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(54) Automatic packaging machine

(57) This machine is of the type used for the automatic packaging of liquid, granulated, ground, or powdered products in bag-shaped packages. The machine comprises bag-shaping means (1) or means for supplying ready-made bags (19) determining a virtual longitudinal axis (X-X), bag transport means (10) for packaging and bag packaging means (15), the bag transport means (10) being linked with the bag-shaping means (1) or with the supply of ready-made bags (19) by means of a transfer device (3). The bag transport means (11) are provided with a bag transport guide (11) which describes a closed path and determines a virtual longitudinal axis (Y-Y).

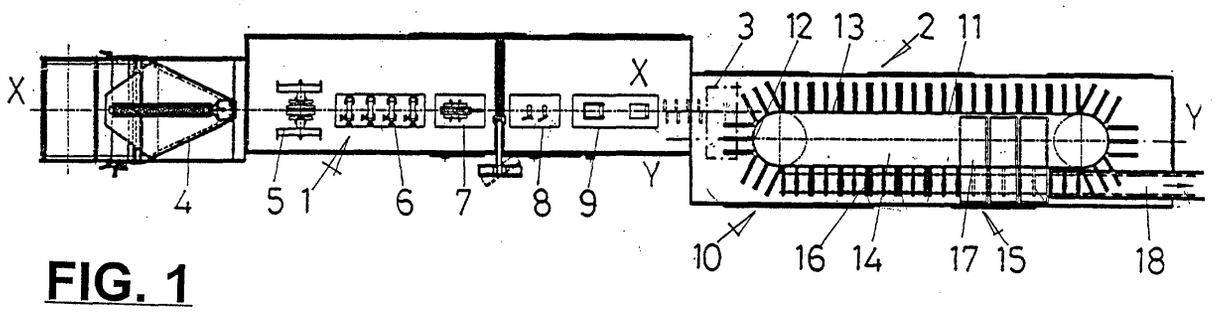

FIG. 1

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Description

Technical sector of the invention

[0001] The object of the invention is an automatic packaging machine, of the type used for the automatic, continuous packaging of liquid, granulated, ground, or powdered food products in bag-shaped packages.

Background to the invention

[0002] A wide variety of embodiments of machines are known, which are intended for the automatic packaging of liquid products, such as fruit juices and soft drinks, and granulated, ground, or powdered liquid products in bag-shaped packages. Generally, the known embodiments of automatic packaging machines are provided with a shaping train for bags of thermweldable material and a train for filling the bags with the product to be packaged or packaging train, which links with the former.

[0003] A known arrangement of automatic packaging machine is that in which the bag-shaping train and the packaging train are arranged longitudinally with regard to each other; the main drawback of this arrangement is a reduced packaging capability, expressed in bags per minute.

[0004] The document of Spanish Patent P 9901832, by the same applicant, discloses an automatic packaging machine in which the bag-shaping train and the packaging train are arranged in an orthogonal manner to each other, provided with a multiple transfer device that transfers bags from the shaping train to the packaging train defining two packaging lines, thus achieving a significant increase in the packaging capacity regarding the packaging machines in which the bag-shaping train and the packaging train are arranged longitudinally to each other.

[0005] The main drawback of the known embodiments of automatic packaging machines such as those described earlier is a limited ability to adapt structurally to those cases in which a very high packaging capacity is required.

Explanation of the invention

[0006] The automatic packaging machine object of the invention is of the type used for the automatic packaging of liquid, granulated, ground, or powdered food products in bag-shaped packages, comprising bag-shaping means or means for supplying ready-made bags, determining a virtual, longitudinal axis, bag transport means for their packaging and bag packaging means, the bag transport means being linked with the bag-shaping means or with the means for supplying ready-made bags by means of a bag transfer device.

[0007] It is a feature of the machine according to the invention that the bag transport means comprise a transport guide that describes a closed path composed of a first semi-circumferential portion and a second semi-circumferential portion which are facing each other by their inner face and are linked by their corresponding ends by straight portions, configuring an oblong interior in which the bag packaging means are arranged, the transport guide determining a virtual longitudinal axis.

[0008] A first mode of embodiment of the automatic packaging machine of the invention, characterised in that the bag-shaping means comprises a bag-shaping train whose virtual longitudinal axis is arranged parallel regarding the virtual longitudinal axis of the transport guide.

[0009] A second mode of embodiment of the automatic packaging machine of the invention, characterised in that the bag-shaping means comprise a bag-shaping train whose virtual longitudinal axis is arranged perpendicularly as regards the virtual longitudinal axis of the transport guide.

[0010] A third mode of embodiment of the automatic packaging machine according to the invention, characterised in that the bag-shaping means comprise two bag-shaping trains, whereof one bag-shaping train has its virtual longitudinal axis arranged perpendicularly as regards the virtual longitudinal axis of the transport guide and on one side of same, whereas the other bag-shaping train has its virtual longitudinal axis arranged perpendicularly with regard to the virtual longitudinal axis of the transport guide and on its other side.

[0011] A fourth mode of embodiment of the automatic packaging machine of the invention, characterised in that the bag-shaping means comprise two bag-shaping trains whose respective virtual longitudinal axes are arranged parallel to one another and perpendicularly as regards the virtual longitudinal axis of the transport guide.

[0012] A fifth mode of embodiment of the automatic packaging machine according to the invention, characterised in that the means for supplying ready-made bags comprise a ready-made bags deposit whose virtual longitudinal axis is arranged parallel with regard to the virtual longitudinal axis of the transport guide.

[0013] A sixth mode of embodiment of the automatic packaging machine according to the invention, characterised in that the means for supplying ready-made bags comprise two ready-made bags deposits, whereof a ready-made bags deposit has its virtual longitudinal axis arranged parallel with regard to the virtual longitudinal axis of the transport guide and by one of its sides, whereas the other ready-made bags deposit has its virtual longitudinal axis arranged parallel as regards the virtual longitudinal axis of the transport guide and on its other side.

Brief description of the drawings

[0014] Illustrated in the attached drawings, by way of non-limiting example, are several modes of embodi-

ment of the automatic packaging machine object of the invention. In said drawings:

Fig. 1, is a diagrammatic plan view of a first mode of embodiment of the machine according to the invention, provided with a bag-shaping train and a packaging train;

Fig. 2, is a diagrammatic plan view of a second mode of embodiment of the machine of the invention, provided with a bag-shaping train and a packaging train;

Fig. 3, is a diagrammatic plan view of a third mode of embodiment of the machine according to the invention, provided with two bag-shaping trains and two packaging trains;

Fig. 4, is a diagrammatic plan view of a fourth mode of embodiment of the machine according to the invention, provided with two bag-shaping trains and one packaging train;

Fig. 5, is a diagrammatic plan view of a fifth mode of embodiment of the machine according to the invention, provided with a ready-made bags deposit; and

Fig. 6, is a diagrammatic plan view of a sixth mode of embodiment of the machine according to the invention, provided with two ready-made bags deposits.

Detailed description of the drawings

[0015] In Fig. 1 a first mode of embodiment of the automatic packaging machine object of the invention is represented, comprising a bag-shaping train 1 that determines a virtual longitudinal axis X-X, and a packaging train 2 that determines a virtual longitudinal axis Y-Y, both trains 1 and 2 being arranged longitudinally to each other, with their respective virtual longitudinal axes X-X and Y-Y parallel to each other, and linked by means of a bag transfer device 3, which transfers bags from the bag-shaping train 1 to the packaging train 2.

[0016] The bag-shaping train 1 essentially comprises the following elements: a supply device 4 of a laminate of thermoweldable material; a welding device 5 for bag-bottoms; a welding device 6 for bag sides; weld cooling means 7; stamping means 8; and transport and vertical cutting means 9. This configuration for the bag-shaping train 1, is solely given by way of example, and corresponds with that represented in the embodiment examples in Fig.2, 3 and 4 corresponding to the second, third and fourth mode of embodiment of the machine of the invention; in addition, and for simplification purposes, in said modes of embodiment the same numerical references have been used to designate identical components.

[0017] The packaging train 2 comprises bag transport means 10 provided with a transport guide 11, which describes a closed path composed of two equal semi-circumferential portions 12 facing each other by their respective inner faces and linked at their corresponding ends by means of straight portions 13, the transport guide 11 determining the virtual longitudinal axis Y-Y of the packaging train 2. The transport guide 11 configures an oblong interior 14 which has packaging means 15, provided with dosage devices 16 of the product to be packaged and bag closing devices 17, carrying out the evacuation of the bags filled with the product and closed by means of a ramp 18. This packaging train 2 configuration is given by way of example and corresponds with that represented in the embodiment examples in Figs. 2, 3 and 4, corresponding to the second, third, and fourth mode of embodiment of the machine of the invention; in addition, and for simplification purposes, in said modes of embodiment the same numerical references have been used to designate identical components.

[0018] The second mode of embodiment of the automatic packaging machine of the invention, represented in Fig. 2, differs from the first mode of embodiment, represented in Fig. 1, in virtue of the fact that the virtual longitudinal axis X-X of the bag-shaping train 1 is arranged perpendicularly as regards the virtual longitudinal axis Y-Y determined by the transport guide 11 of the packaging train 2.

[0019] The third mode of embodiment of the automatic packaging machine represented in Fig. 3 comprises two bag-shaping trains 1 and a packaging train 2. Both bag-shaping trains 1 are similar to that described earlier for the first mode of embodiment of the machine of the invention in Fig. 1, whereas the packaging train 2 differs from that described in the first mode of embodiment by the fact that in the oblong interior 14, configured by the transport guide 11, there are first and second packaging means 15 arranged therein. Each bag-shaping train 1 links with the packaging train 2 by means of a respective transfer device 3. In this third mode of embodiment it can be observed that the bag-shaping train 1 has its virtual longitudinal axis X-X perpendicular to the virtual longitudinal axis Y-Y determined by the transport guide 11 of the packaging train 2 and to one side of same, whereas the other bag-shaping train 1 has its virtual longitudinal axis X-X also perpendicular to the virtual longitudinal axis Y-Y of the transport guide 11 and on its other side.

[0020] The fourth mode of embodiment of the automatic packaging machine represented in Fig. 4 comprises two bag-shaping trains 1 and a packaging train 2. Both bag-shaping trains 1 are equal to one another and are similar to the bag-shaping train 1 described for the first mode of embodiment of the machine of the invention, represented in Fig. 1, and pointed out therein is the fact that the two bag-shaping trains are arranged on a single bed, whereas the packaging train 2 does not differ from that described in the first mode of embodiment of the machine of the invention in Fig. 1. In this fourth mode of embodiment of the machine of the invention it can be observed that the two bag-shaping trains 1 have their respective virtual longitudinal axes X-X arranged paral-

lel to each other and perpendicular as regards the virtual longitudinal axis Y-Y determined by the transport guide 11 of the packaging train 2.

[0021] The fifth mode of embodiment of the automatic packaging machine represented in Fig. 5 comprises a deposit for ready-made bags 19 and a packaging train 2, which only has its transport guide 11 represented and is linked by means of a bag transfer device 3. In this fifth mode of embodiment it can be appreciated that the virtual longitudinal axis X-X of the deposit for ready-made bags 19 is arranged parallel with regard to the virtual longitudinal axis Y-Y determined by the transport guide 11 of the packaging train 2.

[0022] The sixth mode of embodiment of the automatic packaging machine represented in Fig. 6 comprises two deposits for ready-made bags 19 and a packaging train 2 whereof, just as in the previous fifth mode of embodiment, only its transport guide 11 has been represented, each deposit for ready-made bags 19 being linked with the packaging train 2 by means of a respective transfer device 3. In this sixth mode of embodiment it can be seen that the virtual longitudinal axis X-X of a deposit for ready-made bags 19 is arranged parallel to the virtual longitudinal axis Y-Y of the transport guide 11 of the packaging train 2 and on one of its sides, whereas the virtual longitudinal axis X-X of the other deposit for ready-made bags 19 is also parallel to said virtual longitudinal axis Y-Y and on its other side.

Claims

1. Automatic packaging machine, of the type used for the automatic packaging of liquid, granulated, ground, or powdered food products in bag-shaped packages, comprising bag-shaping means (1) or means for supplying ready-made bags (19), determining a virtual, longitudinal axis (X-X), bag transport means (10) for their packaging and bag packaging means (15), the bag transport means (10) being linked with the bag-shaping means (1) or with the means for supplying ready-made bags (19) by means of a bag transfer device (3), which is **characterised in that** the bag transport means (10) comprise a bag transport guide (11) that describes a closed path composed of a first semi-circumferential portion (12) and a second semi-circumferential portion (12)which are facing each other by their inner face and are linked by their corresponding ends by straight portions (13), configuring an oblong interior (14) in which the bag packaging means (15) are arranged, the transport guide (11) determining a virtual longitudinal axis (Y-Y).

2. Automatic packaging machine according to claim 1, which is **characterised in that** the bag-shaping means comprises a bag-shaping train (1) whose virtual longitudinal axis (X-X) is arranged parallel regarding the virtual longitudinal axis (Y-Y) of the bag transport guide (11).

3. Automatic packaging machine according to claim 1, which is **characterised in that** the bag-shaping means comprise a bag-shaping train (1) whose virtual longitudinal axis (X-X) is arranged perpendicularly as regards the virtual longitudinal axis (Y-Y) of the bag transport guide (11).

4. Automatic packaging machine according to claim 1, which is **characterised in that** the bag-shaping means comprise two bag-shaping trains (1), whereof one bag-shaping train has its virtual longitudinal axis (X-X) arranged perpendicularly as regards the virtual longitudinal axis (Y-Y) of the transport guide (11) and on one side of same, whereas the other bag-shaping train (1) has its virtual longitudinal axis (X-X) arranged perpendicularly with regard to the virtual longitudinal axis (Y-Y) of the bag transport guide (11) and on its other side.

5. Automatic packaging machine according to claim 1, which is **characterised in that** the bag-shaping means comprise two bag-shaping trains (1) whose respective virtual longitudinal axes (X-X) are arranged parallel to one another and perpendicularly as regards the virtual longitudinal axis (Y-Y) of the bag transport guide (11).

6. Automatic packaging machine according to claim 1, which is **characterised in that** the means for supplying ready-made bags comprise a ready-made bags deposit (19) whose virtual longitudinal axis (X-X) is arranged parallel with regard to the virtual longitudinal axis (Y-Y) of the bag transport guide (11).

7. Automatic packaging machine according to claim 1, which is **characterised in that** the means for supplying ready-made bags comprises two ready-made bags deposits (19), whereof a ready-made bags deposit (19) has its virtual longitudinal axis (X-X) arranged parallel with regard to the virtual longitudinal axis (Y-Y) of the bag transport guide (11) and by one of its sides, whereas the other ready-made bags deposit (19) has its virtual longitudinal axis (X-X) arranged parallel as regards the virtual longitudinal axis (Y-Y) of the bag transport guide (11) and on its other side.

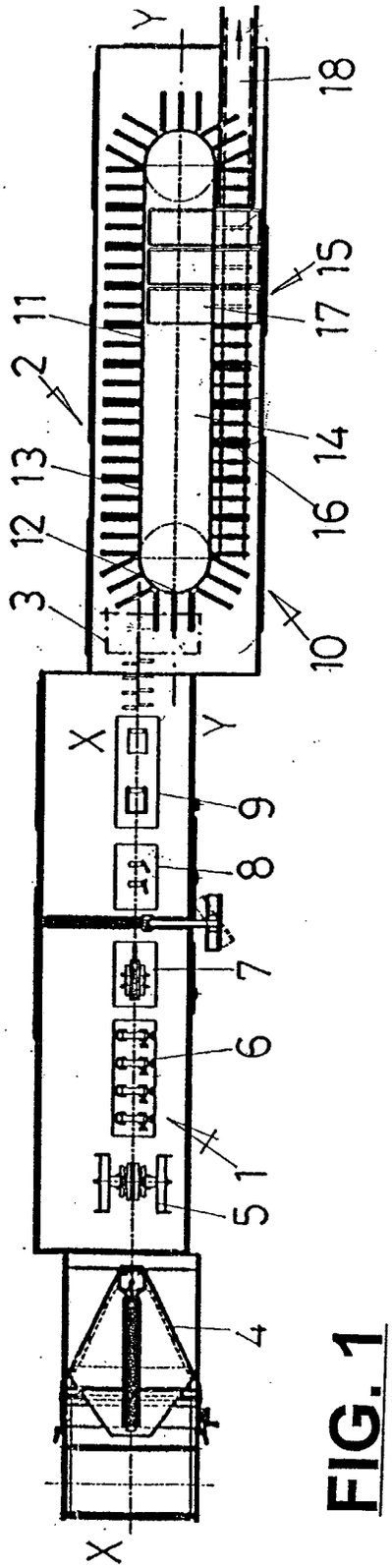

FIG. 1

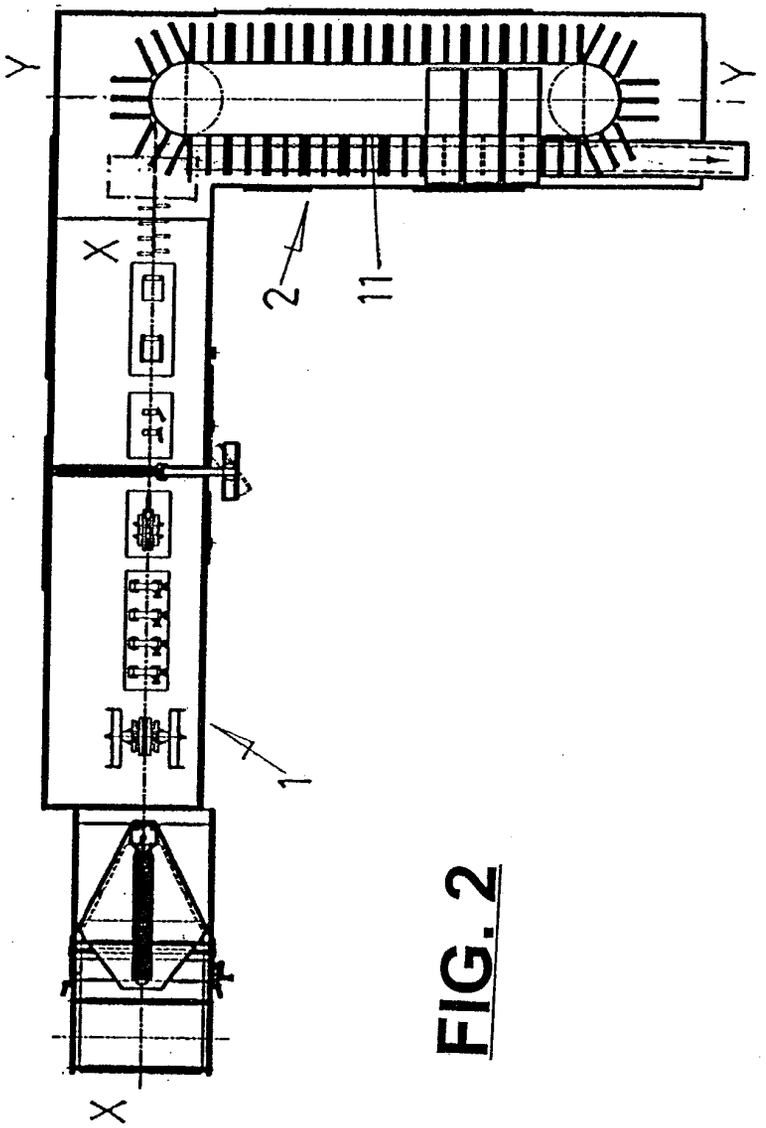

FIG. 2

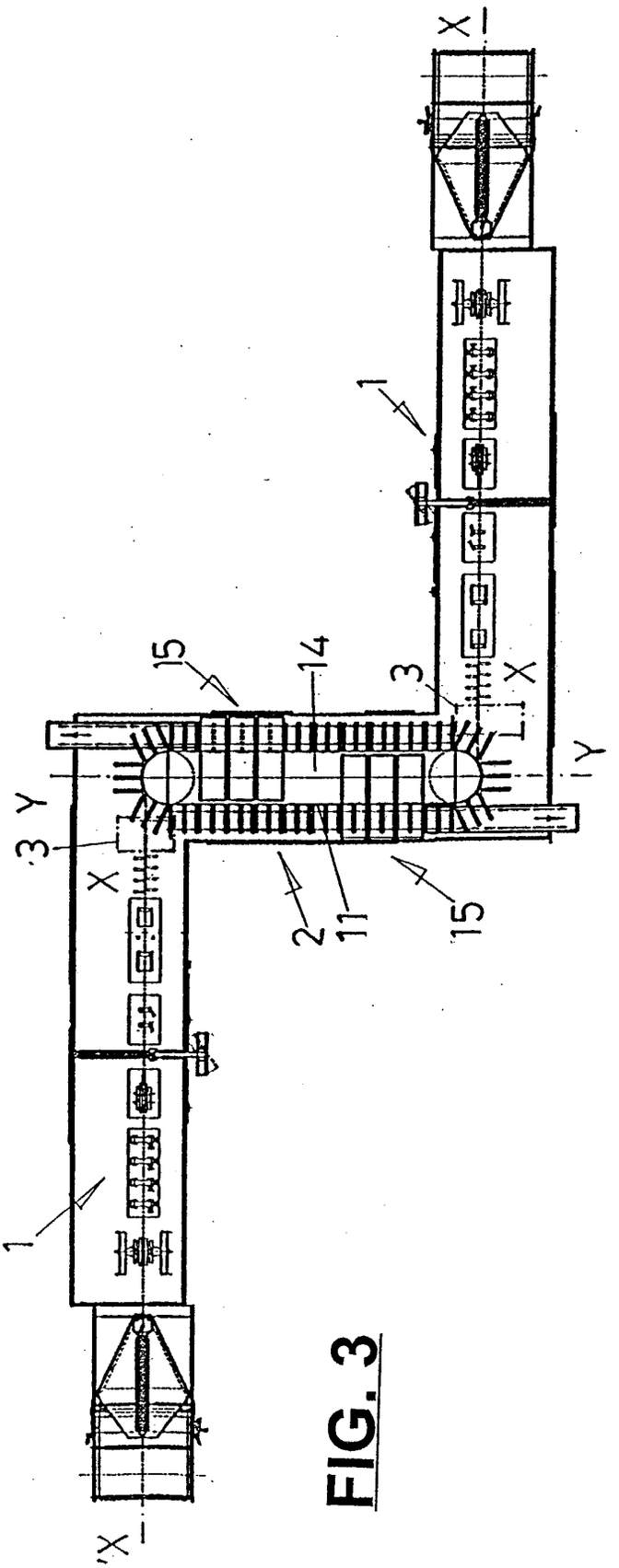

FIG. 3

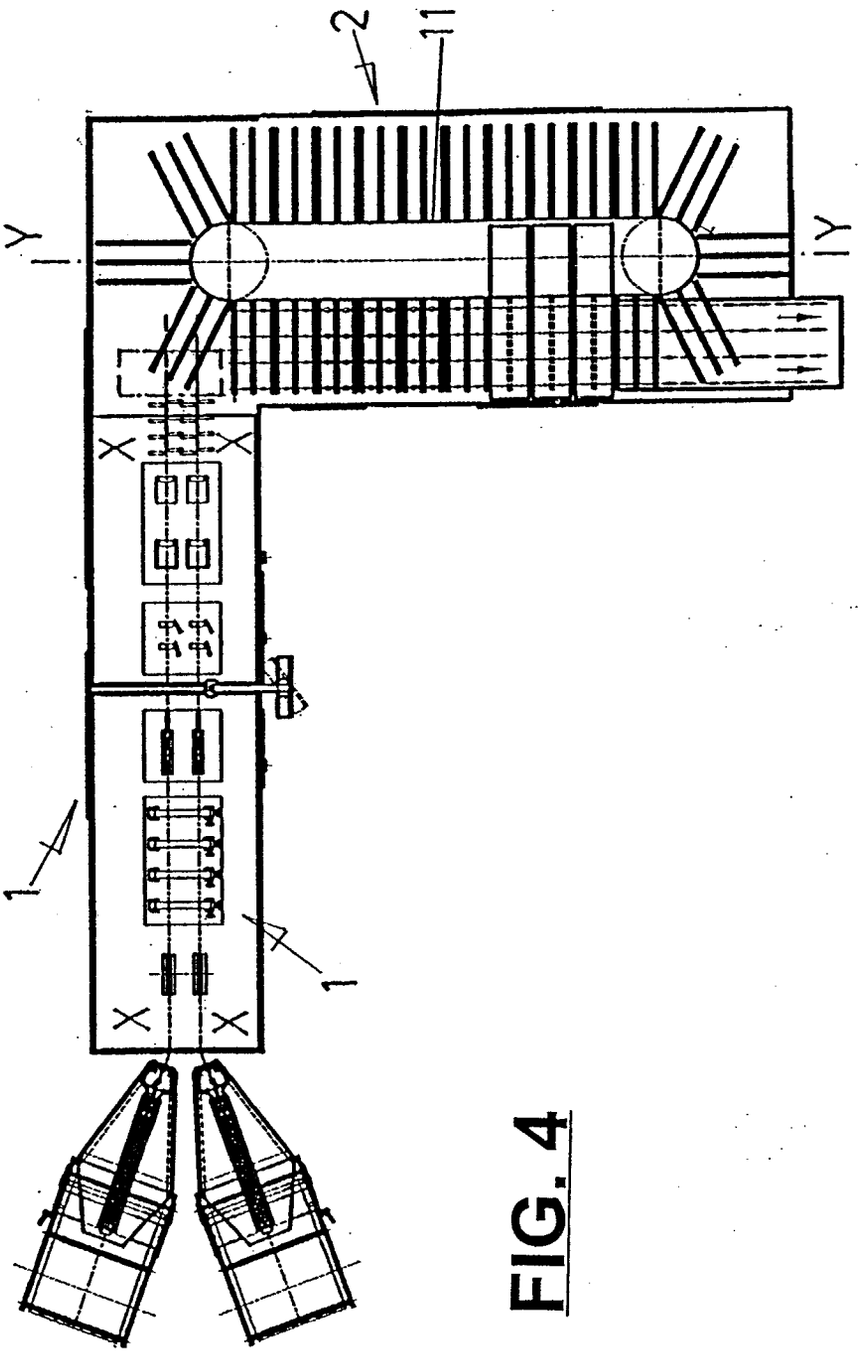

FIG. 4

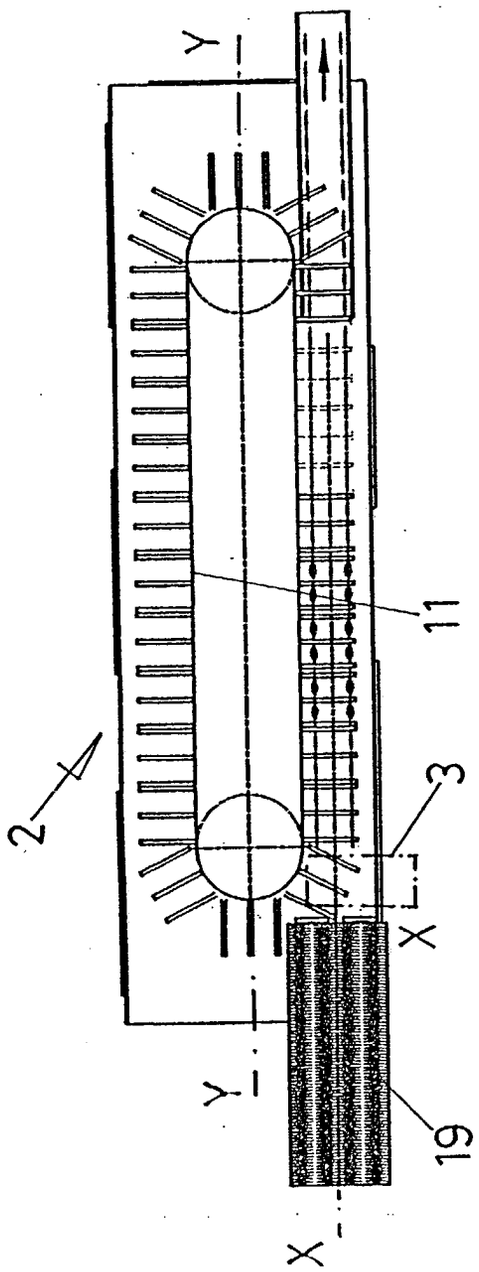

FIG. 5

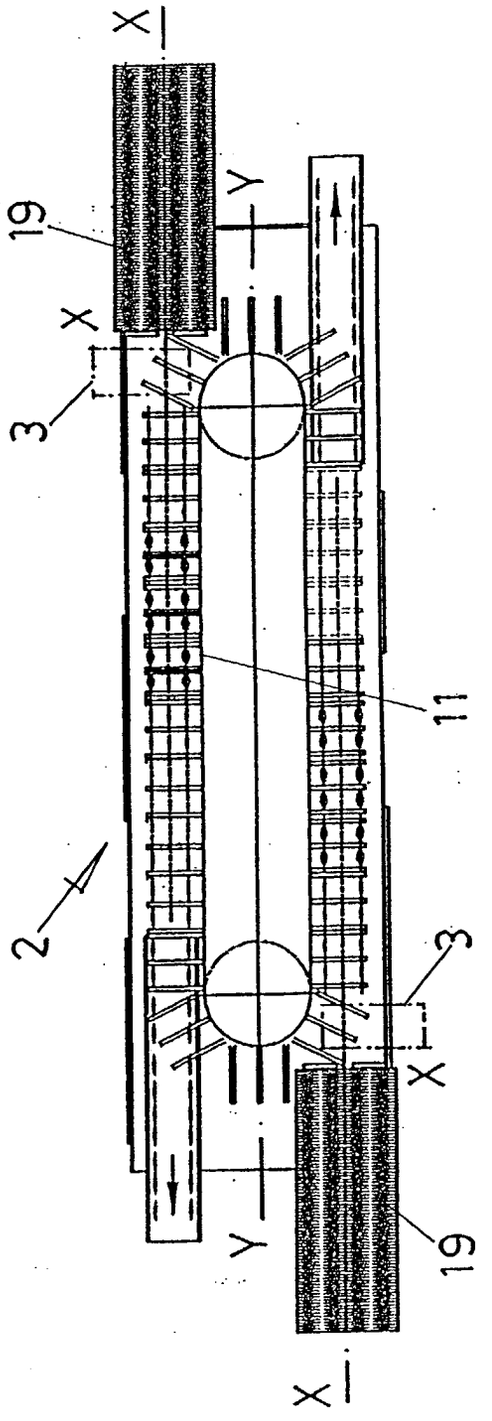

FIG. 6