(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 672 587 A1**

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **94830110.6**

(51) Int. Cl.[6]: **B65B 31/06**, G07F 9/10

(22) Date of filing: **16.03.94**

(43) Date of publication of application:
20.09.95 Bulletin 95/38

(84) Designated Contracting States:
AT BE CH DE DK ES FR GB IT LI NL

(71) Applicant: **Lovo, Domenico**
20, Via Curiel
I-45030 Santa Maria Maddalena (Rovigo) (IT)

(72) Inventor: **Lovo, Domenico**
20, Via Curiel
I-45030 Santa Maria Maddalena (Rovigo) (IT)

(74) Representative: **Sassatelli, Franco T., Dr.**
c/o INIP
5, via Ruggi
I-40137 Bologna (IT)

(54) Automatic machine for slicing, vacuum packing and self-service distribution of sausages.

(57) The automatic machine foresees a selecting push-button (3) which by means of a personal computer, of a microprocessor (4), of a motor reducer (5) and of a clutch (5) starts the motion of a set of cylindrical containers (1) housing the sausages. The starting of the motor reducer (5) and the engaging of the clutch (15), by means of shafts (17 and 18), activates the cylindrical containers (1) rotation as long as the pneumatic cylinder (16) stops the container (1) with the wanted sausage in the cutting station. In the cutting station a cylinder (20) presses the sausage against the rotating runway (12) to be moved with the disk knives (9) to be moved on their axis and also in rotation. The disk knives (9) with their cutting side held out from the open of the runway rotating cut a slice of sausage (21) getting in touch with the sausage. The slices (21) fall down onto a loading cell (22) which, reached the indicated weight, utters an electric impulse to the microprocessor (4) which prints the label with weight and price. Simultaneously the motor reducer (5) is stopped and the sliced product laid on a plastic film, coming from two feed reels (23 and 27), is sent under a welding device (28) which vacuum packs the product. The same product is then got out from the machine by means of an ejecting cylinder (31).

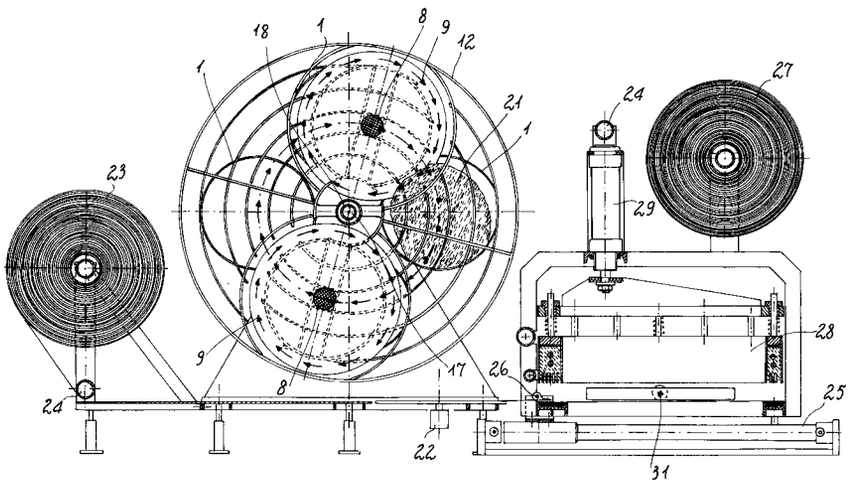

FIG.2

EP 0 672 587 A1

The invention refers to a machine particularly to be used into the food department stores which automatically effects the self-service distribution of the sausages. Received the starting by means of keyboard, the machine intervenes on the wanted sausages, making part of a set of sausages foreseen into the machine, and in succession it acts the slicing, the weighing, the vacuum packing, the labelling, the stamping of weight and price of the requested goods and last the packaging expulsion to be taken up by the buyer. Actually for the retail of sausages it is necessary to use slicing machine foreseen a circular rotated knife against which the operator keeps pressed the goods placed on the movable part to be alternatively and manually moved for all the slicing phase. The sliced sausage then must be taken away and weighed out to get to the wanted quantity and then, before being delivered to the client, it must be packed and completed with the checking details so to identify weight and price. This current procedure creates a lot of drawbacks such the high operating cost of the distribution, owing to the necessity to request persons who manually do all the procedures, the not whole satisfaction of the client request for the possible presence of a bigger or smaller quantity of goods in comparison with what requested or alternatively to have slicing residues and last the no higienity of the different working procedures such the same foresee the manual contact with the sausage. The drawback of the manual working for the distribution of sausages is particular heavy into the supermarkets where it is cause of long waiting for the customers and it can create crowd in the points where the distribution is actuated, crowd which causes damages also to the self-service distribution of other goods placed in near points. The above said drawbacks are avoided by the invented machine which totaly excluded the manual work so to reduce the distribution costs and times, it permits to the buyer to buy the exact wanted quantity and it packs the goods hygienically and in a vacuum so to arrange the same for a longer conservation. During the slicing, differently to the current procedure which foresees a machine with a rotate disk against which the sausage is pressed being brought on movable part to be alternatively moved by the operator, into the automatic unit of the invented machine said sausage is kept pressed against a rotated runway and it is sliced by two circular knives, inserted into the same runway, which rotate on own axis making a circular motion. Said knives, held out the runway, slice the sausage each time they come in contact with the same. The customer pushes the push-button corresponding to the wanted sausage so putting in rotation, by a motor reducer and by a clutch, the knives and a tumbler foreseen a set of cylindrical containers each of one to contain a different kind of sausage. A selecting piston is foreseen to stop the container with the wanted sausage into the cutting station where the sausage received a light axial hydraulic thrust by a cylinder which maintains said sausage in adherence with the rotated runway. Said runway rotates with the knife-holders and with the knives. The knives being rotated on theselves by means of two epicycloidal multiplier groups engaged with a fixed crown and held out from the running face of the runway running on the sausage. Where the knives cut a sausage slice each time they get in touch with it during their rotation. The slices fall down onto a balance. The balance, reached the indicated weight, excites a microprocessor which put out the label with weight and price, then it stops the motor reducer and it starts a packing device able to vacuum closed the sliced sausage. To better describe the invented machine features, the same machine is illustrated in schematic view in the drawings of sheets 1, 2, 3 and 4. In sheet 1 fig. 1 is section longitudinal view of the slicing machine without the packing device. In sheet 2 fig. 2 is B-B' section view of the slicing machine with the packing device. In sheet 3 fig. 3 is plan view of the slicing macine with the packaging device. In sheet 4 fig. 4 is electric-pneumatic diagram to show the operation of the machine with the packing device. The invented machine is able to act with a pre-arranged set of sausages every one of them to be put into cylindrical containers 1 engaged by means of hooks 2 into the machine. For requesting the wanted sausage the customer digits on keyboard a selecting push-button 3 so permitting to a microprocessor 4 to receive the given data. In the same time it is started a motor reducer 5 moving a shaft 6 and a double crank 7 to bring knife-holder shafts 8 with disk knives 9 put in rotation by two epicycloidal multiplier groups 10 as their pinion comes to engage with the fixed crown 11. The two knife-holder shafts 8 are slightly slanting compared to the shaft 6 so permitting to the disk knife 9 to hold out with its cutting side to an open on the grilled rotating runway 12. Said runway 12 to be supported by two pins 13 and by more tie rods 14 by means of which the thickness regulation of the sausage slices to be cut is actuated. Simultaneously to the starting of the motor reducer 5 also the clutch 15 si connected and the pneumatic cylinder 16 is started, pneumatic cylinder 16 that is one of the set of cylinders to act each on a container 1. The shaft 17 transmits motion to the clutch 15 that, being engaged, carries away in rotation the hollow shaft 18 with the set of cylindrical containers 1 with it connected. Said rotation goes on as long as the activated pneumatic cylinder 16, running with its stem onto the selection sleeve 19, meets the hole corresponding to the wanted sausage so stopping

the same in the cutting station to be foreseen under the mouth of the container 1. Simultaneously the pneumatic cylinder 16 disengages the clutch 15 and excites the cylinder 20 which presses the sausage on the rotating runway 12 so the sausage getting in touch with the cutting side of the disk knife 9. It begins the production of the sausage slices 21 which fall down onto the loading cell 22 on which a plastic film is laid coming from a feed reel 23 and from a roll 24. When the loading cell 22 reaches the indicated weight, the same loading cell utters an electric impulse stopping the motor reducer 5 and deenergizing the cylinder 20. The electric impulse transmits the data to the microprocessor 4 which prints the label with weight and price and it excites the without stem cylinder 25. On the without stem cylinder 25 two pneumatic cylinders 26 are connected which, with the end part of the stem needle shaped, keeps back the film previous jointed with the film coming from the feed reel 27. Starting the without stem cylinder 25 carries away the plastic film and the sliced product under the welding device 28. The cylinder 29 is then excited. The cylinder 29 brings in lowering the welding device 28. Going down the welding device 28 excites the other cylinder 30 producing the vacuum into the packaging through the needles of the pneumatic cylinders 26. After a short break the needles are taken out from the plastic film and the vacuum welding of the packaging is actuated. In withdrawal the pneumatic cylinders 26 excite the without stem cylinder 25. In advancement the without stem cylinder excites, at end of stroke, the pneumatic cylinders 26 which with their needle shaped stems keep the plastic film cut by the welding group 28. After a short break the without stem cylinder 25 excites the cylinder 29 which raises the welding device 28 while the cylinder 30 returns in position. At the end of the procedures the cylinder 29, coming to its upper end of stroke, excites an ejecting cylinder 31 so determining the getting out from the machine of the vacuum packaging of sausage.

Claims

1. Automatic machine for slicing, vacuum packing and self-service distributing sausages acting with a set of sausages one by one to be put into cylindrical containers (1) and providing a selecting push-button (3) to be digited by the customer on keybord to request the wanted sausage which permits to a microprocessor (4) to receive the given data, characterized in that the pressing of the selecting push-button (3) puts in rotation, by a motor reducer (5) and a clutch (15), the disk knives (9) and the set of cylindrical containers (1) each of one to contain a different sausage; the selecting pneumatic cylinder (16) already moved then stops the container with the wanted sausage in the cutting station where the sausage received a light axial hydraulic thrust by a cylinder (20) which maintains the sausage in adherence with the grilled rotating runway (12); said runway rotates with the knife-holders and with the disk knives (9) also rotating on their axis which cut a sausage slice (21) each time they get in touch with it during their rotation; the slices (21) fall down onto a loading cell (22), on which a plastic film is laid, which reached the wanted weight utters and electric impulse which excites the microprocessor (4) for printing of the label, stops the motor reducer (5) and it starts a packaging device where a cylinder (29) brings in lowering the welding device (28) which going down excites an other cylinder (30) producing the vacuum packaging through the needles of the pneumatic cylinder (26).

2. Automatic machine for slicing, vacuum packing and self-service distributing sausages, as per claim 1), characterized in that the knife-holder shafts (8) with the disk knivew (9) to be put in rotation by two epicycloidal multiplier groups (10) as their pinion comes to engage with the fixed crown (11).

3. Automatic machine for slicing, vacuum packing and self-service distributing sausages, as per claim 1), characterized in that the grilled rotating runway (12) to be supported by two pins (13) and by more tie rods (14) by means of which the thickness regulation of the sausage slices to be cut is actuated.

4. Automatic machine for slicing, vacuum packing and self-service distributing sausages, as per claim 1), characterized in that the plastic film, laid onto the loading cell (22), comes from a feed reel (23) and for the packaging it is previous jointed with a second plastic film coming to a second feed reel (27).

5. Automatic machine for slicing, vacuum packing and self-service distributing sausages, as per claim 1), characterized in that for the vacuum packaging the without stem cylinder (25) is started on which two pneumatic cylinder (26) are connected with the end part of the stem needle shaped, said without stem cylinder (25) carries away the plastic film and the sliced product under the welding device (28); the cylinder (29) is then excited and it brings in lowering the welding device (28) which going down excites an other cylinder (30) producing

the vacuum into the packaging through the needles of the pneumatic cylinders (26); after a short break the needles are taken out from the plastic film and the pneumatic cylinders (26) in withdrawal excite the without stem cylinder (25) which advancing excites again, at end of stroke, the pneumatic cylinders (26) which with their needle shaped stems keep the plastic film cut by the welding device (28); after a short break the without stem cylinder (25) excites the cylinder (29) which raises the welding device (28) while the cylinder (30) returns in position.

6. Automatic machine for slicing, vacuum packing and self-service distributing sausages, as per claim 1), characterized in that at the end of the packaging the cylinder (29), coming to its upper end of stroke, excites an ejecting cylinder (31) so determining the getting out from the machine of the vacuum packaging of sausage.

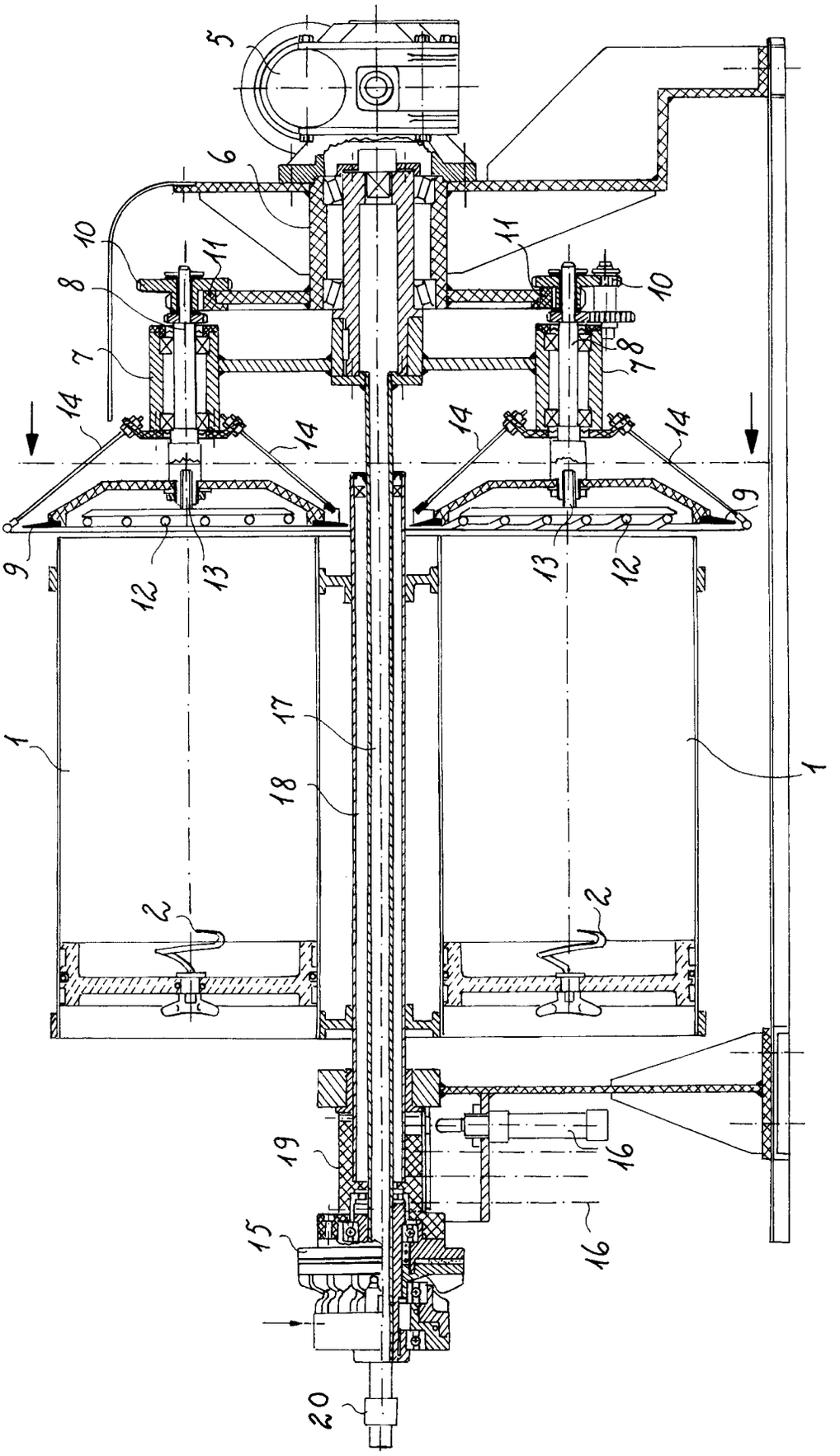

FIG. 1

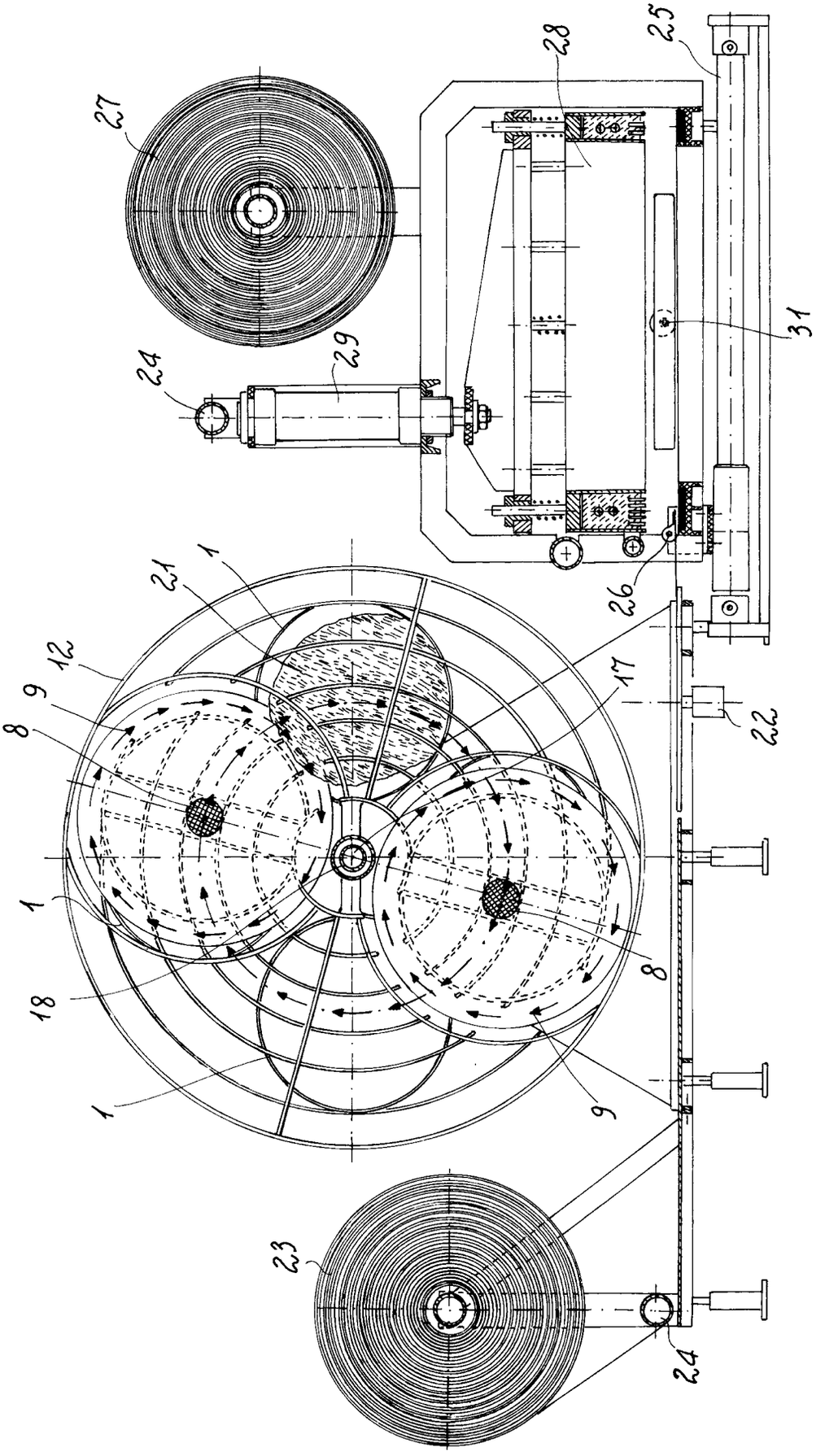

FIG.2

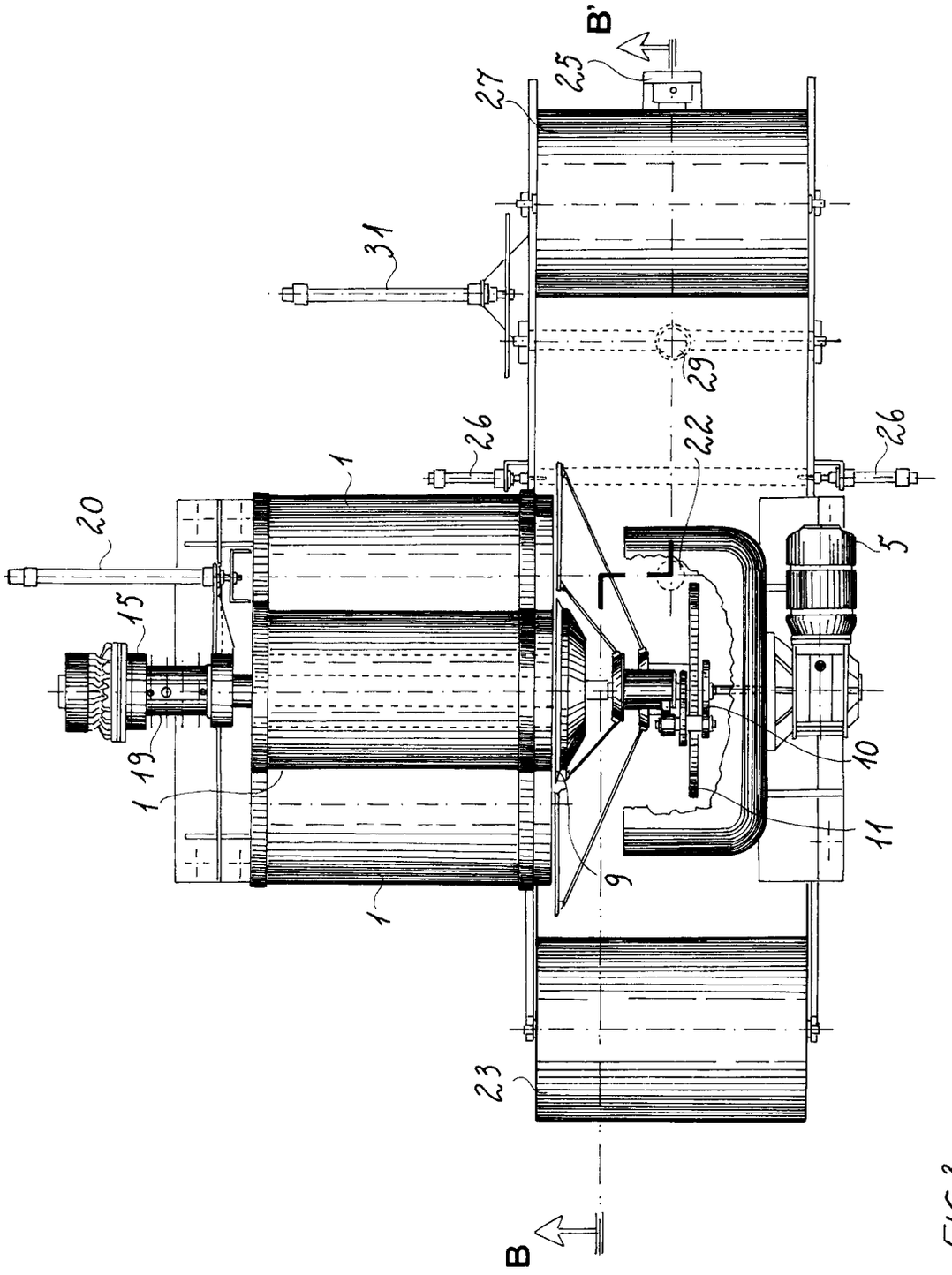

FIG.3

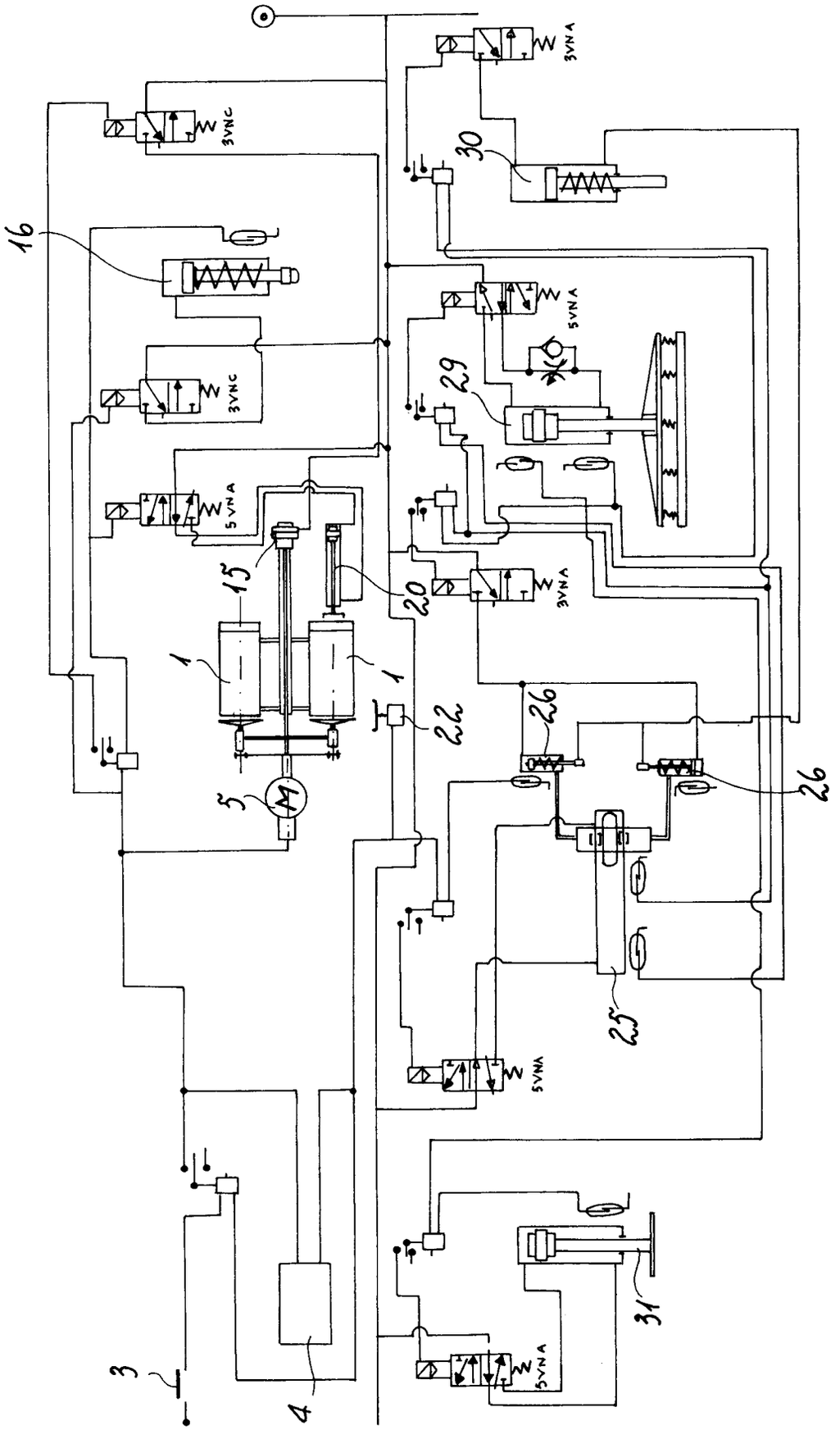

FIG. 4

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 94 83 0110

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	US-A-3 526 077 (MIXON) * claim 1; figure 3 *	1-6	B65B31/06 G07F9/10
A	EP-A-0 371 687 (J.M. SCHNEIDER INC.) * claim 1; figure 1 *	1-6	
A	GB-A-1 427 917 (UNILEVER LIMITED) * claim 1; figure 1 *	1-6	
A	US-A-5 107 659 (DAVIS ET AL) * claim 1; figure 1 *	1-6	

TECHNICAL FIELDS SEARCHED (Int.Cl.6)

B65B
G07F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	28 July 1994	Kirsten, K

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)