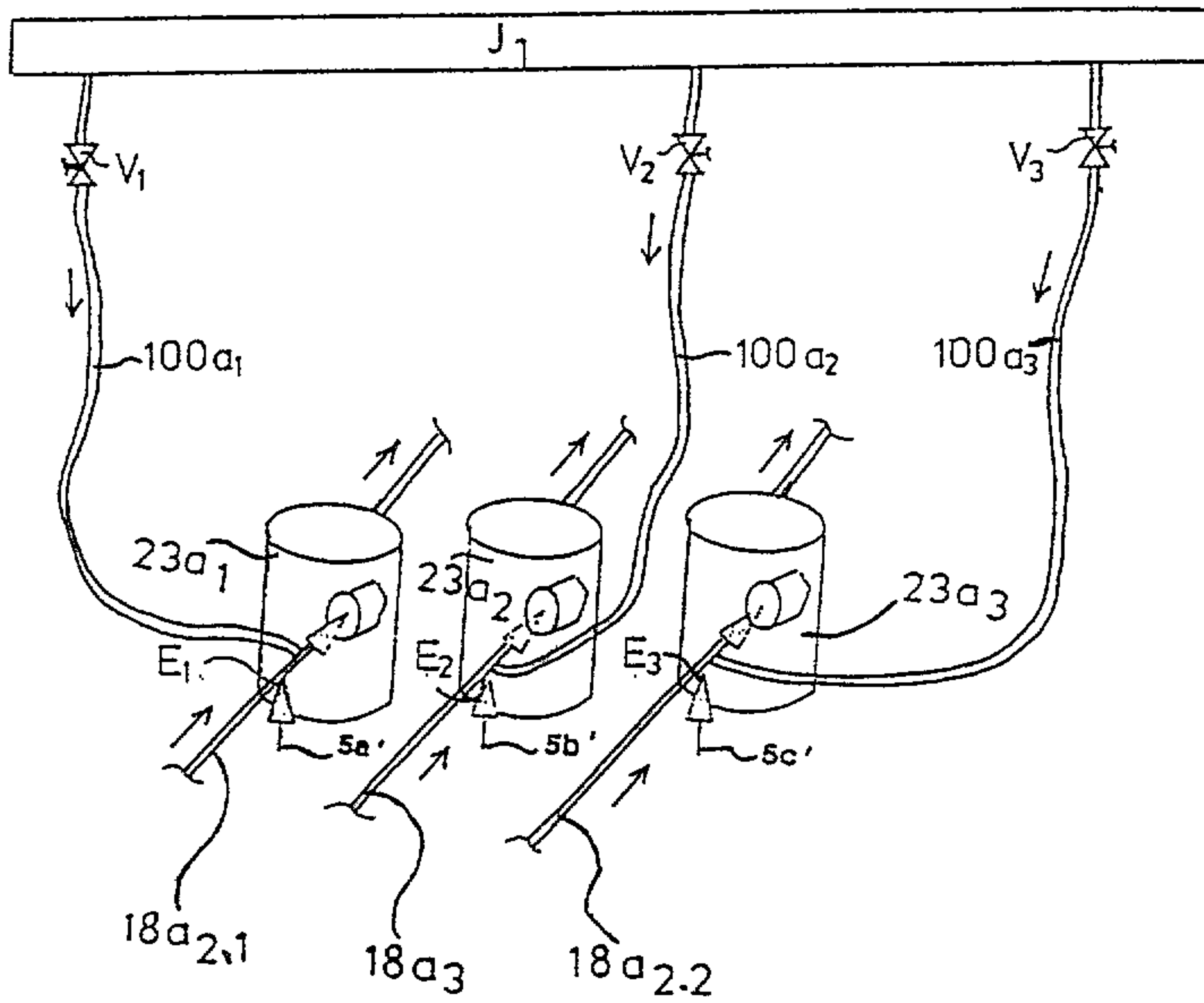


FIG. 3

Sim: M. Surney

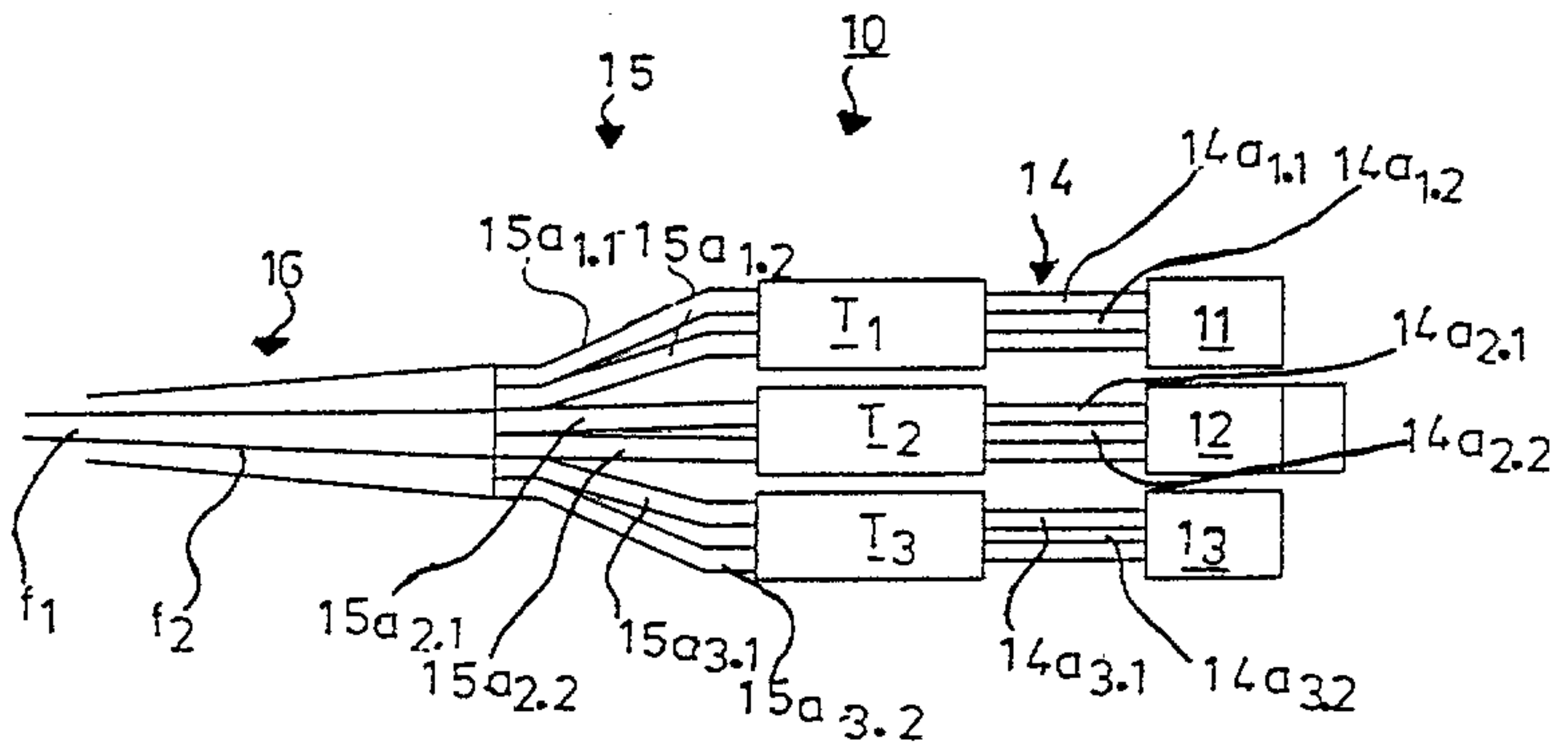


FIG. 4A

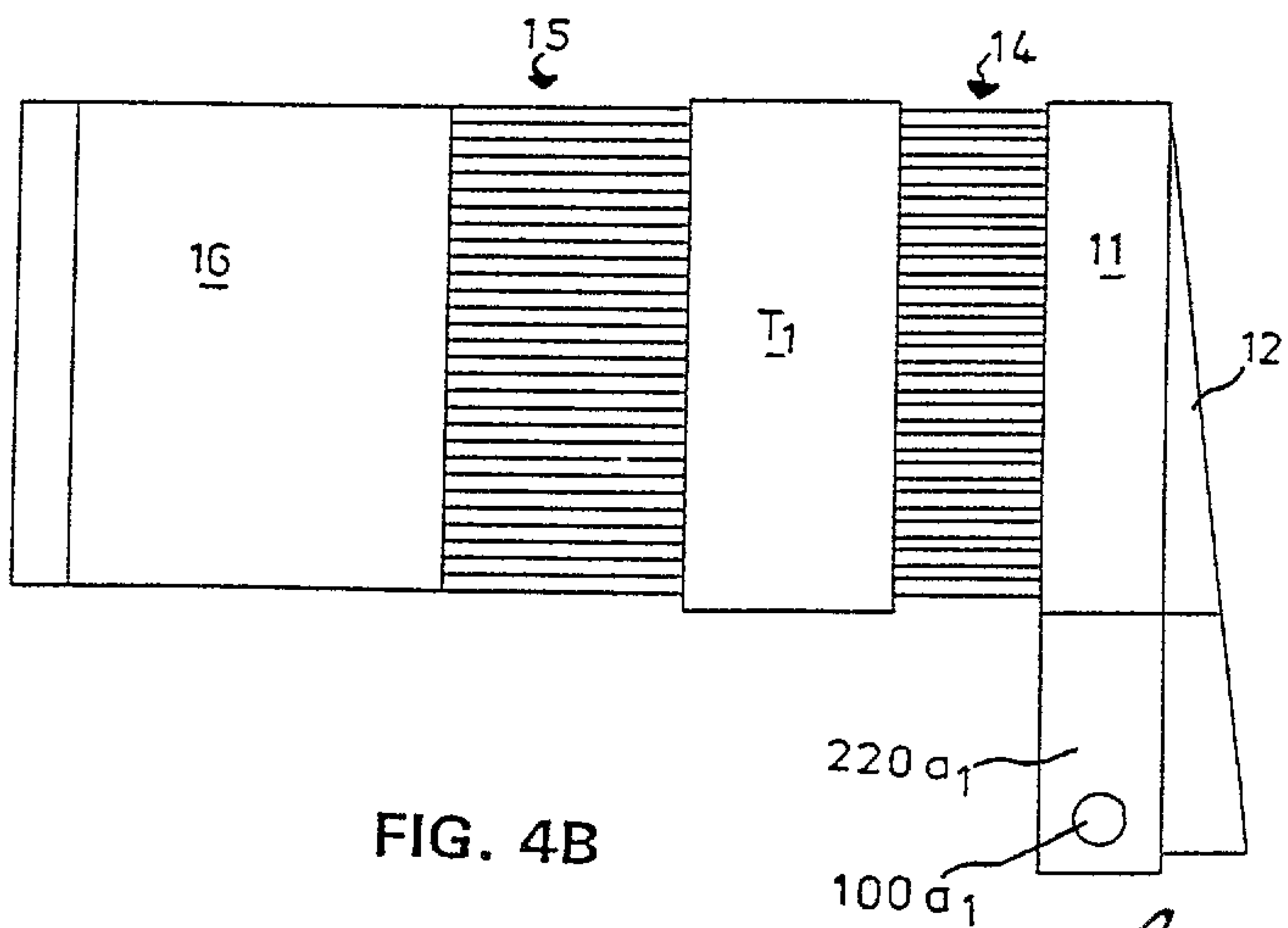


FIG. 4B

220a₁
100a₁
Sim: M. Luning

FIG. 5A

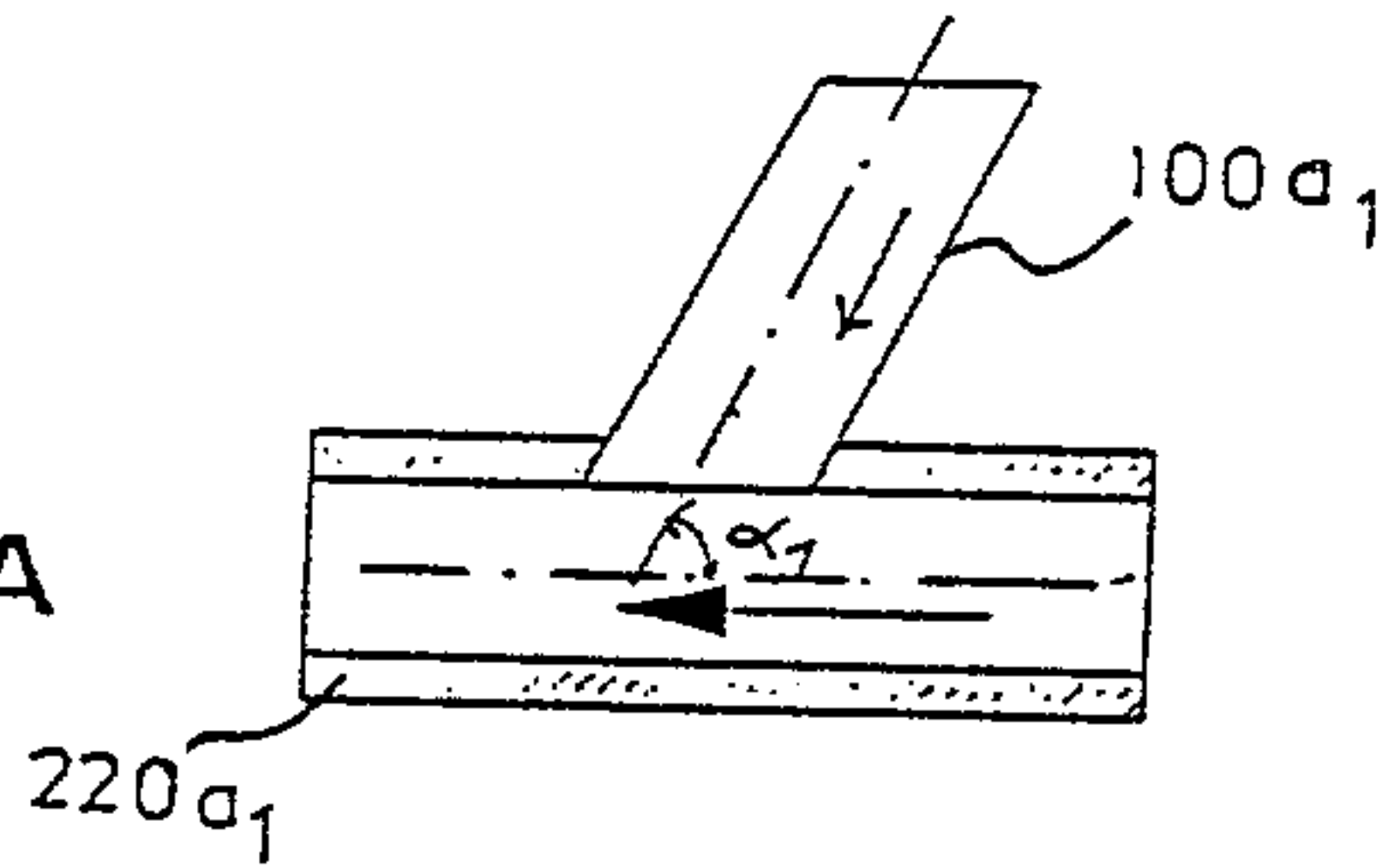


FIG. 5B

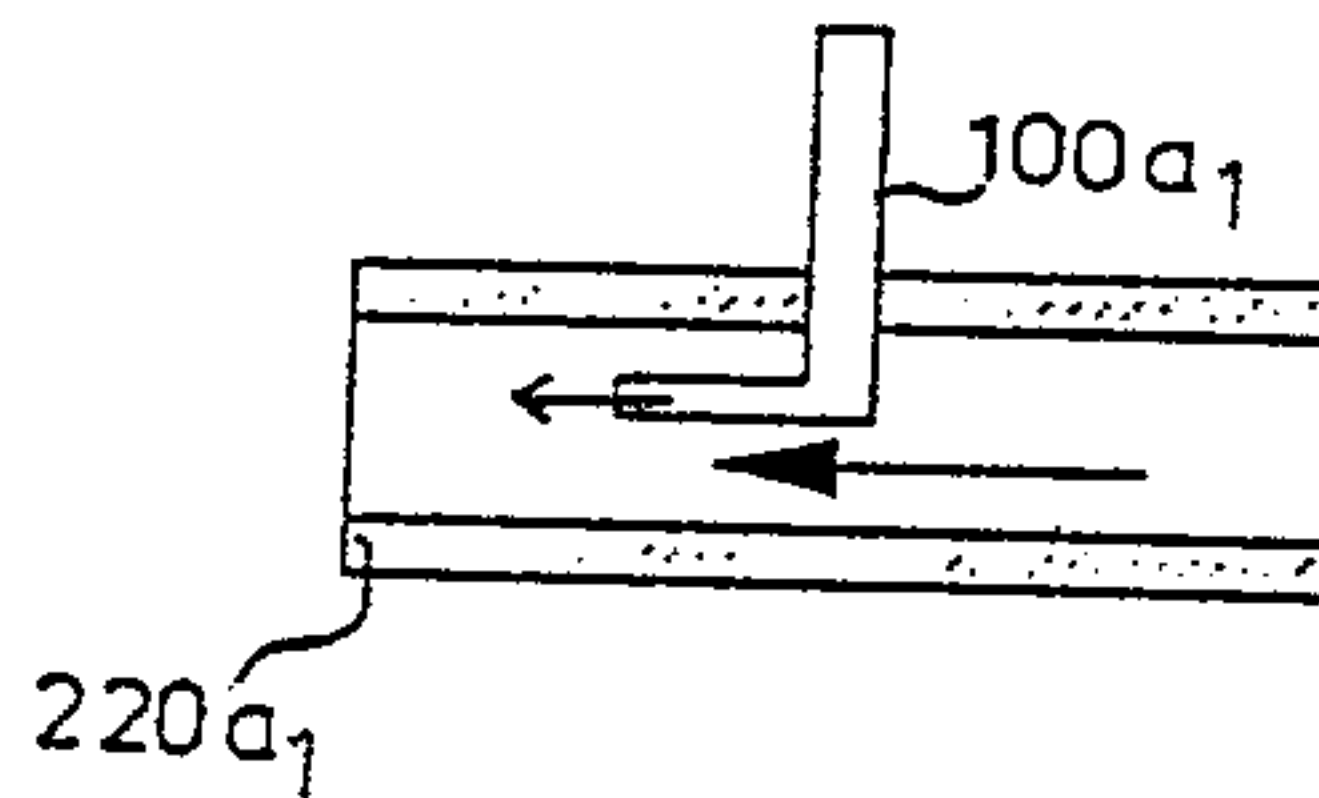


FIG. 5C

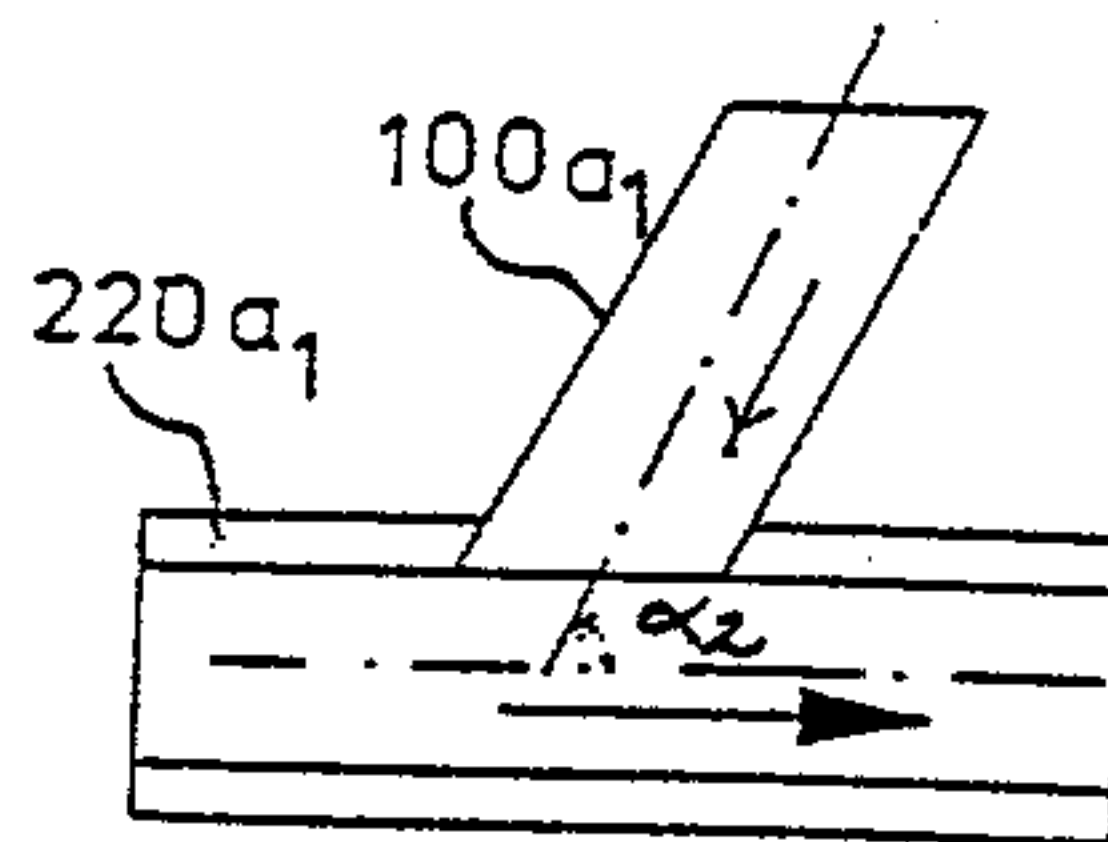
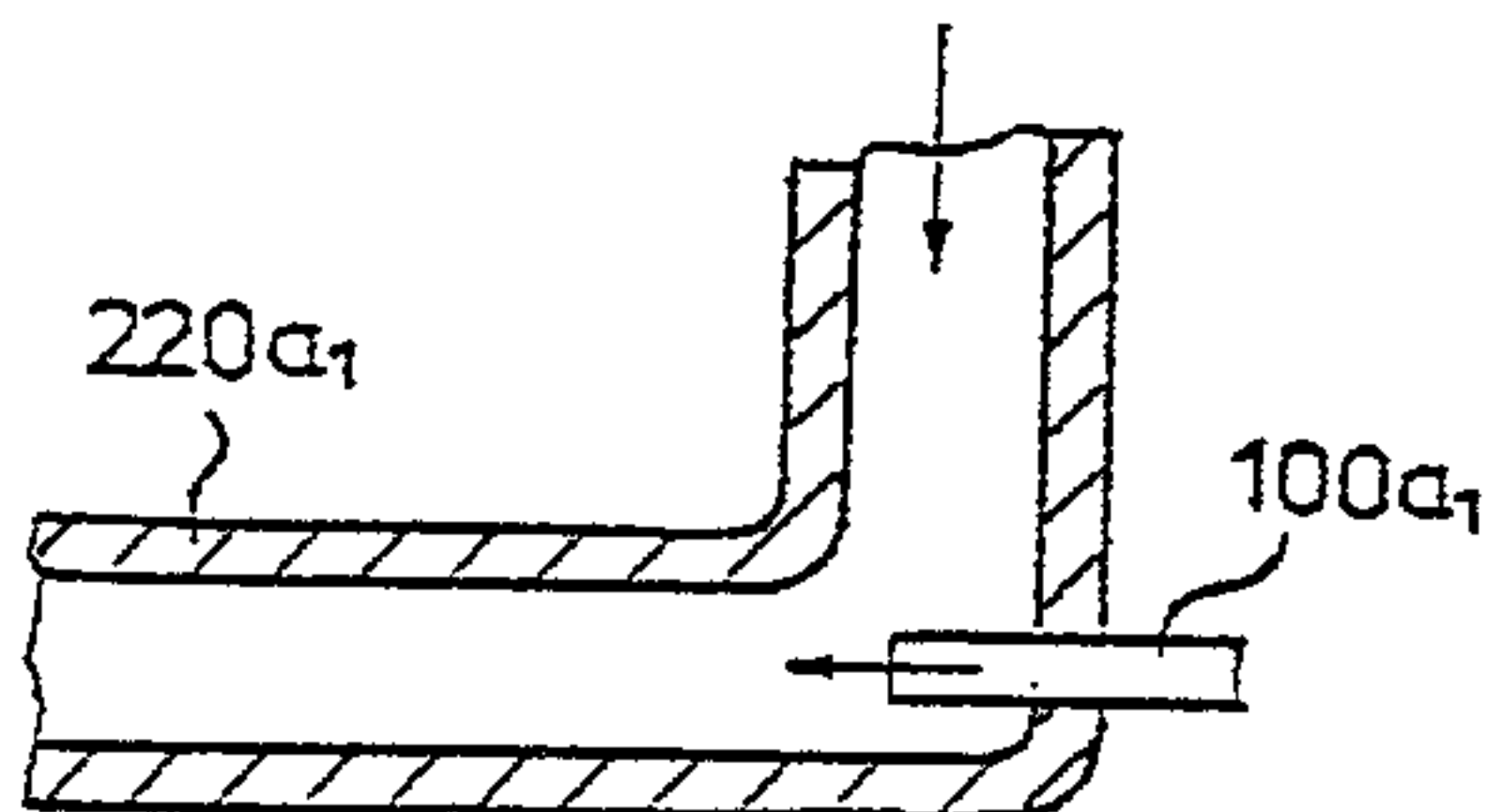


FIG. 5D



Sim: M. Lanning

