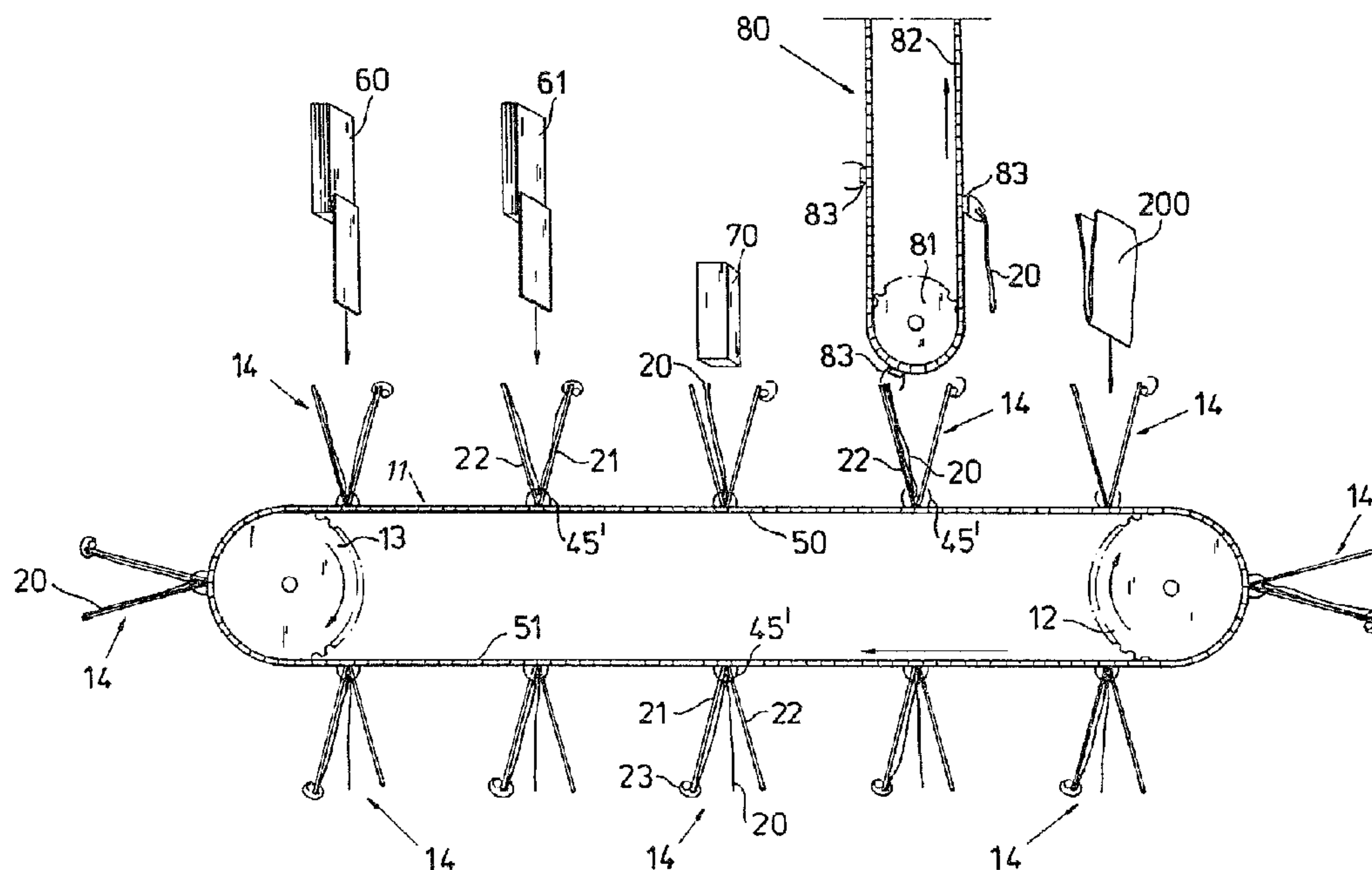




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(72) Inventeur/Inventor:  
Backman, Ralf, SE  
(73) Propriétaire/Owner:  
Idab Wamac Aktiebolag, SE  
(74) Agent: SMART & BIGGAR

(54) Titre : INSERTION D'ENCARTS DANS LES JOURNAUX  
(54) Title: INSERTION OF SUPPLEMENTS INTO NEWSPAPERS



(57) **Abrégé/Abstract:**

A method of inserting supplements into newspapers or magazines (20) and a general method of opening newspapers or magazines prior to the insertion process entail separate newspapers being transported in open state through an insertion station. The spines of the newspapers are held in firm contact with pocketlike holders (14, 45) on a conveyor (10) and the holders (14, 45) are caused to temporarily open when they pass the insertion station (60, 61), the firm contact between newspaper (20) and holders being still maintained. Apparatus for performing the method comprises a conveyor (10) and an insertion arrangement (60, 61) with means (14, 21, 22, 23, 25, 26) to open each newspaper (20) and means (60, 61) to insert a supplement into the opened newspaper. The apparatus may also include a second conveyor (40) with separate grippers (45) for each newspaper. The conveyor (40) extends through the conveyor (10). The apparatus also includes means (P11, P12, P13) to temporarily open each gripper during its passage through the insertion station (60, 61; P12) of the insertion equipment. The apparatus furthermore includes means (46) to maintain orientation and position of the newspaper in relation to the gripper (45) while the latter is open in the insertion station (P12).



A b s t r a c t

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arrangement (60, 61) with means (14, 21, 22, 23, 25, 26)  
15 to open each newspaper (20) and means (60, 61) to insert  
a supplement into the opened newspaper. The apparatus may  
also include a second conveyor (40) with separate grip-  
pers (45) for each newspaper. The conveyor (40) extends  
through the conveyor (10).

20 The apparatus also includes means (P11, P12, P13) to  
temporarily open each gripper during its passage through  
the insertion station (60, 61; P12) of the insertion  
equipment. The apparatus furthermore includes means (46)  
25 to maintain orientation and position of the newspaper in  
relation to the gripper (45) while the latter is open in  
the insertion station (P12).

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The invention relates to a method for inserting supplements into a newspaper or magazines and apparatus for performing said method.

The insertion of supplements into daily newspapers is  
5 a process that has undergone considerable development in recent years. From being performed manually, the process has now developed into one that is even connected on-line to the printing press. The need for reliability is thus greatly increased, since disturbances in the process are extremely  
10 expensive.

The insertion technique currently utilized entails the newspaper produced in the press being transported by one or more conveyors to an insertion machine where it is then surrendered. The newspaper (main product) coming straight from  
15 the press is aligned in the insertion machine so that individual main products are opened with the aid of special opening mechanisms enabling one or more supplements to be inserted into the opened newspaper. The newspaper is then folded together and the complete product is carried out of the  
20 insertion machine by a new conveyor.

The process has proved complicated, extremely product-dependent and sensitive to disturbances. This results in reduced capacity, wastage of newspapers and limited reliability.

25 An extremely critical stage is, when the main product is to be passed from the feeding conveyor to the insertion machine. Deficiencies at this point may result in the newspaper lying incorrectly in the insertion machine, with the risk of stoppage, loss of newspapers and an unreliable  
30 insertion function or none at all.

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An example of conventional technology is the use of an insertion machine comprising a continuous conveyor with generally horizontal upper part. Pockets opening outwards are fitted externally on the conveyor. The newspaper is inserted  
5 into a pocket with its spine facing down and at one free edge (that opposite the spine) one half of the paper usually protrudes a few millimeters past the other half. One wall of the pocket may be provided with a clamp clamping the protruding edge of the newspaper half against the adjacent pocket wall,  
10 and both walls can be hinged to permit opening of the paper. The pockets with opened newspapers then pass beneath a supplement feeder which inserts a supplement into the opened newspaper. Of course several supplement feeders may be arranged one after the other if several supplements are to be  
15 inserted into each newspaper. After insertion of the supplements the pocket is closed and the newspaper with supplements is gripped to be carried away by another conveyor.

The newspaper itself is fed into its pocket by an arrangement which is in principle a supplement feeder.

20 When the newspaper itself is surrendered to the insertion machine, i.e. to a pocket therein, the newspaper is released from its feeder and is unrestrained until it has been caught by the pocket and its accessories. Thus, from an uncontrolled position, each newspaper must be synchronised to a  
25 well defined position in which it is to be opened. However, obviously the newspaper frequently gets caught, is located askew or is displaced in relation to the pocket. This not only affects the position of the supplement in the newspaper, but may also cause disturbance in feeding the newspapers  
30 interrupted operation, etc. Orientation and position of the newspaper differ, which is reflected in the resultant flow of papers and this in turn leads to increased risk of disturbances in following steps.

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US-A-3 269 720 discloses an apparatus and a method for adding inserts to newspapers and similar products using an endless insertion conveyor having a plurality of circumferentially spaced grippers to which the newspapers are fed one-by-one by a separate conveyor. Each gripper of the insertion conveyor grips the spine of one newspaper and moves it along the conveyor path, thereby tilting the newspaper from a spine-up position to a spine-down position, in which the gripper opens up while holding the front end of the newspaper and the insert is inserted from a position above the opened newspaper.

CH-C-417 647 discloses an apparatus corresponding to the insertion conveyor of US-A-3 269 720 to which the newspapers are fed spine-down and held in the same position in pockets retaining their orientation in a vertical plane during a full revolution of the conveyor.

One object of the present invention is therefore to eliminate or reduce the above-mentioned inconveniences.

The invention can be considered as encompassed in the concept of avoiding in the proper sense surrendering the newspapers from a supply conveyor to an insertion machine and instead transporting the newspaper with the aid of a conveyor provided with holders, thus ensuring that the newspapers are aligned in a fixed position throughout in relation to the holders, while the holders and newspapers are conducted through an insertion machine which may in principle be of conventional structure (with the deviations and modifications described below).

More specifically, the invention provides a method for inserting supplements into newspapers or magazines, comprising the steps of: conveying the newspapers or magazines held by a plurality of grippers of a gripper conveyor to,

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through and away from an insertion station in an insertion machine for insertion of supplements into the newspapers, bringing the newspapers to pass the insertion station with the newspaper spines facing downwardly, opening the newspapers before they pass the insertion station, to permit then the insertion of a supplement into the newspaper, temporarily opening the grippers as they pass the insertion station, inserting supplements down into the open newspaper to the spine thereof, characterised by moving the newspapers held by the grippers into pockets of a pocket conveyor extending through the insertion station by bringing the gripping conveyor to converge to a portion of the pocket conveyor before the insertion station, the pockets on the pocket conveyor and the grippers in the gripper conveyor having the same pitch, and the pocket conveyor and the gripper conveyor being driven in synchronism, bringing the pockets to support the newspapers as they pass the insertion station so that the spine of each newspaper remains firmly in contact and in unaltered position and orientation relative to the gripper as the gripper is momentarily opened to diverge from the pocket conveyor after the insertion station, to remove the newspapers as held by the gripper conveyor, from the pockets of the pocket conveyor.

The invention also provides an apparatus for inserting supplements into newspapers or magazines at an insertion machine, comprising a gripper conveyor for conveying the newspapers or magazines one by one towards an insertion station, in the insertion machine and through and away from the station, said gripper conveyor comprising a plurality of grippers disposed on the conveyor for gripping the newspapers or magazines, means for opening the newspapers or magazines, means for temporarily opening each of said plurality of grippers as each gripper passes through the insertion station, with the newspaper spine facing downwardly, inserting means at

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the insertion station for inserting supplements into the spine area of the opened newspapers or magazines, characterised in that it further comprises: a pocket conveyor with pockets which receive the newspapers as carried by the grippers of the gripper conveyor, said pocket conveyor extending through the insertion station, the pitch of the pockets on the pocket conveyor being the same as the pitch of the grippers on the gripper conveyor, and means for driving the pocket conveyor and gripper conveyor in synchronism through the insertion station, the pockets being arranged to firmly maintain the spines of the newspapers or magazines in the same orientation and position relative to the gripper while the gripper is open during passage through the insertion station, means for bringing the gripper conveyor to converge to the pocket conveyor before the insertion station, and for bringing the gripper conveyor to diverge from the pocket conveyor after the insertion station.

One embodiment of the invention will now be described with reference to the accompanying drawings.

Figure 1 shows schematically a side view of an apparatus according to the invention,

Figure 2 shows schematically a section taken along the line A-A in Figure 1,

Figure 3 shows schematically a holder known per se which can be used for the newspaper conveyor forming a part of the equipment according to the invention,

Figure 4 shows schematically a pocket included in the insertion machine.

Figure 1 shows a first conveyor 10 comprising a chain 11 running around two pulleys 12, 13. The conveyor 10 is provided with pockets 14, each of which receives a newspaper,

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20, its spine facing the bottom of the pocket. The pocket 14 has a front and a rear support wall 21, 22. At least the front wall is provided with a clamp 23 to temporarily clamp the free edge of the front half of the newspaper. At least one of the  
5 walls 21, 22 may be hinged and provided with drive means 25, 26 for the hinging movement. These drive means may be edge controls. One half of the newspaper is suitably somewhat longer from spine to edge than the other half, this longer half being preferably arranged on the wall with the clamp. When a  
10 newspaper has been inserted into a pocket 14 and one half has been clamped against the wall 21 by the clamp 23, the newspaper can be opened by folding open the walls 21, 22. Extra clamps may possibly be arranged to keep the other half of the newspaper in contact with wall 22. A conveyor, with such  
15 pockets and the function described above is well known and is included in a commercially available insertion machine sold under the designation SLS-1000 inserts by GMA Grafic Management Association Inc., Southborough, MA USA.

Referring to Figure 2 it is seen that the conveyor 10  
20 according to the invention comprises two substantially parallel parts 10a, 10b with a space between them for a second conveyor 40.

The principal modification of the pocket conveyor in the known insertion machine SLS-1000 is that it has been cut  
25 into two parts with space between them for another conveyor 40.

The two parts 10a, 10b of the first conveyor 10 are driven synchronously and said pocket 14 comprises two parts 14a, 14b aligned with each other.

A conveyor 40 is located in the space between the  
30 conveyor parts 10a, 10b. This second conveyor 40 is of the type described in EP-A-0 241 631, for instance, and comprises a

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series of grippers 45 fitted on a chain 41 running in a channel section 42.

As can be seen in Figure 3, each gripper 45 has a support 46 to firmly receive the spine of a newspaper. The gripper is provided with two collect jaws 47, 48 which grip across the spine of the newspaper and between which the newspaper can be clamped.

One collect jaw of the gripper 45, preferably the fixed jaw 47, may then be provided with two pockets, separated in transverse direction, which form separate support points for the newspaper. The second collect jaw, preferably the movable jaw 48, engages between the two pockets 46 and clamps against said collect jaw 47.

The support 46 of the gripper defines a contact line along the spine of the newspaper.

Reverting to Figure 1 it can be seen that the conveyors 10, 40 have the same pitch between pockets 14 and grippers 45. It can also be seen that the two conveyors 10, 40 run along the same track along a considerable length of the equipment. The two conveyors 10, 40 are thus aligned in such manner that the support line 49 for the newspapers substantially coincides with the hinge 50 for the opening movement of the pockets 14.

Figure 2 shows schematically that the chains on the two parts of the conveyor 10 and the conveyor 40 are driven by similar sprockets on a common shaft so that both conveyors 10 and 40 run synchronously and aligned as described.

The newspapers into which supplements are to be inserted arrive clamped by the gripper conveyor and are opened by the opening mechanism of the conveyor 10.

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At the upper part of the two conveyors 10, 40 shown in Figure 1 the pockets pass beneath the supplement feeder 60, 61 which inserts supplements into the open newspapers passing below. At least while the supplement is being inserted into the newspaper to the vicinity of its spine, the grippers of the second conveyor 40 are held open so that the supplement is inserted into the grasp of the grippers.

The feeders 60, 61 feeding out supplements one by one are of known type, such as described in GB 2 071 061-A.

Measures are taken to ensure that the spine of the newspaper remains firmly in the gripper 45 without altering position or orientation in relation to the gripper while the gripper is open. According to the embodiment shown these measures constitute arranging the pockets and grippers to be open at the top during insertion of the supplement, so that the newspaper rests firmly in the gripper while this is open, thus enabling the pocket to stabilize the newspaper also.

When all the supplements have been inserted into the newspaper the gripper is caused to close and the clamps or the like which had retained the paper in the pocket are opened. The two conveyors then diverge and the newspapers (with supplements) continue to the next stage.

At P1 the conveyors 10, 40 have converged. At P2 the front wall of the pocket is swung back past the vertical line. At P3 the protruding front edge of the newspaper half is clamped by clamp 23. When the pocket 14 then swings up to the upper part of the conveyor, the newspaper is automatically opened due to the force of gravity. At P10 the rear half of the newspaper may be gripped and retained by suction means, for instance, on the rear wall 22 of the pocket. At P11 the pocket and the newspaper can be (further) opened, the walls of the pocket being hinged apart by cam members 25, 26, for instance.

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The gripper 45 on the conveyor 40 opens before reaching P12 (at P11, for instance). At P12 supplements are inserted from conventional supplement feeders 60, 61. Prior to or at P13 the gripper 45 closes around the newspaper with inserted  
5 supplements. At P13 the conveyor 40 diverges from the conveyor 10.

Allowing the conveyors 10, 40 to run along together in the lower part of the conveyor 10 has certain advantages but is not a necessary part of the invention. Thus the conveyors  
10 10, 40 may cooperate along only a straight portion, such as the upper part of the conveyor 10. In this case P11 is considered as the point at which the newspaper is opened.

Another advantage is gained thanks to the basic concept of the invention, that the two conveyors 10, 40 run  
15 synchronously, parallel to each other and with pockets and grippers aligned. If the two conveyors run in a common track from a generally horizontal lower transport part, around a pulley 13 to an upper part, and if the front wall of the pockets 14 is caused to slant slightly backwards as shown as P3  
20 in Figure 1, the newspaper will be forced by gravity against the front pocket wall 21. If then the front half of the newspaper is closest to the front wall the clamp 23 can grasp it and when the pocket 14 subsequently swings up around the pulley 13 the other half of the newspaper will fall down by its  
25 own weight into contact with the rear wall 22 where, if necessary, it can be clamped by suitable means such as suction means or the like.

The advantage of the arrangement described above is that the newspaper is in principle opened when the pocket  
30 swings up to the upper part of the conveyor. This means that the insertion process can be started close to the start of the upper, substantially horizontal part of the conveyor. Since

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the first section of the upper part of the conveyor need not be used for inserting a newspaper into the pocket and for opening the pocket, the first conveyor 10 may be made relatively short.

5 The pockets on the first conveyor serve partly to support the halves of the newspapers and partly as bases for the clamps 23 and any suction means temporarily retaining the halves of the newspapers against the pocket walls. The walls of the pockets 14 may be hinged as in the known insertion machine SLS-1000.

10 However, it is in principle possible to omit the hinging facility of the walls in the arrangement described above in which the newspaper is opened by the front wall of the downwardly facing pocket, with the front half of the newspaper clamped to it, being tilted forwards past the vertical line.  
15 The hinging facility of the walls in relation to the conveyor chain could be simply omitted provided the chain follows a track which will cause the front wall of the pocket to perform said tilting movement in relation to the vertical.

Alternatively the walls of the pockets may be fixed  
20 in relation to each other, in which case the pocket can be folded down as a whole in relation to the direction of travel of the conveyor.

The invention has been described in the above in connection with newspapers and the insertion of supplements  
25 therein.

However, it should be evident that the invention is applicable to similar main products other than newspapers, as well as to flat objects for insertion other than newspaper supplements. Furthermore the invention has been described in  
30 connection with newspapers having spines. However, since the newspapers now lie firmly in contact with the grippers

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throughout the insertion process, it is not strictly necessary for the "newspaper" to be bound along its edge.

The embodiments described above shall not be interpreted in any restrictive way, but serve primarily to  
5 illustrate the invention.

The technique for opening newspapers revealed herein can also be used to advantage in more conventional insertion processes in which the newspapers are transferred in a more or less controlled manner from a feeder to the pockets of the  
10 opening equipment, and after insertion the newspapers are again gripped and removed from the pockets by an adjoining conveyor.

An essential feature of the invention is thus how the newspapers are opened prior to the actual insertion. Starting with the newspapers being inserted individually into radially  
15 outwardly open pockets for opening the newspapers, said pockets being located on a continuous conveyor running in the vertical plane, the opening technique is characterised in that the newspaper is inserted into an empty pocket before the pocket is tilted upwards at the transition to the upper part of the  
20 conveyor, and that the front part of the newspaper is caused to be retained at the front end of the pocket before the tilting movement is complete. The newspaper is thus opened by means of or with the aid of gravity when the pocket is turned upwards.

The apparatus for opening the newspapers in this  
25 manner comprises a continuous conveyor running in the vertical plane and provided with outwardly open newspaper pockets, the characteristic feature of the apparatus being that a newspaper feeder is arranged to insert a newspaper into an empty holder before the latter is turned to face upwards at the transition  
30 to the upper part of the conveyor, and that the supply means is arranged to bring the front part of the newspaper into alignment with the retention means at the front wall of the

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pocket before tilting of the pocket to its upright position in the upper part of the conveyor has been completed.

Once the newspaper has been inserted into the pocket and opened, then the actual insertion can be performed by means of supplement feeders as described above. The newspaper, together with supplements, can then be gripped and removed by a gripping feed-out conveyor substantially as described in US 4 723 770.

The feed-out conveyor may also be arranged to grip and remove the newspaper while the pockets are still located in the upper, straight part of the conveyor and newspapers can then be fed into the pockets thus emptied. This could be effected by a feeder corresponding substantially to the feeder 60 or 61 in the example according to Figure 1.

It is possible per se to insert the newspaper at any point between the pockets being emptied and their being tilted to face upwards again. However, certain advantages can be gained if insertion is effected from above into an upwardly facing pocket. The opportunity can then be taken to clamp the front half of the newspaper against the front wall of the pocket when the pocket turns down to the lower part of the conveyor, thus causing the newspaper to be brought into contact with the front wall due to the force of gravity.

In such an embodiment the newspaper feeder is located above the region of the end of the upper part of the conveyor so that, with the aid of gravity, the newspaper will assume a correct position in the pocket. The member for applying the front half of the newspaper against the front wall of the pocket is thus included in the switchover from upper to lower part of the conveyor, and the front half of the newspaper can be retained against the front wall of the pocket by clamps, for instance, located on the front wall of the pocket.

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Retaining members are arranged to retain the newspapers in the pockets while the latter face downwards. In one embodiment the retaining members may comprise grippers located at the bottom of the pockets to grip the spine of the newspaper when the pocket faces downwards.

However, it should be evident that other forms of retaining members are also feasible. The members holding the front part of the newspaper against the front pocket wall may, for instance provide a general retaining function for the newspaper.

Since the newspaper is in principle already open when its pocket is tilted to face upwards, the pocket conveyor may be relatively short. As soon as insertion has been effected, the newspaper can be folded together, thus enabling it to be easily gripped by one end for removal. Folding the newspaper entails primarily that the clamp on the front pocket wall is opened so that the pocket can be closed. Alternatively means can be arranged along the upper conveyor part such as brushes, air nozzles, folding arms or the like, to be brought into engagement with the upper part of the newspaper, preferably so that the folded newspaper is laid against one wall, preferably the rear wall, of the open pocket, to be gripped at a specific point by a feedlot conveyor of the type described in US 4 723 770, for instance.

The pocket is now free and can be supplied with a newspaper to be opened, from a feeder which feeds newspapers one by one into empty pockets passing by. The newspaper feeder may, for instance, correspond to the feeder in US 4 723 770.

The walls of the pockets may be provided with a central recess at the upper edge to permit the folding member to operate on the central part of the newspaper. It should

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also be obvious that the gripper 45' may be arranged to act on the longitudinal mid-region of the newspaper spine and that clamps 23 may be arranged on each side of the wall 21.

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CLAIMS:

1. A method for inserting supplements into newspapers or magazines, comprising the steps of:

conveying the newspapers or magazines (20) held by a plurality of grippers (45) of a gripper conveyor (40) to, through and away from an insertion station (60,61) in an insertion machine for insertion of supplements into the newspapers, bringing the newspapers to pass the insertion station with the newspaper spines facing downwardly,

opening the newspapers before they pass the insertion station, to permit then the insertion of a supplement into the newspaper,

temporarily opening the grippers (45) as they pass the insertion station,

inserting supplements down into the open newspaper to the spine thereof,

characterised by moving the newspapers held by the grippers into pockets of a pocket conveyor extending through the insertion station by bringing the gripping conveyor (40) to converge to a portion of the pocket conveyor before the insertion station, the pockets on the pocket conveyor and the grippers in the gripper conveyor having the same pitch, and the pocket conveyor and the gripper conveyor being driven in synchronism,

bringing the pockets to support the newspapers as they pass the insertion station so that the spine of each newspaper remains firmly in contact and in unaltered position and orientation relative to the gripper as the gripper is momentarily opened to diverge from the pocket conveyor after

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the insertion station, to remove the newspapers as held by the gripper conveyor, from the pockets of the pocket conveyor.

2. The method of claim 1, wherein the gripper conveyor runs in line with the pocket conveyor along a downwardly facing part of the pocket conveyor wherein the pockets thereof are  
5 open downwardly,

bringing the front part of the newspapers to engage the front wall of the pockets in said downwardly facing part of the pocket conveyor, and clamping the front part of the  
10 newspapers to the front wall of the pockets, and opening the newspapers by conveying the grippers and pockets from the downwardly facing part of the pocket conveyor into an upwardly facing part of the pocket conveyor, wherein the pockets are open upwardly.

15 3. The method of claim 1 or claim 2, wherein the gripper conveyor (40) is a conveyor on line from the printing press for the newspapers or magazines.

4. The method of any one of claims 1 to 3, wherein the gripper conveyor extends to, through and away from the  
20 insertion machine.

5. An apparatus for inserting supplements into newspapers or magazines (20) at an insertion machine, comprising

a gripper conveyor (40) for conveying the newspapers  
25 or magazines one by one towards an insertion station (61), in the insertion machine and through and away from the station, said gripper conveyor (40) comprising a plurality of grippers (45) disposed on the conveyor for gripping the newspapers or magazines,

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means (13,23,45) for opening the newspapers or magazines,

means for temporarily opening each of said plurality of grippers (45) as each gripper passes through the insertion  
5 station, with the newspaper spine facing downwardly,

inserting means at the insertion station for inserting supplements (61) into the spine area of the opened newspapers or magazines (20),

characterised in that it further comprises:

10 a pocket conveyor with pockets which receive the newspapers as carried by the grippers of the gripper conveyor, said pocket conveyor extending through the insertion station, the pitch of the pockets (14) on the pocket conveyor (10) being the same as the pitch of the grippers (45) on the gripper  
15 conveyor, and means for driving the pocket conveyor and gripper conveyor in synchronism through the insertion station,

the pockets (14) being arranged to firmly maintain the spines of the newspapers or magazines in the same orientation and position relative to the gripper (14) while the  
20 gripper is open during passage through the insertion station,

means for bringing the gripper conveyor (40) to converge to the pocket conveyor before the insertion station, and for bringing the gripper conveyor to diverge from the pocket conveyor after the insertion station.

25 6. The apparatus of claim 5, characterised in that the pocket conveyor (10) comprises two synchronously driven parts (10a,10b) which are separated by a gap, and that the gripper conveyor (40) is run in the gap.

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7. The apparatus of claim 5 or 6 characterised in that each pocket (14) includes a front wall (21) and a retaining member (23) disposed on said front wall to retain a front half of the newspaper or magazine held in the pocket (14) against  
5 the front wall (21).

8. The apparatus of any one of claims 5 to 7, characterised in that the gripper conveyor is arranged to introduce the newspaper into downwardly open pockets on a downwardly facing part of the pocket conveyor, means for  
10 bringing the front part of the newspaper in the pocket to engage the front wall on the pocket, whereby a retaining member (23) can hold the front part of the newspapers against said front wall of the pocket, whereby the newspapers are opened as the pocket conveyor and gripper conveyor run into an upper  
15 conveyor part in which the pockets (14) are open upwardly.

9. The apparatus according to any one of claims 5 to 8, characterised in that the gripper conveyor is a main conveyor on line from the printing press for the newspapers or magazines.

20 10. The apparatus according to any one of claims 5 to 9, characterised in that the gripper conveyor extends to, through and away from the insertion machine, which comprises the pocket conveyor and the insertion station (60).

SMART &amp; BIGGAR

OTTAWA, CANADA

PATENT AGENTS

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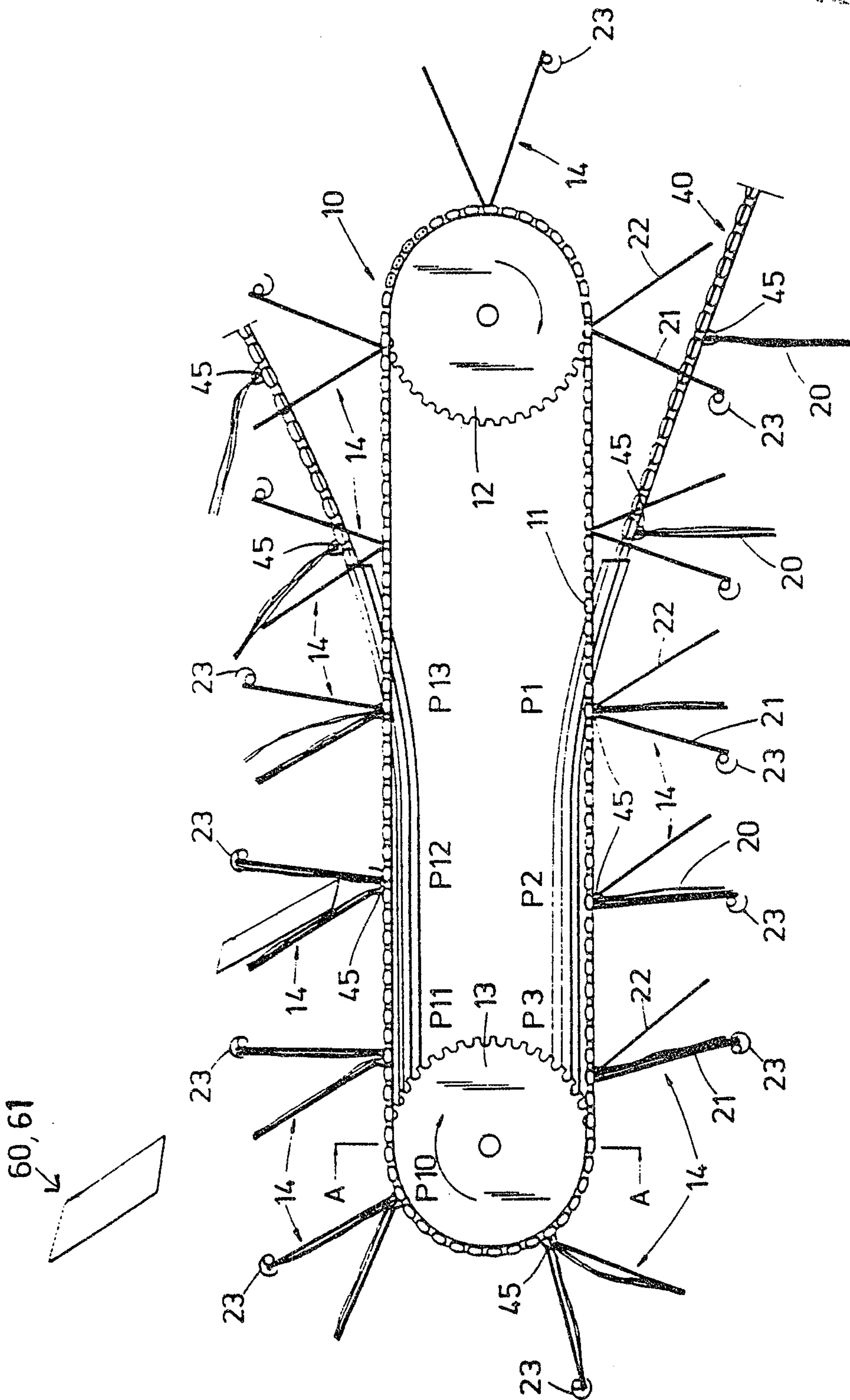


Fig. 1

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Fig. 2 A-A

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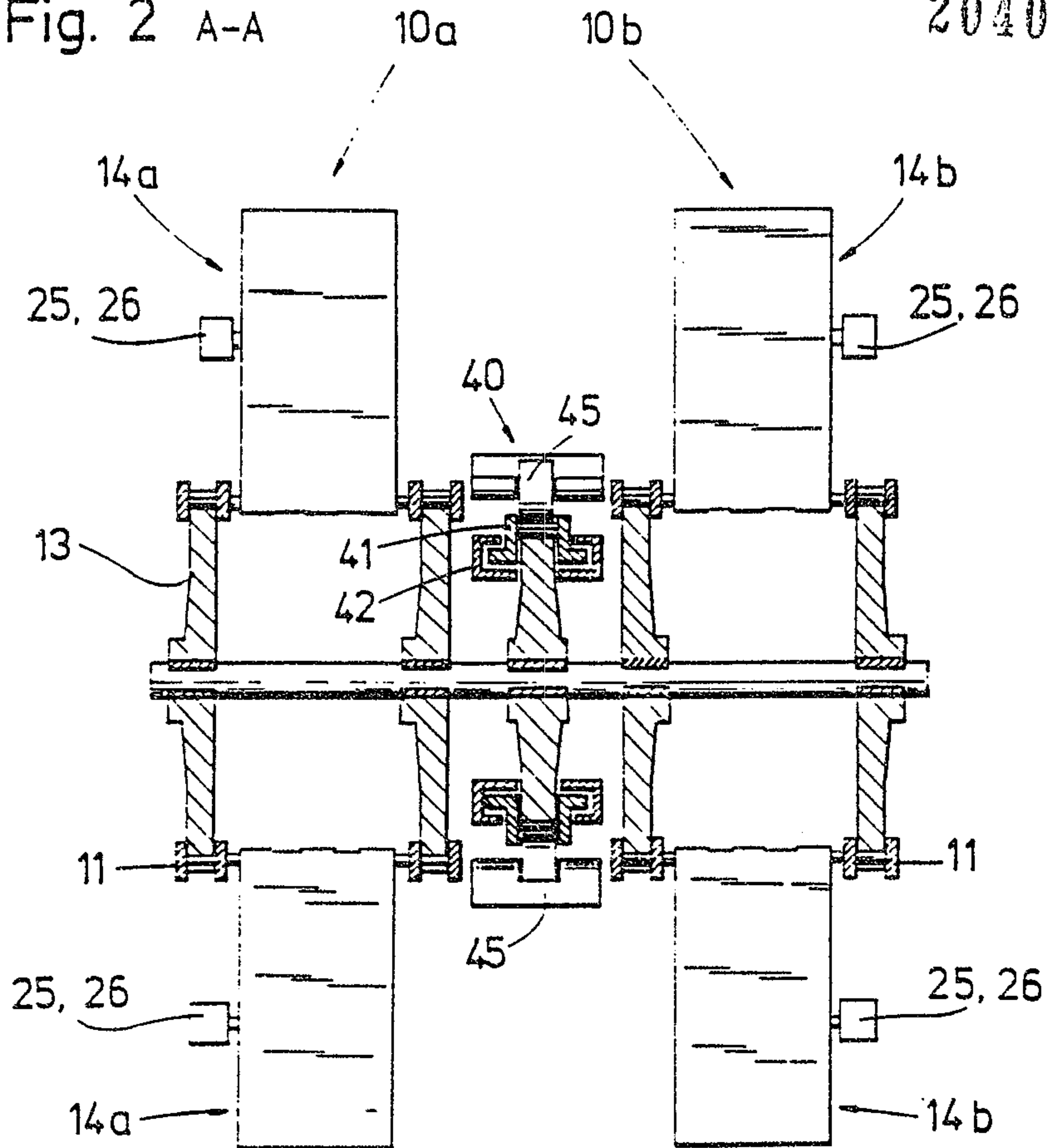


Fig. 4

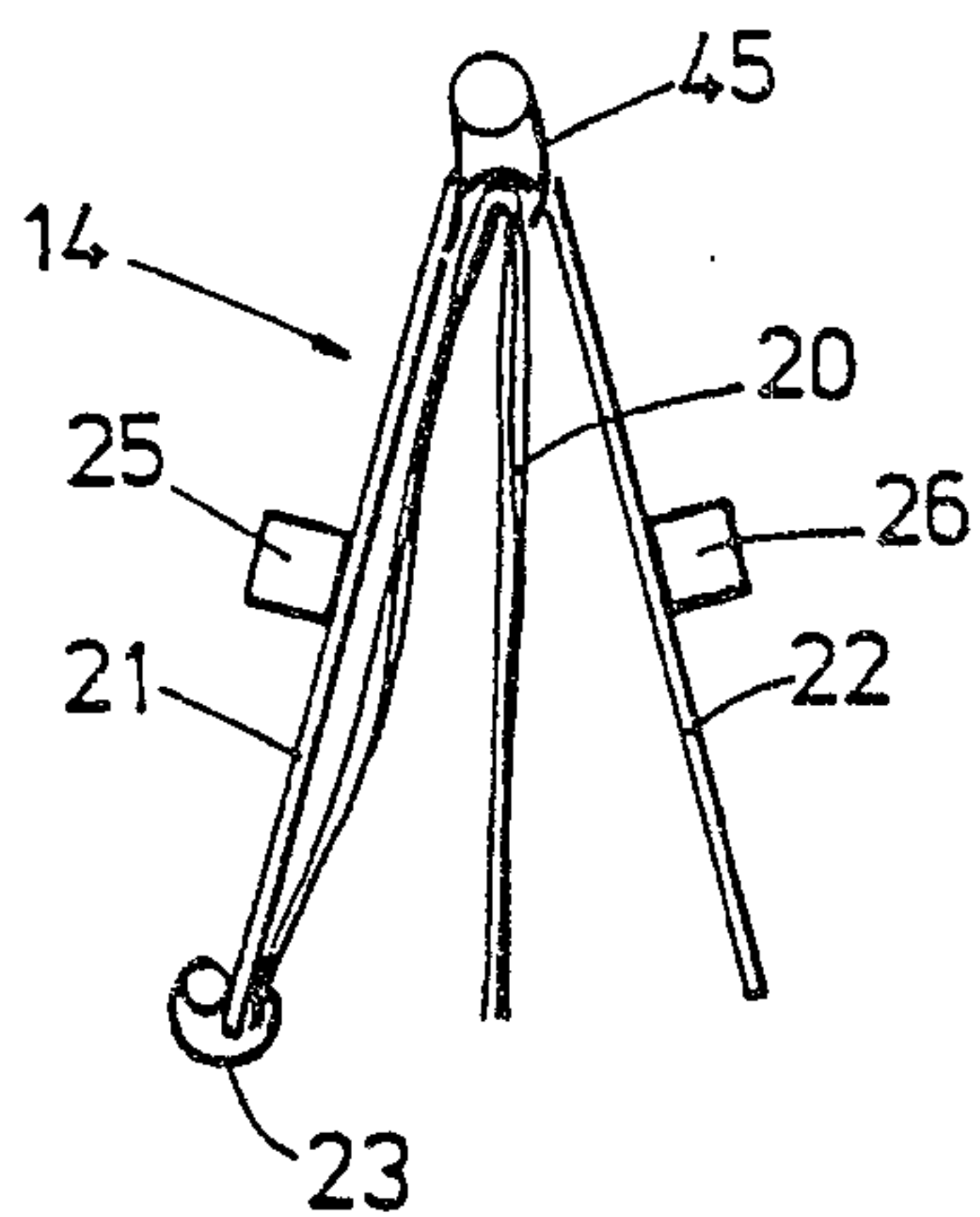
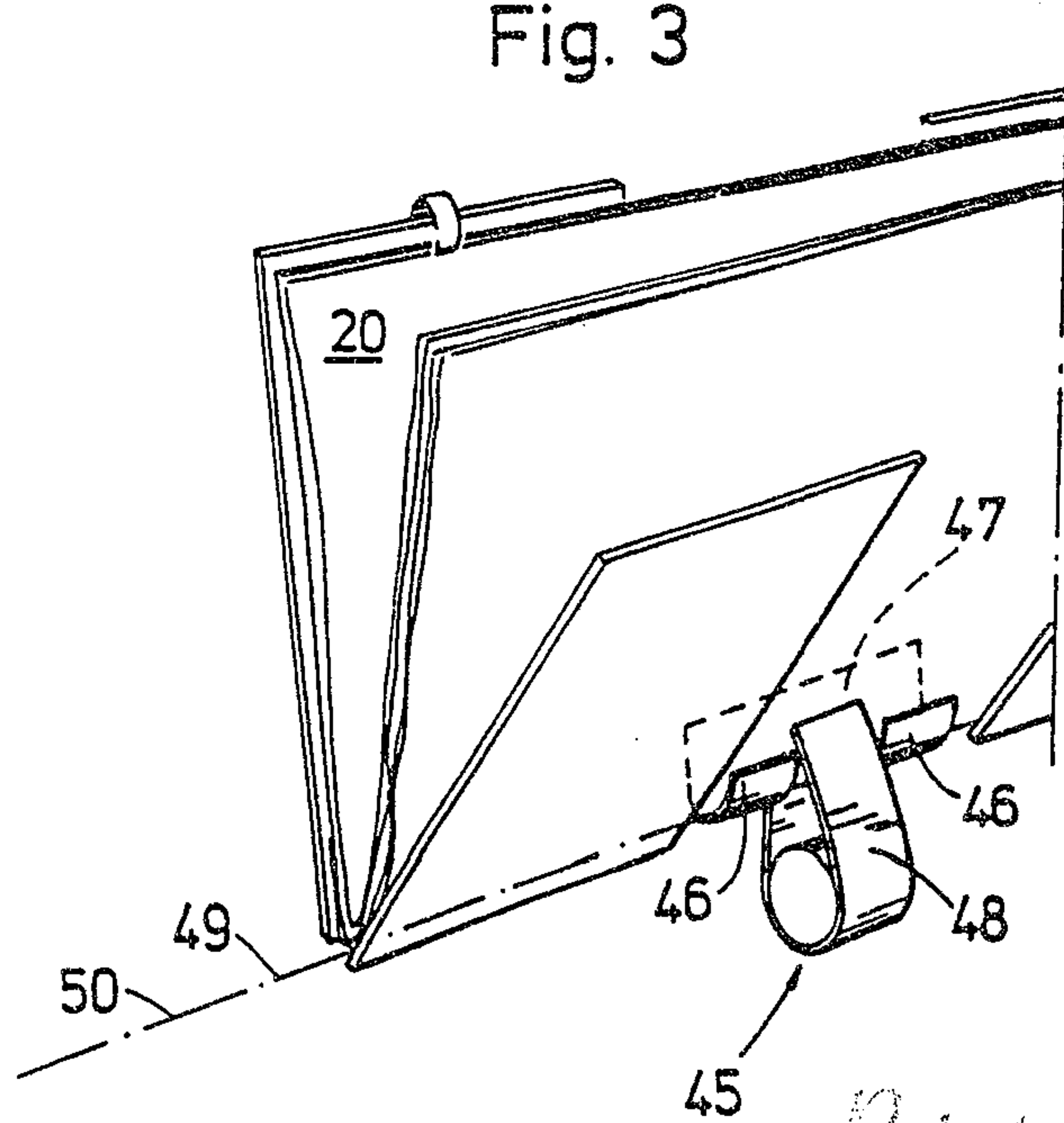
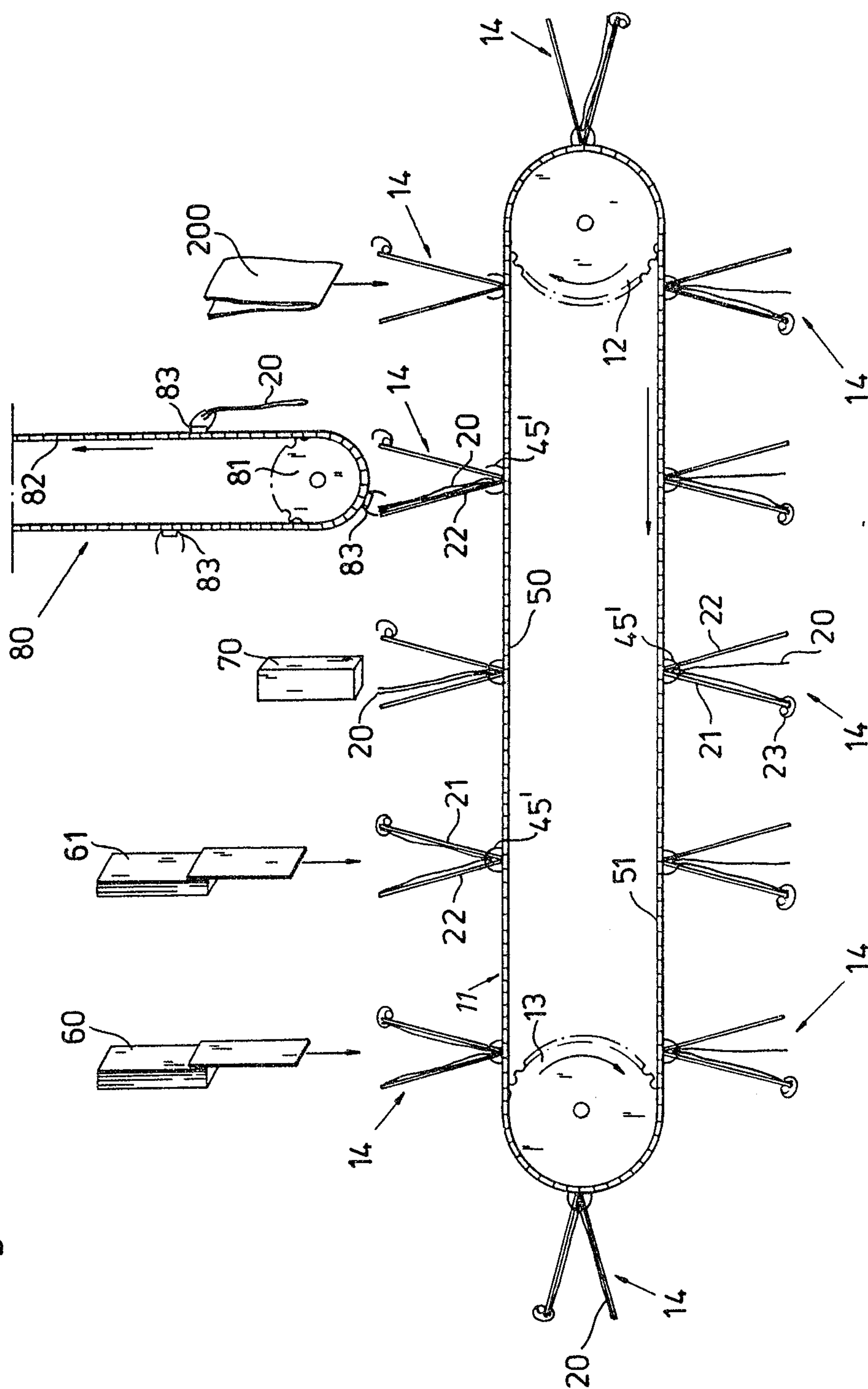


Fig. 3



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