



⑪ Publication number : **0 247 300 B1**

⑫ **EUROPEAN PATENT SPECIFICATION**

④⑤ Date of publication of patent specification :
05.06.91 Bulletin 91/23

⑤① Int. Cl.⁵ : **B31F 1/20**

②① Application number : **87103312.2**

②② Date of filing : **09.03.87**

⑤④ **Automatic machine for the processing of corrugated paper.**

③⑩ Priority : **14.03.86 IT 8251586**

⑦③ Proprietor : **PANOTEC S.r.l.**
Calmaggiore 10
I-31100 Treviso (IT)

④③ Date of publication of application :
02.12.87 Bulletin 87/49

⑦② Inventor : **Fabris, Bruno**
Via Picasso 14
I-31038 Paese (Province of Treviso) (IT)

④⑤ Publication of the grant of the patent :
05.06.91 Bulletin 91/23

⑧④ Designated Contracting States :
AT BE CH DE ES FR GB GR IT LI LU NL SE

⑦④ Representative : **Modiano, Guido et al**
MODIANO, JOSIF, PISANTY & STAUB
Modiano & Associati Via Meravigli, 16
I-20123 Milano (IT)

⑤⑥ References cited :
EP-A- 0 129 640
DE-A- 2 436 717
US-A- 4 500 381

EP 0 247 300 B1

Note : Within nine months from the publication of the mention of the grant of the European patent, any person may give notice to the European Patent Office of opposition to the European patent granted. Notice of opposition shall be filed in a written reasoned statement. It shall not be deemed to have been filed until the opposition fee has been paid (Art. 99(1) European patent convention).

Description

The present invention relates to an automatic machine for the processing of corrugated paper in order to obtain containers according to the preamble of claim 1. Such machines are generally known.

Currently, the need to place the various industrial products in suitable containers forces the individual companies, due to the plurality of items produced thereby which differ in dimensions, to resort to large stocks of containers in various sizes.

The machines currently known for providing said containers allow the manufacturing of a single product, or more than one but with features which are very similar to each other in dimensions and type of stiffening or reinforcement.

The main aim of the present invention is therefore to eliminate the disadvantages described above in known types by devising an automatic machine which allows to obtain containers in corrugated cardboard which are provided, according to the specific requirements, with the required dimensions and the desired stiffenings and reinforcements.

Within the scope of the above described aim, a further important object is to devise a machine which associates to the previous characteristics that of being provided with high flexibility in use, allowing, at the same time, to obtain a product which can be stored optimally.

Another object is to provide a machine which allows to obtain, in sequence, containers having even different dimensions and characteristics from one to the next.

The aim and the objects mentioned above and others which will become apparent hereinafter, are achieved by an automatic machine for the processing of corrugated paper, characterized in claim 1.

Further characteristics and advantages of the invention will become apparent from the detailed description of a particular, but not exclusive, embodiment, illustrated only by way of non-limitative example in the accompanying drawing tables, wherein :

- Fig. 1 is a perspective view of the machine ;
- Fig. 2 is a lateral view of the first station ;
- Fig. 3 is a partly sectional front view of the end of the shafts which support the rolls ;
- Fig. 4 is a view taken along the cross section plane IV-IV of Fig. 3 ;
- Fig. 5 is a lateral, partly sectional view of the second station ;
- Fig. 6 is a partly sectional front view of one of the three pairs of rollers associated to the lifting assembly ;
- Fig. 7 is a plan view of the third station ;
- Fig. 8 is a partial front view of the same station ;
- Fig. 9 is a view taken along the cross section plane IX-IX of Fig. 8 ;
- Fig. 10 is a partly sectional lateral view of the

fourth station ;

Fig. 11 is a fragmentary partly sectional front view of a scoring assembly and related advancement devices ;

Fig. 12 is a fragmentary perspective view of the dinking assembly ;

Fig. 13 is a fragmentary partially sectional front view of the fifth station ;

Fig. 14 is a sectional view taken along the cross section plane XIV-XIV of Figure 13 ;

Fig. 15 is a plan view of the sixth station ;

Fig. 16 is a front view of the latter ;

Fig. 17 is a view of a device adapted for allowing the glueing of two corrugated cardboards associated with counterposed corrugations ;

Fig. 18 is a view, similar to the one of Fig. 6, of a different aspect of one of the pairs of rollers ; and Figs. 19 and 20 are views of another aspect of the means for centering the cardboard.

With reference to the above described figures, the machine 1 is composed of a first station 2 for the multiple feed of corrugated paper or cardboard 3.

In the particular embodiment chosen, rolls of cardboard have been positioned at the station 2, which comprises a supporting frame 4 to the side members of which the shafts 5 of three rolls, indicated with the reference numerals 6a, 6b and 6c, are freely pivoted.

Each roll may be composed of corrugated cardboard having a different width and/or different length.

Preferably, the cardboard of the rolls 6a and 6b is unrolled by making it slide on free rollers 7a and 7b arranged below and transversely with respect to the frame 4.

The axes of said rollers lie in planes arranged parallel to each other, between the same and the ground there being provided separation rods indicated with the reference numerals 8 and 9.

In order to prevent the inertia imparted during the unrolling of the cardboard from excessively unrolling the rolls, a brake 10 is associated to one of the ends of the shafts 5.

Said brake is composed of two identical jaws 11a and 11b arranged diametrically with respect to the shaft 5 and placed on a plane which is perpendicular thereto.

Each jaw is provided with a throat, arranged concentrically with respect to the shaft 5, to which a rubber crown 12 is rigidly coupled ; the two jaws are mutually associated to each other by means of screws 13 concentrically to which springs 14 are arranged which interact with the facing surfaces of the jaws.

The lower jaw 11a, rotating together with the shaft 5 during the unrolling, interacts with a pin 15 which projects from the frame 4.

Said pin, which is provided with an axis parallel to the one of the shaft, thus allows the brake 10 to always

keep the corrugated cardboard 3 at the optimum tension.

The shaft 5 is indeed gripped vice-like during the interaction with said pin.

The station 2 can be composed of a plurality of frames 4 joined to each other so as to allow the use of cardboard rolls having different characteristics.

Consecutively to the station 2, the second station 16, for the insertion of the cardboard, is provided, composed of a supporting frame 17 which supports a lifting assembly 18.

The frame 17 is provided with two rectangular lateral shoulders 19, provided, on the side arranged proximate to the first station, with a pair of free transverse rollers 20a and 20b, the axes of which are arranged on the same plane as those of the rollers 7a and 7b.

Three more free transverse rollers 21a, 21b, and 21c, with the axes arranged on the same plane perpendicular to the one of the axes of the pair 20a and 20b, allow the feed of the corrugated cardboard 3 on parallel planes within the station 16.

The roller 21c takes up the cardboard directly from the roll 6c, as illustrated in Fig. 2.

The lifting assembly 18 is composed of two identical rectangular lateral plates 22a and 22b, transversely to which three pairs of rollers are pivoted, each being indicated with the reference numeral 23, the axes of which, parallel to each other, are arranged on the same plane, perpendicular to the base or rest plane of the station.

Each pair of rollers 23 is composed of a motorized roller 24, driven by a suitable motor 25, and of a free counter-roller 26, the axis 27 of which is associated, at each end, to a slot 28 with a vertical axis formed on the plates 22a and 22b.

Each end of the axis 27 is furthermore engaged in a groove 29 provided on the stem of a swinging element 30, which is essentially Y-shaped, and freely pivoted to the plates 22a and 22b at the terminal end of the stem facing opposite to the station 2.

Between the flaps of each element 30, a shaft 31 is provided, mounted on an eccentric element 32, which can be operated by means of a lever 33.

The rotation of the lever 33, as illustrated in Fig. 5, causes the element 30 to rotate with respect to its pivot axis, thus raising or lowering the flaps of said element 30.

At the same time, the axis 27 of the counter-roller 26 is raised or lowered, thus allowing its uncoupling-coupling with the motorized roller 24.

This allows the manual insertion of the corrugated cardboard 3 in the initial phase or during the eventual roller replacement phase.

Fig. 18 illustrates another aspect of the invention, in which two eccentric elements, indicated with the reference numerals 114 and 115, are associated to the end of the axis 27 of the free counter-roller 26,

which eccentric elements are rotatably associated with the lateral plates 22a and 22b.

The angular position of the eccentric element 115 can be varied by means of the lever 33, it being possible to fix said lever, by means of a suitable locking element interposed between said lever and the plate 22a, in a preset position.

This allows one to preset the interspace between the motorized roller 24 and the counter-roller 26.

The vertical motion of the lifting assembly 18 is imparted by means of a pair of chains 34, each of which is provided with its ends associated to the upper and lower ones of one of the plates 22a and 22b.

On the upper and lower crosspieces of the shoulders 19, two toothed wheels are provided, indicated with the reference numerals 35a and 35b: the first wheel 35a is keyed on the axis of a motor and reducer assembly 36, while the second wheel 35b is freely rotatable.

The motion along a vertical axis, perpendicular to the base of the station, is instead allowed by the presence of a pair of driving shafts 37, arranged vertically between the upper and lower crosspieces of the shoulders 19 proximate to the beam facing towards the third station 38.

The coupling between the shafts 37 and the plates 22a 22b occurs by means of a wheel 39a and a pulley 39b freely pivoted onto a pair of tabs 40 which protrude from the plates.

At the end of the plates 22a and 22b where the cardboard feed occurs, proximate to each of the pairs of rollers 23, oscillable bars 41, slideable on crosspieces 42, are provided, suitable for allowing the exact centering of the cardboard with respect to the middle longitudinal axis of the machine 1, which axis may be indicated hereinafter as the operating axis.

This centering is facilitated, since the beams of the shoulders 19 are sufficiently mutually spaced apart.

Downstream of each pair of rollers 23, combs 43 are provided which are adapted for facilitating the insertion of the cardboard selected among the three available by the lifting assembly 18.

Figures 19 and 20 illustrate an aspect of the invention which is adapted for maintaining the cardboard straight in case the cardboard is uneven in its dimensions due, e.g., to thermal changes it has been subject to. This is obtained by providing the adjustment of the position of the lifting assembly 18 by rigidly coupling to the plate 22b a pair of U-shaped tabs 40, and closed at the free end by an abutment 116. Inside each of said tabs, sliders 117 are slideable and accommodatable, and the wheel 39a and the pulley 39b are pivoted thereto and interact with the shaft 37.

Said sliders 117 are rigidly mutually interconnected by means of a beam 118. The terminal end of the

stem 119 of a piston 120, connected to the plate 22b, is associated proximate to the middle portion of said beam.

Should the cardboard thus have a certain concavity, the operation of the piston 120 allows the angular motion of the entire lifting assembly 18 with respect to the plane of arrangement of the shafts 37, fixed to the shoulders 19, until it straightens and thus allows to center the cardboard for subsequent processing.

The cutting station 38 is composed of a cutter assembly which comprises a supporting frame 44, pivoted to a transverse guiding rail 45 and moved by means of a chain 46 operated by a suitable motor and reducer assembly 47.

The frame 44 accommodates a tempered rotating blade 48, arranged on a plane which is transverse with respect to the machine 1; the blade is of the self-sharpening type, since it cooperates with a replaceable fixed abutment blade 49, above which the cardboard is pushed by means of the roller 24.

The blade 48 is freely pivoted on a small shaft 50, which is connected to the frame 44; a spring 51, coaxial to the small shaft, allows a regular motion of the blade 48 and an adequate pressure on the fixed abutment blade 49. A cylinder with trapezoidal cross section 52 is arranged to the side of the latter, which cylinder interacts, during the transverse motion of the frame 44, with the ends of a metal strap 53 tilted towards the cardboard feed region and, at the other end, pivoted to a transverse axis. The blade 48 is fixed coaxially with respect to the cylinder 52.

The strap thus blocks the corrugated cardboard in the cutting phase, preventing the formation of burr.

At least one elastically deformable element 54 is associable with the strap, for adjusting the inclination thereof; accordingly, the blade 48 can also assume a desired angle with respect to the fixed blade 49.

This, together with the fact that the frame 44 can swing slightly with respect to the axis 45, renders the blade 48 self-sharpening, and facilitating cutting at the same time.

In order to prevent said blade 48 from leaving the cutting seat in any way, a biasing bar 55 is provided above the frame 44, which bar interacts with a connecting rod 56 by means of a bearing 57 freely pivoted thereto.

Said connecting rod is in turn freely pivoted, at one end, to the frame 44; between the other end and said frame, a cylindrical helical compression spring 58 is instead interposed.

It should be observed that it is possible to extract, to the side of one shoulder 19, the entire cutting assembly, thus allowing maintenance and/or the eventual replacement of the rotating blade 48 and coaxial cylinder 52.

In order to gain access to the abutment blade 49, instead, it is sufficient to raise the strap 53.

Consecutively to the station 38, a fourth station 59

follows for the scoring of the corrugated cardboard.

In the particular embodiment chosen, said station is composed of three pairs of scorers, each scorer of the three pairs being indicated with the reference numerals 60a, 60b and 60c.

Each scorer of each pair is pivoted on a transverse shaft 61 and is associated to a fork 62, upwardly provided with a cylindrical guide 63 which is slideable on a transverse shaft 64, which is fixed and parallel to the previous one.

Each scorer of each pair can furthermore be positioned symmetrically with respect to the operating axis of the machine 1 by means of a suitable worm screw 65.

Said worm screw is arranged transversely with respect to the station along an axis which is parallel to the one of the shafts 61 and 64 and is associated to the fork 62 by means of a bush 66.

As indicated in Figure 11, a locking ring 67, associable to the bush 66, allows the manual adjustment of the initial position of each scorer, so that each pair of scorers is arranged symmetrically with respect to the operating axis of the machine.

The motion of each pair of scorers along the transverse axis is allowed by the fact that each worm screw 65 is motorized with its own motor and reducer assembly 68.

In order to allow movements in opposite directions from a one-way rotation of the worm screw 65, said worm screw has formed thereon half a left-handed thread and half a right-handed thread.

Each scorer interacts with a roller 69, placed below and provided with an axis parallel to the one of the small shaft 61, allowing to perform the longitudinal scoring of the cardboard.

Advantageously, the ends of said roller 69 are mounted on eccentric elements so as to permit adjustment of its parallelism with respect to the shaft 61 to thus allow the optimum scoring of the corrugated cardboard 3.

A single motor 70, instead, controls the rotation of the shaft 61 of the scorer 60c and therefore, by means of suitable transmissions constituted by toothed wheels 71 interacting with matchingly toothed wheels keyed to one end of the shafts 61 of the scorers 60a, 60b and 60c, the advancement of the corrugated cardboard 3.

Subsequently to the station 59, the fifth station is provided for the punching or dinking of said cardboard.

As illustrated in Figs. 12, 13 and 14, the fifth station is composed of two dinking bodies 72a and 72b which comprise a box-like supporting frame 73a and 73b, pivoted laterally to a transverse guiding rail 74.

The end of a same chain 75 is associated with each frame, which chain is transmitted, at the extreme sides of the machine, by two identical toothed wheels 76, of which one is freely rotating and the other is

keyed on the axis of a motor and reducer assembly 77.

The two dinking bodies operate by moving simultaneously towards the operating axis of the machine 1 : indeed, the chain 75 is associated, in the upper part, to the frame 73a of the right-hand punching body 72a (Fig. 13) and, in the lower part, to the frame 73b of the left-hand punching body 72b (Fig. 12).

Each frame 73a and 73b accommodates a pair of identical, mutually counterposed rotating blades 78, which are furthermore mutually blocked between two disks 79a and 79b to ensure their parallelism.

Said blades, are mounted on the same small shaft 80 arranged transversely with respect to the frame, are allowed an axial clearance, and are spaced from the inner surfaces of the frame.

Coaxially to the small shaft, a cylindrical helical spring 81 is arranged interposed between the inner surfaces of the disks.

A cylinder with a trapezoidal cross section 82 is coaxially associated to the disk 79a and interacts, during the transverse motion of the dinking body, with the end of a transverse metal strap 83 tilted towards the side where the cardboard 3 is fed, and associated at the other end to an axis arranged transversely with respect to the machine.

Said strap thus blocks, similarly to what occurred for the cutter assembly, the corrugated cardboard 3 during the dinking.

The dinking body furthermore comprises two fixed abutment blades 84a and 84b, arranged on the plane of the cardboard, replaceable and arranged mutually parallel with such an interspace as to allow the passage of the blades 78, and having moreover such a shape as to make the latter self-sharpening.

Again similarly to the cutter assembly, at least one elastically deformable means 85 is associable with the strap 83, between the two ends, which means adjusts the inclination of the blades 78, since the frame 73a and 73b can swing slightly with respect to the guiding bar 74.

Again similarly to the cutter assembly, each frame 73a and 73b is upwardly provided with a connecting rod 86 interacting, by means of a bearing 87 pivoted freely thereto proximate to the middle portion, with a biasing bar 88.

The connecting rod is freely pivoted, at one end, to the frame of the dinking body, between the other end and said frame there being interposed a cylindrical helical spring 89.

Also in this case, each dinking body can be moved out of the lateral shoulders 90 of the station in order to perform operations.

The ends of the chain 75 are associated with the frames 73a and 73b so that their position can be adjusted until it is symmetrical with respect to the operating axis of the machine.

In order to allow each dinking body to perform the

required path, and therefore to punch the cardboard correctly, each frame 73a and 73b is provided with a mechanical stroke limit at the location of a blade which is fixed to and projects from the pair of scorers 60c, which is closest to the operating axis of the machine.

Each dinking body is furthermore provided with means adapted for the removal of the strip of cardboard obtained during the dinking.

Said means, illustrated in Fig. 13, comprises a magnet 91, associated to the frame to the rear of the work area of the blades, which magnet controls the motion, along a vertical axis, of a small bar 92 to which an arm 93 is downwardly freely pivoted and is angled and arranged on a plane passing through the connecting plane of the pair of blades 78.

One end of said arm 93, adjacent to the pivoting point of the small bar 92, is in turn freely pivoted to the frame whilst at the other end of the arm 93, underlying the pair of blades 78, there is associated a blade 94, facing towards the direction of said blades 78.

When the magnet is not activated, the end of the blade 94 is arranged on a plane which is lower than the rest plane of the cardboard : when the magnet is activated, the small bar 92 is drawn upwards, raising the arm 93 and thus causing the blade 94 cut the terminal end of the cardboard strip.

A suitable switch keeps the magnet activated for a fraction of a second while the punching body is returned to a position proximate to the walls 90 : this allows the tearing off of the cardboard strip if it has not been cut off previously.

The sixth station is provided at the outlet of the fifth station, which sixth station comprises a pair of transverse rollers 95a and 95b adapted for ensuring the outgoing entrainment of the cardboard, as well as the off-cuts or punchings. In this case, the motion occurs by means of a toothed belt 96 trained around toothed wheels 97a and 97b ; the first wheel takes up the motion from the roller 69 and the second one transmits it to a roller 97c which moves the roller 95a which transmits the motion to the 95b, via the belt 96.

This solution has been adopted to allow the optimum adjustment of the parallelism between the rollers 95a and 95b according to the thickness of the cardboard.

After said rollers, a motorized set of rollers 98 is provided for the transport, the glueing and the folding of the flaps of the cardboard obtained by scoring.

Said functions are obtainable by means of glue dispensers 99 and L-shaped swinging arms 100 hinged at the end of the shortest part.

Both dispensers and arms may be moved transversely with respect to the set of rollers, and provided with a bush 101 interacting with a worm screw 102.

The worm screw is operated by a single motor 103 : the symmetry of the pairs of dispensers and arms with respect to the operating axis of the machine

is allowed by virtue of the fact that the worm screws 102 are provided along half of their length with right-handed thread and along the other half of their length with a left-handed thread.

The machine 1 finally comprises a means 104 for control and data input for the programming, command and control of the operating phases.

Said means is constituted by a central logic unit contained within a box-like structure 105.

The data can be input by means of a keyboard 106 and can be displayed on a monitor 107 or a printer 108 may be provided for printing the cardboard.

A button panel 109 finally allows manual intervention in case of malfunction, as well as the verification, by means of suitable optical indicators, of the functionality of the various components.

The machine 1 is furthermore provided with sensors and actuators so as to allow the control means 104 to command and control the various processing phases.

The use of the machine 1 initially entails the positioning of the corrugated cardboard 3 of each roller 6a, 6b and 6c, each proximate to a pair of rollers 23.

This positioning is facilitated by the presence of the eccentric element 32 which allows the lifting of the counter-roller 26 when inserting the cardboard.

The oscillable or swinging bars 41 furthermore allow the exact centering of the cardboard with respect to the operating axis of the machine, said axis being the reference axis for the control means 104.

Subsequently, the control means 104 will command the actuation of the motor and reducer assembly 36, which positions the lifting assembly 18 so that the desired cardboard is positioned at the working plane of the third station 38.

In the case illustrated in Fig. 5, this is the cardboard of the roll 6b.

Entrained by the rollers 24, the cardboard may be initially trimmed by the cutter assembly and then introduced into the fourth station.

Meanwhile, the control means 104 will have positioned the scorers 60a, 60b and 60c in the required positions, so as to perform the required scorers or creases.

After passing beyond the last scorer 60c, the cardboard will enter in the fifth station, where the two dinking bodies 72a and 72b will perform the dinking of the cardboard, removing at the same time the strip of punched-off cardboard.

Meanwhile, the control means 104 will have activated the cutter assembly of the third station 38, which will cut the cardboard once it reaches the required length.

Should it be required to perform trailing dinkings, the cutting of the cardboard is ensured in any case by the presence of the pair of rollers 95a and 95b of the sixth station.

In the sixth station the last phase of the proces-

sing occurs, which entails the eventual glueing of the flaps of the cardboard and their folding.

It has thus been observed that the invention achieves the intended aim and objects, an automatic machine being provided which allows one to obtain cardboard which is punched and scored or creased so as to obtain a container having the desired dimensions and reinforcements.

Since it is furthermore possible to preselect the cardboard of the required dimensions, the machine allows remarkable flexibility in use, it being possible to provide punched and scored cardboards for the obtainment of containers of any dimensions.

Naturally, the invention thus conceived is susceptible to numerous modifications and variations, all of which are within the scope of the same inventive concept.

Thus, as an example, one of the three scoring assemblies 60a, 60b and 60c may be replaced by a cutter assembly for the longitudinal cutting of the cardboard.

Similarly, an assembly for the transverse scoring of the cardboard may be provided, positioned, for example, after the station 38.

Regarding the type of cardboard used, it may also be constituted by sheets of corrugated paper, by pleated cardboard, or by similar material with which a box may be produced. Fig. 17 illustrates the use of an oscillably mounted container 110 which contains glue 111 which is applied to the cardboard 3 by means of one or more brushes 112 connected to an outflow duct.

The container can be refilled, is pivoted between two beams which constitute the frame 4, and its angle with respect to the plane of the underlying cardboard can be adjusted by means of a suitable screw 113 protruding, below the pivoting point of the container, from the beam of the frame.

Said container allows, e.g., to stably and mutually associate two sheets of corrugated cardboard unrolled from two contiguous rollers so that they are associated with counterposed corrugations.

Naturally the processed cardboard may have any dimensions and thickness, and it may be obtained by superimposing a plurality of individual sheets.

Naturally, the materials and the dimensions of each individual component of the machine may be any according to requirements.

Also, all of the individual components may be replaced with technically equivalent elements.

Claims

1. Automatic machine for the processing of corrugated paper, comprising :
 - a) a first station (2) for the feeding of corrugated cardboard (3) ;

- b) a second station (16) for inserting the corrugated cardboard into the processing area of the machine ;
- c) a third station (38) for cutting the corrugated cardboard ;
- d) a fourth station (59) for scoring the corrugated cardboard ;
- e) a fifth station for the dinking of the corrugated cardboard ;
- f) a sixth station for removing the corrugated cardboard from the processing area of the machine and for the eventual gluing and folding of the flaps resulting from the manufacturing process ;

the machine characterized in that the first station (2) is adapted to allow for the multiple feeding of corrugated cardboard with the possibility of different widths and comprises frame means (4) which support rotatable rolls (6a, 6b, 6c) of corrugated cardboard (3) having possible different characteristics such as widths and/or lengths, and guiding roller means (7a, 7b, 20a, 20b, 21a, 21b, 21c) for the multiple guiding of the corrugated cardboard (3) from said rolls (6a, 6b, 6c) into the second station (16) such that the corrugated cardboard (3) from each roll (6a, 6b, 6c) is arranged on parallel planes within the second station (16), and that the second station (16) is adapted to thereby insert corrugated cardboard having different characteristics into the processing area of the machine and comprises second frame means (17) which support a lifting assembly 18 having, for each roll (6a, 6b, 6c) of corrugated cardboard (3), driven means for inserting (23, 30-33) the cardboard (3) into the processing area of the machine, the lifting assembly (18) being linearly movable in a direction substantially perpendicular to the parallel planes of corrugated cardboard so that a selected type of corrugated cardboard can be inserted into the processing area of the machine, control and data input means being provided for programming, command and control of the operating phases of the machine and for printing the cardboard.

2. Machine according to claim 1, comprising a first station (2) characterized in that it is provided with eventual means (110-113) for the jointing and the centering of said cardboard and/or for the gluing of at least two of said mutually superimposable cardboards.

3. Machine according to the preceding claims, comprising a second station (16) characterized in that it comprises a multiple and movable insertion assembly (18) for said corrugated cardboard, said assembly (18) being provided with means for guiding (23) said cardboard, means for the quick insertion (30-33) thereof and means for centering (41, 42) the same with respect to the middle longitudinal axis of the machine.

4. Machine according to the preceding claims, comprising a third station (38) characterized in that it is composed of one or more self-sharpening cutters (48, 49) which are extractable from the station (38) and are provided with means (52, 53) for the temporary blocking of the corrugated cardboard during the cutting phase, as well as with means (55-57) suitable for retaining them in the cutting seat.

5. Machine according to the preceding claims, comprising a fourth station (59) characterized in that it is composed of one or more independently motorized scoring assemblies, each assembly being composed of a pair of scorers (60a, 60b, 60c) which interact with a means (69) for the traction of the cardboard and are symmetrical with respect to the middle longitudinal axis of the machine, each of said pairs being provided with means (65) for the adjustment of their mutual position and with means (66, 67) for maintaining the parallelism with said cardboard traction means.

6. Machine according to the preceding claims, comprising a fifth station characterized in that it is composed of at least one pair of dinking punches (72a, 72b) extractable from the station and provided with means (75-77) for adjusting their position with respect to the longitudinal middle axis of the machine, each of said punches being provided with a means (91-94) suitable for allowing the removal of the punched cardboard strip.

7. Machine according to the preceding claims, comprising a first station (2) characterized in that it comprises a supporting frame (4), to the lateral beams of which the shafts (5) of three rollers (6a, 6b, 6c) are freely pivoted, having different width and/or length, at the end of each of said shafts there being associated a brake (10) adapted for preventing the excessive unrolling of the cardboard, the latter being fed to the subsequent station (16) by means of three transverse free rollers (21a, 21b, 21c), arranged mutually parallel to each other with the axes arranged on the same plane perpendicular to the base plane of the machine.

8. Machine according to the preceding claims, comprising a second station (16) consecutive to the previous one (2) characterized in that it comprises a supporting frame (17) which supports a lifting assembly (18) composed of two lateral plates (22a, 22b), identical and rectangular, transversely to which three pairs of rollers (23) are pivoted, their axes, mutually parallel to each other, being arranged on the same plane perpendicular to the base plane of the station, each of said pairs of rollers being composed of a motorized roller (24), operatable by means of a suitable motor (25), and of a free counter-roller (26) arranged above the previous one, the axis (27) of each counter-roller being associated, at the ends, to a slot (28) with a vertical axis provided on the plates (22a, 22b).

9. Machine according to claims 1 and 8, compris-

ing three free counter-rollers (26), each of which is characterized in that it is provided with the end engaged in a throat (29) provided on the stem of an essentially Y-shaped swinging element (30), said element (30) being in turn freely pivoted to the lateral plates (22a, 22b) at the terminal end of the stem facing opposite to the first station (2), between the flaps of each swinging element (30) there being provided a shaft (31) mounted on an eccentric element (32) which can be operated by means of a lever (33), said eccentric element (32) allowing the coupling and the uncoupling between the counter-roller (26) and the motorized roller (24).

10. Machine according to claims 1, 8 and 9, comprising a lifting assembly (18) characterized in that it is moved along a vertical axis by means of a pair of chains (34) each of which is provided with ends associated with the upper and lower one of the lateral plates (22a, 22b) of the lifting assembly (18), said chains (34) being trained around toothed wheels (35a, 35b) upwardly and downwardly associated with the frame (17, 19) constituting said second station (16), one of said wheels (35b) being free and the other (35a) motorized (36).

11. Machine according to claims 1, 8, 9 and 10, comprising a lifting assembly (18) the lateral plates (22a, 22b) of which are characterized in that each is provided with a pair of tabs (40) protruding therefrom, to said tabs (40) there being associated a wheel (39a) and a pulley (39b) which cooperate with a guiding element composed of a cylindrical shaft (37) arranged vertically with respect to the frame (19) which constitutes said second station (16).

12. Machine according to the preceding claims, comprising a lifting assembly (18) the lateral plates (22a, 22b) of which are characterized in that three pairs of swinging bars (41) are associated thereto in the direction of the first station (2), which bars (41) are slideable on crosspieces (42), and allow the exact centering of the cardboard with respect to the longitudinal mid-axis of the machine, downstream of each pair of said rollers (23) there being provided combs (43) suitable for facilitating the insertion of the cardboard selected among the available ones by the lifting assembly (18).

13. Machine according to the preceding claims, comprising a third station (38) characterized in that it is composed of a cutter assembly comprising a box-like supporting frame (44) pivoted laterally by a transverse guiding bar (45) and moved by means of a chain (46) operated by a motor and reducer assembly (47), said frame (44) accommodating a rotating tempered blade (48) arranged on a plane which is transverse with respect to the machine (1), said rotating blade (48) cooperating with a fixed abutment blade (49) which can be removably accommodated on the plane of the cardboard.

14. Machine according to claims 1 and 13, com-

prising a rotating blade (48) characterized in that it is freely pivoted on a shaft (50) connected to the frame (44), to the side of said blade (48) there being arranged a cylinder (52) with a trapezoidal cross section which interacts, during the transverse motion of the frame (44), with the end of a metal strap (53), angled towards the cardboard feed region and pivoted at the other end to a transverse axis, between the ends of said strap (53) there being associatable an elastically deformable means (54) adapted for adjusting the inclination of the rotating blade (48).

15. Machine according to claims 1, 13 and 14, comprising a box-like frame (44) characterized in that it is upwardly provided with a connecting rod (56) which interacts, by means of a bearing freely pivoted thereto proximate to the middle portion, with a biasing bar (55), said connecting rod (56) being freely pivoted at one end to said frame (44), between the other end and said frame (44) there being interposed a cylindrical helical spring (58), said connecting rod (56), bar (55) and spring (58) constituting the means adapted for retaining the rotating blade (48) in the cutting seat.

16. Machine according to claims 1 and 15, comprising a rotating blade (48), pivoted on a small shaft (50) characterized in that coaxially to said shaft (50) a cylindrical helical spring (51) is provided, interacting at the ends with said frame (44) and said blade (48) so as to impart to the latter an adequate pressure on the abutment blade (49).

17. Machine according to the preceding claims, comprising a fourth station (59) composed of three pairs of scorers (60a, 60b, 60c) which are characterized in that each scorer of each pair is pivoted on a first transverse shaft (61) and is associated to a fork (62) upwardly provided with a cylindrical guide (63) which is slideable on a second transverse shaft (64), fixed and parallel to the previous one, each scorer of each pair being symmetrically positionable with respect to the mid-longitudinal axis of the machine (1) by means of a suitable bush (66), adjustable and interacting with a worm screw (65), the latter being provided along half of its length with a right-handed thread and along half of its length with a left-handed thread so as to allow the motion of the scorers (60a, 60b, 60c) in opposite directions due to a one-way rotation of said screw (65).

18. Machine according to claims 1 and 17, comprising scorer assemblies (60a, 60b, 60c) characterized in that they are moved by means of a single motor (70) keyed on the axis (61) of one of said scorers, the others receiving the motion by means of suitable transmissions constituted by toothed wheels (71).

19. Machine according to the preceding claims, comprising scorers (60a, 60b, 60c) which are characterized in that they interact with an abutment roller (69) the ends of which are mounted on eccentric elements so as to adjust the parallelism with the axis of

the scorer and thus allow the optimum scoring of the corrugated cardboard.

20. Machine according to the preceding claims, comprising a fifth station composed of two dinking bodies (72a, 72b), each of which is characterized in that it is composed of a box-like supporting frame (73a, 73b) laterally pivoted by a transverse guiding rail (74), to each frame there being associated the end of a same chain (75) transmitted, to the extreme sides of the machine, by two identical toothed wheels (76), one of which is free and the other is keyed on the axis of a motor and reducer assembly (77), said frames (73a, 73b) being adapted for moving simultaneously in opposite directions, the chain (75) being associated in its upper part to one frame (73a) and in the lower part to the other frame (73b), in such points as to allow the positioning of said frames simultaneously at the ends of the machine.

21. Machine according to claims 1 and 20, comprising box-like supporting frames (73a, 73b) characterized in that each accommodates a pair of identical rotating blades (78), counterposed to each other and furthermore mutually blocked with two disks (79a, 79b), said disks being axially journaled on a small shaft (80) arranged transversely with respect to the frame (1) and being coaxially provided with a cylindrical helical spring (81) interacting on the inner surfaces of said disks, to the one of said disks (79a) which faces towards the cardboard feed region there being coaxially associated a cylinder (82) with trapezoidal cross section, interacting, during the transverse motion of the dinking body (72a), with a strap (83) similar to the one (53) used for the cutter body (38).

22. Machine according to claims 1 and 21, provided with a pair of punches (78) characterized in that they interact with two abutment blades (84a, 84b) which are removably associable on the resting plane of the corrugated cardboard, said abutment blades being positioned so as to allow the self-sharpening of the rotating blades (78), to each of said box-like frames (73a, 73b) there being upwardly associated means (86-89) suitable for retaining said rotating blades (78) in the cutting seat, said means being similar to those (55-58) used in the cutter body (38).

23. Machine according to claims 1, 22 and 23, comprising box-like frames (73a, 73b) which are characterized in that a magnet (91) is associated thereto, to the rear of the work area of the blades (78), which magnet controls the motion, along a vertical axis, of a small bar (92) to which a metal arm (93) is downwardly freely pivoted, which metal arm is angled and arranged on a plane which passes through the one connecting the pair of blades (78), said arm being provided with the end adjacent to the pivoting point of the bar freely pivoted to the frame, while at the other end an underlying blade (94) is associated and faces towards the blades (78) which provide the dinking.

24. Machine according to the preceding claims,

provided with a sixth station characterized in that it comprises two pairs of transverse rollers (95a, 95b) adapted for ensuring the outgoing entrainment of the cardboard, one (95a) of said rollers being motorized by means of a toothed belt (96) associated to a matching shaped toothed wheel (97a) which takes up the motion from a corrugated cardboard traction roller (69) arranged proximate to a scoring assembly (59), the motion being transmitted to the other rollers (95a, 95b) by means of suitable toothed wheels (97b, 97c).

25. Machine according to claims 1 and 24, characterized in that it is provided with a motorized set of rollers (98) for the transport, gluing and folding of the flaps of the cardboard (3).

26. Machine according to the preceding claims, characterized in that it comprises means (104) for the programming, the command and the control of the processing phases of the machine, which are characterized in that they are composed of a central logic unit contained within a box-like structure (105) provided with a keyboard (106), a monitor (107), a printer (108) and a button panel (109), said central logic unit effecting, by means of suitable sensors and actuators positioned at the various stations, the command and control of the various processing phases.

27. Machine according to the preceding claims, comprising a first station (2) which is characterized in that an oscillable container (110), associated with a beam of the supporting frame (4) of the cardboard rolls (6a, 6b, 6c), which container contains an adhesive substance (111) which can be applied to the underlying cardboard (3) by means of suitable brushes (112) downwardly protruding therefrom.

28. Machine according to the preceding claims, comprising a first station (2) characterized in that it is composed of means (4-10, 20, 21) for feeding pleated cardboard.

29. Machine according to the preceding claims, comprising a first station (2) characterized in that it is composed, of means (4-10, 20, 21) for feeding individual sheets of corrugated cardboard.

30. Machine according to claims 1, 8, 9, characterized in that said counter-roller (26) is provided, with an axis (27) to the ends of which are associated two eccentric elements (114, 115) rotatably associated with said two lateral plates (22a, 22b), the angular position of said two eccentric elements being adjustable in a presettable position by means of a lever (33).

31. Machine according to claims 1, 11 and 12, characterized in that to at least one (22b) of said two lateral plates (22a, 22b) a pair of tabs (40) is coupled, within each of which a slider (117) is placed and slides, to which slider said wheel (39a) and pulley (39b) which interact with said guiding element (37) are pivoted, said sliders being rigidly interconnected to each other by a beam (118) to the middle portion of which the end of the stem (119) of a piston (120) is associated, which piston (120) is rigidly coupled to

said at least one (22b) of said two lateral plates (22a, 22b).

Ansprüche

1. Automatische Maschine zur Verarbeitung von Wellpappe mit :

- a) einer ersten Station (2) für das Zuführen von Wellpappe (3) ;
- b) einer zweiten Station (16) für das Einbringen der Wellpappe in den Verarbeitungsbereich der Maschine ;
- c) einer dritten Station (38) für das Schneiden der Wellpappe ;
- d) einer vierten Station (59) für das Rillen der Wellpappe ;
- e) einer fünften Station um Ausschnitte in der Wellpappe zu erzeugen ;
- f) einer sechsten Station für das Entnehmen der Wellpappe aus dem Verarbeitungsbereich der Maschine und für das eventuelle Leimen und Falten der Klappen, die aus dem Fertigungsprozess resultieren ;

dadurch gekennzeichnet, dass die erste Station (2) so ausgebildet ist, dass sie die Mehrfacheinführung von Wellpappe auch mit unterschiedlichen Breiten erlaubt und dass sie einen Rahmen (4) aufweist, der drehbare Rollen (6a, 6b, 6c) von Wellpappe (3) trägt, die ggfs. unterschiedliche Eigenschaften wie z.B. Breiten und/oder Längen haben, und ferner Führungswalzen (7a, 7b, 20a, 20b, 21a, 21b, 21c) aufweist, welche die Wellpappe (3) von den Rollen (6a, 6b, 6c) in der Weise in die zweite Station (16) mehrfach führen, dass die von allen Rollen (6a, 6b, 6c) kommende Wellpappe in der zweiten Station (16) in parallelen Ebenen angeordnet ist,

und dass die zweite Station (16) so ausgebildet ist, dass durch sie Wellpappe mit unterschiedlichen Eigenschaften in den Verarbeitungsbereich der Maschine eingeführt wird, und einen zweiten Rahmen (17) aufweist, der eine Hebeeinrichtung (18) trägt, die für jede Rolle (6a, 6b, 6c) von Wellpappe (3) angetriebene Mittel (23, 30 bis 33) für das Einführen der Pappe (3) in den Verarbeitungsbereich der Maschine hat und in einer Richtung i.w. senkrecht zu den parallelen Ebenen der Wellpappe in der Weise linear beweglich ist, dass eine ausgewählte Art von Wellpappe in den Verarbeitungsbereich der Maschine eingebracht werden kann, wobei Steuer- und Dateneingabe-einrichtungen für das Programmieren, Steuern und Kontrollieren der Verarbeitungsvorgänge der Maschine und für das Bedrucken der Pappe vorgesehen sind.

2. Maschine nach Anspruch 1 mit einer dadurch gekennzeichneten ersten Station (2), dass sie ggfs.

mit Mitteln (110-113) zum Verbinden und Zentrieren der Pappe und/oder zum Leimen von mindestens zwei der aufeinanderschichtbaren Pappen versehen ist.

3. Maschine nach den vorstehenden Ansprüchen mit einer dadurch gekennzeichneten zweiten Station, dass sie eine bewegliche Mehrfacheinrichtung (18) für das Einbringen der Wellpappe enthält, die mit Mitteln (23) für das Führen der Pappe, mit Mitteln (30-33) für die Schnelleinführung (30-33) derselben und mit Mitteln (41, 42) für das Zentrieren derselben auf die mittlere Längsachse der Maschine versehen ist.

4. Maschine nach den vorstehenden Ansprüchen mit einer dadurch gekennzeichneten dritten Station (38), dass sie eines oder mehrere sich selbst schärfende Schneidewerkzeuge (48, 49) enthält, die aus der Station (38) herausziehbar und mit Mitteln (52, 53) zum zeitweisen Festhalten der Wellpappe während des Schneidevorganges sowie mit Mitteln (55-57) versehen sind, um sie (48, 49) in der Schneidestellung zurückzuhalten.

5. Maschine nach den vorstehenden Ansprüchen mit einer dadurch gekennzeichneten vierten Station (59), dass sie eine oder mehrere unabhängig angetriebene Vorrichtungen zum Rillen aufweist, wobei jede Vorrichtung ein Paar Rillwerkzeuge (60a, 60b, 60c) aufweist, die mit Mitteln (69) zum Ziehen der Pappe zusammenwirken und symmetrisch zur mittleren Längsachse der Maschine angeordnet sind, wobei jedes dieser Paare mit Mitteln (65) zum Einstellen ihrer gegenseitigen Position und mit Mitteln (66, 67) zum Aufrechterhalten der Parallelität zu den Mitteln zum Ziehen der Pappe versehen ist.

6. Maschine nach den vorstehenden Ansprüchen mit einer dadurch gekennzeichneten fünften Station, dass sie mindestens ein Paar aus der Station herausziehbare Ausschneidewerkzeuge (72a, 72b) aufweist und mit Mitteln (75-77) für das Einstellen ihrer Position bezüglich der mittleren Längsachse der Maschine versehen ist, wobei jedes dieser Ausschneidewerkzeuge mit Mitteln (91-94) versehen ist, die das Entfernen des ausgeschnittenen Kartonstreifens ermöglichen.

7. Maschine nach den vorstehenden Ansprüchen mit einer dadurch gekennzeichneten ersten Station (2), dass sie einen Halterahmen (4) aufweist, an dessen seitlichen Schenkeln die Wellen (5) der drei Rollen (6a, 6b, 6c) mit unterschiedlichen Breiten und/oder Längen frei drehbar gelagert sind, wobei am Ende jeder Welle eine Bremse (10) angeordnet ist, um ein übermäßiges Abrollen der Pappe zu verhindern, welche der nachfolgenden Station (16) mit Hilfe von drei freilaufenden, transversalen Rollen (21a, 21b, 21c) zugeführt wird, die parallel zueinander und mit ihren Achsen in ein und derselben Ebene senkrecht zur Grundebene der Maschine angeordnet sind.

8. Maschine nach den vorstehenden Ansprüchen mit einer zweiten Station (16), die auf die vorherge-

hende (2) folgt und dadurch gekennzeichnet ist, dass sie einen Halterahmen (17) enthält, der eine Hebeeinrichtung (18) trägt, die aus zwei seitlichen, gleichen, rechteckigen Platten (22a, 22b) gebildet wird, an denen drei quer zu ihnen verlaufende Rollenpaare (23) drehbar gelagert sind, deren parallel zueinander verlaufende Achsen in derselben senkrecht zur Grunde-
ebene der Station verlaufenden Ebene angeordnet sind, wobei jedes Rollenpaar aus einer motorgetriebenen Rolle (24), die durch einen geeigneten Motor (25) angetrieben wird, und aus einer freilaufenden Gegenrolle (26) besteht, die über der motorgetriebenen angeordnet ist, wobei die Achse (27) jeder Gegenrolle an den Enden einem Schlitz (28) mit vertikaler Achse zugeordnet ist, der in den Platten (22a, 22b) vorgesehen ist.

9. Maschine nach den Ansprüchen 1 und 8 mit drei freilaufenden Gegenrollen (26); von denen jede dadurch gekennzeichnet ist, dass sie mit ihrem Ende in einen Einschnitt (29) eingreift, der auf dem Stiel einer ungefähr Y-förmigen Schwinge (30) angebracht ist, welche frei verschwenkbar an den seitlichen Platten (22a, 22b) gelagert ist, und zwar um eine Achse, welche an jenem Ende des Stiels liegt, das der ersten Station (2) abgewandt ist, wobei zwischen den Schenkeln jeder Schwinge (30) eine Welle (31) vorgesehen ist, die auf einem mit einem Hebel (33) zu betätigenden Exzenter (32) befestigt ist, wobei der Exzenter (32) das Koppeln und das Entkoppeln der Gegenrolle (26) mit der motorgetriebenen Rolle (24) ermöglicht.

10. Maschine nach den Ansprüchen 1, 8 und 9, mit einer dadurch gekennzeichneten Hebeeinrichtung (18), dass sie entlang einer vertikalen Achse mit Hilfe eines Paares von Ketten (34) beweglich ist, von denen jede mit ihren Enden mit dem oberen bzw. dem unteren Ende der seitlichen Platten (22a, 22b) der Hebeeinrichtung (18) verbunden ist, wobei die Ketten (34) über Zahnräder (35a, 35b) laufen, die oben und unten an dem Rahmen (17, 19) der zweiten Station (16) angebracht sind, wobei eines der Zahnräder (35b) frei drehbar und das andere (35a) motorgetrieben ist.

11. Maschine nach den Ansprüchen 1, 8, 9 und 10 mit einer Hebeeinrichtung (18), dessen seitliche Platten (22a, 22b) dadurch gekennzeichnet sind, dass jede von ihnen mit einem Paar von abstehenden Ansätzen (40) versehen ist, denen ein Rad (39a) und eine Führungsrolle (39b) zugeordnet sind, die mit einem Führungselement zusammenarbeiten, das durch eine zylindrische Stange (37) gebildet wird und bezogen auf den Rahmen (19) der zweiten Station (16) vertikal angeordnet ist.

12. Maschine nach den vorstehenden Ansprüchen mit einer Hebeeinrichtung (18), deren seitliche Platten (22a, 22b) dadurch gekennzeichnet sind, dass ihnen auf der der ersten Station (2) zugewandten Seite drei Paare schwenkbarer Stäbe (41) zuge-

ordnet sind, die auf sich quer erstreckenden Teilen (42) verschiebbar sind und das exakte Zentrieren der Pappe auf die mittlere Längsachse der Maschine erlauben, wobei in Verarbeitungsrichtung hinter jedem Paar von Rollen (23) Kämme (43) vorgesehen sind, die geeignet sind, das Einbringen der durch die Hebeeinrichtung (18) aus den verfügbaren Pappen ausgewählten Pappe zu erleichtern.

13. Maschine nach den vorstehenden Ansprüchen mit einer dadurch gekennzeichneten dritten Station (38), dass sie eine Schneidevorrichtung aufweist, welche einen gehäuseähnlichen Tragrahmen (44) enthält, der mittels einer querverlaufenden Führungsstange (45) seitlich schwenkbar gelagert ist und mit Hilfe einer durch einen Motor mit Getriebeeinheit (47) angetriebenen Kette (46) bewegt wird, wobei der Tragrahmen (44) ein rotierendes, gehärtetes Messer (48) enthält, welches in einer Ebene quer zur Maschine (1) angeordnet ist und mit einem feststehenden Anschlagmesser (49), das herausnehmbar auf der Ebene der Pappe liegt, zusammenarbeitet.

14. Maschine nach Anspruch 1 und 13 mit einem dadurch gekennzeichneten rotierenden Messer (48), dass es frei drehbar auf einer mit dem Tragrahmen (44) verbundenen Welle (50) gelagert ist, wobei auf der Seite des Messers (48) ein Kegelstumpf (52) angeordnet ist, der während der Querbewegung des Tragrahmens (44) mit dem Ende eines Metallstreifens (53) wechselwirkt, der in Richtung des Pappezuführbereichs geneigt und am anderen Ende an einer quer verlaufenden Achse schwenkbar gelagert ist, wobei zwischen den Enden des Metallstreifens (53) ein elastisch deformierbares Mittel (54) angeordnet werden kann, um die Neigung des rotierenden Messers (48) einzustellen.

15. Maschine nach den Ansprüchen 1, 13 und 14 mit einem dadurch gekennzeichneten gehäuseförmigen Tragrahmen (44), dass er auf seiner Oberseite mit einer Verbindungsstange (56) versehen ist, die mit Hilfe eines Lagers, welches nahe des Mittelteils frei verschwenkbar gelagert ist, mit einer Stange (55) wechselwirkt, die zum Vorspannen dient, wobei die Verbindungsstange (56) an einem Ende (44) frei schwenkbar am Tragrahmen (44) gelagert ist und zwischen dem anderen Ende und dem Tragrahmen (44) eine zylindrische Wendelfeder (58) eingesetzt ist, wobei die Verbindungsstange (56), die Stange (55) und die Feder (58) die Mittel bilden, die geeignet sind, das rotierende Messer (48) in der Schneidestellung zurückzuhalten.

16. Maschine nach den Ansprüchen 1 und 15 mit einem rotierenden Messer (48), das auf einer kurzen Welle (50) drehbar gelagert und dadurch gekennzeichnet ist, dass koaxial zu der Welle (50) eine zylinderförmige Wendelfeder (51) vorgesehen ist, die an den Enden mit dem Tragrahmen (44) und dem Messer (48) in der Weise wechselwirkt, dass sie das Messer mit hinreichendem Druck gegen das

Anschlagmesser (49) drückt.

17. Maschine nach den vorstehenden Ansprüchen mit einer vierten Station (59), die drei Paare von Rillwerkzeugen (60a, 60b, 60c) enthält, die dadurch gekennzeichnet sind, dass jedes Rillwerkzeug der Paare auf einer ersten transversalen Welle (61) drehbar gelagert ist und einer Gabel (62) zugeordnet ist, die auf der Oberseite mit einer zylindrischen Führung (63) versehen ist, welche auf einer zweiten transversalen, in festem Abstand und parallel zu der ersten Welle angeordneten Welle (64) verschiebbar ist, wobei jedes Rillwerkzeug in jedem der Paare bezogen auf die mittlere Längsachse der Maschine (1) mit Hilfe einer passenden Laubuchse (66) symmetrisch positionierbar ist, die mit einer Spindel (65) wechselwirkt und einstellbar ist, wobei die Spindel (65) und auf ihrer halben Länge mit einem Rechtsgewinde und auf ihrer anderen halben Länge mit einem Linksgewinde versehen ist, um bei gleicher Drehrichtung der Spindel (65) eine Bewegung der Rillwerkzeuge (60a, 60b, 60c) in entgegengesetzten Richtungen zu ermöglichen.

18. Maschine nach den Ansprüchen 1 und 17 mit dadurch gekennzeichneten Rillwerkzeugen (60, 60b, 60c), dass sie mit Hilfe eines einzigen Motors (70) bewegt werden, der mit der Achse (61) eines der Rillwerkzeuge drehfest verbunden ist, während die anderen ihre Bewegung mit Hilfe von passenden Übertragungseinrichtungen, die durch Zahnräder (71) gebildet werden, erhalten.

19. Maschine nach den vorstehenden Ansprüchen mit dadurch gekennzeichneten Rillwerkzeugen (60a, 60b, 60c), dass sie mit einer Anschlagrolle (69) zusammenwirken, deren Enden auf Exzentern befestigt sind, um die Parallelität zu der Achse des Rillwerkzeuges einzustellen und damit das optimale Rillen der Wellpappe zu ermöglichen.

20. Maschine nach den vorstehenden Ansprüchen mit einer fünften Station, die zwei Ausschneidekörper (72a, 72b) enthält, von denen jeder dadurch gekennzeichnet ist, dass er einen gehäuseförmigen, seitlich an einer quer verlaufenden Führungsschiene (74) schwenkbar gelagerten Halterahmen (73a, 73b) enthält, wobei jedem Halterahmen dieselbe Kette (75) zugeordnet ist, die mit ihren Enden am einen wie am anderen Halterahmen angreift und über zwei gleiche Zahnräder (76) zu den äußeren Seiten der Maschine geführt ist, wobei eines dieser Zahnräder freilaufend und das andere drehfest mit der Achse einer Anordnung (77) aus einem Motor und einem Getriebe verbunden ist und die Halterahmen (73a, 73b) sich gleichzeitig in entgegengesetzte Richtungen bewegen können, wozu die Kette (75) an solchen Stellen in ihrem oberen Teil mit dem einen Halterahmen (73a) und in ihrem unteren Teil mit dem anderen Halterahmen (73b) verbunden ist, dass die Halterahmen gleichzeitig an den Enden der Maschine positioniert werden können.

21. Maschine nach den Ansprüchen 1 und 20 mit dadurch gekennzeichneten gehäuseähnlichen Halterahmen (73a, 73b), dass jeder von ihnen ein Paar gleicher, rotierender Messer (78) enthält, die gegeneinander gestellt und desweiteren durch zwei Scheiben (79a, 79b) verdrehfest miteinander verbunden sind, die axial auf einer kurzen Achse (89) gelagert sind, die quer zur Maschine (1) angeordnet und koaxial mit einer zylindrischen Wendelfeder (81) versehen ist, die auf die inneren Flächen der Scheiben wirkt, wobei einer der Scheiben (79a), die dem Papeinführbereich zugewandt ist, koaxial ein Kegelstumpf (82) zugeordnet ist, der während der Querbewegung des Ausschneidekörpers (72a) mit einem Streifen (83) ähnlich demjenigen (53), welcher für das Schneidewerkzeug (38) benutzt wird, zusammenwirkt.

22. Maschine nach den Ansprüchen 1 und 21, die mit einem Paar Ausschneidewerkzeugen (78) versehen ist, die dadurch gekennzeichnet sind, dass sie mit zwei Anschlagmessern (84a, 84b) zusammenwirken, welche auswechselbar der Auflageebene der Wellpappe zugeordnet werden können, wobei die Anschlagmesser so positioniert sind, dass sie das Selbstschärfen der rotierenden Messer (78) ermöglichen, wobei an jedem gehäuseähnlichen Halterahmen (73a, 73b) oben Mittel (76-79) zum Zurückhalten der rotierenden Messer (78) in der Schneidestellung angeordnet sind, die jenen Mitteln (55-58) in der Schneidevorrichtung (38) entsprechen.

23. Maschine nach den Ansprüchen 1, 22 und 23 mit dadurch gekennzeichneten gehäuseähnlichen Halterahmen (73a, 73b), dass ihnen hinter dem Arbeitsbereich der Messer (78) ein Magnet (91) zugeordnet ist, der die Bewegung einer kurzen Stange (92) längs einer vertikalen Achse kontrolliert, an welcher ein Metallarm (93) nach unten frei schwenkbar gelagert ist, der gewinkelt und in einer Ebene zwischen dem Paar von Messern (78) angeordnet und mit dem einen Ende, welches dem Gelenkpunkt der Stange benachbart ist, frei verschwenkbar am Rahme gelagert ist, während er an seinem anderen Ende ein schrägstehendes Messer (94) hat, welches gegen die Ausschneidemesser (78) gerichtet ist.

24. Maschine nach den vorstehenden Ansprüchen mit einer dadurch gekennzeichneten sechsten Station, dass sie zwei Paare quer verlaufender Rollen (95a, 95b) enthält, die das Abfordern der Wellpappe gewährleisten, wobei eine (95a) der Rollen mit Hilfe eines Zahnriemens (96) angetrieben ist, der mit einem passend geformten Zahnrad (97a) kämmt, welches die Bewegung von einer der Wellpappe einziehenden Rolle (69) aufnimmt, die in der Nähe einer Rilleinrichtung (59) angeordnet ist, wobei die Bewegung mit Hilfe passender Zahnräder (97b, 97c) auf die anderen Rollen (95a, 95b) übertragen wird.

25. Maschine nach den Ansprüchen 1 und 24, dadurch gekennzeichnet, dass sie mit einem ange-

triebenen Satz von Rollen (98) für das Transportieren, Leimen und Falten der Klappen der Pappe (3) versehen ist.

26. Maschine nach den vorstehenden Ansprüchen, dadurch gekennzeichnet, dass sie Mittel (104) für das Programmieren, Steuern und Regeln der Verarbeitungsvorgänge der Maschine enthält, die dadurch gekennzeichnet sind, dass sie eine logische Zentraleinheit in einem gehäuseähnlichen Gebilde (105) aufweisen, das mit einer Tastatur (106), einem Monitor (107), einen Drucker (108) und einer Frontplatte (109) mit Schalttasten versehen ist, wobei die Zentraleinheit mit Hilfe von in den verschiedenen Stationen angebrachten Sensoren und Betätigungselementen das Steuern und Regeln der verschiedenen Verarbeitungsvorgänge bewirkt.

27. Maschine nach den vorstehenden Ansprüchen mit einer dadurch gekennzeichneten ersten Station (2), dass ein an einem Schenkel des Halterahmens (4) der Papprollen (6a, 6b, 6c) angebrachter schwingfähiger Behälter (110) einen Klebstoff (111) enthält, der auf die darunterliegende Pappe (3) mit Hilfe von nach unten vom Behälter (110) abstehenden Bürsten (112) aufgetragen werden kann.

28. Maschine nach den vorstehenden Ansprüchen mit einer dadurch gekennzeichneten ersten Station (2), dass sie Mittel (4-10, 20, 21) für das Einbringen von gefalteter Pappe aufweist.

29. Maschine nach den vorstehenden Ansprüchen mit einer dadurch gekennzeichneten ersten Station (2), dass sie Mittel (4-10, 20, 21) für das Einbringen von einzelnen Wellpappebögen aufweist.

30. Maschine nach den Ansprüchen 1, 8, 9, dadurch gekennzeichnet, dass die Gegenrolle (26) eine Achse (27) hat, an deren Ende sich zwei Exzenter (114, 115) befinden, die drehbar an den zwei seitlichen Platten (22a, 22b) angeordnet sind, wobei die Winkelstellung der zwei Exzenter mit Hilfe eines Hebels (33) in eine vorwählbare Position einstellbar ist.

31. Maschine nach den Ansprüchen 1, 11 und 12, dadurch gekennzeichnet, dass mindestens an einer (22b) der beiden seitlichen Platten (22a, 22b) ein Paar Ansätze (40) angebracht sind und in jedem von ihnen ein Schieber (170) angeordnet ist und gleitet, mit dem das Rad (39a) und die Führungsrolle (39b), welche mit dem Führungselement (37) zusammenwirken, drehbar verbunden sind und wobei die Schieber untereinander starr mit einem Stab (118) verbunden sind, dessen Mittelbereich mit dem Ende der Kolbenstange (119) eines Zylinders (120) verbunden ist, der starr mit jener einen (22b) der beiden seitlichen Platten (22a, 22b) verbunden ist.

Revendications

1. Machine automatique pour le travail de carton ondulé comprenant :

- a) un premier poste (2) pour l'alimentation de carton ondulé (3),
- b) un second poste (16) pour l'insertion du carton ondulé dans la zone de travail de la machine,
- c) un troisième poste (38) pour couper le carton ondulé,
- d) un quatrième poste (59) pour sacrifier le carton ondulé,
- e) un cinquième poste pour la découpe marginale du carton ondulé,
- f) un sixième poste pour évacuer le carton ondulé de la zone de travail de la machine et finalement pour encoller et plier les volets résultant du procédé de fabrication,

la machine étant caractérisée en ce que le premier poste (2) est adapté à permettre une alimentation multiple à partir de carton ondulé comportant des possibilités de largeurs différentes et il comporte des moyens de cadrage (4) qui supportent des rouleaux rotatifs (6a, 6b, 6c) de carton ondulé (3) ayant des caractéristiques éventuellement différentes telles que leur largeur ou leur longueur et des rouleaux de guidage (7a, 7b, 20a, 20b, 21a, 21b, 21c) pour le guidage multiple du carton ondulé (3) depuis lesdits rouleaux (6a, 6b, 6c) vers le second poste (16), de telle façon que le carton ondulé (3) à partir de chaque rouleau (6a, 6b, 6c) soit disposé sur des plans parallèles à l'intérieur du second poste (16) et que le second poste (16) soit adapté à l'insertion de carton ondulé ayant des caractéristiques différentes vers la zone de travail de la machine et il comporte des seconds moyens de cadrage (17) qui supportent un ensemble de levage (18) ayant, pour chacun des rouleaux (6a, 6b, 6c) de carton ondulé (3), des moyens de guidage (23, 30 à 33) pour insérer le carton (3) dans la zone de travail de la machine, l'ensemble de levage étant déplaçable de façon linéaire dans une direction sensiblement perpendiculaire par rapport au plan parallèle du carton ondulé de façon à ce que un type sélectionné de carton ondulé puisse être inséré dans la zone de travail de la machine, des moyens de contrôle et de saisie de données étant disposés pour permettre la programmation, la commande et le contrôle des phases opérationnelles de la machine et pour imprimer le carton.

2. Machine selon la revendication 1, comportant un premier poste (2) caractérisé en ce qu'il est pourvu de moyens ultérieurs (110 à 113) pour l'accouplement et le centrage dudit carton ondulé et/ou pour l'encollage d'au moins deux des dits cartons ondulés mis en superposition.

3. Machine selon les revendications qui précèdent.

dent, comportant un second poste (16) caractérisé en ce qu'il comporte un ensemble déplaçable pour l'insertion dudit carton ondulé, cet ensemble (18) étant pourvu de moyens de guidage (23) dudit carton, des moyens pour une insertion rapide (30 à 33) de ce dernier et des moyens pour le centrage (41 et 42) du carton par rapport à l'axe longitudinal médian de la machine.

4. Machine selon les revendications qui précèdent, comportant un troisième poste (38) caractérisé en ce qu'il est composé d'un ou plus couteaux auto-affutants (48, 49) qui sont amovibles par rapport audit poste et qui sont pourvus de moyens (52, 53) pour le blocage temporaire du carton ondulé pendant l'opération de coupe, comme de moyens (55, 57) pour maintenir lesdits couteaux dans le siège de coupe.

5. Machine selon les revendications qui précèdent, comportant un quatrième poste (59) caractérisé en ce qu'il est composé de un ou plus ensembles de scarification indépendants et motorisés, chaque ensemble étant composé d'une paire de scarificateurs (60a, 60b, 60c) qui coopèrent avec un moyen (69) pour la traction du carton et qui sont disposés symétriquement par l'axe longitudinal médian de la machine, chacune des dites paires de scarificateurs étant pourvue de moyens (65) pour le réglage de leur position mutuelle et de moyens (66, 67) pour maintenir le parallélisme par rapport au moyen de traction du carton.

6. Machine selon les revendications précédentes, comportant un cinquième poste caractérisé en ce qu'il est composé d'au moins une paire d'outils de découpe marginale (72a, 72b) amovibles par rapport au poste et comportant des moyens (75, 77) pour régler leur position par rapport à l'axe longitudinal médian de la machine, chacun de ces outils comportant un organe (91, 94) permettant l'enlèvement de la bande ce carton découpée.

7. Machine selon les revendications qui précèdent, comportant un premier poste (2) caractérisé en ce qu'il comporte un cadre de supportage (4) dont les longerons supportent les arbres (5) de trois rouleaux (6a, 6b, 6c) montés librement sur les dits axes et comportant des longueurs ou largeurs différentes, les dits arbres comportant à leur extrémité un frein (10) permettant un déroulement excessif de carton, ce dernier étant alimenté à la station ultérieure (16) au moyen de trois rouleaux transversaux (21a, 21b, 21c) disposés parallèlement entre eux et leurs axes étant situés dans un même plan perpendiculaire au plan de base de la machine.

8. Machine selon les revendications qui précèdent, comportant un second poste (16) faisant suite au précédent (2) caractérisé en ce qu'il comporte un cadre de supportage (17) qui supporte un ensemble de levage (18) constitué de deux plaques latérales (22a, 22b) identiques et rectangulaires, trois paires de rouleaux (23) étant disposées transversalement et mon-

tées à pivotement sur lesdites plaques, leurs axes étant maintenus parallèles, et étant disposés dans un même plan perpendiculaire au plan de base de la machine, chacune des paires de rouleaux étant constituée d'un rouleau motorisé (24) manoeuvré par un moteur convenable (25) et un contre-rouleau libre (26) disposé au dessus du précédent, l'axe (27) de chaque contre-rouleau étant associé à ses extrémités à une fente (26) d'axe vertical et pratiquée dans les plaques (22a, 22b).

9. Machine selon les revendications 1 et 8, comportant trois contre-rouleaux libres (26) chacun desquels étant caractérisé en ce que chaque extrémité est engagée dans une gorge (29) disposée sur la tige d'un organe basculant en forme générale de Y, ledit organe (30) étant à son tour monté à pivotement par rapport aux plaques latérales (22a, 22b) à l'extrémité terminale de la tige faisant face au premier poste (2) entre les volets de chaque élément basculant (30) est prévu un arbre (31) monté sur un élément excentrique (32) qui peut être manoeuvré au moyen d'un levier (33), ledit élément excentrique (32) permettant l'accouplement et le désaccouplement du contre-rouleau (26) par rapport au rouleau motorisé correspondant (24).

10. Machine selon les revendications 1, 8 et 9, comportant un ensemble de levage (18) caractérisé en ce qu'il est déplaçable le long d'un axe vertical au moyen d'une paire de chaînes (34), dont chaque extrémité est associée avec la partie supérieure et la partie inférieure respectivement des plaques latérales (22a, 22b) de l'ensemble de levage (18), lesdites chaînes (34) étant engrenées sur des roues dentées (35a, 35b) situées respectivement vers le haut et vers le bas et associées au cadre (17, 19) constituant ledit second poste (16) l'une des roues (35b) étant libre et l'autre (35a) étant motorisée par le moteur (36).

11. Machine selon la revendication 1, 8, 9 et 10, comportant un ensemble de levage (18) dont les plaques latérales (22a, 22b) sont caractérisées en ce que chacune est prévue avec une paire d'oreilles (40) débordant à partir de la plaque, à chacune des oreilles sont associées une roue (39a) et une poulie (39b) qui coopèrent avec un élément de guidage constitué d'un arbre cylindrique (37) disposé verticalement par rapport au cadre (19) qui constitue ledit second poste (16).

12. Machine selon les revendications précédentes, comportant un ensemble de levage (18) dont les plaques latérales (22a, 22b) sont caractérisées en ce que trois paires de barrettes basculantes (41) lui sont associées en direction du premier poste, lesdites barrettes (41) étant montées à coulissement sur des entretoises (42) et permettent le centrage exact du carton par rapport à l'axe longitudinal médian de la machine, et en aval de chacune des paires des dits rouleaux (23) sont disposés des peignes (43) convenables pour faciliter l'insertion du carton sélectionné

parmi les cartons disponibles dans l'ensemble de levage (18).

13. Machine selon les revendications qui précèdent, comportant une troisième poste (38) caractérisé en ce qu'il est composé d'un ensemble de coupe comportant un cadre de supportage en caisson (44) pivoté latéralement sur une barre de guidage transversale (45) et déplaçable au moyen d'une chaîne (41) manoeuvrée par un ensemble (47) moto-réducteur, ledit cadre (44) coopérant avec un couteau rotatif (48) en acier trempé disposé dans un plan transversal par rapport à la machine (1), ledit couteau rotatif (48) coopérant avec une lame fixe de butée (49) qui peut être disposée de façon amovible sur le plan du carton.

14. Machine selon les revendications 1 et 13, comportant un couteau rotatif (48), caractérisé en ce qu'il est monté à pivotement libre sur un arbre (50) relié au cadre (44) et sur le côté dudit couteau (48) est disposé un galet (52) de section transversale trapézoïdale et qui interfère pendant le mouvement transversal du cadre (44) avec le bord d'une bande métallique (53) disposée de façon angulaire par rapport à l'arrivée du carton et pivotée à son autre extrémité selon un axe transversal, et entre les bords de ladite bande (53) est prévu un moyen élastiquement déformable (54) permettant l'ajustement de l'inclinaison dudit couteau rotatif (48).

15. Machine selon les revendications 1, 13 et 14, comportant un cadre caisson (44) caractérisé en ce qu'il est monté à pivotement vers le haut par rapport à une barre de liaison (56) qui interfère au moyen d'un palier pivotant engagé sensiblement à proximité de la partie moyenne de ladite barre de liaison avec un rail de mise sous tension (55), ladite barre de liaison étant montée à pivotement à une extrémité par rapport audit cadre (44) et entre l'autre extrémité dudit cadre (44) est disposé en ressort hélicoïdal (58), ladite barre de liaison (56), le rail (55) et le ressort (58) constituant le moyen permettant de maintenir le couteau rotatif (48) dans son siège de coupe.

16. Machine selon les revendications 1 et 15, comportant un couteau rotatif (48) monté à pivotement sur un petit arbre (50), caractérisé en ce que un cylindre hélicoïdal (51) est disposé coaxialement par rapport audit arbre (50), ce ressort hélicoïdal prenant appui d'un côté sur ledit cadre (44) et de l'autre sur ledit couteau (48) de façon à impartir à ce dernier une pression adéquate contre la lame d'appui (49).

17. Machine selon les revendications qui précèdent, comportant un quatrième poste constitué de trois paires de scarificateurs (60a, 60b, 60c) qui sont caractérisées en ce que chaque scarificateur de chaque paire est monté à pivotement sur un premier arbre transversal (61) et est associé à une fourche (62) orientée vers le haut et pourvue d'un guide cylindrique (63) lequel est monté à coulissement sur un second arbre transversal (64) fixe et parallèle au premier,

chaque scarificateur de chaque paire étant susceptible d'être positionné symétriquement par rapport à l'axe longitudinal médian de la machine (1) au moyen d'un écrou prisonnier (66) réglable en position par le jeu d'une vis sans fin (65), cette dernière comportant le long de sa longueur un filetage à droite et sur l'autre moitié de sa longueur un filetage à gauche de façon à permettre le mouvement des scarificateurs (60, 60b, 60c) dans des directions opposées suite à la rotation uniforme et dans le même sens de ladite vis sans fin (65).

18. Machine selon les revendications 1 et 17, comportant des ensembles de scarification (60a, 60b, 60c), lesquels sont caractérisés en ce qu'ils sont mûs par un seul moteur (70) claveté sur l'axe (61) de l'un desdits scarificateurs, les autres recevant le mouvement au moyen de transmissions convenables constituées de pignons (71).

19. Machine selon les revendications qui précèdent, comportant des scarificateurs (60a, 60b, 60c) qui sont caractérisés en ce qu'ils interfèrent avec un galet d'appui (69), les extrémités duquel sont montés sur des éléments excentriques de façon à ajuster le parallélisme par rapport à l'axe du scarificateur et à permettre ainsi la scarification optimum du carton ondulé.

20. Machine selon les revendications qui précèdent, comportant un cinquième poste composé de deux ensembles de découpe marginale (72a, 72b) chacun desquels étant caractérisé en ce qu'il est composé d'un cadre de supportage en caisson (73a, 73b) monté à pivotement latéralement sur un rail de guidage (74) lui-même transversal, et à chacun des cadres est associée la fin d'une même chaîne (75) de transmission et montée sur deux roues dentées identiques aux extrémités de la machine, l'une de ces roues étant libre et l'autre étant clavetée sur l'arbre d'un ensemble moto-réducteur (77), lesdits cadres (73a, 73b) étant prévus pour se mouvoir simultanément dans des directions opposées, la chaîne (75) étant associée à sa partie supérieure à un cadre (73a) et à sa partie inférieure à l'autre cadre (73b), à des points convenablement choisis pour permettre le positionnement desdits cadres simultanément aux extrémités de la machine.

21. Machine selon les revendications 1 et 20, comportant des cadres de supportage en caisson (73a, 73b) caractérisés en ce que chacun d'eux comporte une paire de couteaux rotatifs identiques (78) solidarisés l'un contre l'autre et bloqués mutuellement par deux disques (79a, 79b), lesdits disques étant axialement montés sur un arbre (80) disposé transversalement par rapport au cadre (1) et étant pourvu coaxialement d'un ressort hélicoïdal (81) prenant appui d'un côté sur la surface desdits disques, et à celui desdits disques (79a) faisant face à l'arrivée du carton est associé coaxialement un galet de forme trapézoïdale agissant durant le mouvement transver-

sal du corps de découpe (72a) sur une bande (83) similaire à celle (53) utilisée pour l'outil de coupe (38).

22. Machine selon les revendications 1 et 21, comportant une paire d'outils de découpe (78) caractérisés en ce qu'ils interfèrent avec deux lames d'appui (84a, 84b) qui sont montées de façon amovible sur le plan de repos du carton ondulé, lesdites lames d'appui étant positionnées de façon à permettre l'auto-affutage des couteaux rotatifs (78) et à chacun des cadres caisson (73a, 73b) sont associés vers le haut des moyens (86, 89) permettant de maintenir lesdites lames rotatives (78) dans leur siège de coupe, les dits moyens étant similaires à ceux (55, 58) utilisés dans l'outil de coupe (38).

23. Machine selon les revendications 1, 22 et 23, comportant des cadres caisson (73a, 73b) qui sont caractérisés en ce qu'ils comportent un aimant (91) disposé à la partie arrière de la zone de travail des lames (78), lequel aimant contrôle le mouvement, selon un axe vertical, d'une barrette de faible dimension (92) à laquelle un bras métallique (93) est monté à pivotement étant orienté vers le bas, ledit bras métallique étant disposé selon un angle et dans un plan qui coupe celui reliant les paires de lames (78), l'extrémité dudit bras, par sa partie adjacente au point de pivotement de la barre, étant monté lui-même librement à pivotement par rapport au cadre, tandis que à l'autre extrémité une lame sousjacent (94) est associée et est orientée vers le couteau (78) qui procure la découpe.

24. Machine selon les revendications qui précèdent, comportant un sixième poste caractérisé en ce qu'il comporte deux paires de rouleaux transversaux (95a, 95b) adaptés à assurer l'entraînement vers l'extérieur du carton, l'un (95a) desdits rouleaux étant motorisé au moyen d'une courroie crantée (96) associée à un rouage denté correspondant (97a) qui prend son mouvement d'un rouleau de traction de carton ondulé (69) disposé à proximité d'un ensemble de scarification (59), le mouvement étant transmis aux autres rouleaux (95a, 95b) au moyen de pignons (97b, 97c).

25. Machine selon les revendications 1 et 24, caractérisée en ce qu'elle comporte un jeu de rouleaux motorisés (98) pour le transport, l'encollage et le pliage des volets du carton (3).

26. Machine selon les revendications précédentes, caractérisée en ce qu'elle comporte des moyens (104) pour la programmation, la commande et le contrôle des phases de traitement de la machine, et qui sont caractérisés en ce qu'ils comportent une unité centrale logique contenue dans un carter (105) comportant un clavier (106), un moniteur (107), une imprimante (108) et un panneau de boutons (109), ladite unité logique centrale effectuant, au moyen de palpeurs et contacteurs positionnés aux différents postes, la commande et le contrôle des différentes phases du procédé.

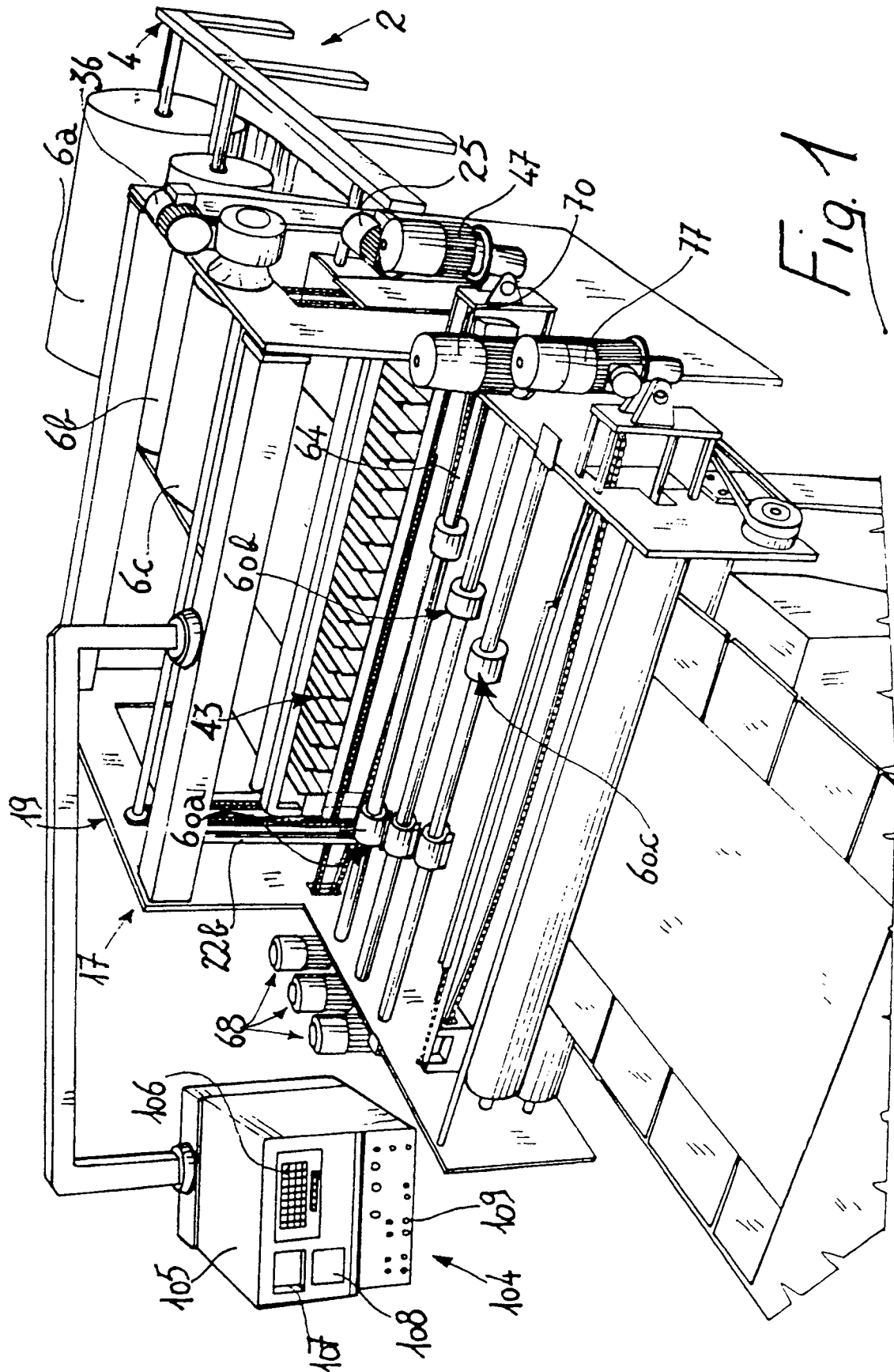
27. Machine selon les revendications qui précèdent, comportant un premier poste (2) caractérisé par un conteneur oscillant (110) associé à une poutre du cadre de supportage (4) des rouleaux de carton (6a, 6b, 6c) qui contient une substance adhésive (111) susceptible d'être appliquée au carton sousjacent (3) au moyen de brosses convenables (112) débordant vers le bas depuis lesdits conteneurs.

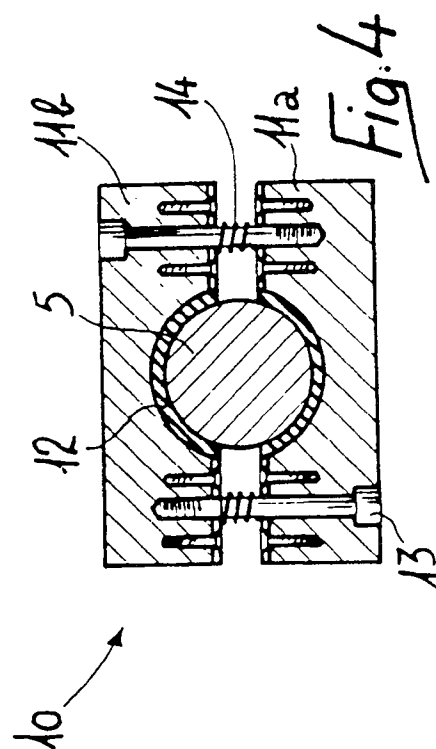
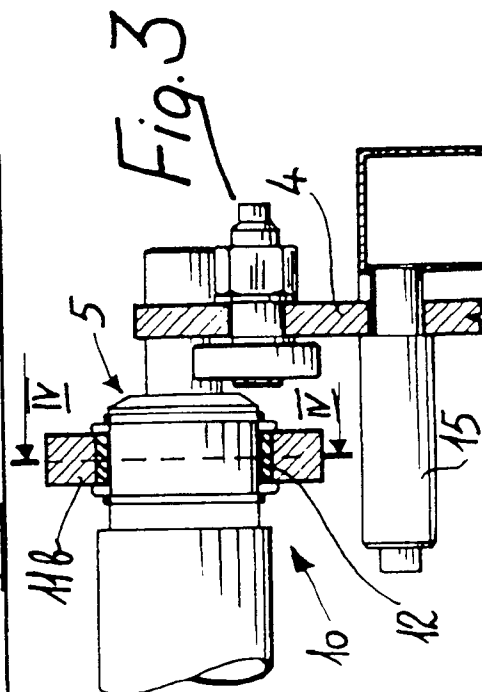
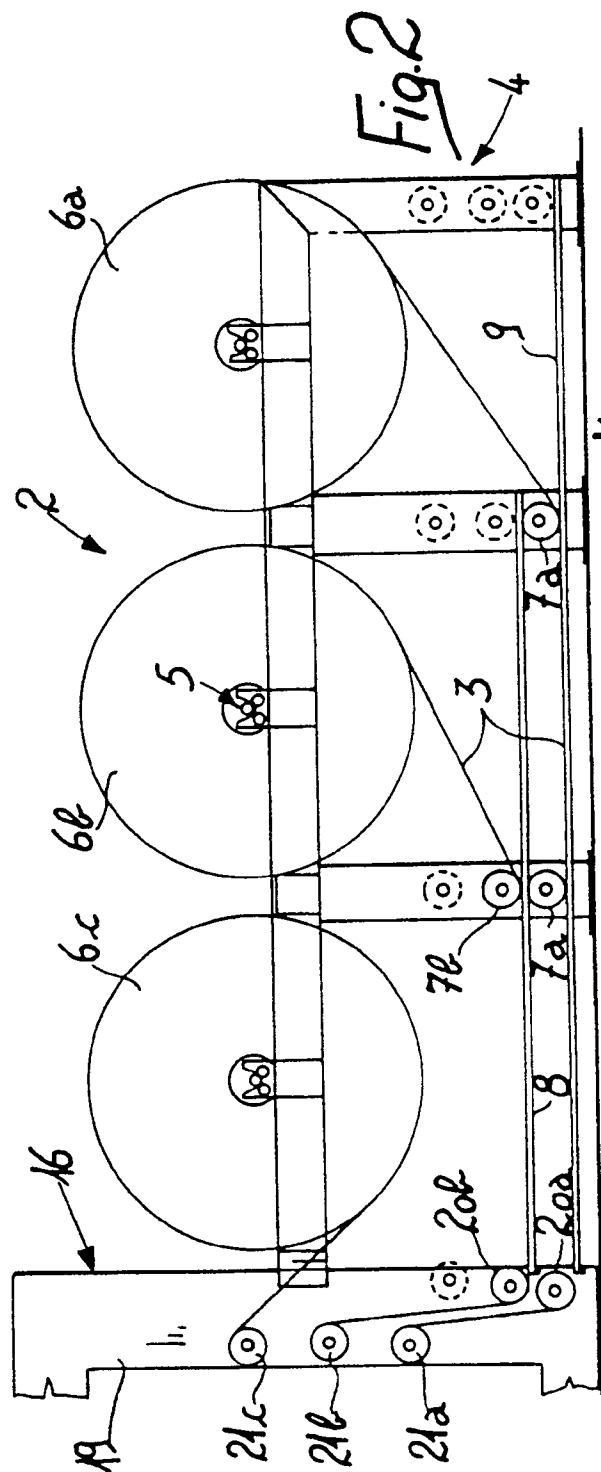
28. Machines selon les revendications qui précèdent, comportant un premier poste (2) caractérisé en ce qu'il est composé de moyens (4 à 10, 20, 21) pour l'alimentation en carton plissé.

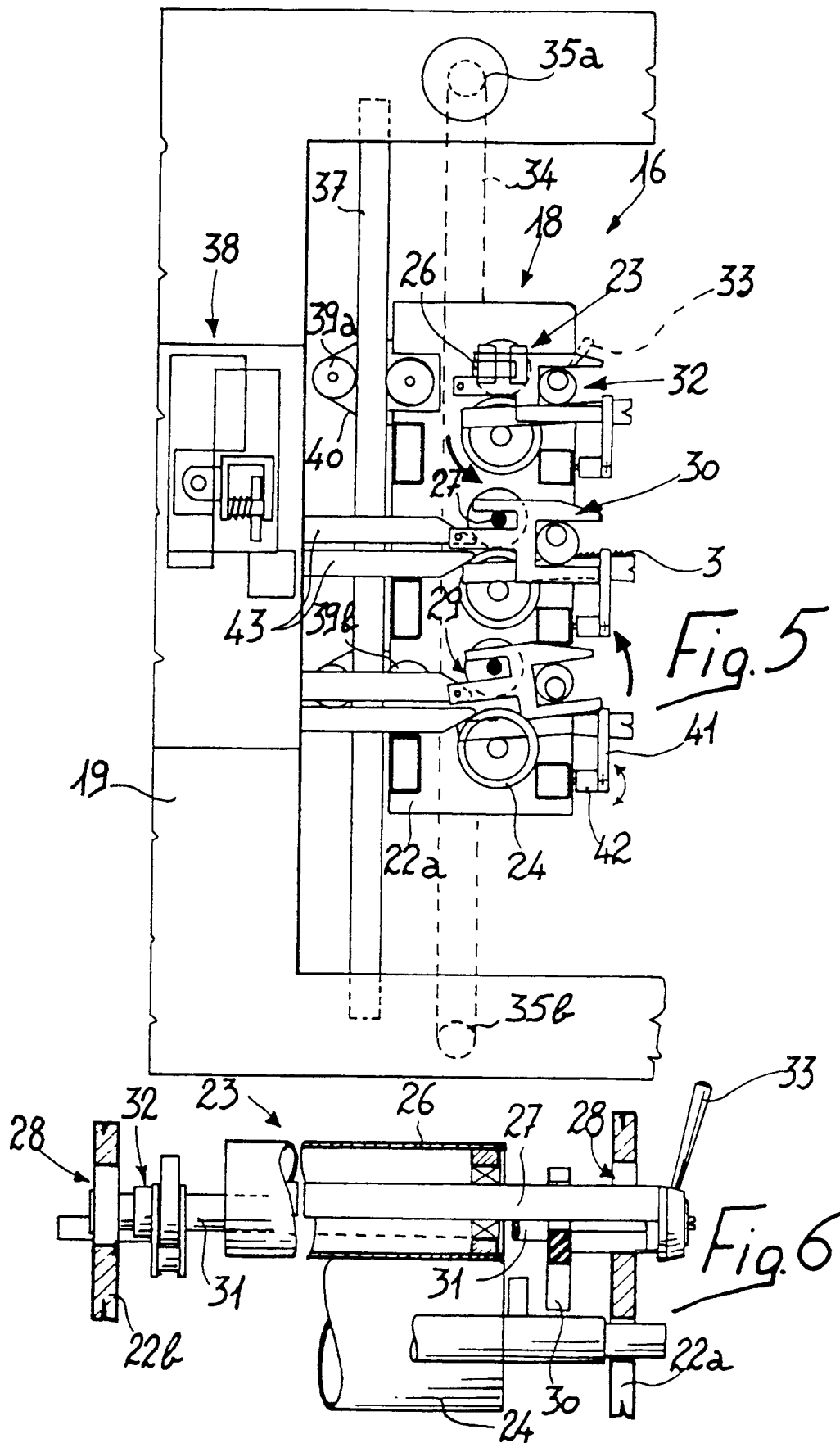
29. Machine selon la revendication qui précède, comportant un premier poste (2) caractérisé en ce qu'il est composé de moyens (4 à 10, 20, 21) pour l'alimentation en feuilles de carton ondulé individuelles.

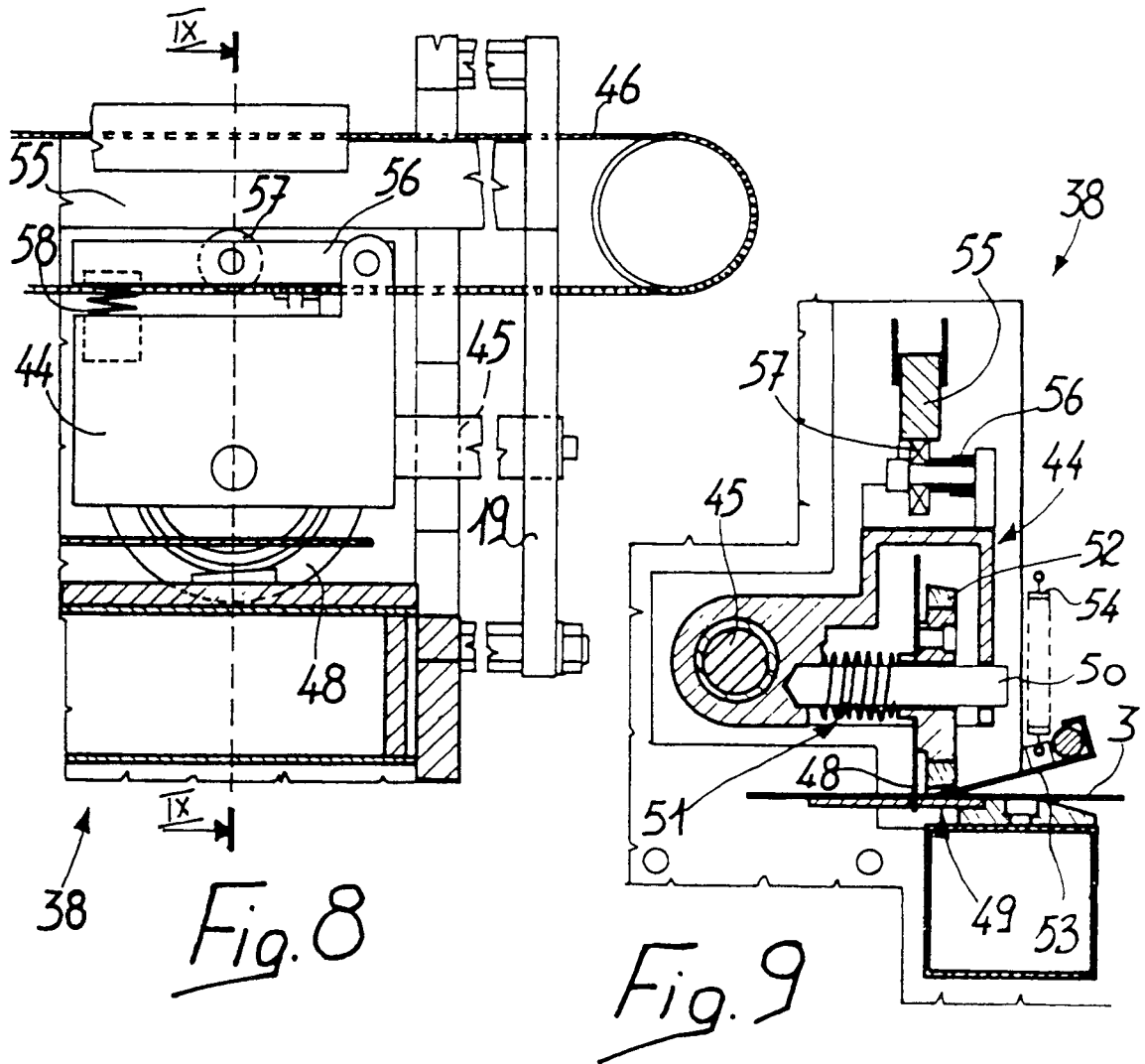
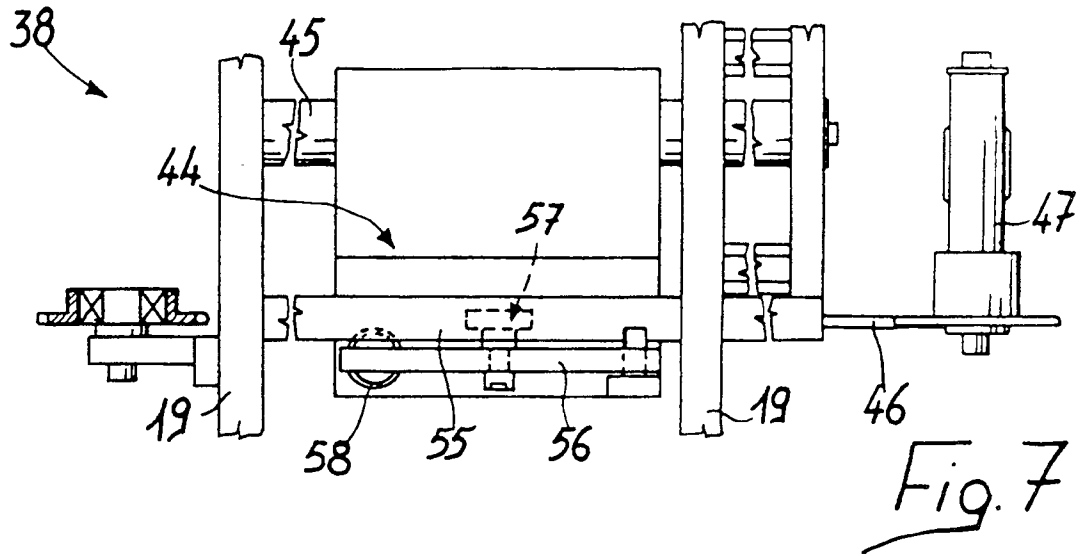
30. Machine selon les revendications 1, 8 et 9, caractérisée en ce que ledit contre-rouleau (26) est prévu avec un axe (27) aux extrémités duquel sont associés deux éléments excentriques (114, 115) montés à rotation sur les deux plaques latérales (22a, 22b), la position angulaire desdits deux éléments excentriques étant ajustable à des positions préréglées au moyen d'un levier (33).

31. Machine selon les revendications 1, 11 et 12, caractérisée en ce que au moins l'une (22b) desdites deux plaques latérales (22a, 22b) comporte une paire d'oreilles (40) entre lesquelles est disposé à coulissement un coulisseau (117), à chaque coulisseau sont associés en rotation lesdites roue (39a) et poulie (39b) qui réagissent par rapport à l'élément de guidage (37), lesdits coulisseaux étant reliés entre eux par une membrure (118), à la partie centrale de laquelle est associée l'extrémité de la tige (119) d'un vérin (120), lequel vérin (120) est couplé au moins à l'une (22b) des deux dites plaques latérales (22a, 22b).









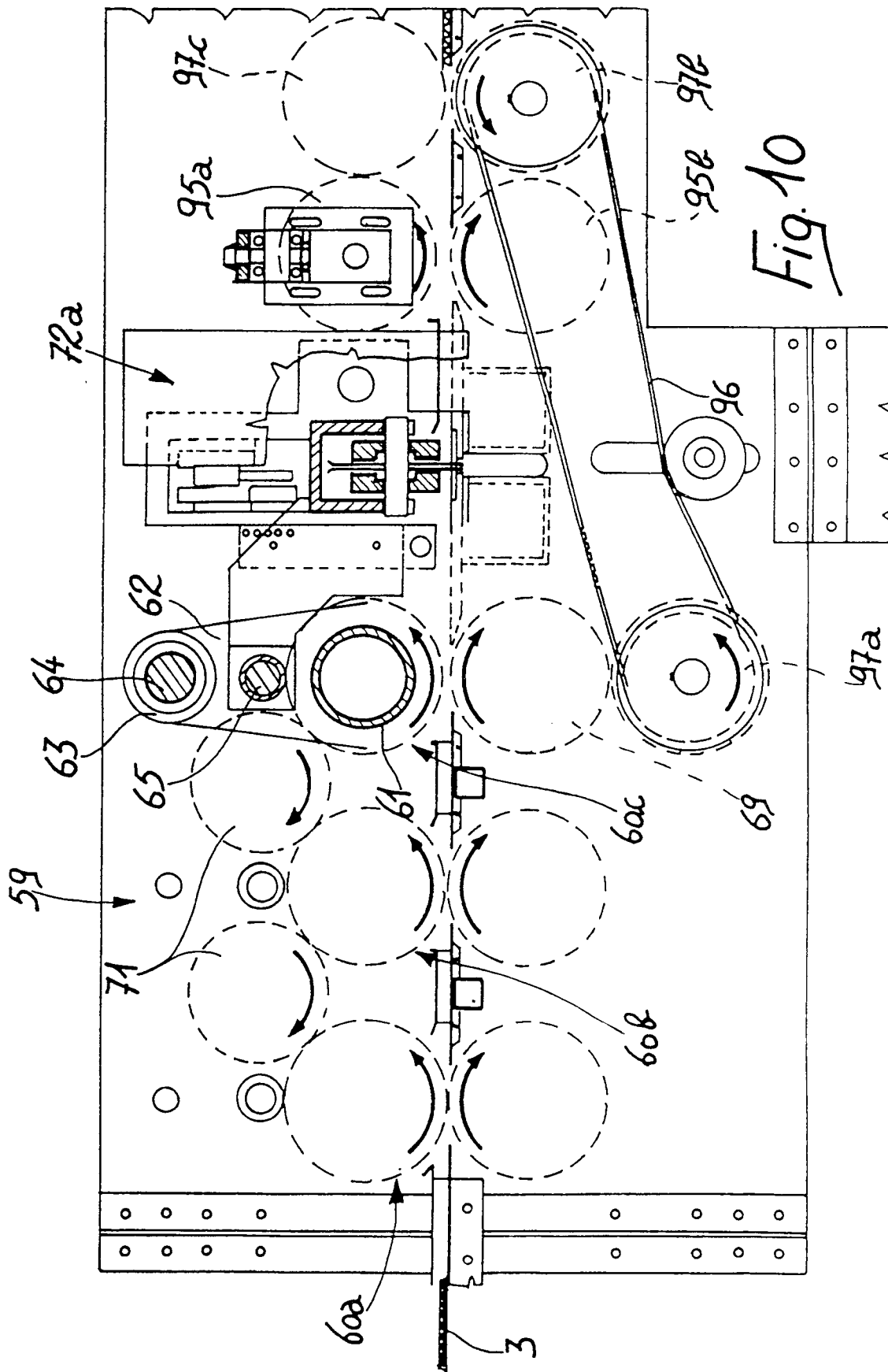


Fig. 10

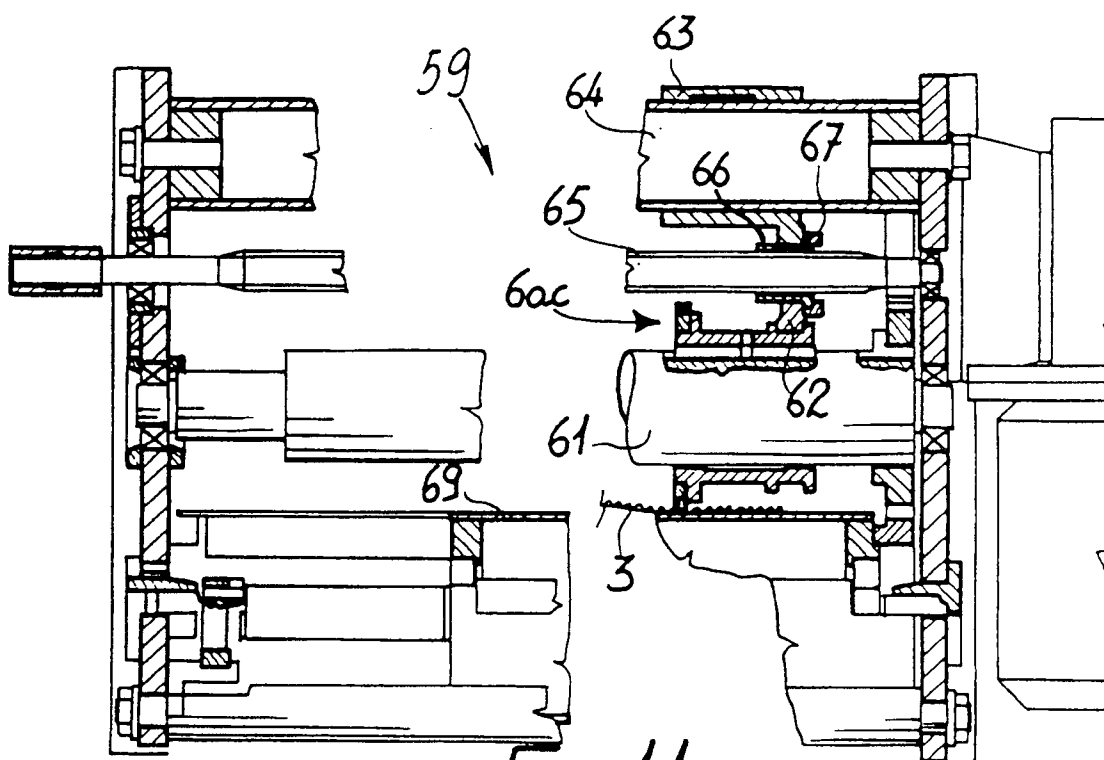


Fig. 11

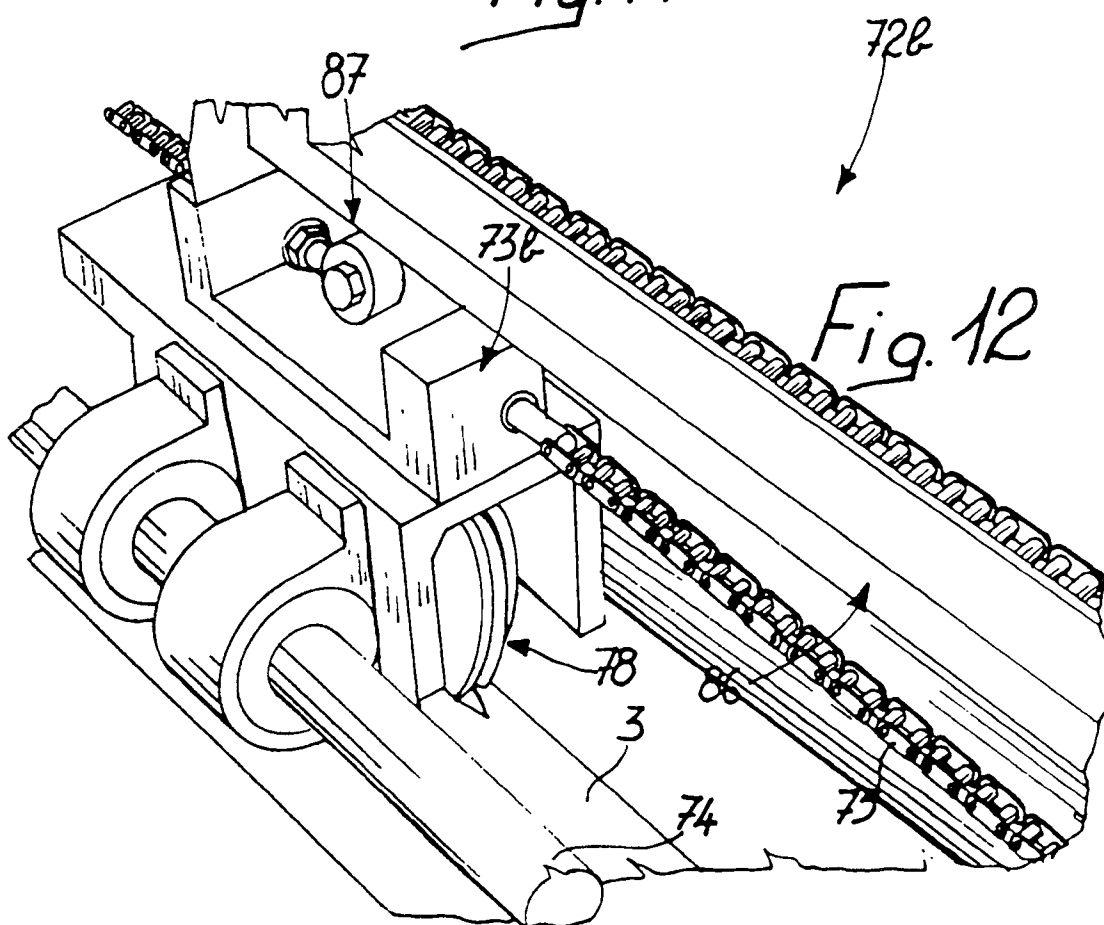
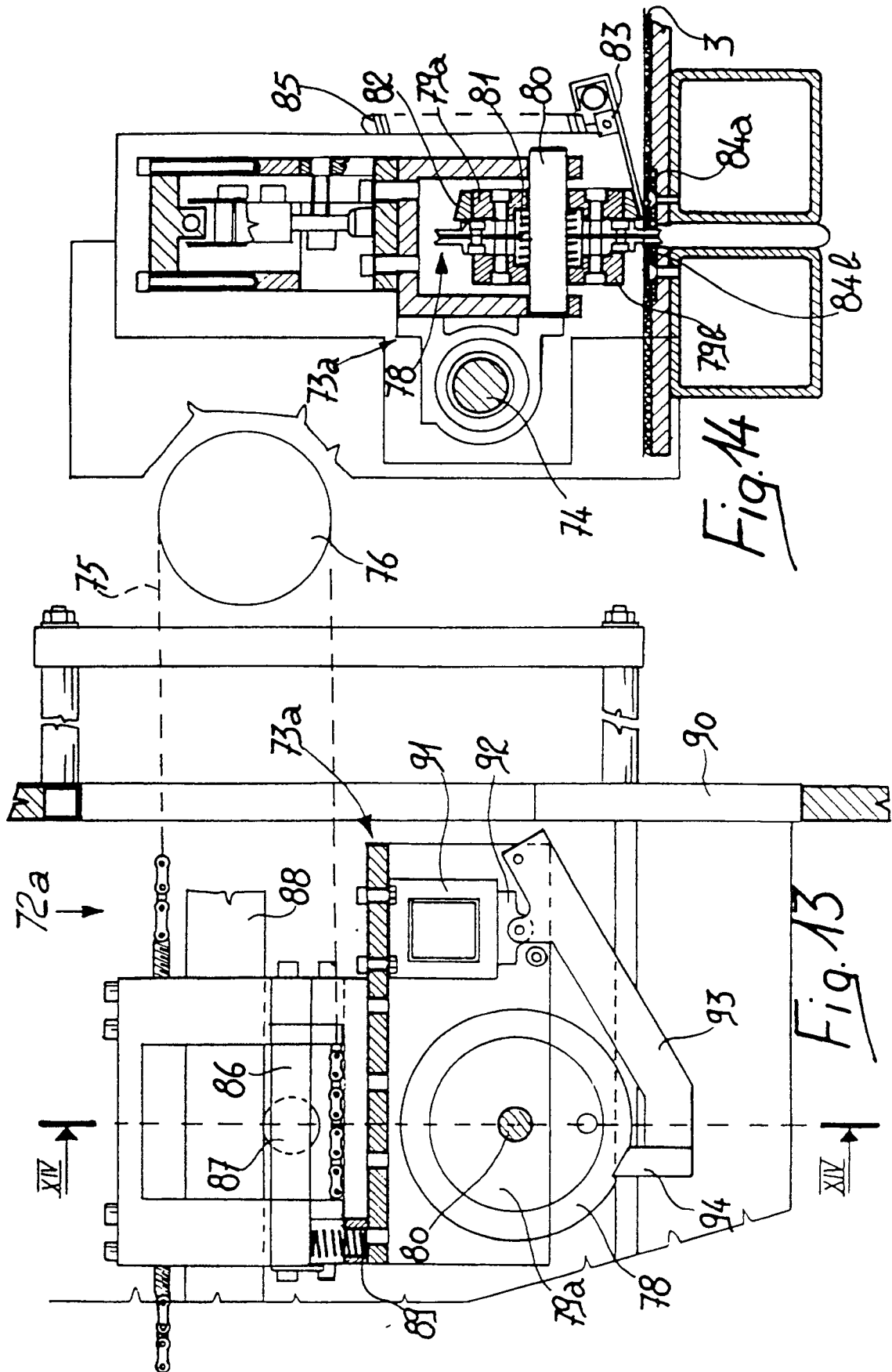
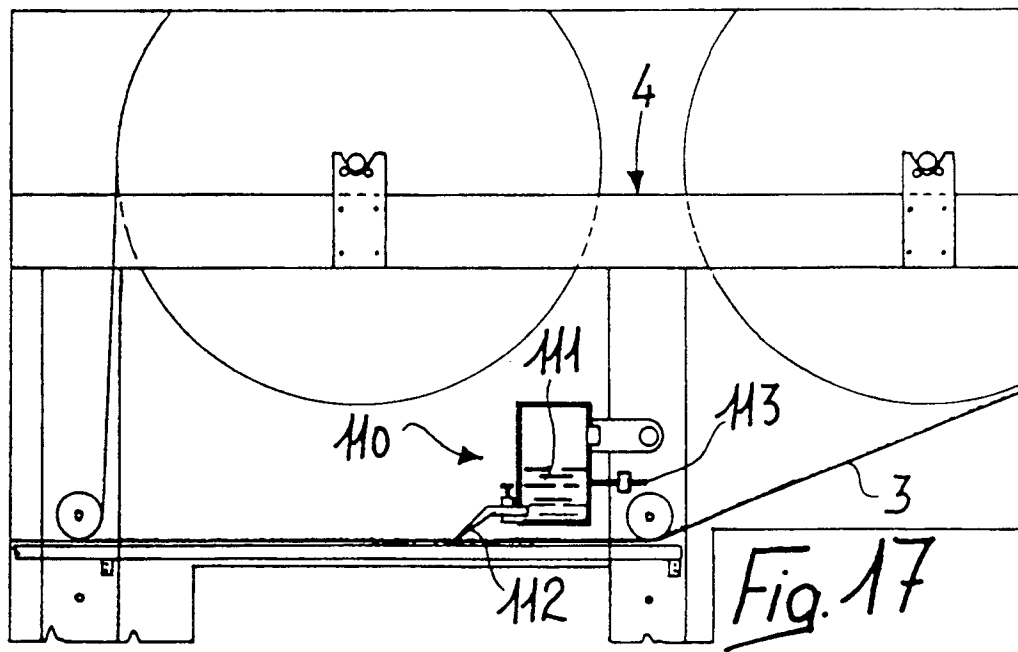
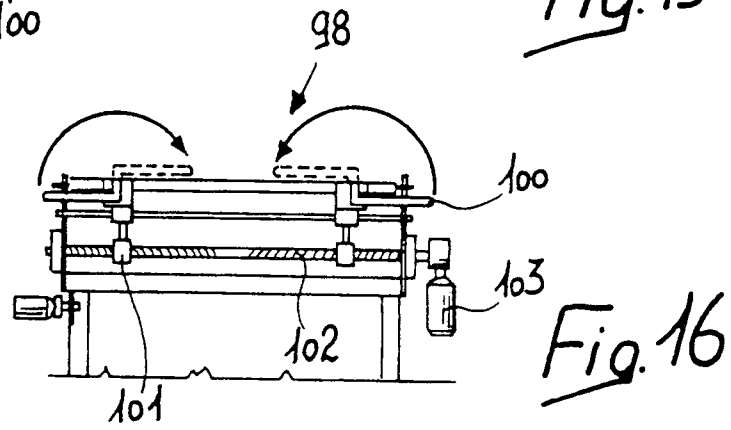
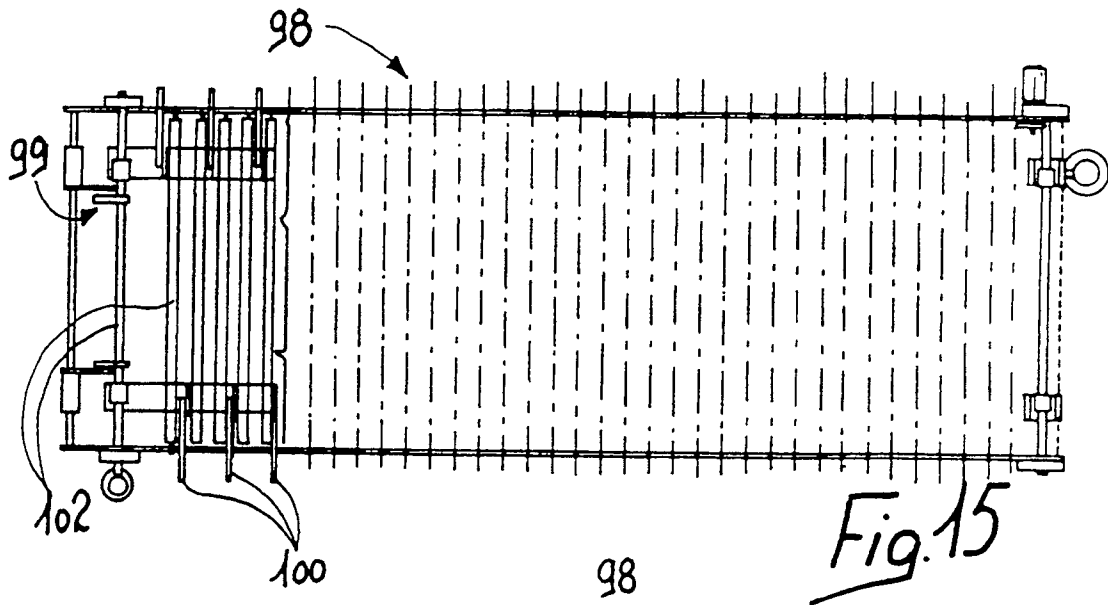


Fig. 12





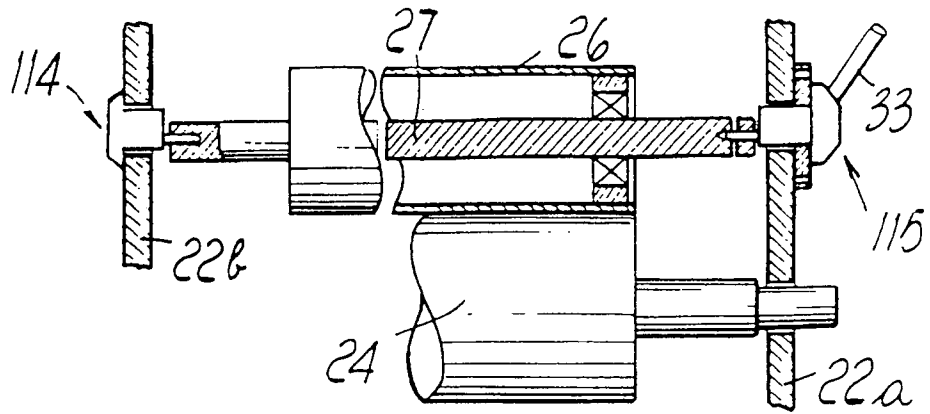


Fig. 18

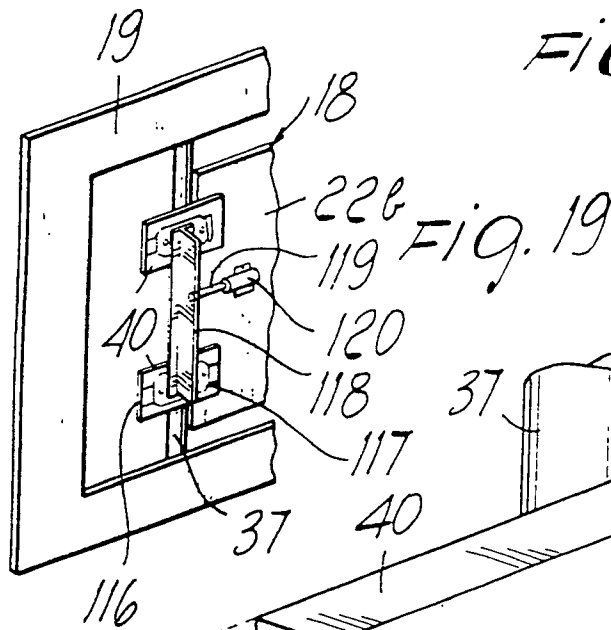


Fig. 19

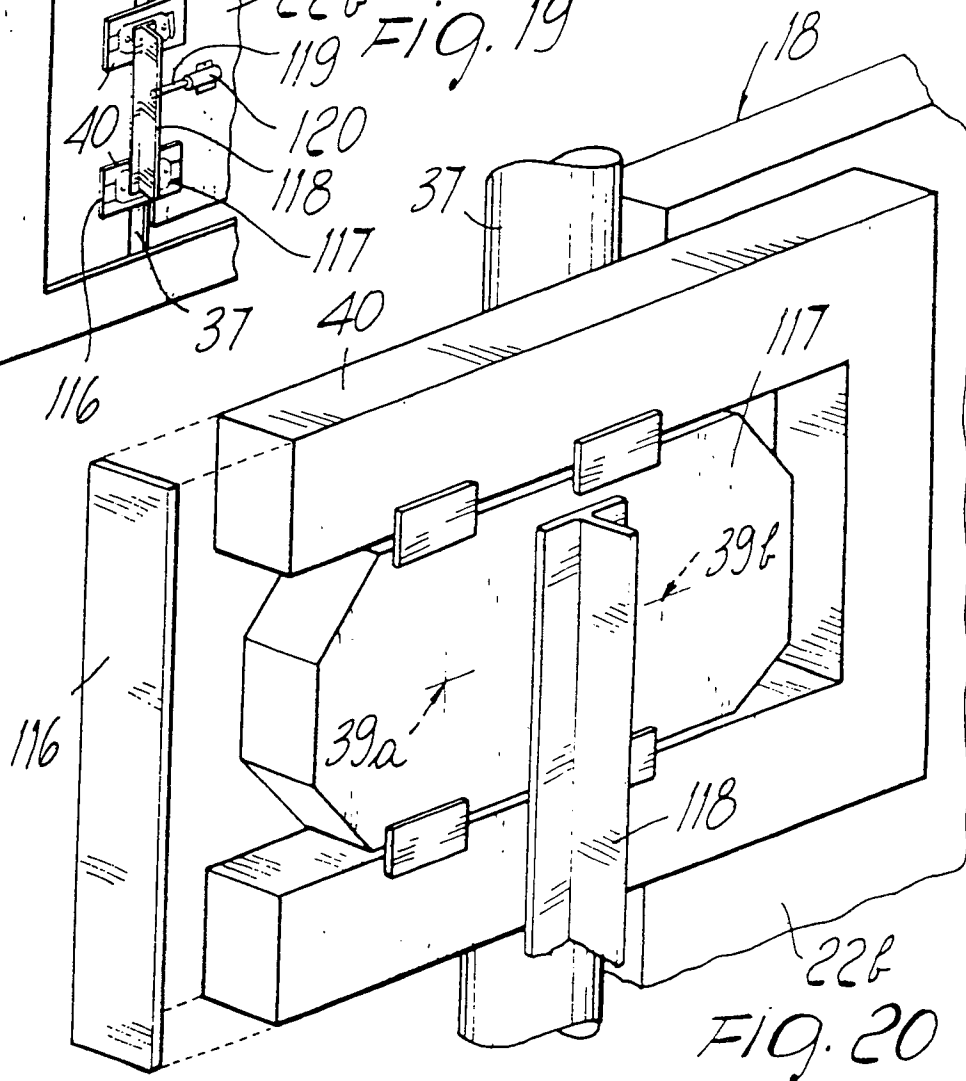


Fig. 20