



(11) **EP 1 908 714 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
07.04.2010 Bulletin 2010/14

(51) Int Cl.:
B65H 5/30 (2006.01)

(21) Application number: **07445035.4**

(22) Date of filing: **27.09.2007**

(54) **A device for opening folded sheets during transportation**

Vorrichtung zur Öffnung von Falzbögen während deren Transport

Dispositif pour l'ouverture de feuilles pliées pendant le transport

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC MT NL PL PT RO SE SI SK TR

(30) Priority: **06.10.2006 SE 0602141**

(43) Date of publication of application:
09.04.2008 Bulletin 2008/15

(73) Proprietor: **Idab Wamac International AB**
575 22 Eksjö (SE)

(72) Inventor: **Svensson, Göte**
575 91 Eksjö (SE)

(74) Representative: **Nielsen, Leif**
Patrade A/S
Fredens Torv 3A
8000 Århus C (DK)

(56) References cited:
EP-A- 0 596 581 WO-A-91/04934
DE-A1- 1 436 585 US-A- 3 450 400
US-A1- 2004 061 271

EP 1 908 714 B1

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

Description

[0001] The invention relates to a device for opening folders of the kind that is seen in the preamble of claim 1 and described in WO 91/04934.

[0002] SE-C-464757 or WO 91/04934 describes a device by means of which folders can be opened during controlled transportation piece by piece, for feeding one or more supplements into an opened folder. In that connection, there is utilized an endless conveyor carrying generally V-shaped pockets, each one of which receives a folder, the back of the folder being placed in the bottom of the pocket. At the outer free border part thereof, at least one wall of the pocket has one or more controllable clips for gripping of one tail part of the opened folder.

[0003] According to a technique known from practice, said folders are formed so that one half thereof is somewhat longer than the other half as counted from the back. The clips can only grip the outermost end of the longer half of the folder, and in this way, the shorter half of the folder can be turned away from the longer half of the folder, for instance, by the fact that the pocket is turned so that the shorter half of the folder, under the action of the gravity, will rest against the adjacent wall of the pocket. Possibly, the shorter half of the folder may also be gripped by means of additional controllable grippers on the adjacent other pocket wall. One or more supplements can now be fed into the accordingly opened folder.

[0004] Possibly, there may be a gripper clip at the bottom of the pocket to retain the folder in the pocket, when the pocket has such an orientation (for instance, facing downward) that there is a risk that the folder otherwise could fall out of the pocket.

[0005] A folder conveyor having such clips or controllable grippers may run synchronously with the pocket conveyor.

[0006] The opening of each folder is a critical part of the process. In practice, said folders may consist of newspapers that come from a newspaper press with a flow of 10-15 newspapers per second, and then it may be desirable to carry out 10-15 folder opening operations per second to be able to supply each newspaper in the flow from the press with one or more supplements. Even if the insertion process is carried out on a flow of newspapers off-line, it is desirable to be able to carry out the folder opening at a correspondingly high pace.

[0007] Therefore, an object of the invention is to provide a technique that allows opening folders at a folder-tail edge at a high pace, while said folders are transported piece by piece by a conveyor at a high flow, also when the folder sheets are entirely overlapping at the folder tail.

[0008] DE-A-1436585 reveals an insertion technique in which folders, during separate transportation in the respective pockets, are opened for insertion by clamping the folder against a pocket wall and by sticking a wedge into the side edge of the folder at a preselected distance from the supporting pocket wall. In this way, the folder can be opened at a well-determined position, even if the

sheets of the folder are mutually equal and entirely overlap each other. A drawback is that the wedge only can have a small width, and that the gap between the folder pages, in the area where the wedge is stuck in, only slowly propagates along the free folder edges, since the wedge should have a small wedge angle and therefore has to be introduced far into the folder to cause a propagation of the gap. When the gap eventually has become opened also at the tail of the folder, a thread of a screw is introduced between the opened folder portions in order to further separate the same and hold them apart during the following transportation of the folders to a station where a supplement is introduced into the opened folder. The technique according to DE-A-1436585 is slow by nature and can therefore not be used for the purpose according to the invention.

[0009] US 3,450,400 A shows an apparatus for stuffing printed matter with at least one insert or supplement, where an opening action is exerted by applying an opening force to a lateral open edge along the thickness of the jacket section.

[0010] EP 0,596,581 A2 shows a device for opening the pages of a printed product by separation of edges of a group of pages.

[0011] US 2004/0061271 A1 shows an opening device for selectively opening folded printed products.

[0012] The object is attained by the invention.

[0013] The invention is defined in the appended claims.

[0014] Thus, in one embodiment, the invention relates to a device for opening folders during transportation comprising a folder conveyor having an endless chain having folder pockets that are arranged mutually equidistantly and have a leading wall each running ahead in the direction of transportation and, at a free edge, having at least one clip for clamping a tail portion of a folder part against said leading wall, openers being arranged to run each close to the free edge of the leading wall of a pocket along at least a part of the path of motion thereof, each opener comprising a clamping jaw arranged to clamp the folder against a support, and a wedge that has a tip and that is displaceable for introducing the tip into a tail end of the folder at a selected distance from the support.

[0015] The wedge has two guide edges that diverge from the wedge tip in a direction opposite the drive-in direction of the wedge into the folder, away from each other in the plane of the folder, as well as away from the support so that a folder part deflected upon the driving-in of the wedge is supported by the two guide edges thereby allowing the two non-deflected folder tail parts to be exposed in order to be fixed to the leading wall of the pocket by the at least one clip. The clamping jaw of the opener is preferably arranged to be biased against the support in order to hold together the folder tail in the central part thereof where the wedge tip is driven-in. The wedge is driven-in so that the two guide edges thereof support the deflected folder part in separated positions along the folder tail, and at a distance from the folder

edge (within the extension area of the folder), while the clamping jaw holds the folder compressed at the folder-tail edge. In this way, the deflected folder part will, along the folder tail, form two triangular parts, the tips of which are situated at the transversally central edge of the folder tail and at the clamping jaw. In order to further support a controlled turning-up of the triangular edge portions of the deflected folder part, the opener may also comprise additional clamping jaws that are pressed against the folder (and offer a clamping of the folder against the leading wall) at a position above the deflection line of the triangular folder part that, in that connection, is established in the maximally introduced state of the wedge. Thus, said additional clamping jaws are separated from the central part centre of the folder, on both sides thereof. In the areas below the bent-up triangular folder parts, the clip of the leading wall may be reliably pressed against the folder part situated closest to the leading wall. The continued opening of the folder may, for instance, be effected such as has been disclosed in connection with the device according to SE-C-464757. The insertion into, and the transportation away of the folder including input supplements can also be effected according to prior art, for instance, such as it is seen in SE-C-464757.

[0016] An embodiment of the invention will now be described by way of examples, reference being made to the appended drawing.

- Fig. 1 schematically shows a side view of an insertion apparatus.
- Fig. 2 schematically shows a section taken along the line A-A in Fig. 1.
- Fig. 3 shows a gripper of a gripper conveyor by means of which folders can be transported through an insertion apparatus according to the invention.
- Fig. 4 schematically shows a pocket included in the insertion apparatus.
- Fig. 5 shows a variant of an insertion apparatus, having another transportation of the folders that are provided with supplements.
- Fig. 6 shows a schematic side view of a folder opener that engages with a folder tail.
- Fig. 7 shows a schematic section view taken along the line VII-VII in Fig. 6.
- Fig. 8 shows a view corresponding to Fig. 7 when the wedge of the opener has been driven into the folder tail.
- Fig. 9 illustrates a schematic section taken along the line IX-IX in Fig. 7.
- Fig. 10 illustrates a schematic view taken along the line X-X in Fig. 8.
- Fig. 11 shows a planar view of the wedge and arms of the opener.
- Fig. 12 shows a view taken along the line XII-XII in Fig. 11.
- Fig. 13 shows a side view taken along XIII-XIII in Fig. 11.

[0017] The device according to Figs. 1-4 corresponds substantially to the one according to Figs. 1-4 in SE-C-464757, but has in Figs. 1 and 2 been supplemented with an additional conveyor 90 that carries openers according to the invention for folders transported in the insertion apparatus. A conveyor 90 is also shown in connection with the apparatus illustrated in Fig. 5.

[0018] For the purpose of understanding the following explanation on the operation of the device according to an embodiment of the invention, it should be understood that a folder 20, see for example Figs. 3 and 4, has a "back" and a "tail". The "back" is the portion of the folder 20 being held by the gripper 45 or 45' see Figs. 1 to 5. The "tail" 24 is the opposite edge of the folder 20 which in Figs. 1, 4 and 5 is illustrated as being fixed to the leading front wall 21 by the clip 23.

[0019] Fig. 1 schematically illustrates an endless conveyor 10 comprising a chain 11 that runs over two chain wheels 12, 13, at least one of which is driven for rotation in the direction indicated. The conveyor 10 contains two equal parts displaced in the axial direction of the wheels 12, 13, each one of the parts is a series of pockets 14 that mouth outward away from the chain 11 and extend transverse to the longitudinal direction of the chain 11. Each pocket 14 consists of a leading wall 21 and a trailing wall 22, and a clip 23 at the outer end of the leading wall 21. An endless conveyor 40 has controllable grippers 45 at a mutual distance, corresponding to the distance between adjacent pockets 14 of the chain 10. The endless conveyor 40 is guided by a shown guide, so that the grippers 45 run along and close by the path of the chain 11 along a part of the running path thereof such as is shown. Each gripper 45 carries the back of a folder 20 and converges toward the chain 11 so that each folder is lifted into an appurtenant pocket. Correspondingly, the endless conveyor 40 and the grippers 45 may leave the pockets by the fact that the endless conveyor 40 diverges from the conveyor 10. While the pockets are turned substantially over the horizontal plane, the grippers 45 can be opened. A supplement 61 can be fed out from a storage 60 and be introduced into an opened folder in a pocket that is facing upward so that the gripper 45 in question can be open, whereby the supplement 61 can be introduced up to the back of the folder and thereby reliably be retained in the folder during further transportation by means of the gripper 45. The conveyor 40 may be a conveyor that picks up the folders (newspapers) from a printing press or the corresponding production area.

[0020] Fig. 5 shows an embodiment where the grippers 45' are fixedly attached on the conveyor 10 at the bottom area of the pockets. In this case, folders 20 are fed down into passing pockets by means of a feeding-in device 200. Furthermore, two feeding-in devices 62, 63 are shown for supplements, and in addition, a device 70 is illustrated that after the opening of the clip 23 closes the folder including supplements and puts the folder in a pre-determined position, for instance, so that it abuts against the trailing rear wall 22 of the pocket 14. In this way, an

unloading conveyor 80 having grippers 83 can work synchronously with the conveyor 10 and grip the closed folders including the supplements in the tail for transportation away.

[0021] In Figs. 1 and 5, it can be assumed, that the pockets, as facing downward, have, the leading walls 21 thereof situated approximately in the vertical plane, so that the unopened folder tends to lie next to this wall 21. It can be seen that an endless conveyor 90 carries openers 91, which have a mutual distance corresponding to the pitch between the pockets 14, the conveyor 90 being synchronized with the conveyor 11 so that an opener 91 is placed close by the outer end of the leading wall 21 of each pocket 14 and synchronously accompanies the same a chosen distance.

[0022] Figs. 2-4 illustrate that the conveyor 11 may contain two mutually equal conveyor parts 14a and 14b, wherein the grippers 45 may run between said parts 14a, 14b.

[0023] In Fig. 3, it can be seen that the gripper comprises a support chute 46, the bottom line 50 of which corresponds to the bottom line of the pockets 14. The grippers 45 further comprise a movable clamping jaw 48, which co-operates with a stationary clamping jaw 47 that is shown to be a wall in the pocket. Possibly, the walls of the pockets may be mounted around spindles 49 at the bottom of the pocket, and furthermore, the walls of the pockets may be provided with drivers 25, 26 that co-operate with control members that control the turning motion of the walls 21, 22 during transportation, if desired.

[0024] The opener conveyor 90 may be assumed to be located between the conveyor parts 10a, 10b, such as is illustrated in Fig. 2.

[0025] Fig. 6 schematically illustrates an opener 91 of the conveyor 90. In Fig. 6, the tail end 24 of a folder 20 can be seen. The folder 20 abuts against the leading wall 21, which lies in the plane indicated. The opener 91 comprises a body 94, which is fitted into the transportation chain 92. Via a pivot mounting 109, the body 94 carries an arm 110, which at one end is provided with a support plate 111 and on the other end with a tracer 112, for instance, a tracer roller that is guided by a guiding path, so that the support plate 111 can be put under in order to allow the folder tail 24 to come into and out of the position shown without being blocked by the support plate 111. Furthermore, the support plate 111 should assume an exact end position, which is shown in Fig. 6 and which preferably lies in the vicinity of the plane indicated. In addition, the body 94 carries via a pivot mounting 119 an arm 120, which is turnable into and out of the shown position. The arm 120 is shown to carry a clamping jaw 121, which is connected to the arm 120 via a pivot mounting 122. A spring 123 (see Fig. 9) resting against the arm 120 biases the clamping jaw 121 into an outer end position. The pivot mounting 122 and the spring 123 allow the clamping jaw 121 to assume end positions at different distances from the support plate 111 when the arms 110, 120 have assumed the end positions thereof shown.

[0026] The arm 120 may be turned around the mounting 119 into a folded-away position to allow the folder tail 24 to be easier introducible into the shown position in relation to the body 94.

5 [0027] The arm 120 is shown to have a tracer 124, for instance, in the form of a roller, which is guided by an appurtenant guiding path, not shown, which is formed to bring about the different turning positions of the arm 120 during transportation.

10 [0028] The arm 120 of the opener and possibly also the arm 110 can be turned away to allow the opener to diverge away from the path of motion of the pockets, without mutual interference. The free folder part 20B (see Fig. 5) comes into abutment against the trailing wall 22 (see Fig. 5) and turns up toward the horizontal plane, i.e., at the left end of the conveyor according to, for instance, Fig. 5. A clip (not shown) at the outer edge of the trailing wall 22 can then clamp the tail end of the free folder part 20B in a known manner *per se*, if it is desirable to hold
15 both end edges of the folder parts 20A, 20B retained at the pocket walls during an insertion operation.

[0029] In, for instance, Fig. 5, it can be seen that the conveyor 90 comprises an endless transportation chain 92 that runs around two chain wheels 93, at least one of
20 which is driven. One run of the chain extends along the path of motion of the free edges of downwardly turned pockets, and the pitch between the openers 91 corresponds to the pitch between the pockets 14.

[0030] Furthermore (see Fig. 6), the body 94 is shown to have a guide 130 for a bar 131, which thereby is movable in a direction parallel to the support surface of the support plate 111 and thereby parallel to the main surface of the folder. The bar 131 is, at one end thereof, provided with a wedge 132, having a leading lip 134 (see Fig. 13).
25 The leading lip 134 is preferably parallel to the support surface of the support plate 111 and essentially perpendicular to the linear direction of motion of the bar 131. The front surface 133 of the wedge 132 that is facing the support plate 111 is preferably parallel to the support surface of the support plate. The bar 131 is shown to have a tracer 139, in the form of a roller that is guided by a guiding path (not shown) along the path of motion of the opener and the pocket, whereby the bar 131 is imparted a chosen reciprocating motion by which the wedge 132 is driven into the folder tail 24. In this way, the wedge 132 initiates an opening of the folder tail 24. By adjusting the distance along the chain of the conveyor 90 between the support plate 111 and the wedge 132, it is possible to exactly select the position for the penetration of the
30 wedge into the folder tail, i.e., between which pages the folder should be split. The wedge 132 penetrates into the folder tail 24 between the support plate 111 and the spring-loaded clamping jaw 121. In Fig. 9, it can be seen that the clamping jaw 121 holds together the folder tail
35 also when the wedge 132 with the shank thereof connecting thereto is driven into the folder tail.

[0031] Figs. 6, 11, it can be understood that the wedge 132 has a tip 138 that is thin and has a leading lip 134

(see Fig. 13) that is parallel to the extension plane of the folder. The wedge 132 has furthermore two arms 136 that extend toward opposite directions from the tip part, and away from the plane defined by the leading wall 21. The arms 136 have, on the upper sides thereof facing the folder tail, a guide edge 137 each. Said guide edges extend from the tip 138 and are substantially symmetrically diverging out of the plane of the leading wall 21 and away from the tip and the bar 131 that is shown to extend in the displacement direction of the wedge. The wedge 132 is shown to be carried by the bar 131 that lies in a symmetry plane to the wedge, and the guide edges 137 are accordingly mirror-symmetrical in relation to said plane. By the fact that the arms 136, in the portions thereof closest to the bar 131, extend substantially in the plane of the folder and not until at a relatively great distance from the bar 131 have portions that extend transverse to the plane of the folder, such that a tail part of the folder 20 due to the interaction with the guide edges 137 will be deflected a relatively great distance out of the plane in which the wedge tip 138 is arranged. The guide edges 137 try to roll up the outer folder tail part 24A when the guide edges 137 reach a level above the folder tail as viewed in Fig. 7, and since the effective parts of the guide edges 137 are at a relatively great distance from each other, a stable bending-up of the outer folder tail part 24A can be attained. In this position, the clips 23 can be driven into engagement with the folder tail part 24B. By the fact that the clamping jaw 121 and the support 111 hold together the folder tail all the way to the lower edge thereof, also when the central part of the wedge 132 is introduced in the intermediate folder tail part, the bent-up outer folder tail parts 24A will assume the shape of triangular tongues, such as is shown in Fig. 8. In this way, the bent-up outer folder tail parts 24A are further stabilized. Possibly one may, such as is schematically illustrated at 144 in Fig. 8, temporary press supporting shoulders against the free main surface of the folder in the area above the bent-up outer folder tail part 24A and so that the same experience an additional stabilization during the period of time when the clip 23 should be pressed. As soon as the clips 23 have gripped the folder tail parts 24B, the wedge 132 can be retracted and the opener has fulfilled the work thereof. In Fig. 13, it can be seen that the wedge tip 138 has a small width and a sharp leading lip 134 extending parallel to the extension plane of the folder, the side of the wedge tip facing the leading wall 21 being parallel to the same while the corresponding surface 135 of the wedge tip converges in relation to the front surface 133 toward the leading lip 134.

Claims

1. A device for opening folders (20) during transportation, said folders (20) having a front and a back side and a thickness comprising a plurality of pages between said front and back sides, limited by side edges,

whereby one side edge is defined as the back of the folder and the opposing side edge is defined as the folder tail (24), the device comprising a folder conveyor (10) having an end-less chain (11) with a series of folder pockets (14) mouthing outward away from the chain (11) and arranged at a mutual distance from each other, each folder pocket (14) having a leading wall (21) running ahead in the direction of transportation and, at a free edge of the leading wall where a folder tail (24) will be situated, at least one clip (23) for clamping a non-deflected tail portion (24B) of a folder against the leading wall, **characterized in that** the device further comprises openers (91) being arranged to run each close to a central part of the free edge of the leading wall (21) of a pocket along at least a part of the path of motion thereof, the pitch between the openers (91) corresponding to the pitch between the pockets (14), each opener (91) comprising a body (94) having a clamping jaw (121) and a support (111), the clamping jaw (121) being arranged, such that when a gripper (45, 45') carrying the back of a folder (20) at the bottom area of a pocket (14) and the pocket (14) is facing downward and the leading wall (21) is situated approximately in the vertical plane and the folder (20) abuts against the leading wall (21) of the pocket (14), said clamping jaw (121) is able to clamp the folder tail (24) against the support (111), the opener (91) further comprising a wedge (132) that has a wedge tip (138) which is displaceable for introducing the wedge tip (138) into the folder tail (24), where said wedge (132) has two guide edges (137) that diverge from the wedge tip (138) in a direction opposite the drive-in direction of the wedge into the folder, away from each other in the plane of the folder (20), as well as away from the support (111), where said wedge is able to penetrate into the folder tail (24) between the support (111) and the clamping jaw (121) in a direction parallel to the support (111) thus initiating an opening of the folder (20) at the folder tail (24) between pages so that a folder part deflected upon the driving-in of the wedge is supported by the two guide edges (137) thereby allowing two non-deflected folder tail portions (24B) to be exposed in order to be fixed to the leading wall (21) of the pocket (14) by the at least one clip (23).

2. A device for opening folders as claimed in claim 1, **characterized in that** the series of folder pockets comprises two equal series of axially displaced folder pockets (14A, 14B) where said two series of folder pockets are displaced in the axial direction of two chain wheels (12, 13) driving the endless chain (11).

3. A device for opening folders as claimed in any one of claims 1-2, **characterized in that** the clamping jaw (121) of the opener (91) is spring-loaded (123) toward the support (111) in order to hold together

the folder tail (24) in the central part where the wedge tip (138) is driven-in.

4. A device for opening folders as claimed in any one of claims 1-3, **characterized in that** the leading wall (21) of the pockets (14) carries two clips (23) that are separated along the free edge of the leading wall (21).
5. A device for opening folders as claimed in any one of claims 1-4, **characterized in that** the support (111) is pivotally arranged on the body (94) of the opener (91).
6. A device for opening folders as claimed in any one of claims 1-5, **characterized in that** the clamping jaw (121) is pivotally mounted (122) and spring-loaded (123) on an arm (120), which is pivotally mounted (119) on the body (94) into and out of an end position in which the clamping jaw (121) can assume different spring-loaded turning positions in relation to the arm (120).
7. A device for opening folders as claimed in claim 6, **characterized in that** an arm (110) carrying the support plate (111), the wedge (132) and the arm (120) carrying the clamping jaw (121) each has a tracer (112, 139, 124) that co-operates with a guiding path for guiding their motions in relation to the body (94) along a path of motion of the body (94).
8. A device for opening folders as claimed in any one of claims 1-7, **characterized in that** the openers (91) are carried by an endless conveyor (90).

Patentansprüche

1. Vorrichtung zum Öffnen von Aktenumschlägen (20) während Beförderung, wobei die Aktenumschläge (20) eine Vorderseite und eine Rückseite sowie eine aus einer Anzahl von Bogen zwischen der Vorder- und Rückseite bestehende und durch Seitenkanten begrenzte Dicke aufweisen, wobei eine Seitenkante als Rückseite des Aktenumschlages und die gegenüberliegende Seitenkante als Umschlagzipfel (24) definiert wird, und die Vorrichtung ein Umschlagförderband (10) mit einer endlosen, eine Reihe von nach aussen von der Kette (11) abgewandt mündenden und gegenseitig beabstandeten Umschlagtaschen (14) aufweisenden Kette (11) umfasst, wobei jede Umschlagtasche (14) eine in der Förderrichtung nach vorne verlaufende Leitwand (21) und - an der freien Kante der Leitwand, wo ein Umschlagzipfel (24) angebracht wird - wenigstens einen Halter (23) zum Festhalten eines nichtgebogenen Zipfelteils (24B) eines Umschlags gegen die Leitwand aufweist, **dadurch gekennzeichnet, dass** die Vorrichtung weiterhin Öffner (91) je zum Verlaufen dicht an einem zentralen Teil der freien Kante der Leitwand (21) eines Taschens entlang wenigstens einem Teil der Bewegungsweg aufweist, wobei der Abstand zwischen den Öffnern (91) dem Abstand zwischen den Taschen (14) entspricht, wobei jeder Öffner (91) einen eine Klemmbacke (121) und eine Unterstützung (111) aufweisenden Körper (94) aufweist, wobei die Klemmbacke (121) so angeordnet ist, dass wenn ein Greifer (45, 45') die Rückseite eines Umschlags (20) am Boden eines Taschens (14) trägt, und die Tasche (14) nach unten gerichtet ist, und die Leitwand (21) etwa in der Vertikalebene angebracht ist, und der Umschlag (20) die Leitwand (21) der Tasche (14) angrenzt, ist die Klemmbacke (121) fähig, den Umschlagzipfel (24) gegen die Unterstützung (111) festzuklemmen, wobei der Öffner (91) weiterhin einen mit einer verschiebbaren, zur Einführung in den Umschlagzipfel (24) vorgesehenen Keilspitze (138) versehenen Keil (132) aufweist, wobei der Keil (132) zwei von der Keilspitze (138) und in einer im Verhältnis zur Einführungsrichtung des Keils in den Umschlag entgegengesetzten Richtung divergierende Leitkanten (137) aufweist, voneinander in der Ebene des Umschlags (20) sowie von der Unterstützung (111) abgewandt, wobei der Keil in den Umschlagzipfel (24) zwischen der Unterstützung (111) und der Klemmbacke (121) in einer mit der Unterstützung (111) parallelen Richtung eindringungsfähig ist und somit ein Öffnen des Umschlags (20) am Umschlagzipfel (24) zwischen Bogen einleitet, so dass ein Umschlagteil, der nach der Einführung des Keils gebogen wird, von den zwei Leitkanten (137) unterstützt wird und somit das Ausstellen der zwei nichtgebogenen Umschlagzipfelteile (24B) ermöglicht, so dass sie durch den wenigstens einen Halter (23) zur Leitwand (21) der Tasche (14) befestigt werden können.
2. Vorrichtung nach Anspruch 1 zum Öffnen von Aktenumschlägen, **dadurch gekennzeichnet, dass** die Reihe von Umschlagtaschen zwei gleiche Reihen von achsial versetzten Umschlagtaschen (14A, 14B) umfasst, wobei die zwei Reihen von Umschlagtaschen in der Achsialrichtung der zwei, die endlose Kette (11) treibenden Kettenräder (12, 13) versetzt werden.
3. Vorrichtung nach irgendeinem der Ansprüche 1-2 zum Öffnen von Aktenumschlägen, **dadurch gekennzeichnet, dass** die Klemmbacke (121) des Öffners (91) zum Festklemmen des Umschlagzipfels (24) im zentralen Teil, wo die Keilspitze (138) eingeführt wird, gegen die Unterstützung (111) federbelastet ist.
4. Vorrichtung nach irgendeinem der Ansprüche 1-3 zum Öffnen von Aktenumschlägen, **dadurch ge-**

kennzeichnet, dass die Leitwand (21) der Taschen (14) zwei entlang der freien Kante der Leitwand (21) getrennte Halter (23) aufweist.

5. Vorrichtung nach irgendeinem der Ansprüche 1-4 zum Öffnen von Aktenumschlägen, **dadurch gekennzeichnet, dass** die Unterstützung (111) auf dem Körper (94) des Öffners (91) schwenkbar angeordnet ist.
6. Vorrichtung nach irgendeinem der Ansprüche 1-5 zum Öffnen von Aktenumschlägen, **dadurch gekennzeichnet, dass** die Klemmbacke (121) schwenkbar (122) und federbelastet (123) auf einem auf dem Körper (94) in eine Endposition hinein und hinaus schwenkbar gelagerten Arm (120) angeordnet ist, wobei die Klemmbacke (121) in der Endposition verschiedene federbelasteten Drehstellungen im Verhältnis zum Arm (120) einnehmen kann.
7. Vorrichtung nach Anspruch 6 zum Öffnen von Aktenumschlägen, **dadurch gekennzeichnet, dass** ein Arm (110), der die Unterstützungsplatte (111), den Keil (132) und den die Klemmbacke (121) tragenden Arm (120) trägt, je einen Fühler (112, 139, 124) aufweist, der mit einem Leitweg zur Steuerung der Bewegung im Verhältnis zum Körper (94) entlang dem Bewegungsweg des Körpers (94) zusammenwirkt.
8. Vorrichtung nach irgendeinem der Ansprüche 1-7 zum Öffnen von Aktenumschlägen, **dadurch gekennzeichnet, dass** die Öffner (91) von einem endlosen Förderband (90) getragen werden.

Revendications

1. Dispositif pour l'ouverture de chemises (20) pendant le transport, lesdites chemises (20) présentant un recto et un verso et une épaisseur comprenant une pluralité de pages entre ledit recto et ledit verso délimitée par des côtés latéraux, un côté latéral étant défini comme le verso de la chemise et le côté latéral opposé étant défini comme l'arrière de la chemise (24), le dispositif comportant un convoyeur de chemise (10) comprenant une chaîne sans fin (11) avec une série de poches de chemises (14) s'ouvrant vers l'extérieur éloignée de la chaîne (19) et arrangée à une distance mutuelle entre elles, chaque poche de chemise (14) possédant une paroi directrice (21) s'étendant dans la direction de transport et, à un côté libre de la paroi directrice où une arrière de chemise (24) va être placée, au moins un clip (23) pour serrer une partie de l'arrière non-fléchié (24B) d'une chemise contre la paroi directrice **caractérisé en ce que** le dispositif en outre comporte des ouvreurs (91) étant arrangés pour aller chacun près d'une partie

centrale du côté libre de la paroi directrice (21) d'une poche au long d'au moins une partie de son trajet de mouvement, le pas entre les ouvreurs (91) correspondant au pas entre les poches (14), chaque ouvrier (91) comportant un corps (94) ayant un crampon (121) et un support (111), le crampon (121) étant arrangé de sorte que lorsque une pince (45, 45') porte l'arrière de la chemise (20) à la partie inférieure d'une poche (14) et la poche (14) s'oriente vers le bas et la paroi directrice (21) est située approximativement dans le plan vertical et la chemise (20) appuie sur la paroi directrice (21) de la poche (14), ledit crampon (121) est capable de serrer l'arrière de la chemise (24) contre le support (111), l'ouvreur (91) comportant en outre un coin (132) qui comporte une pointe de coin (138) qui est déplaçable pour introduire la pointe de coin (138) dans l'arrière de la chemise (24), où ledit coin (132) a deux côtés directeurs (137) qui divergent de la pointe de coin (138) dans une direction opposée la direction de marche du coin dans la chemise, écartés les uns des autres dans le plan de la chemise (20), tant qu'éloignés du support (111), où ledit coin étant capable de pénétrer dans l'arrière de la chemise (24) entre le support (111) et le crampon (121) dans une direction parallèle au support (111) ainsi commençant l'ouverture de la chemise (20) à l'arrière de la chemise (24) entre des pages de sorte qu'une partie de la chemise fléchit lors de l'acheminement du coin est supportée par les deux côtés directeurs (137), par ce moyen permettant aux deux sections d'arrière de la chemise non-fléchies (24B) d'être exposées pour être fixées à la paroi directrice (21) de la poche (14) par le au moins un clip (23).

2. Dispositif pour l'ouverture de chemises selon la revendication 1, **caractérisé en ce que** les séries de poches de chemise comportent deux séries égales de poches de chemise déplacées axialement (14A, 14B), lesdites deux séries de poches de chemise sont déplacées dans une direction axiale de deux roues à chaîne (12, 13) entraînant la chaîne sans fin (11).
3. Dispositif pour l'ouverture de chemises selon l'une quelconque des revendications 1-2, **caractérisé en ce que** le crampon (121) de l'ouvreur (91) est chargé par ressort (123) vers le support (111) pour tenir ensemble l'arrière de chemise (24) dans la partie centrale où la pointe de coin (138) est insérée.
4. Dispositif pour l'ouverture de chemises selon l'une quelconque des revendications 1-3, **caractérisé en ce que** la paroi directrice (21) des poches (14) porte deux clips (23) qui sont séparés au long du côté libre de la paroi directrice.
5. Dispositif pour l'ouverture de chemises selon l'une

quelconque des revendications 1-4, **caractérisé en ce que** le support (111) est arrangé de façon pivotable sur le corps (94) de l'ouvreur (91).

6. Dispositif pour l'ouverture de chemises selon l'une quelconque des revendications 1-5, **caractérisé en ce que** le crampon (121) est monté de manière pivotable (122) et chargé par ressort (123) sur un levier (120) qui est monté de façon pivotable (119) sur le corps (94) entrant et sortant d'une position finale dans laquelle le crampon (121) peut adapter de différentes positions tournantes à ressort par rapport au levier (120). 5 10
7. Dispositif pour l'ouverture de chemises selon la revendication 6, **caractérisé en ce qu'**un levier (110) supportant la plaque de support (111), le coin (132) et le levier (120) supportant le crampon (121) ont chacun un traceur (112, 139, 124) qui coopère avec un trajet de guidage pour guider leur mouvements par rapport au corps (94) au long du trajet de mouvement du corps (94). 15 20
8. Dispositif pour l'ouverture de chemises selon l'une quelconque des revendications 1-7, **caractérisé en ce que** les ouvreurs (91) sont portés par un transporteur continu (90). 25

30

35

40

45

50

55

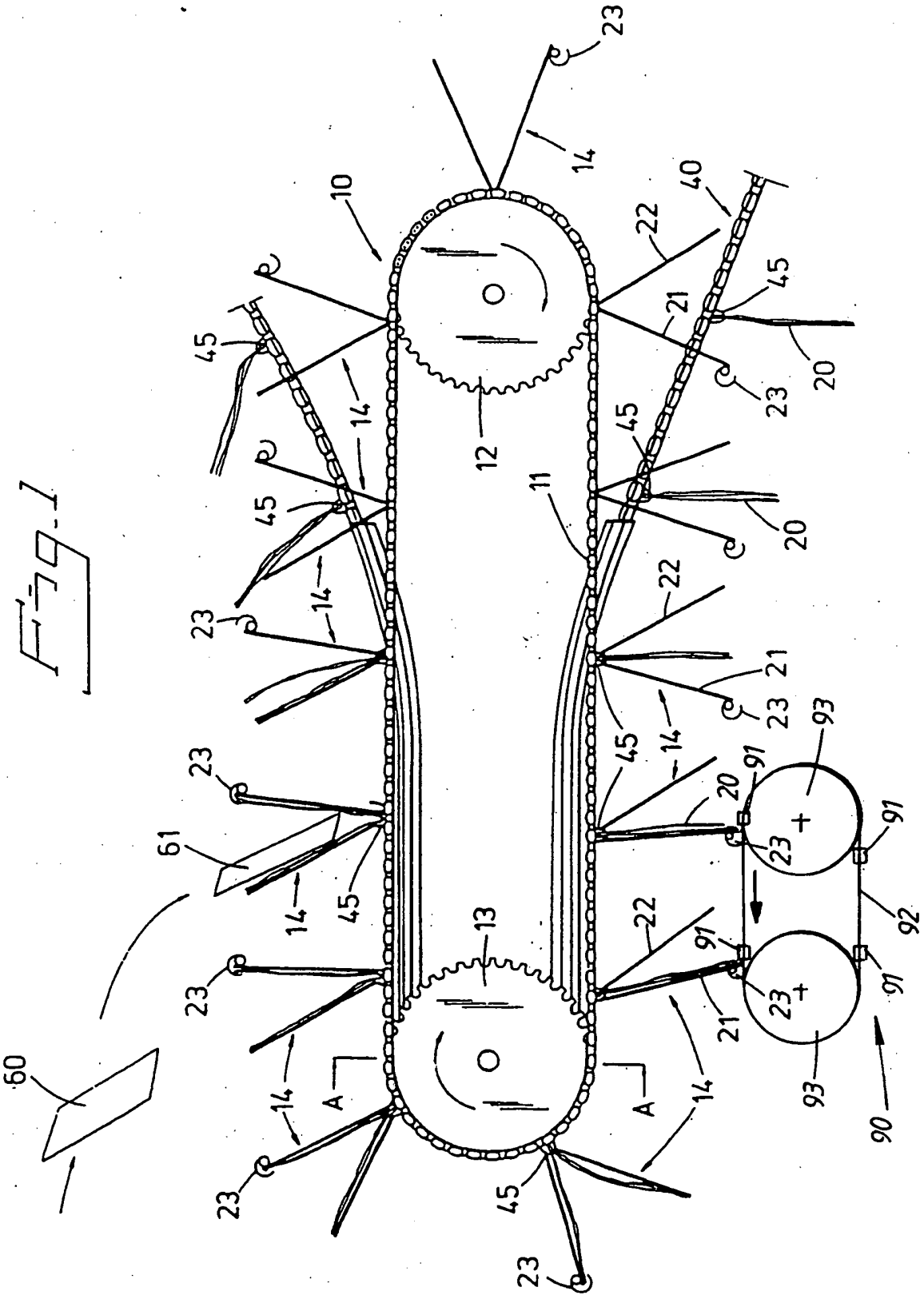


Fig. 2

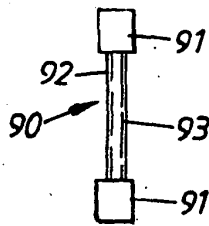
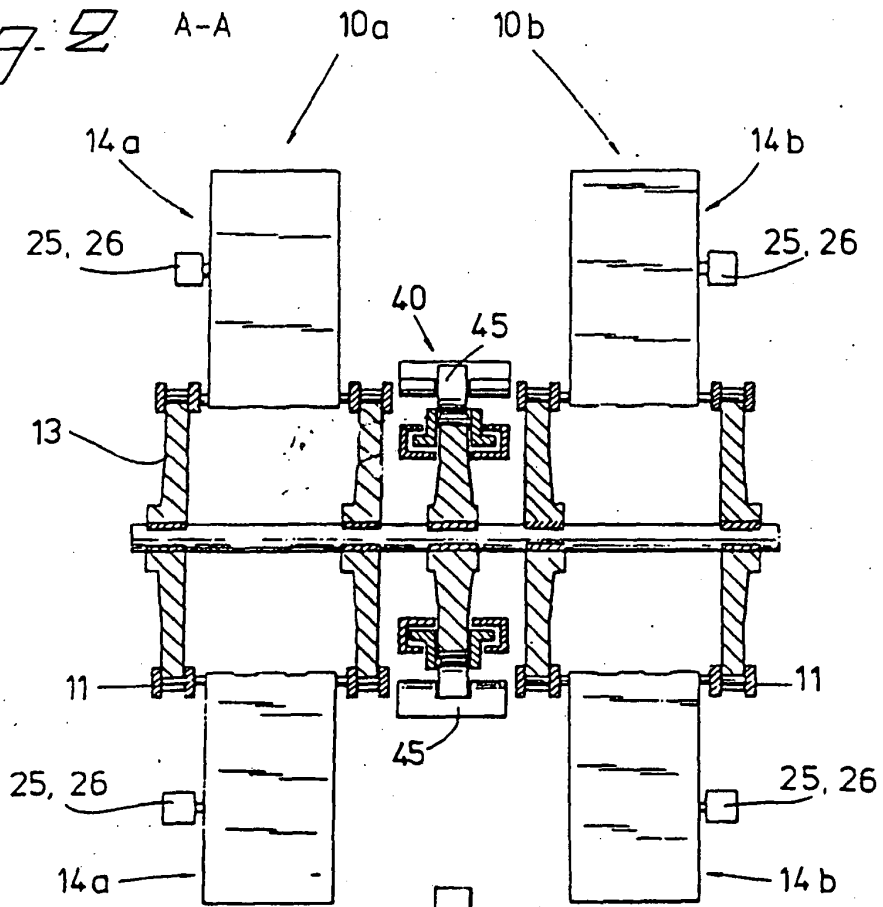
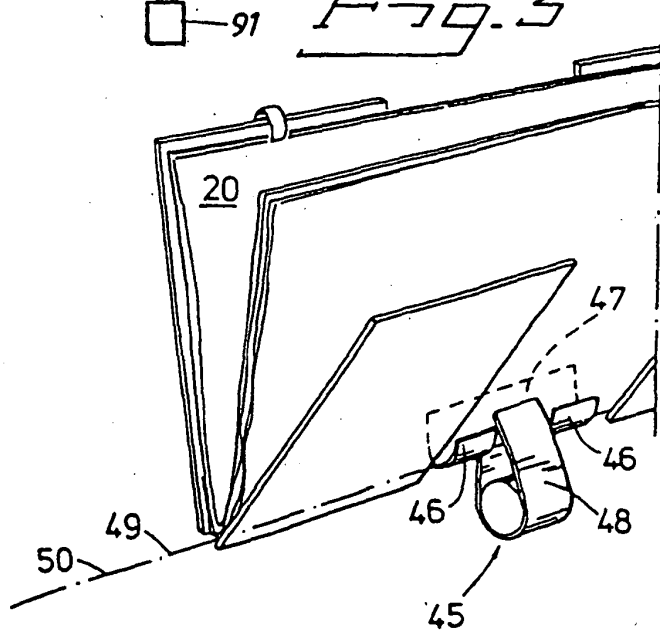
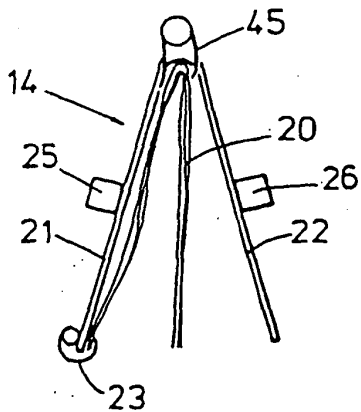


Fig. 3

Fig. 4



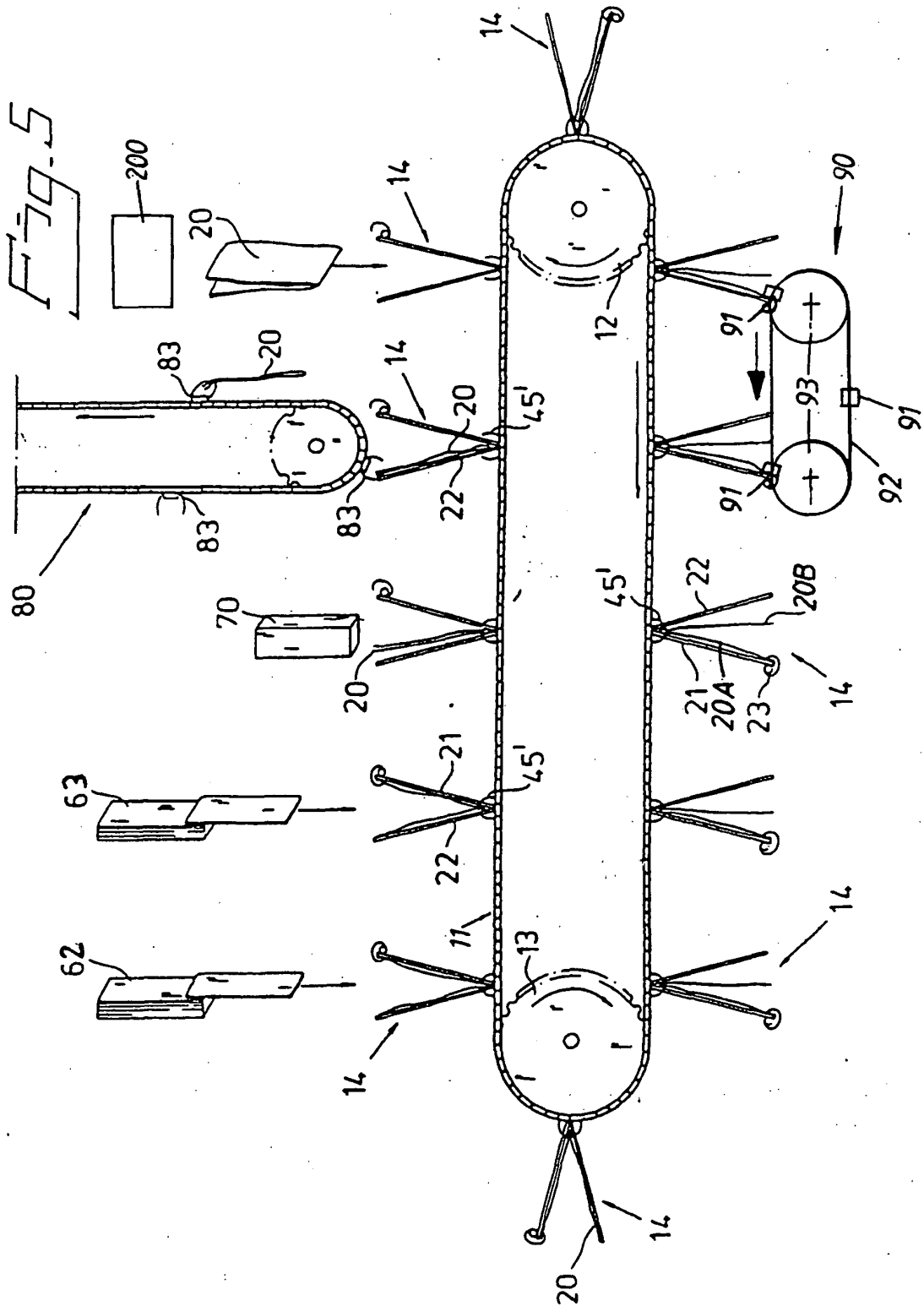


Fig. 6

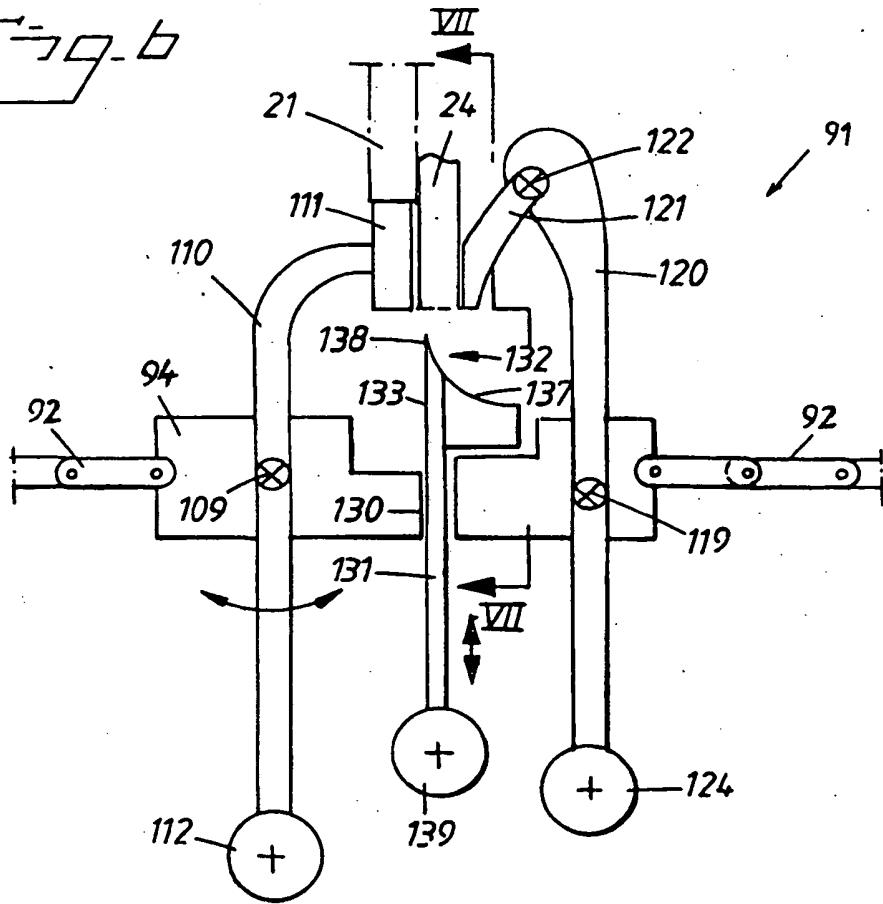
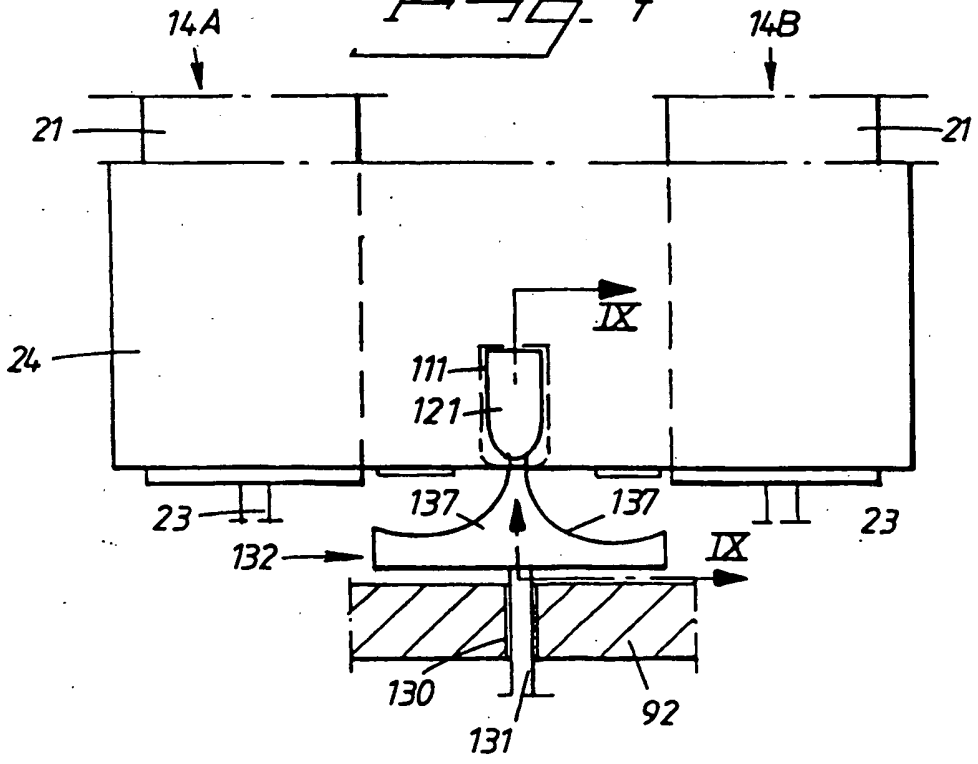


Fig. 7



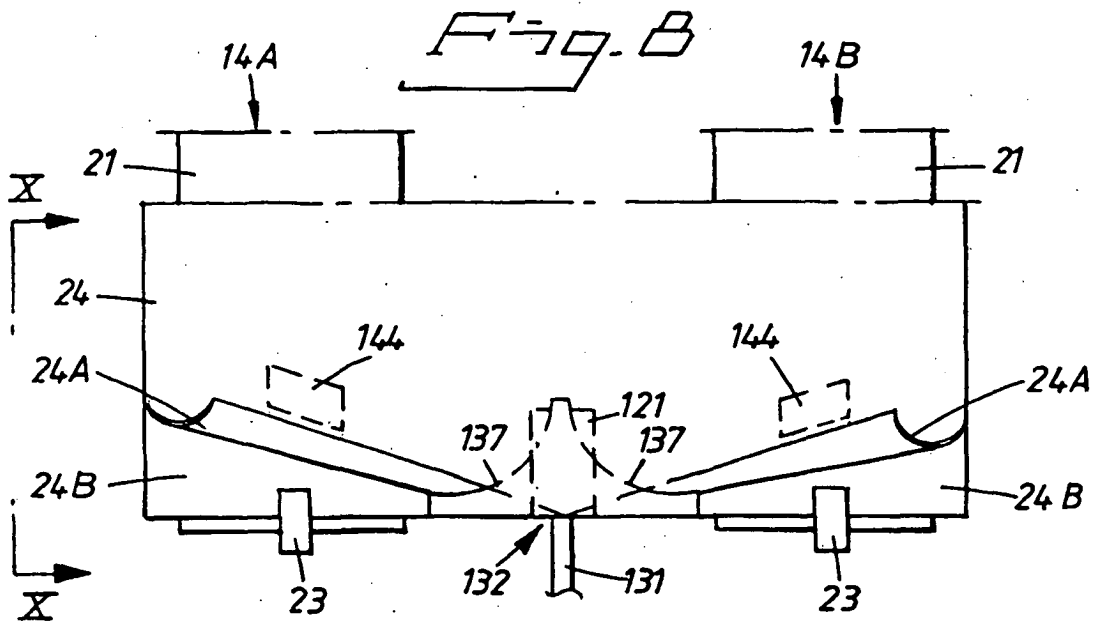


Fig. 9

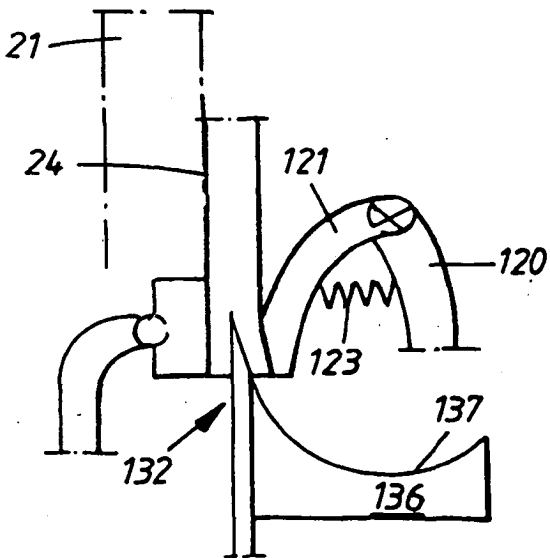


Fig. 10

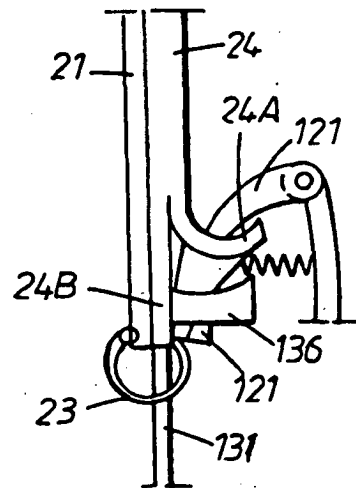


Fig. 11

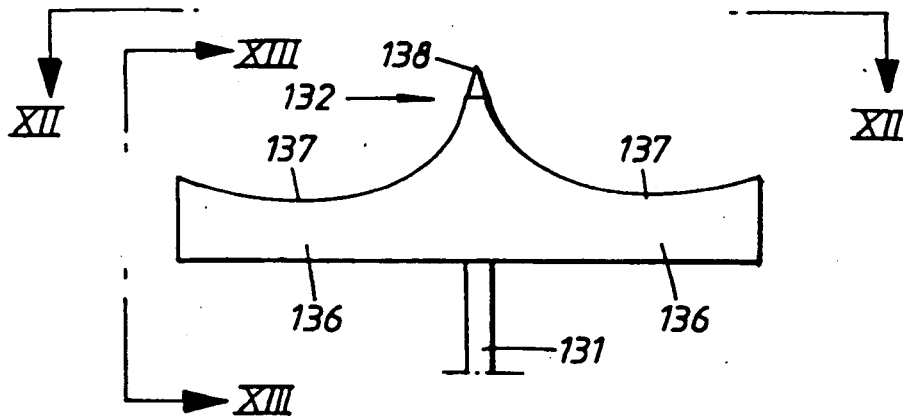


Fig. 12

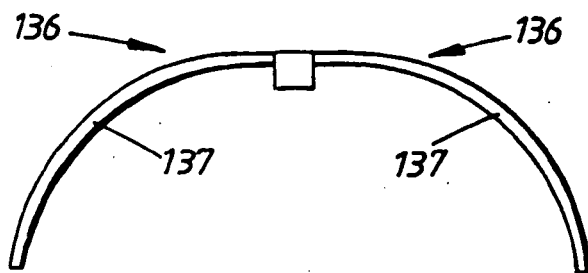
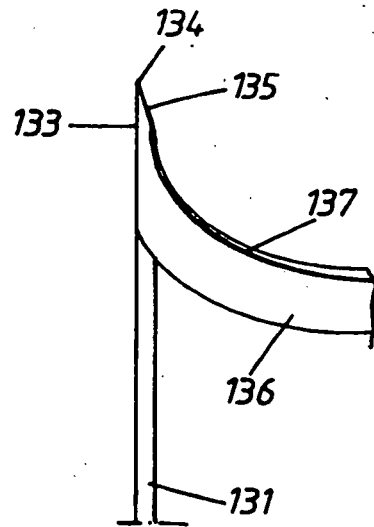


Fig. 13



REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- WO 9104934 A [0001] [0002]
- SE 464757 C [0002] [0015] [0017]
- DE 1436585 A [0008]
- US 3450400 A [0009]
- EP 0596581 A2 [0010]
- US 20040061271 A1 [0011]