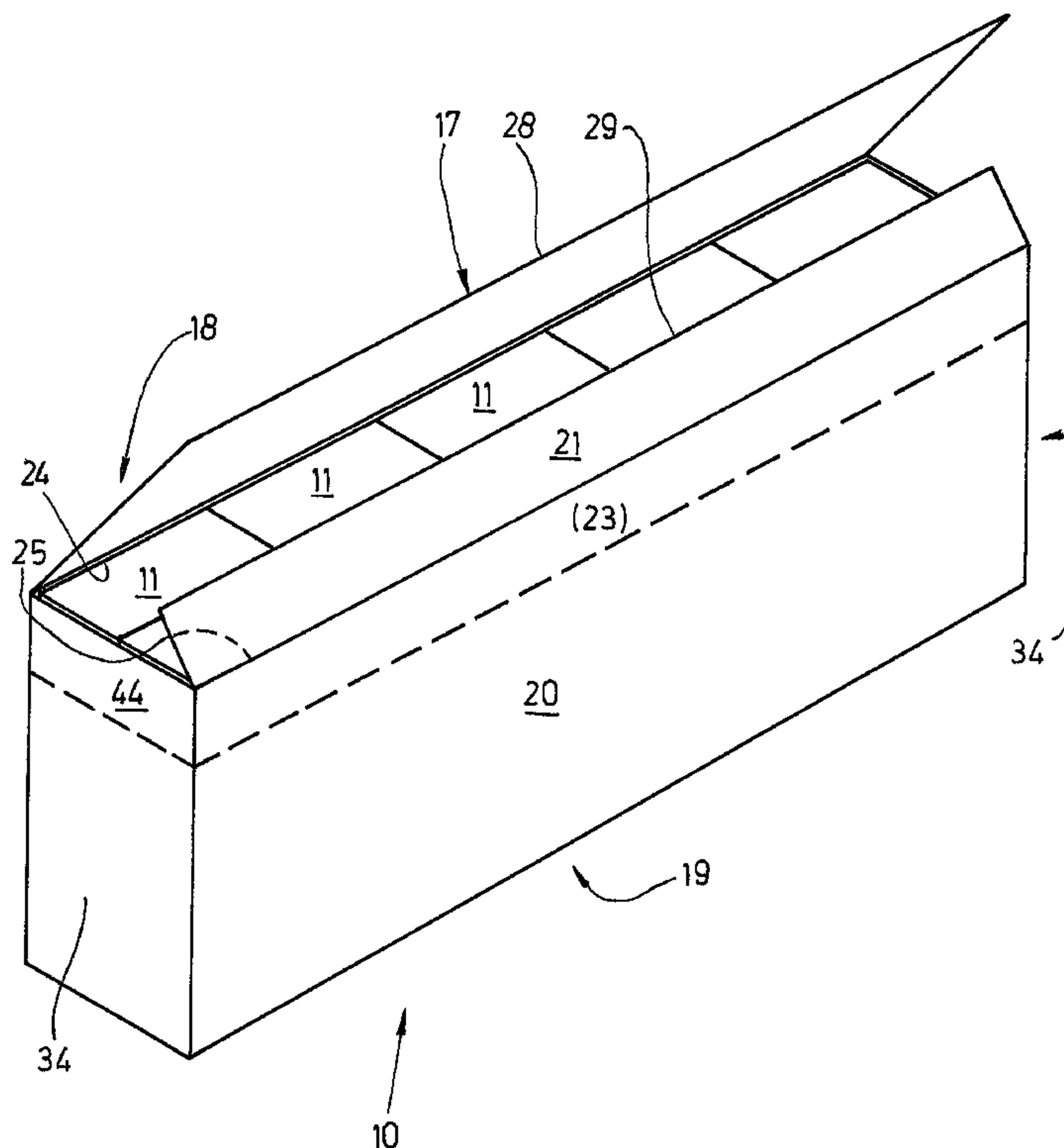




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(54) Titre : EMBALLAGE, EN PARTICULIER CARTOUCHE POUR PAQUETS DE CIGARETTES ET PAQUETS VIDES
 ET METHODE DE FABRICATION
 (54) Title: PACKAGE, ESPECIALLY BUNDLE FOR CIGARETTE PACKS, AS WELL AS PACKAGE BLANK AND
 METHOD FOR PRODUCING THE PACKAGE



(57) Abrégé/Abstract:

Disclosed is a package, especially a bundle for cigarette packs, as well as a package blank and a method for producing the package. Packages for cigarette cartons are usually made of thin cardboard or paper. In the latter case, the opening and reclosure of the cigarette carton is problematic. The invention provides a remedy for this problem. For this purpose, a bundle blank which is used to form a package for cigarette cartons comprises reinforcements (16, 22) extending over entire surfaces in the region of closing tabs (17, 21) or insertion flaps.

A b s t r a c t :

(in conjunction with Fig. 1)

1 Disclosed is a package, especially a bundle for cigarette
packs, as well as a package blank and a method for pro-
ducing the package. Packages for cigarette cartons are
usually made of thin cardboard or paper. In the latter
5 case, the opening and reclosure of the cigarette carton is
problematic. The invention provides a remedy for this
problem. For this purpose, a bundle blank which is used to
form a package for cigarette cartons comprises reinforce-
ments (16, 22) extending over entire surfaces in the region
10 of closing tabs (17, 21) or insertion flaps.

D e s c r i p t i o n :

1 The invention relates to a package, especially a bundle
package for cigarette cartons, formed from a blank of thin
packaging material, especially paper, which completely
surrounds the package contents and forms a top wall, front
5 wall, rear wall, bottom wall and end walls. The invention
also relates to a blank for forming a package from thin
packaging material and a method for producing a package and
to a suitable apparatus.

10 The invention is primarily directed to forming greater
bundles, so-called cigarette cartons, from individual cigar-
ette packs. Prior art packages used for this purpose are
either made from cardboard, i.e. relatively thick and
expensive material which is unfavorable in terms of dis-
15 posal, or they are formed from a light paper wrapper.
Packages formed from paper wrappers are only stable to some

1 extend in the closed condition. It requires costly and com-
plicated measures to ensure that these packages retain some
sort of stability after they have been opened and reclosed.
It would be desirable to have a light and inexpensive
5 package which could be opened and reclosed several times,
if required. Some countries have tax provisions with re-
spect to cigarettes which require an opening and reclosure
of the package of cigarette cartons at some point on the
way between the manufacturer and the retailer. In the USA,
10 for example, the local wholesaler has to affix revenue
stamps to the individual small packs. Naturally, the whole-
saler needs to open and subsequently reclose the cigarette
carton or bundle package for this purpose. This procedure
must not affect the durability and stability of the package
15 and should not be too labor-intensive.

It is the object of the present invention to create a
package which is as inexpensive as possible and still
exhibits an increased stability and can be reclosed, if
20 required, without impeding its usability.

According to the invention, this object is attained by
forming an insertion flap or closing tabs from the blank in
the region of the top wall for the closure of the filled
25 package, and by providing the insertion flap or the closing
tabs with sheet-like reinforcements which are durably
connected over their entire surface to the insertion flap
or the closing tab and thus strengthen its rigidity. The in-
sertion flap or closing tabs are subjected to increased
30 stress during opening and reclosure and are prevented from
tearing or the like by reinforcements provided in
accordance with the invention.

Expediently, the reinforcements are formed from a plurality
35 of interconnected, especially adhesively bonded layers of
the bundle blank. As a result, reinforcements can be pro-
vided in specific defined regions by means of simple
folding operations during the production of the package

1 from a blank. The reinforcements are adhesively bonded to
the insertion flap or the closing tabs over their entire
surface. For the purpose of this invention, a bonding over
the entire surface is also understood to mean a fine grid
5 of connecting points or adhesive spots. The crucial point
is the creation of the mechanical properties of a thicker
layer.

10 A package in which strip-like portions along free edges of
a pack opening are provided with reinforcements is of
particular advantage. These reinforcements are preferably
formed by folding over edge portions of the blank beyond
the region of the closing tabs or the insertion flap
towards the inside. Additional reinforcements are particu-
15 larly useful within the regions near the pack opening.

In another embodiment of the invention, the closing tabs or
insertion flaps are formed to have multiple layers,
especially three layers by way of a Z-shaped folding of
20 edge portions of the blank, and are preferably reinforced
additionally by an inward folding of projecting end
portions. Z-shaped folds can be made in a simple manner
with only few working steps and result in three-layer
closing tabs or insertion flaps. To permit an inward
25 folding of projecting end portions, free legs of the Z-fold
are formed to be longer. The freely projecting end portions
can be folded around the Z-fold, so that altogether four
layers rest on top of another.

30 The basic shape of a blank according to the invention for
forming a package from thin packaging material is rect-
angular. To define a closing tab or an insertion flap, a
hinge line is disposed parallel to an outer edge. Addition-
ally, a folding line is disposed between the aforementioned
35 hinge line and the aforementioned outer edge in order to
define a reinforcement. A package with reinforced closing
tabs or insertion flaps can be readily formed from a blank
of this type.

1 It would also be possible to provide two hinge lines in
order to form two closing tabs or insertion flaps. In this
case, the blank would have one additional hinge line and
one additional folding line.

5 A further blank according to the invention also has an
originally rectangular shape. Side-by-side portions for
forming a large side face (front wall), a bottom wall and
another large side face (rear wall) are disposed approxi-
10 mately centrally and preferably in the longitudinal
direction of the blank. Portions which adjoin each side
face on the outside - i.e. which are located opposite the
bottom wall - are disposed to each form a closing tab
comprising a three-layer Z-fold. This blank can also be
15 readily formed into a package in accordance with the in-
vention.

The method according to the invention for producing a
package is preferably based on a blank according to the
20 invention and is adapted especially for the production of a
package according to the invention. The method comprises
the steps of folding edge portions inwards (until they rest
against the blank), which portions have a width (width
parallel to the hinge line) which preferably corresponds to
25 the width of the completed package and which portions are
located on both sides in the regions of ends of at least
one hinge line disposed parallel to an outer edge; there-
after forming a closing tab or an insertion flap with a
reinforcement by an inward folding (against the blank)
30 about a folding line located between the hinge line and an
outer edge; and subsequently completing the folding of the
package which thereby assumes a cuboid shape.

A method according to the invention for producing a package
35 having a Z-fold and preferably using a blank according to
one or more of claims 7 to 10 is characterized in that, in
order to form multilayer and especially three-layer
portions of the future package, a loop is made in a con-

1 tinuous web of packaging material, such that two successive
and opposedly directed Z-folds are formed. Accordingly, two
Z-folds are formed simultaneously before any individual
blanks are severed from the web of packaging material. As a
5 result, this method is particularly effective.

Further advantageous embodiments of the invention are
described in the other claims. These improvements are
directed in particular to the attachment and arrangement of
10 additional reinforcements, the design of suitable folding
lines or folding edges, hinge lines and Z-folds, and to
suitable blanks, different methods for producing packages
and an apparatus for these methods.

15 Preferred exemplary embodiments of the invention will be
described below in detail with reference to the drawings,
in which:

Fig. 1 shows a blank for a first embodiment of a package
20 according to the invention which has two closing
tabs,

Fig. 2 shows the blank of Fig. 1 after it has been
folded several times,

25 Fig. 3 shows a cross section of a package in the closed
condition which is formed from a blank according
to Fig. 1,

30 Fig. 4 shows a perspective view of a package according
to Fig. 1 in the open condition,

Fig. 5 shows a blank of another embodiment of a package
35 according to the invention which has an insertion
flap,

1 Fig. 6 shows the blank of Fig. 5 after it has been folded several times,

5 Fig. 7 shows a cross section of a package in the closed condition which is formed from a blank according to Fig. 5,

10 Fig. 8 shows a perspective view of a package in the open condition which is formed from a blank according to Fig. 5,

Fig. 9 shows a blank of another embodiment of the invention,

15 Fig. 10 shows a section of the view of Fig. 9, taken along the line X-X,

20 Figs. 11a to 11e show a representation of successive processing steps for a web of packaging material comprising successive blanks which are connected to one another,

25 Fig. 12 shows a cross section of a ready-folded, filled and closed pack, corresponding to the blank illustrated in Figs. 11a to 11e,

30 Figs. 13a to 13e show a representation of the individual method steps and a corresponding apparatus for forming a loop with two oppositely situated Z-folds in the web of packaging material according to Fig. 11b,

35 Fig. 14a shows a view in the direction indicated by arrow XIVa of Fig. 13d,

Fig. 14b shows a view along line XIVb-XIVb of Fig. 13e.

1 The embodiment illustrated in Figs. 1 to 4 will be de-
scribed first. A package 10 for forming a cigarette carton
in the form of a bundle of a plurality of individual cigar-
ette packs 11 is produced from a rectangular blank 12. In
5 particular, a cigarette carton comprises two rows of
standard cigarette packs such as so-called hinge-lid packs.
The blank 12 has a pair of opposite long blank edges 13 and
a pair of opposite short blank edges 14. To define
different package parts or walls, parallel folding lines
10 extend from one long blank edge 13 to the other. Special
folding lines will be described in more detail further
below. The blank of Fig. 1 comprises, from left to right,
the following package parts or walls:

15 Left edge reinforcement 15, left closing tab reinforcement
16, left closing tab 17, rear wall 18, bottom wall 19,
front wall 20, right closing tab 21, right closing tab rein-
forcement 22 and right edge reinforcement 23. Each of these
parts 15 to 23 directly adjoins an adjacent part and is
20 rectangular in shape. The terms used for designating these
parts relate to their position within the completed
package.

A hinge line 24 is disposed between the left closing tab 17
25 and the rear wall 18. Accordingly, a hinge line 25 is
located between the right closing tab 21 and the front wall
20. Both hinge lines 24, 25 are preferably perforated and
form, so to speak, the pivot for the closing tabs 17, 21.

30 Folding lines 26, 27 which are provided for folds through
90° are disposed between the rear wall 18, the bottom wall
19 and the front wall 20. A folding line 28 for a 180° fold
is disposed between the left closing tab 17 and the left
closing tab reinforcement 16. A folding line 29 which has
35 the same function is located between the right closing tab
21 and the right closing tab reinforcement 22. Folding
lines 30, 31 which lie on the hinge lines 24, 25 in the com-
pleted package 10 are located between the left edge rein-

1 forcement 15 and the left closing tab reinforcement 16 as well as between the right folding tab reinforcement 22 and the right edge reinforcement 23.

5 The partition of lateral portions 32 which directly adjoin the long blank edges 13 is partly different from the partition of the aforescribed walls 15 to 23. Portions which are located adjacent the rear wall 18 and adjoin the long blank edges 13 are designated as end tabs 33.
10 Altogether three tabs are involved in the forming of each end wall 34 in the completed package, in particular, viewed from left to right, the aforementioned end tabs 33, the bottom wall tabs 35 and the front wall tabs 36 which adjoin one another.

15 Reinforcing tabs 37 are located between the long blank edges 13 and the right closing tab 21 in conjunction with the right closing tab reinforcement 22. The corner portions of the blank 12 on the top right and bottom right are edge
20 tabs 38. Correspondingly, left reinforcing tabs 39 and left edge tabs 40 are formed to the left of end tabs 33 with respect to the left closing tab 17, the left closing tab reinforcement 16 and the left edge reinforcement 15.

25 A special feature of the lateral portions 32 are their incisions 41a to 41e which are indicated by thick solid lines and are directed parallel to the folding lines 26 to 29. Incision 41a is in alignment with the folding line 30, incision 41b with the hinge line 25, incision 41c with the
30 folding line 26, incision 41d with the hinge line 25 and incision 41e with the folding line 31. Folding lines 42 are disposed parallel to the long blank edges 13 in order to delimit the lateral portions 32 towards the center of the blank.

35 Fig. 2 illustrates the blank of Fig. 1 after it has been folded several times. As a result, the closing tab reinforcements 16, 22 rest on the closing tabs 17, 21. For this

1 purpose, the right and the left reinforcing tabs 37, 39 are
folded from their position of Fig. 1 inwards, such that
they come to rest on the closing tabs 17, 21 and the
closing tab reinforcements 16, 22, in particular in the
5 regions of the closing tabs and closing tab reinforcements
which are adjacent to the folding lines 42. Subsequently,
the left closing tab reinforcement 16 is folded about the
folding line 28 and onto the left closing tab 17. In this
process, the folding line 30 comes to rest on the hinge
10 line 24, just like the left edge reinforcement 15 and the
left edge tab 40 come to rest on the rear wall 18 and the
end tab 33, respectively. Similar to the aforescribed
folding, the right closing tab reinforcement 22 illustrated
on the right hand side in Fig. 1 is folded onto the right
15 closing tab 21. As a result of the folding operations, the
folding lines 28, 29 are now located on the outside and
form boundary edges for the closing tabs 17, 21. As is
evident from Fig. 2, the folding lines 30, 31 are pre-
ferably perforated, similar to the hinge lines 24, 25.

20 In the next step, the blank is folded about the folding
lines 26, 27. This is preferably accomplished by feeding a
group of cigarette packs in such a way that the blank 12 is
folded around the pack group in a U-shaped manner, so that
25 the rear wall 18 and the bottom wall 20 rest against the
front and rear sides of the cigarette packs.

Thereafter, the end walls 34 are folded. For this purpose,
a tab formed from bottom wall tab 35 and front wall tab 36
30 is folded inwards. In this process, gussets 43 come to lie
between the tabs 35, 36. Finally, the end tabs 33 are
folded against the aforementioned tabs 35, 36. The last two
folding steps may also be conducted in reverse order.

35 The ready-folded package 10 has particularly two out-
standing features. One consists of the reinforced closing
tabs 17, 21 which rest on top of one another when the
package is closed and are connected for example by adhesive

1 bonding. It is possible to open the package, either because
a readily releasable adhesive has been used or by tearing
the closing tabs 17, 21 along the perforated folding lines
30, 31 and hinge lines 24, 25. The package may be reclosed
5 by adhesively bonding the closing tabs again or by
connecting the torn closing tabs to the package with an
adhesive tape.

10 The other outstanding feature is a reinforced edge which
extends circumferentially in the region of the pack
opening. This edge is formed from the left edge reinforce-
ment 15, the right edge reinforcement 23 and, in the region
of the end walls 34, from the edge tabs 38, 40. The afore-
described edge reinforcement even forms four layers in the
15 region of each end wall 34. Such a four-layer portion
formed from edge tabs 38, 40 is designated 44 in Fig. 4.

Another special feature is an additional reinforcement of
the closing tabs 17, 21 in regions which adjoin the folding
20 lines 42. As a result of the inward folding of the rein-
forcing tabs 37, 39 as described above, four layers are
formed in these regions as well.

25 Fig. 3 illustrates the individual layers in the region of
the closing tabs 17, 21. The greater left closing tab 17
extends from the rear wall 18 to the front wall 20 and
forms a top wall 44a, whereas the smaller right closing tab
21 only reaches approximately half as far. The individual
cigarette packs 11 are disposed in the package 10 in such a
30 way that several packs are located next to one another
- side wall by side wall - and two packs rest against one
another - front side 45 against rear side 46. End sides 47
are located at the opening side of the package 10, i.e.
below the closing tabs 17, 21.

35 Figs. 5 to 8 illustrate another embodiment of the in-
vention. In contrast to the previously described embodi-
ment, this embodiment has only one closing tab which takes

1 the form of an insertion flap 48. In Figs. 5, 6, this in-
insertion flap is disposed in the right hand region of the
blank 12'. Besides, the blanks 12 and 12' substantially
correspond to one another. Special features of the embodi-
5 ment of Figs. 5 to 8 will be described in the following.

Because there is no left closing tab, the left edge rein-
forcement 15' directly adjoins the rear wall 18', and the
left edge tabs 40' directly adjoin the end tabs 33'. More-
10 over, the height-width ratio of the completed package 10'
is different to that of the package 10 of the first embodi-
ment. It is evident from Fig. 7 that the cigarette packs
11' are directed upwards to the pack opening, i.e. to the
insertion flap 48 or the top wall 44a' with their large
15 front sides 45'. Accordingly, the bottom wall 19' is
greater than rear wall 18' and front wall 20'. This ratio
of sizes is exactly inversed in the embodiment of Figs. 1
to 4.

20 When the package is formed from the blank 12', reinforce-
ment tabs 37' are - like the right reinforcement tabs 37 -
folded inwards to start with. Thereafter, the insertion
flap reinforcement 22' is folded onto the insertion flap 48
and the edge reinforcement 15' onto the rear wall 18'. In
25 this process, the edge tabs 38' come to rest on the front
wall tabs 36' and the edge tabs 40' on the front wall tabs
33' (see Fig. 6). The folding line 31' lies on the hinge
line 25' and bounds the insertion flap 48.

30 The folded insertion flap 48 of Fig. 6 has bevels 51 at
each end of the free edge 49. An insertion flap end 52
extends between these bevels and is reinforced by an in-
sertion flap end reinforcement 53 which, in Fig. 5, is
located between the insertion flap end 52 and the insertion
35 flap reinforcement 22'. The bevels 51 are formed by a cut
55 along the folding line 29' which is applied at each
point of intersection 54 with the folding lines 42'.
Additional folding lines are disposed around the point of

1 intersection 54 in a diamond-shaped manner, such that the
transverse dimension of the diamonds extends maximally over
the length of the cuts 55 and the longitudinal dimension
does not extend further than up to adjacent folding lines
5 56 which delimit the insertion flap end 52 or the insertion
flap end reinforcement 53. After the reinforcing tabs 37'
have been folded over, the bevels 51 are created by an in-
ward folding of corners 57 prior to an inward folding of
the insertion flap reinforcement 22'. After the insertion
10 flap reinforcement 22' has been folded onto the insertion
flap 48, the package is folded around a group of cigarette
packs and thus completed.

15 In the exemplary embodiment of Figs. 5 to 8, the closing
tab, which takes the form of an insertion flap 48, is also
reinforced over its entire surface and the pack opening is
marginally reinforced. Fig. 7 illustrates that the in-
sertion flap end 52 is inserted in the region of the front
wall 20' between superposed cigarette packs and the front
20 wall 20'.

The end walls 34 also comprise a special feature. The
bottom wall tabs 35 are separated from the front wall tabs
36 by cuts 58, such that the end walls 34' are formed with-
25 out any gussets from the tabs 33', 35', 36' when they rest
on top of one another. As a result of the edge tabs 38',
40', the end walls 34' have multiple layers in the region
of the edge tabs, in particular three layers, and in the
region of an overlap of the end tab 33' and the front wall
30 tab 36' they have six layers.

35 Figs. 9 and 10 illustrate an embodiment which is similar to
that of Figs. 1 to 4 in terms of use. Instead of the rein-
forcements 16, 22 of the first embodiment, the embodiment
of Figs. 9 and 10 has separate reinforcing strips 60, 61
which are affixed individually to a blank 59. Any portions
which correspond to those of Fig. 1 have been provided with
the same reference numerals in Figs. 9, 10. The reinforcing

1 strips 60, 61 are made of cardboard, thin paperboard or the
like and are preferably adhesively bonded to the closing
tabs 17, 21 and nearly cover the entire surface of these
closing tabs. The reinforcing strips 60, 61 may be affixed
5 to the front and/or rear side of the blank 59. Since there
are no edge reinforcements 15, 23 and no closing tab rein-
forcements 16, 22, the edge portions 38, 40 are eliminated
as well. Besides, the reinforcing tabs 37, 39 are only as
wide as the closing tabs 17, 21. Just like in the other
10 embodiments, it is preferred to first of all fold the rein-
forcing tabs 37, 39 inwards at the beginning of the folding
process, prior to any other folding step.

Figs. 11a to 11e illustrate a web of packaging material 62
15 which takes the form of a continuous web to start with. The
web of Fig. 11b is a continuation of the web of Fig. 11a.
Figs. 11c, 11d and 11e show blanks 63 which have been
severed from the continuous web of material 62. In the
upper region of each of Figs. 11b, 11c, 11d and 11e, the
20 web of material 62 or the blanks 63 are shown in cross
section. The cross-sectional view is taken along line 64.

The size and shape of an unfolded flat blank is illustrated
in Fig. 11a. The entire blank is located between the solid
25 lines which are the severing lines 65. A narrow bottom wall
66 is disposed approximately in the center of the blank,
i.e. slightly offset to the right of the center of the
blank. Side faces acting as rear wall 67 and front wall 68
adjoin to the left and right of this bottom wall, re-
30 spectively. Three successive narrow strips 69, 70, 71 of
equal size adjoin the front wall 68 on the right. A further
strip 72 of equal size forms the right edge of the blank.

Three strips 73, 74, 75 of approximately equal size adjoin
35 the rear wall 67 on the left hand side. A further strip 76
forms the left edge of the blank. As a result, a strip 72
and a strip 76 are linked to one another in the region of
every severing line 65. Thin folding lines are sketched

1 between the walls 66, 67, 68 and strips 69 to 76 and extend
transverse to the longitudinal direction of the web of
material 62.

5 End tabs 77, 78, 79 which will form the end walls in the
completed package adjoin on the outside of the walls 67,
68, 69, i.e. at the lateral edges of the web of material
62. A common folding tab 80 laterally adjoins the strips
73, 74. Accordingly, one folding tab 81, 82 and 83 is
10 assigned to two strips 75, 76 and 69, 70 and 71, 72 on each
side. The end tabs 77, 78, 79 and the folding tabs 80 to 83
are separated from one another by cuts. In Figs. 11a to
11e, the cuts are illustrated by thick solid lines.

15 The package 84 which is to be made from the web of material
62 is illustrated in Fig. 12. A right closing tab 85 and a
left closing tab 86 located thereunder are illustrated in
the upper region of the package. Both tabs are, at least
partially, four-layer tabs as a result of a Z-fold with an
20 additional tuck. The procedure of forming such closing tabs
is described in the following, again with reference to
Figs. 11a to 11e.

The aforescribed folding lines and cuts for severing the
25 tabs 77 to 83 are disposed in the continuous web of
packaging material 62 between the walls or strips 66 to 76.
The severing lines 65 which define a blank 63 are marked
but not yet cut.

30 In a first step, the folding tabs 80 and 82 are folded
inwards through 180°, such that they come to rest on the
strips 73, 74 and 69, 70.

35 In a following step (Fig. 11b), a loop 87 is formed in the
continuous web of material 62. This means that a part of
the web of material 62 is moved out of the conveying plane
of the web of material by suitable means and is set to
protrude partly against the conveying direction and partly

1 in the conveying direction of the web of material 62.
Consequently, two opposed Z-folds 88, 89, each having three
superposed layers, are formed. The conveying direction of
the web of packaging material 62 is indicated by arrow 90
5 in the Figures. Accordingly, the left end in Fig. 11b is a
continuation of the right end in Fig. 11a.

The aforescribed looping of the web contracts the web of
material 62 in the region of each severing line 65, in
10 particular in such a way that the strips 69, 70, 71 rest on
top of one another and form the Z-fold 88 and the strips
73, 74, 75 form the Z-fold 89. As a result of these loops,
the gaps in the lateral contour of the web of material 62
which were formed by the inward folding of the tabs 80 and
15 82 disappear.

In a following step, one blank at a time is severed along
the severing line 65. This severing step is illustrated
between Figs. 11b and 11c. As a result, the loop 87 is
20 severed as well. The strip 72 of Z-fold 88 now forms the
end portion 91 adjoining the severing cut 65. A similar
outwardly projecting end portion of the Z-fold 89 is de-
signated 92.

25 In a further step between Figs. 11c and 11d, the afore-
described end portions 91, 92 are folded inwards and around
the respective Z-fold 88, 89 through 180°. As a result,
four layers rest on top of one another in the region of the
Z-fold 88. In the region of Z-fold 89, the four layers at
30 least partly rest on top of one another, depending on the
dimensions of the end portion 92.

Finally, the already folded folding tabs 81 and 83 are
folded inwards from the lateral edge of the web of material
35 62 through 180° in another step (between Figs. 11d and
11e).

1 Subsequently, the blanks which have been prepared in the
aforedescribed manner are folded to form the finished
package and are filled.

5 The aforedescribed method starts out with a continuous web
of packaging material 62. Individual blanks are not severed
until the loop 87 has been formed. Confronting edges 93, 94
of adjacent successive blanks are preferably processed in
the same process step. The end portion 91 of the blank in
10 Fig. 11c, for example, is folded together with the end
portion 92 of the blank in Fig. 11d.

As a result of the described inward folding of the end
portions 91, 92, the free edges 93, 94 are hidden when the
15 closing tabs 85, 86 are closed (Fig. 12).

The process of forming loops as described in conjunction
with Fig. 11b is conducted in a special way. Reference is
made to Figs. 13a to 13e. In Fig. 13a, the continuous web
20 of packaging material 62 is illustrated by a solid line.
The web 62 is guided through between the rollers 95, 96 of
a first pair of rollers. Spaced apart from this first pair
of rollers, another pair of rollers 97, 98 is disposed in
like manner. The lower rollers 96, 98 are mounted fixedly
25 transverse to the web 62 in a direction lying in the image
plane and are marked with a central small cross. The upper
rollers 95, 97 can be moved into the conveying plane of the
web of material 62 in the direction indicated by arrows 99.

30 Fig. 13b illustrates the start of a loop-forming step. The
rollers 95, 97 have been moved into the web 62 in order to
form the loop 87.

The Z-folds 88, 89 are created by a further pivoting of the
35 rollers 95, 97 and a movement of these rollers parallel to
the conveying plane of the web 62. According to Fig. 13c,
the roller 95 is moved further away from its corresponding
roller 96 than the roller 97 from roller 98. As a result,

1 Z-folds of unequal width are formed, corresponding to the width of, on the one hand, the strips 73, 74, 75 and, on the other hand, 69, 70, 71.

5 According to Fig. 13d, the loop 87 is retained in the position of Fig. 13c by suction holders 100, 101 while the rollers 95, 97 pivot back in the direction indicated by arrows 102 to their initial position (Fig. 13a). The suction holders 100, 101 act upon the web near the re-
10 spective lower deflection points 103, 104 of the Z-folds 89, 88 in the region of the straight web section which is already identified as loop 87, parallel to the conveying plane of the web of material 62.

15 Finally, the pairs of rollers 95, 96 and 97, 98 are moved away from one another along the conveying plane of the web of material 62 (arrows 105), such that the Z-folds 88, 89 are accessible. The different layers of the web of material are then folded or pressed into the position illustrated in
20 Fig. 13e by a flattening unit. The configuration of the web according to Fig. 13e thus corresponds to the representation in Fig. 11b. The process is continued with the further steps as described above, for example with the step of separating the blanks and folding over the end portions
25 91, 92.

The abovementioned flattening unit takes the form of an ironing plate 106 and the suction holders 100, 101 are embedded in the top surface of this plate. The ironing
30 plate 106 extends in the conveying direction over a length which is slightly greater than the length which would be required for the Z-folds. The width of the ironing plate 106 reaches beyond the width of the web 62 (see Fig. 14b).

35 The ironing plate 106 interacts with a pair of rolls 107, 108 which are located side-by-side above the web parallel to the conveying direction of the web and are movable transverse to the conveying direction of the web along the

1 arrows 109. At the same time, the rolls 107, 108 are
lowerable in the direction towards the ironing plate 106,
so that they exert a pressure on the ironing plate 106 and
thus already form the final Z-fold of the blank in this
5 region when the rolls 107, 108 are located in the position
of Fig. 14a which is central relative to the web 62.

Figs. 14a, 14b illustrate another special feature which has
not been mentioned in the foregoing. In this case, the
10 rollers 95 to 98 are not continuous in the direction trans-
verse to the web 62, but are divided, such that each of the
rollers 95 to 98 illustrated in Figs. 13a to 13b does, in
fact, consist of two coaxial short edge rollers 95a, 95b,
96a, 96b, 97a, 97b, 98a, 98b. According to Figs. 14a and
15 14b, the edge rollers are disposed such that they act upon
the web in the region of web edges 110, 111. The clearance
formed in this manner between two edge rollers 95a, 95b
and, correspondingly, between the other edge rollers is
used for the movement of the rolls 107, 108 in the lowered
20 position in order to form folding edges of the Z-folds. To
change from the position of Fig. 14a to the position of
Fig. 14b, the edge rollers 95a to 98b are moved apart in
the directions indicated by arrows 105, so that the rolls
107, 108 fit lengthwise between the edge rollers when they
25 move transverse to the web. Subsequently, the ironing plate
106 is lifted slightly, together with the rolls 107, 108,
up to the original conveying plane of the web 62 (see Fig.
13a).

30 The rollers 95 to 98 or edge rollers 95a to 98b as well as
the rolls 107, 108 and the ironing plate 106 are moved by
suitable mechanical drives. In the interest of clarity,
these drives are not shown in Figs. 13a to 14b. The rollers
95, 97 may for example pivot about the rollers 96, 98 on
35 appropriate levers. A combined pivoting and pushing move-
ment (extension of the levers) permits a movement of the
rollers 95, 97 parallel to the web 62. The same applies to
an embodiment in which the rollers take the form of edge

1 rollers 95a, 95b. The rolls 107, 108 and the ironing plate
106 can be moved accordingly. The drives may for example
take the form of electric stepping motors, linear motors
and hydraulically or pneumatically working piston-cylinder
5 units.

The aforescribed embodiment may also be modified such
that the edge rollers 95a to 98b or the rollers 95 to 98
are movable perpendicular to the conveying plane. In this
10 case, the position of Fig. 14a arrives at the position of
Fig. 14b by a downward movement of the edge rollers 95a to
98b or rollers in the direction towards the ironing plate
106, thereby taking along the web 62.

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CLAIMS:

1. A cuboid bundle pack for cigarette cartons, formed from a blank of paper, which completely surrounds the package contents and forms a top wall, front wall, rear wall, bottom wall and end walls, comprises:
 - a) at least one closing flap attached to the rear wall is provided for forming the top wall,
 - b) the closing flap, which comes to rest in the plane of the top wall when the package is closed, has a sheet-like reinforcement which is durably connected over its entire surface with the closing flap, for the purpose of an increased rigidity,
 - c) the closing flap is movable into an opening position for forming a package opening,
 - d) strip-like reinforcements of the end walls, rear wall, and front wall assigned to the respective edges are provided along free edges and along edges of the package opening which are connected to a closing flap,
 - e) the strip-like reinforcements of walls along the edges of the package opening connected to a closing flap are formed by a continuation of the sheet-like reinforcements of the closing flap,
 - f) the strip-like reinforcements of the free edges in the region of the end walls are formed by a continuation of the strip-like reinforcements of edges of the front wall or rear wall.
2. The package according to Claim 1, wherein, for forming the top wall, two closing flaps are provided having one reinforcement each and a respective lateral reinforcement adjoined thereto, one of the closing flaps being attached to the rear wall by a hinge line, and the other closing flap being attached to the front wall by a hinge line.
3. The package according to Claim 2, wherein the larger closing flap extends across the entire surface of the top wall and comes to rest on the smaller closing flap when the package is closed.

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4. The package according to Claim 2, wherein the closing flaps lying in the plane of the front wall are connected to one another by means of releasable adhesive bonding when the package is closed.
5. The package according to Claim 2, wherein the closing flaps, including the corresponding closing flap reinforcements, is severable from the respective adjoining rear wall or front wall including the reinforcement provided in this region along perforated folding lines and hinge lines.
6. The package according to Claim 1, wherein, for forming the top wall, a closing flap which is connected to the rear wall is provided, and said closing flap has an insertion flap arranged on a particular edge of said closing flap which faces the front wall, and said insertion flap assumes a position between the package contents and the front wall when the package is closed, and has an insertion flap reinforcement adjoining the closing flap reinforcement.
7. The package according to Claim 1, wherein the free edges of the closing flaps are designed with multiple layers by means of inwardly folded reinforcement tabs so that altogether four layers are formed if the closing flap reinforcements are considered.
8. The package as claimed in Claim 1, wherein the end walls are formed from tabs respectively connected to the front wall, bottom wall and rear wall, which results in the formation of two or three layers, and in the region of the strip-like reinforcements formed by edge tabs, in the formation of at least four superimposed layers.
9. A cuboid bundle pack for cigarette cartons, formed from a blank of paper, which completely surrounds the package contents and forms a top wall, front wall, rear wall, bottom wall and end walls, comprising:
 - a) at least one closing flap attached to the rear wall is provided for forming the top wall,

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- b) the closing flap, which comes to rest in the plane of the top wall when the package is closed, has a sheet-like reinforcement which is durably connected over its entire surface with the closing flap, for the purpose of an increased rigidity,
- c) the closing flap is movable into an opening position for forming a package opening,
- d) rear wall and front wall have strip-like reinforcements along their respective edges of the package opening which are connected to a closing flap,
- e) the strip-like reinforcements of walls along the edges of the package opening connected to a closing flap are formed by a continuation of the sheet-like reinforcements of the closing flap,
- f) provided for the formation of the top wall is a further closing flap with a reinforcement and connecting edge reinforcement, with the further closing flap being connected via a hinge line to the front wall and the first-mentioned closing flap being connected via a hinge line to the rear wall.

10. A blank made from paper for forming a cuboid package for cigarette cartons, comprising:

- a) within the rectangular basic area there is arranged a rectangular bottom wall, the longitudinal extension of which extends transverse relative to the longitudinal extension of the blank,
- b) in the longitudinal direction of the blank and next to the bottom wall is arranged a rear wall and a front wall which is disposed, via the bottom wall, opposite of the rear wall,
- c) in the longitudinal direction of the blank, the rear wall is adjoined by a closing flap via a folding line, the closing flap being just as long transverse to the longitudinal direction of the blank as the rear wall, bottom wall, and front wall, respectively,
- d) for forming end walls of the ready package, the front wall, bottom wall, and the closing flap, in the longitudinal directions thereof, namely transverse to the longitudinal direction of the blank, are adjoined by tabs on each side,
- e) the closing flaps are adjoined, in the longitudinal direction of the blank, either indirectly with blank parts being disposed in between, or directly, by a closing flap

reinforcement and a lateral reinforcement, the latter being connected to the closing flap reinforcement via a folding line, and having free edges otherwise,

f) the lateral reinforcement extends across the entire width of the blank in the transverse direction of the blank, namely parallel to the rear wall, with parts parallel to the end tabs,

g) closing tabs and closing tab reinforcements are of equal width in the longitudinal direction of the blank, with a folding line disposed in between, so that, when the closing flap reinforcement is folded onto the closing flap, the edge reinforcement reinforces the rear wall near the folding line and, at the same time, the end tabs are reinforced by the edge tabs.

11. A blank for forming a package of thin packaging material, having a rectangular basic shape, characterized in that side-by-side portions for the formation of a large side face, a bottom wall, and a large rear wall are disposed approximately centrally and in the longitudinal direction of the blank, and in that portions which each adjoin the front wall and rear wall on the outside, namely opposite the bottom wall, are provided in each case for forming a closing tab, which has a three-layer Z-fold.

12. A method for producing a package, characterized in that a loop is made in a continuous web of packaging material in order to form multilayer, especially three layer portions of the future package, such that two successive and opposed Z-folds are formed.

13. The method according to Claim 12, wherein lateral incisions which define individual tabs are applied prior to the formation of the Z-folds, and in that individual tabs are folded inwards to form reinforced portions prior to the formation of the Z-folds.

14. The method according to Claim 12, wherein the continuous web of packaging

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material is severed in the region of the Z-folds in order to form individual blanks, and that end portions located in the region of the previously applied severing cut are folded inwards, namely around the Z-folds in order to contact the Z-folds and in order to form a four-layer portion.

15. The method according to Claim 12, wherein the Z-folds are formed by an application of pressure on the loop made in the web.

16. An apparatus for producing a package from a continuous web of packaging material, characterized by the following features:

- a) the web is guided by two pairs of rollers arranged at a distance from one another,
- b) in order to form a loop, the upper rollers are movable toward one another and into the conveying plane of the web until the loop rests on a support surface,
- c) in addition, the upper rollers are movable away from one another between the lower rollers and the support surface parallel to the latter in order to form spaced deflection points of the web in the region of the loop,
- d) retaining means are disposed in the region of the support surface for holding the formed loop in the region of a loop section which rests on the support surface.

17. The apparatus according to Claim 16, further characterized by rolls which are disposed parallel to the conveying direction of the web and are movable into the conveying place in the region of the web loop and transverse to the conveying direction of the web in the respective web plane in order to form folding edges.

18. The apparatus according to Claim 17, wherein the rollers of each roller pair are divided, such that, instead of a roller or roll extending over the entire length of the web, there are disposed two short coaxial edge rollers, each acting upon a web edge and between which the rolls can be moved in the axial direction.

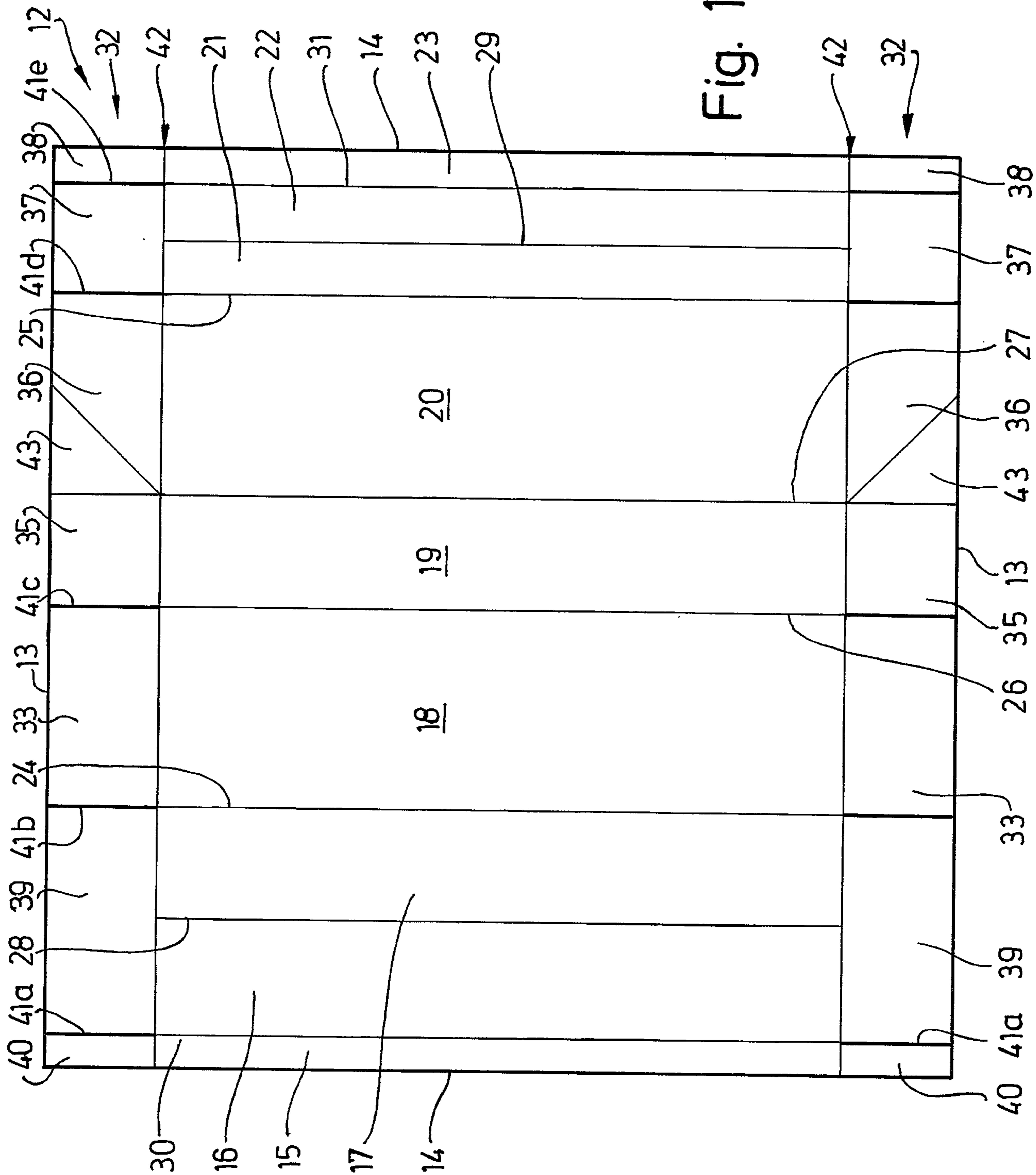


Fig. 1

FIG. 2

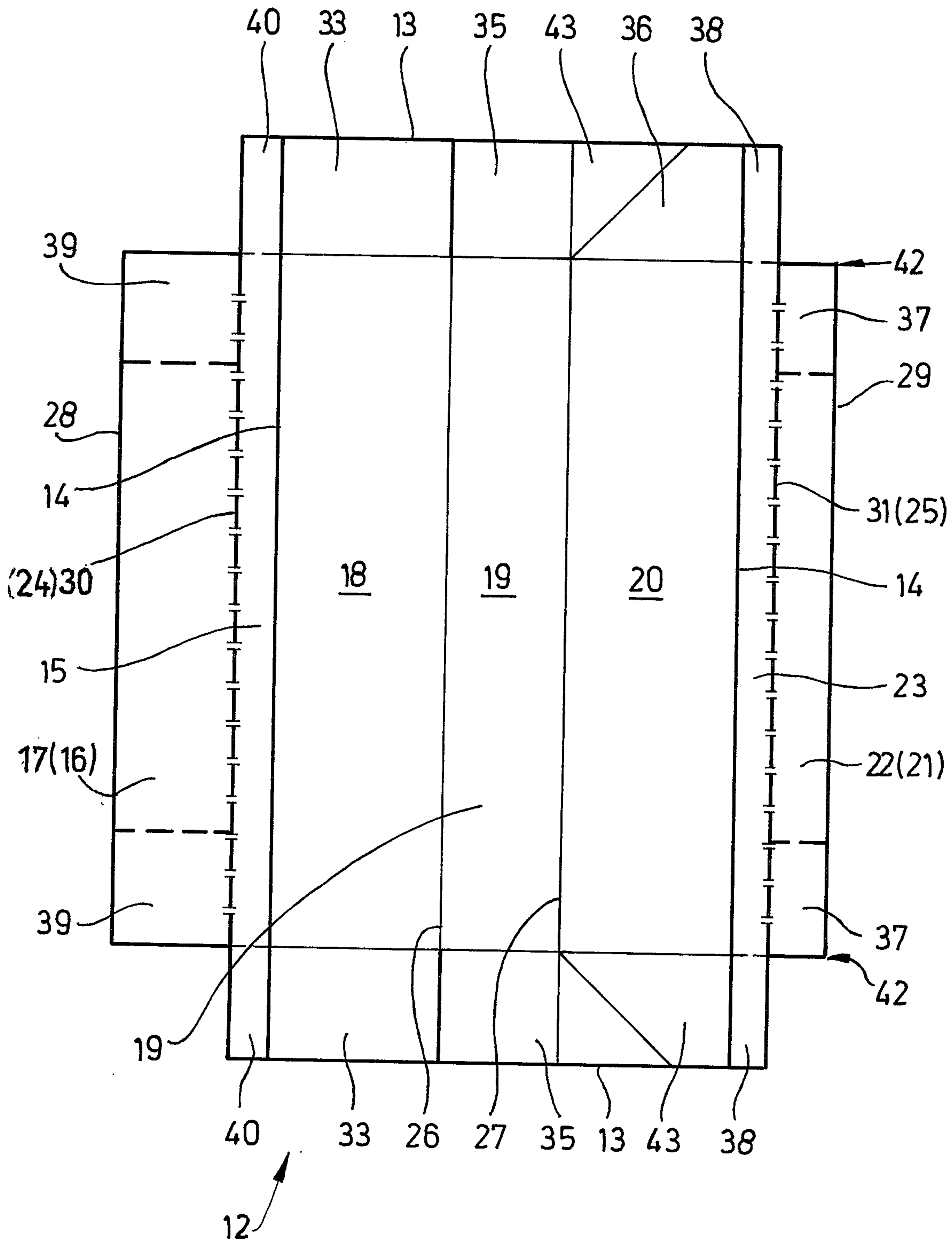
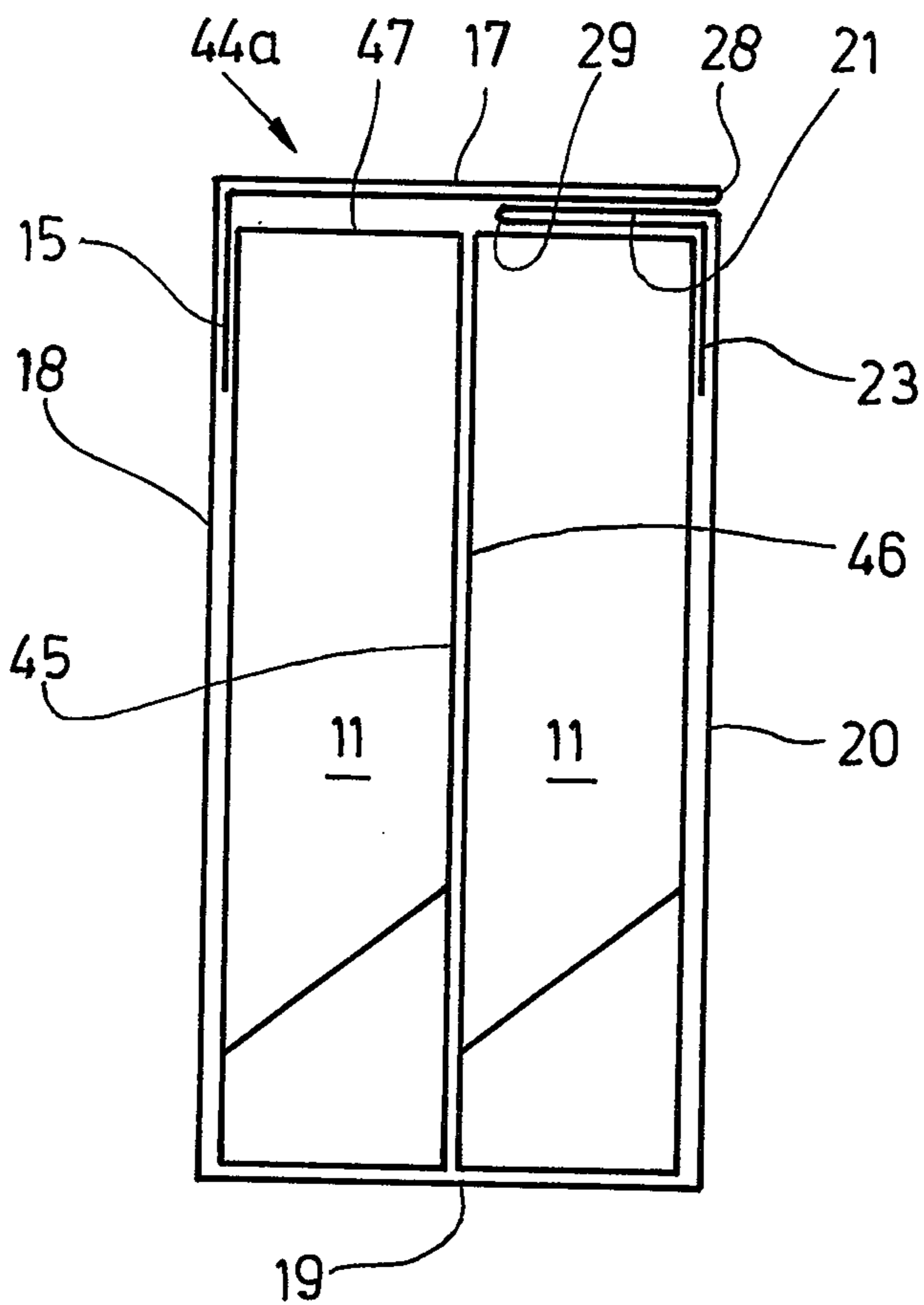


FIG.3



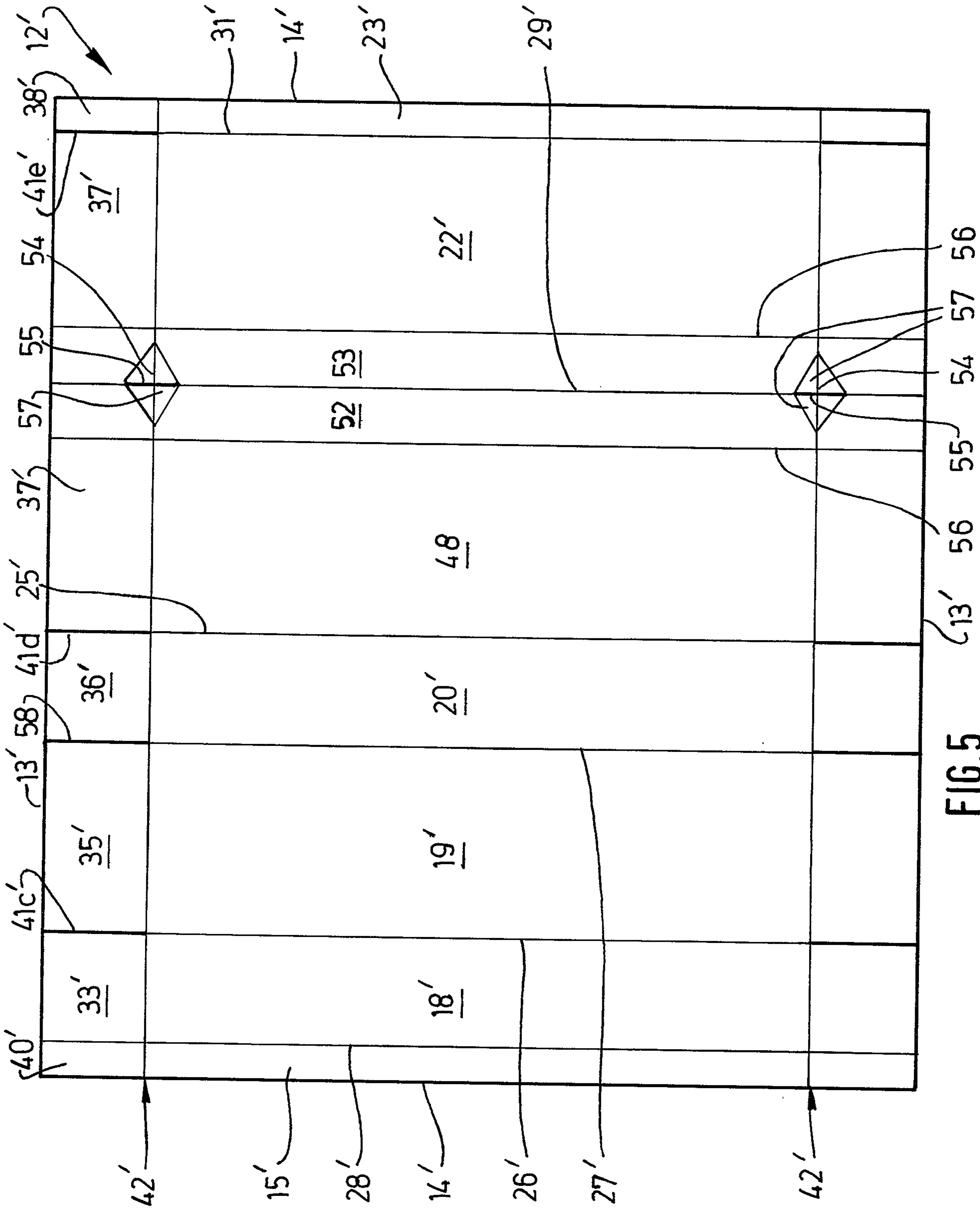


FIG. 5

FIG. 6

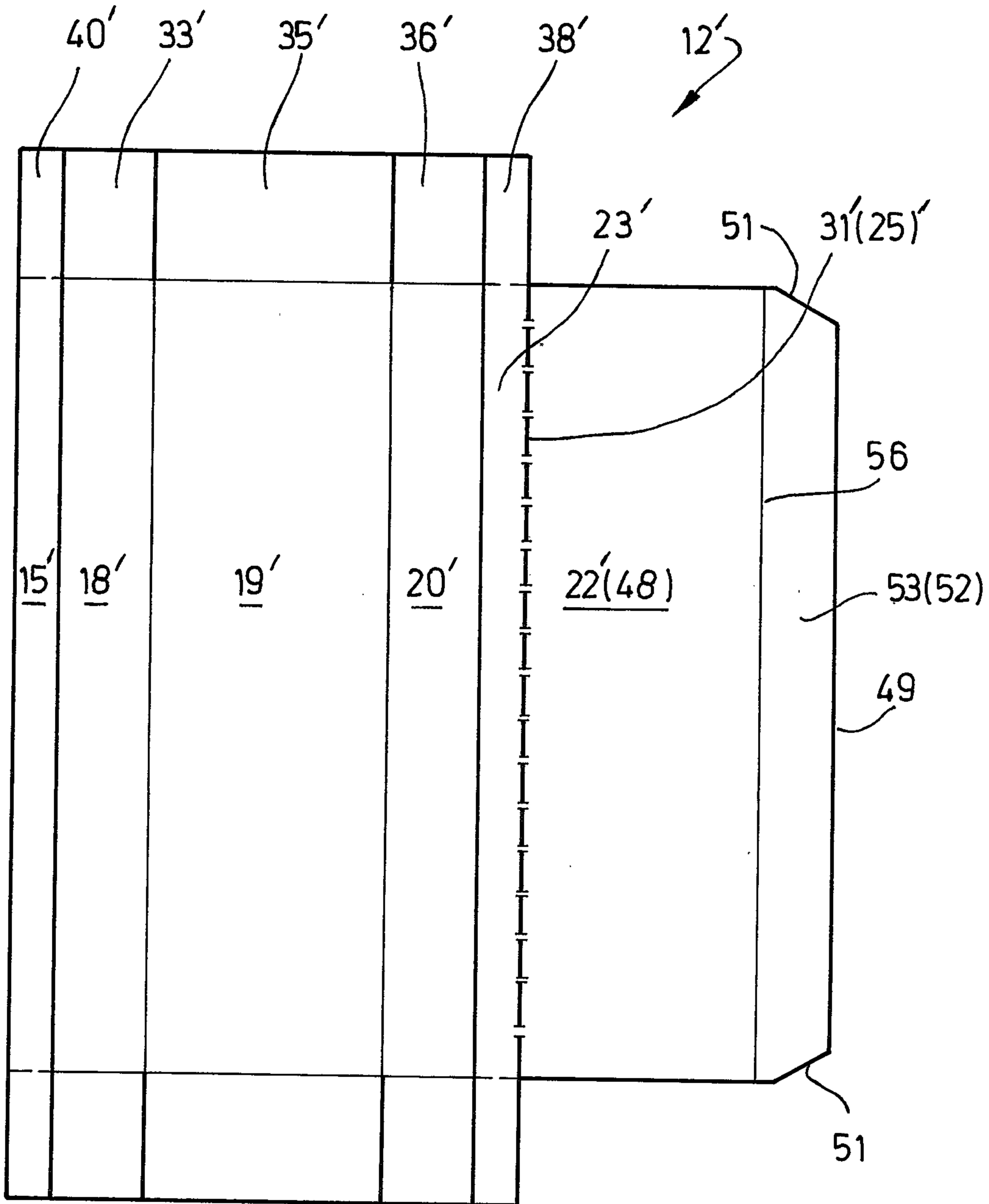
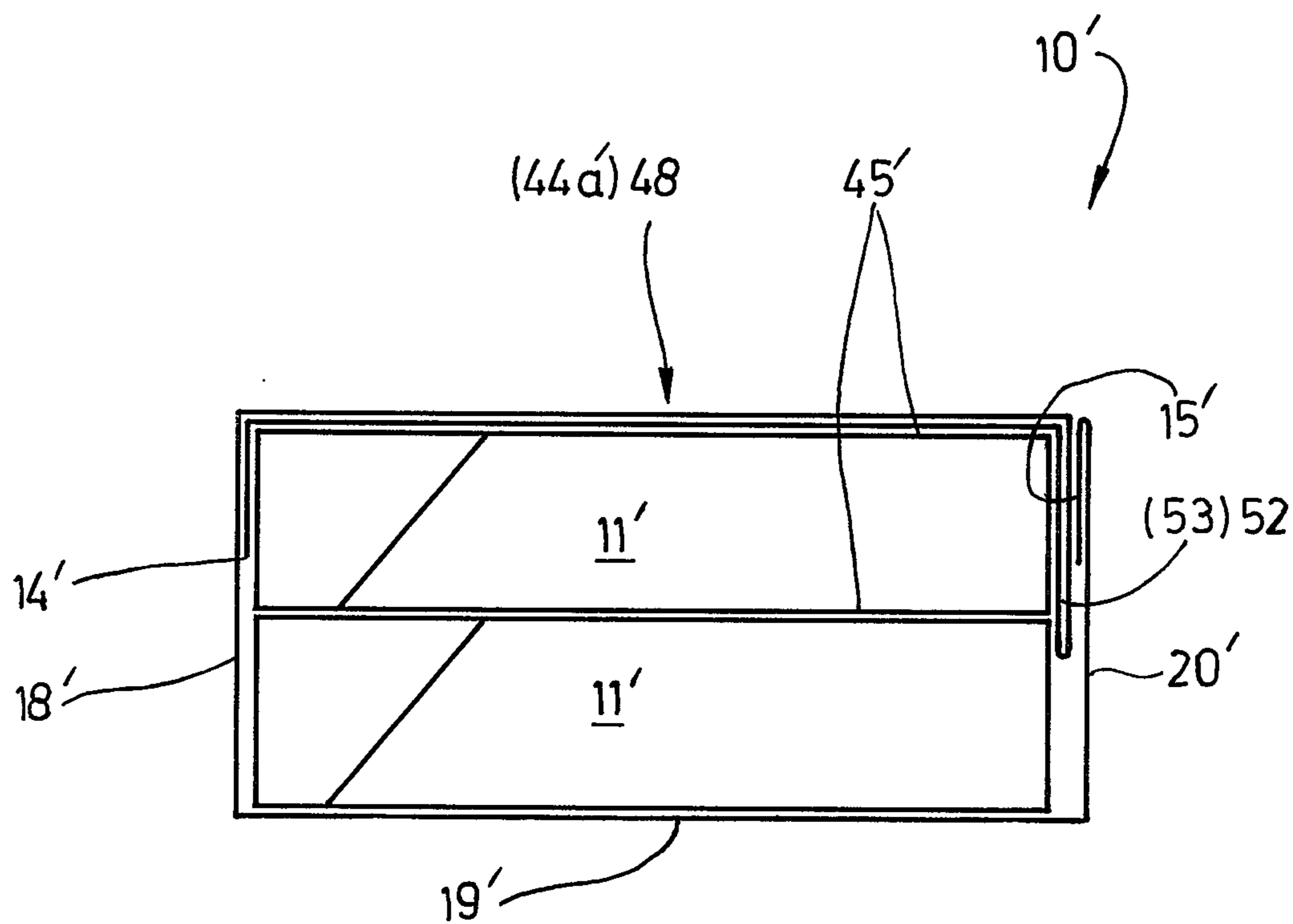


FIG. 7



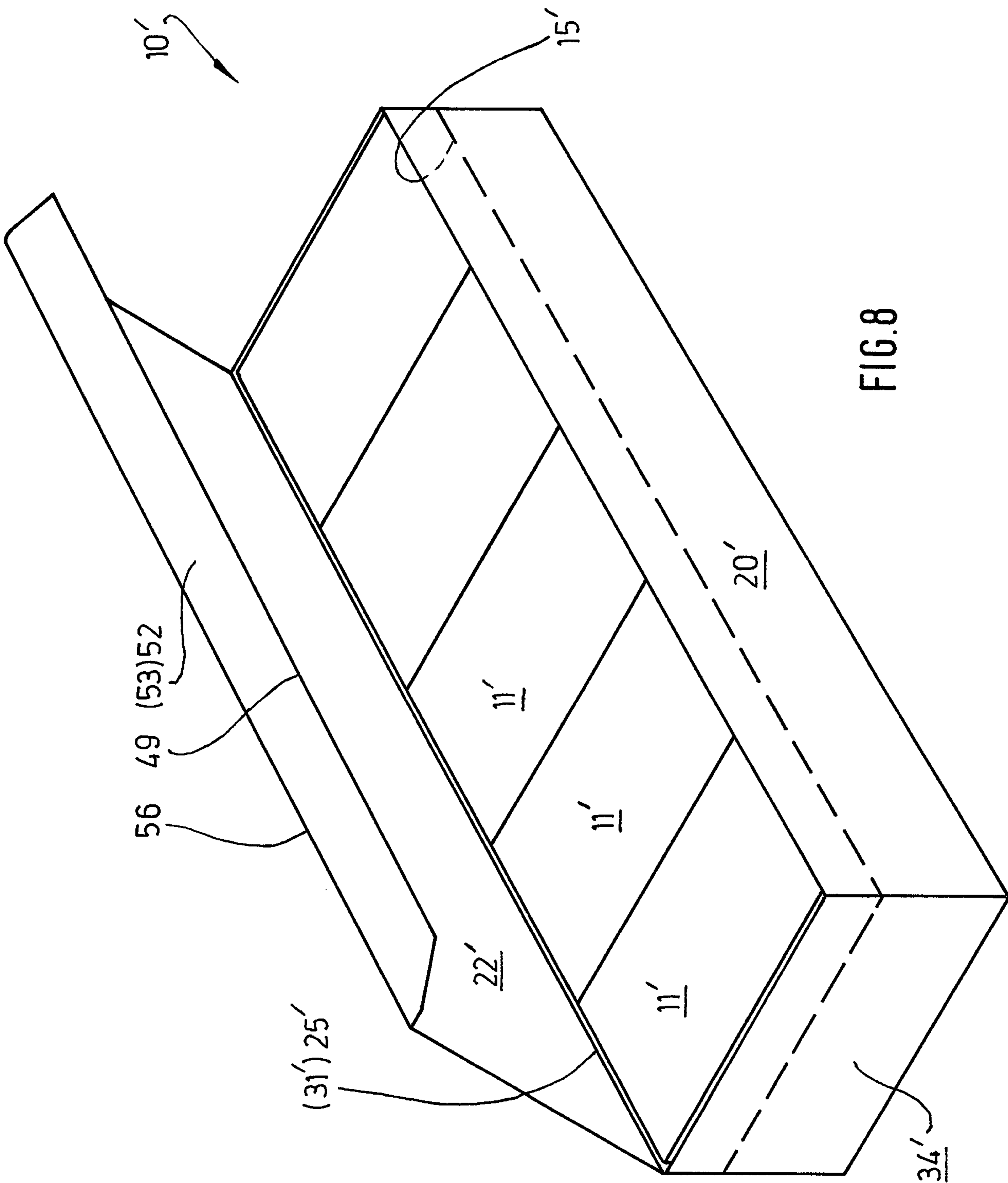


FIG. 8

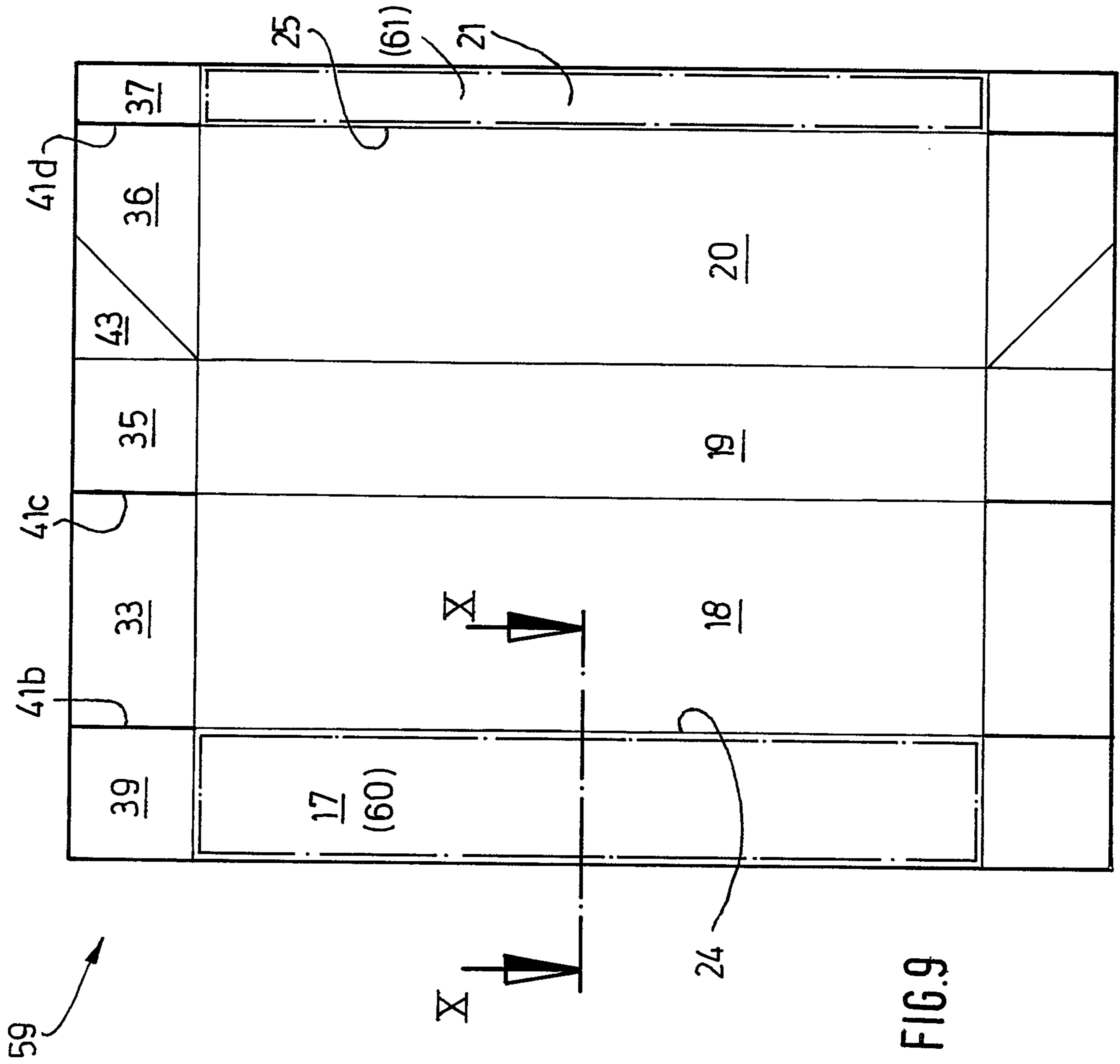


FIG. 9

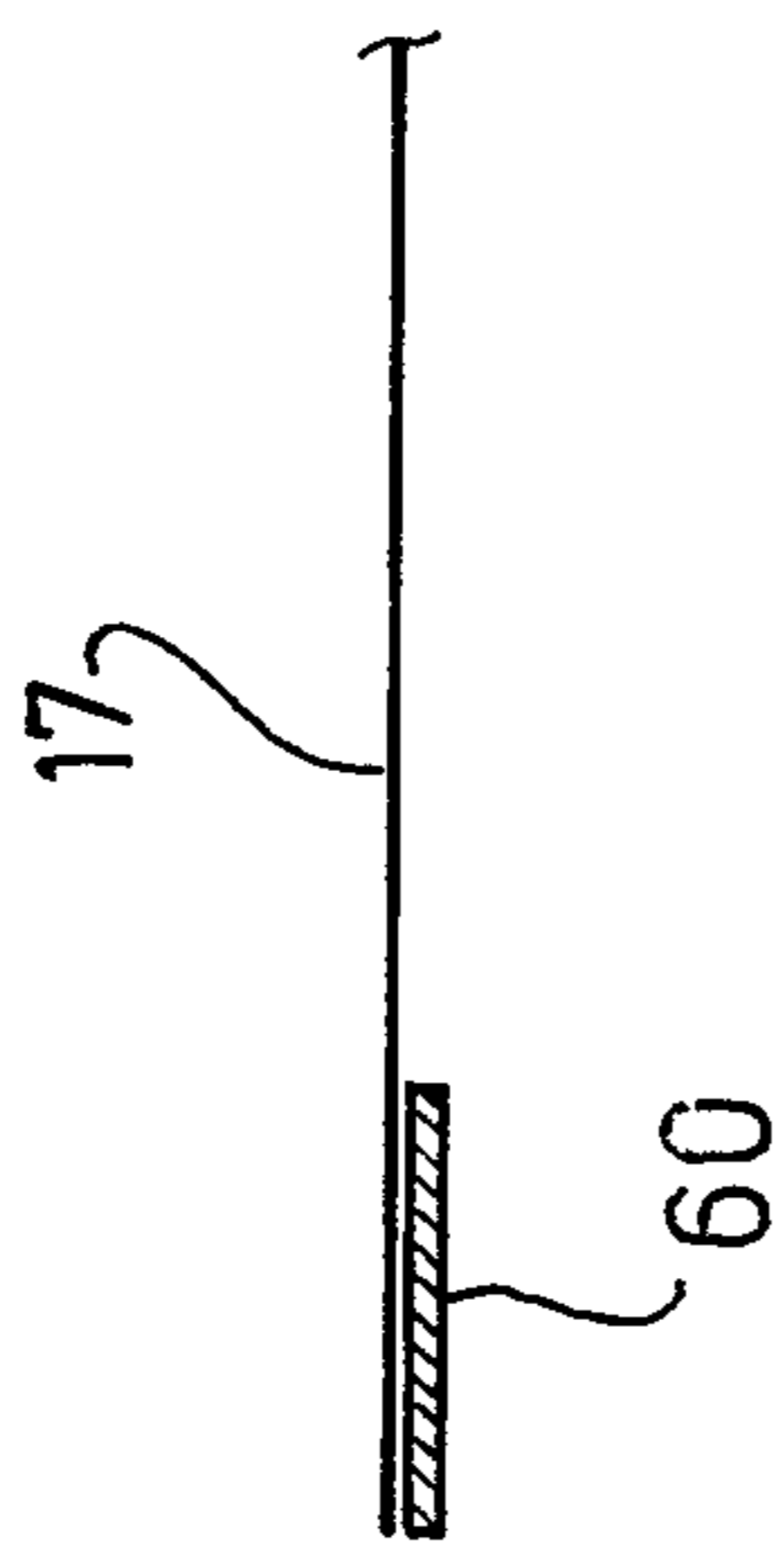


FIG. 10

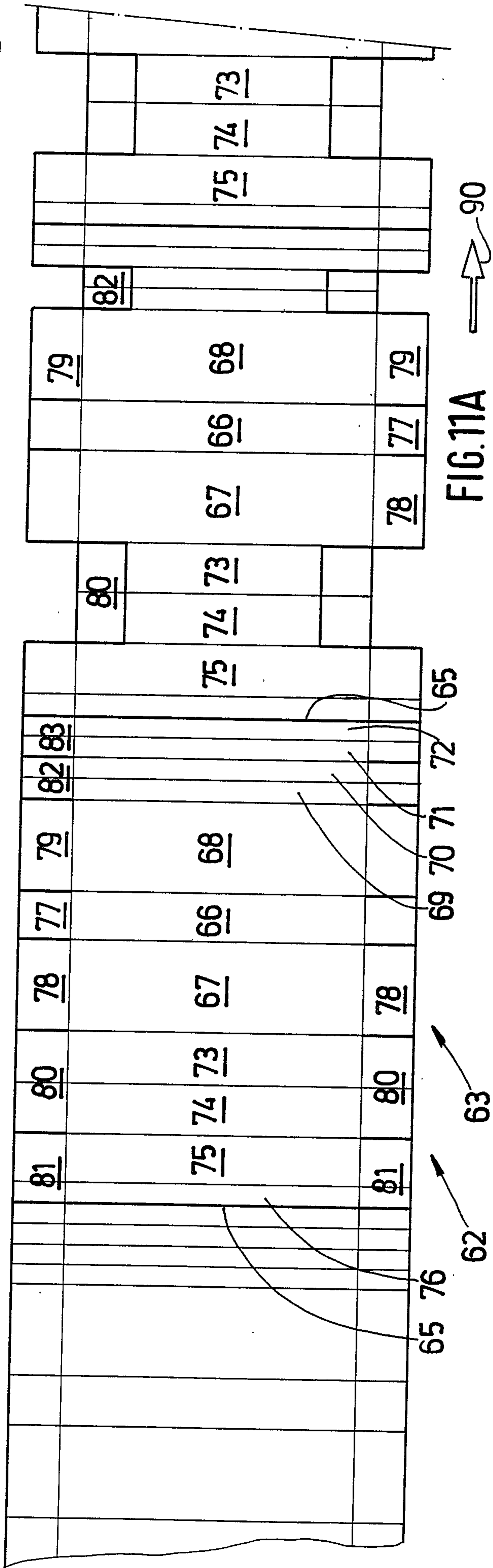


FIG. 11A

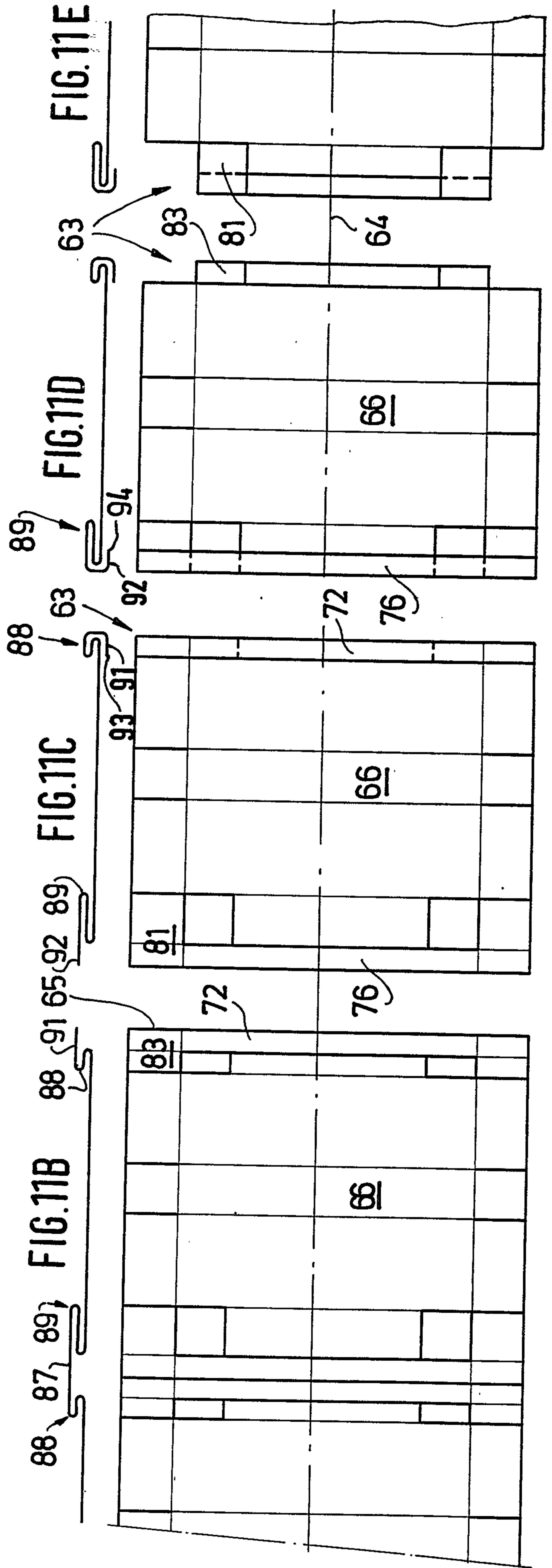


FIG. 11E

FIG. 11D

FIG. 11C

FIG. 11B

FIG.12

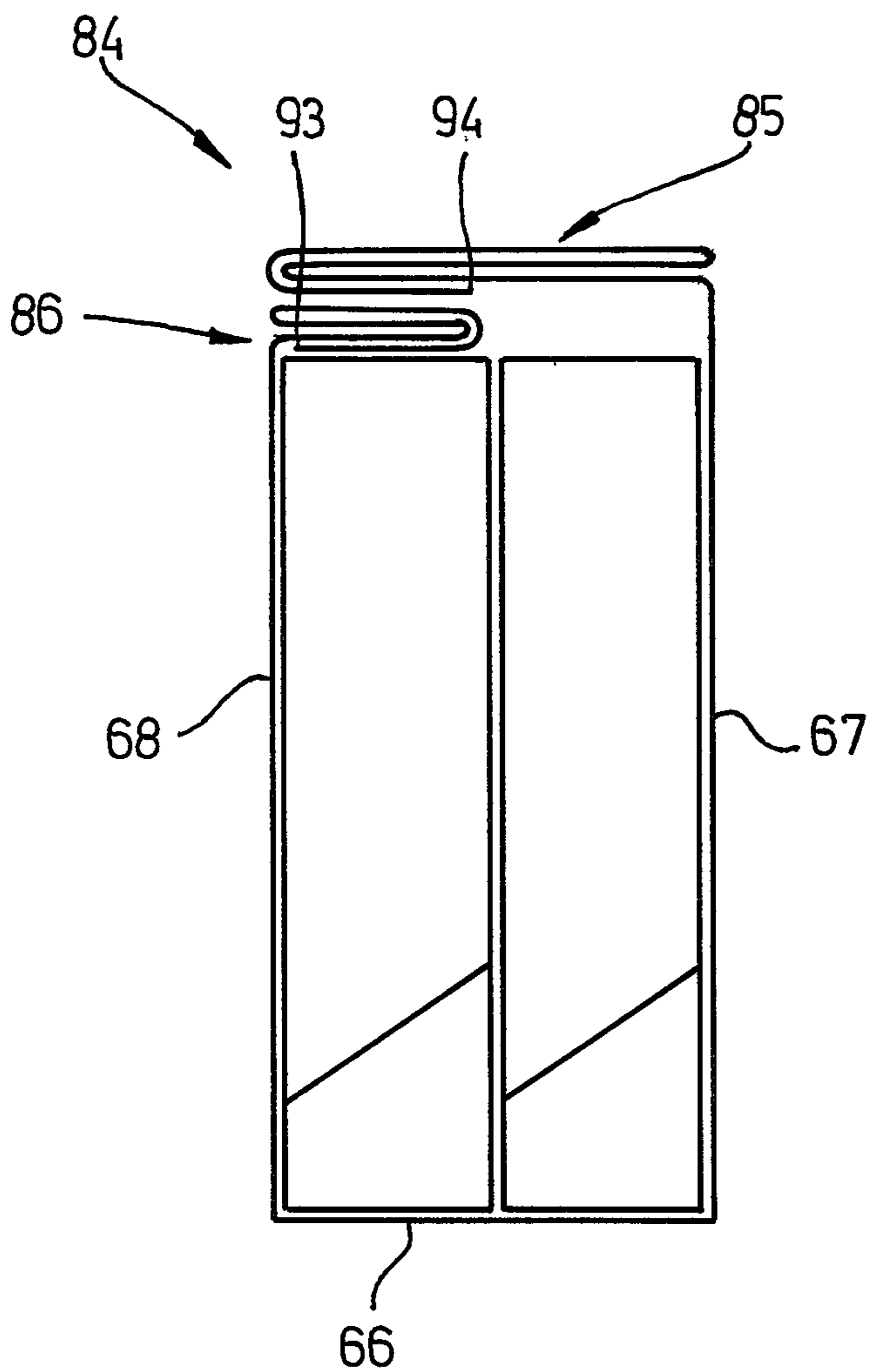


FIG. 13a

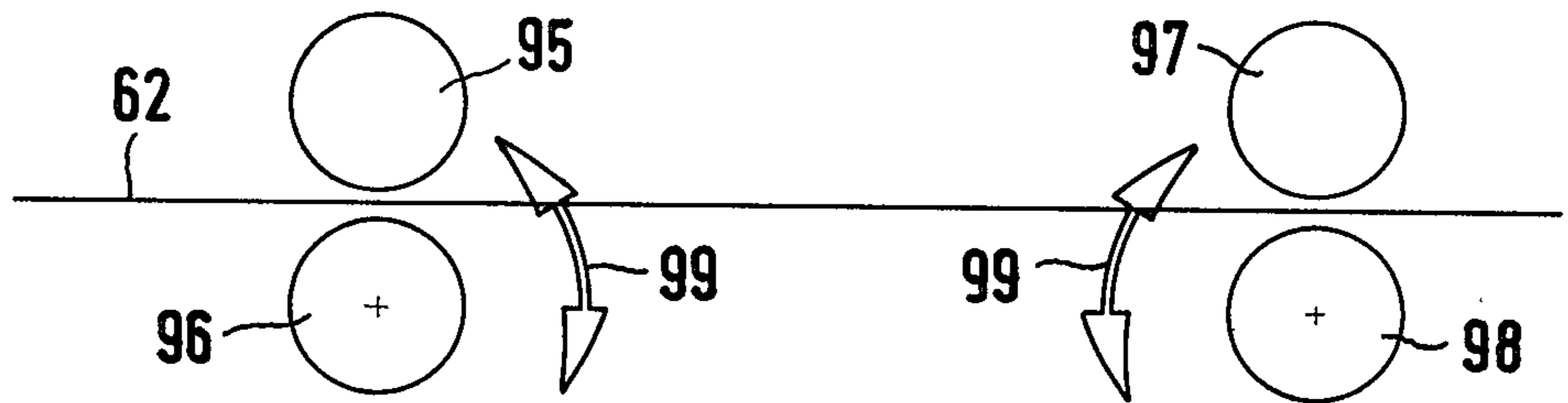


FIG. 13b

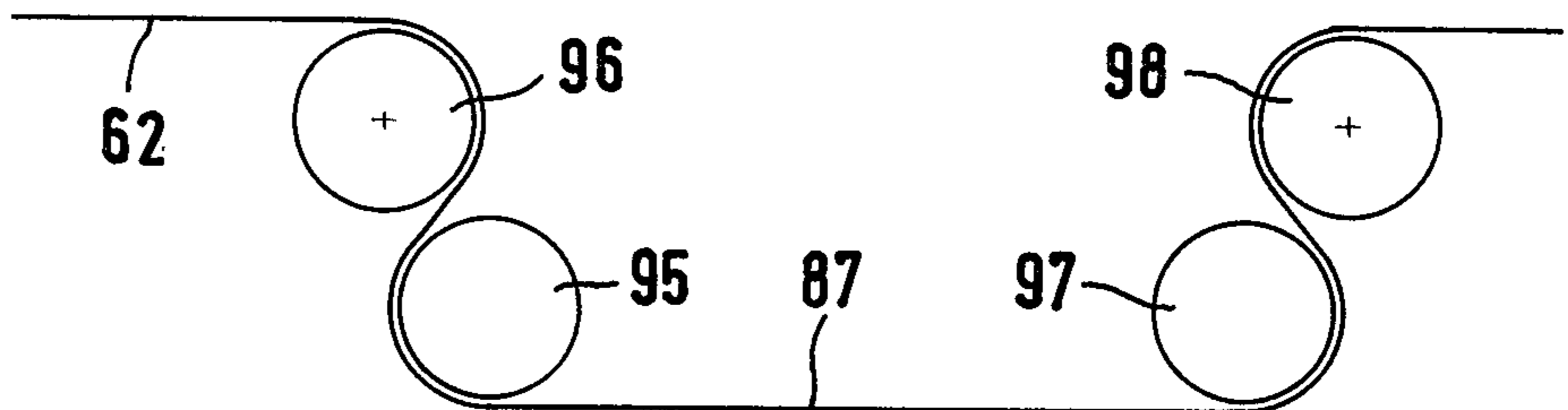


FIG. 13c

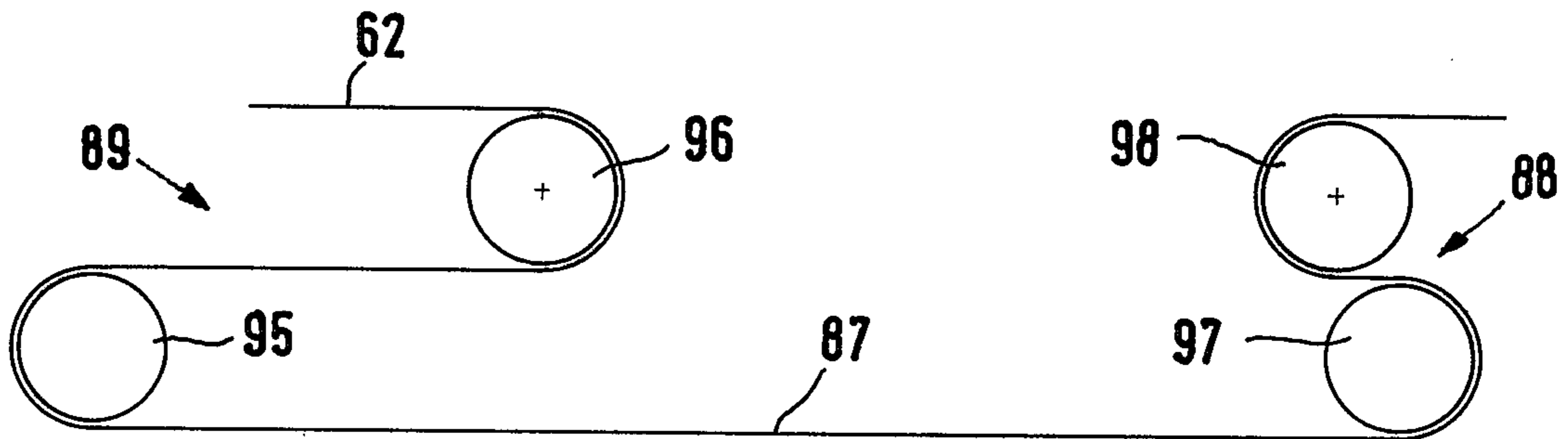
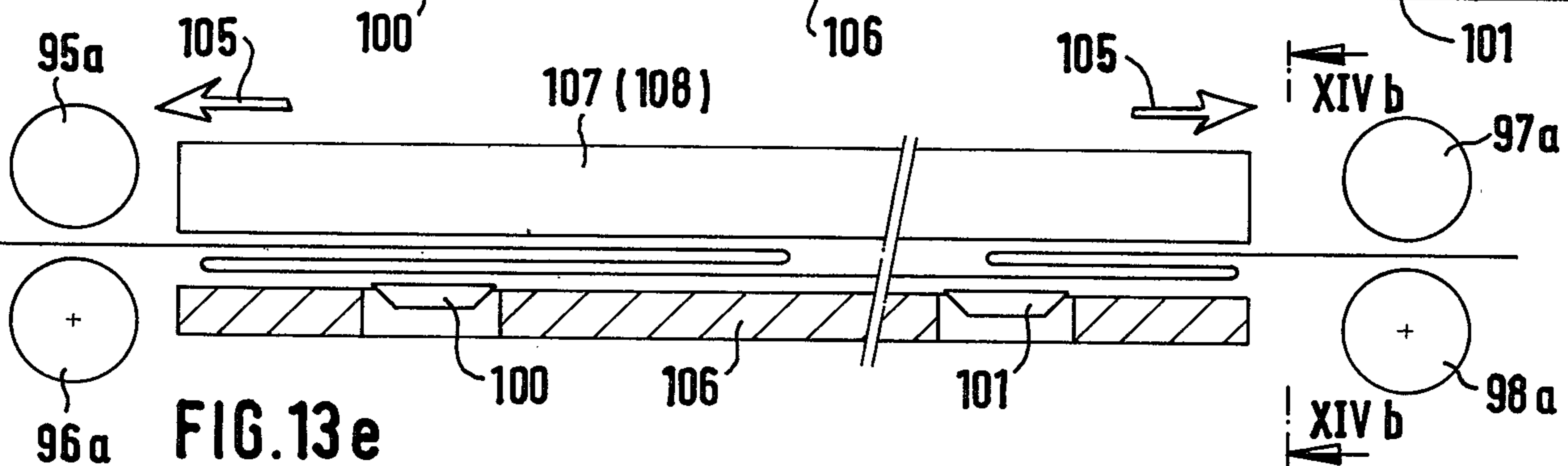
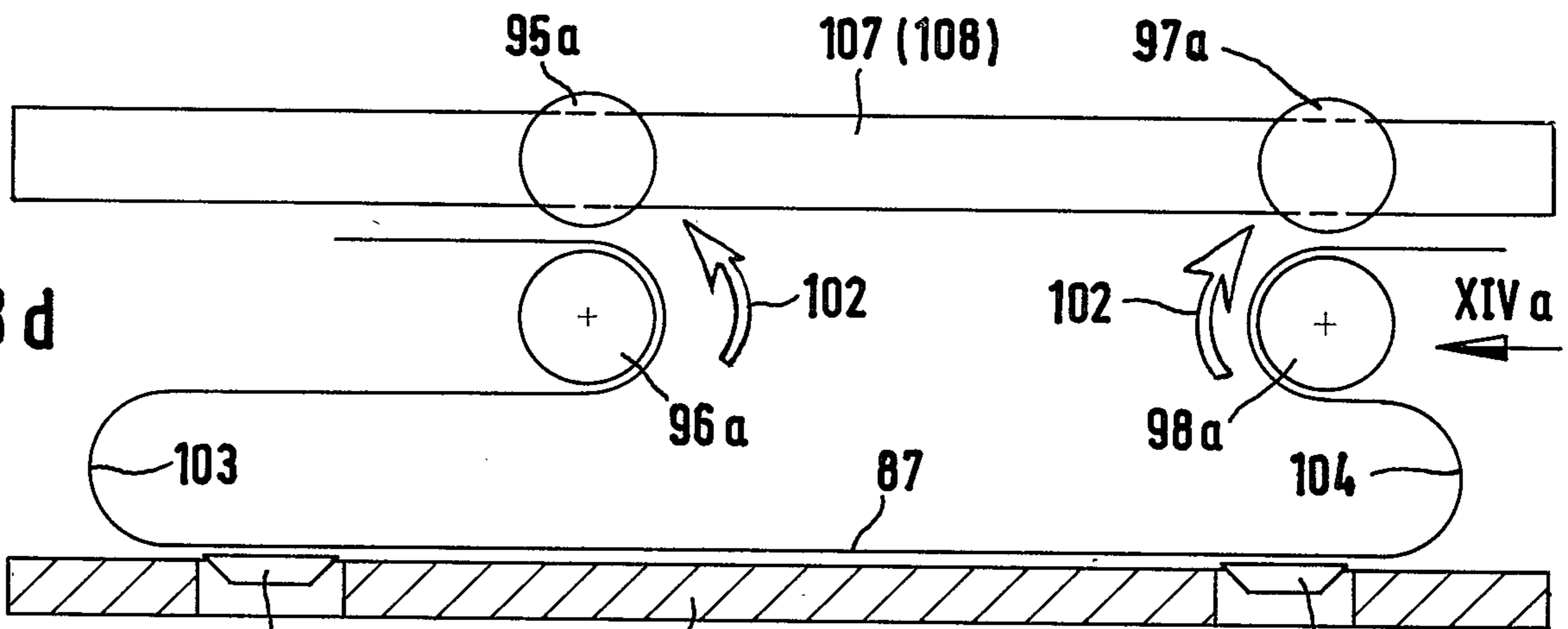


FIG. 13d



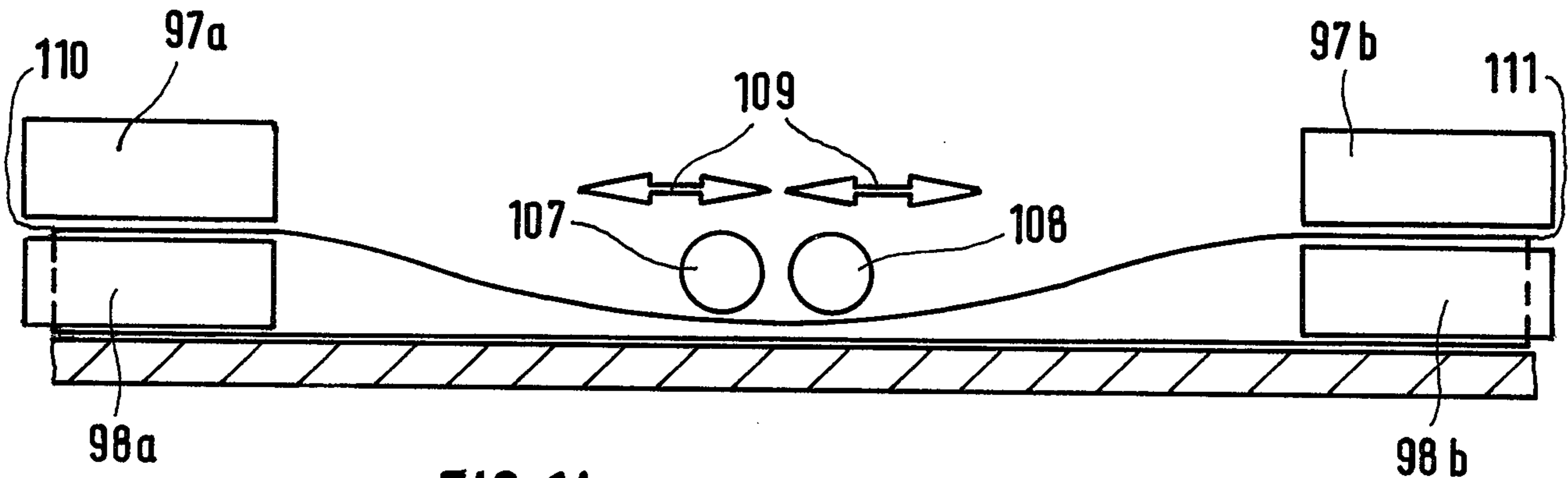


FIG. 14a

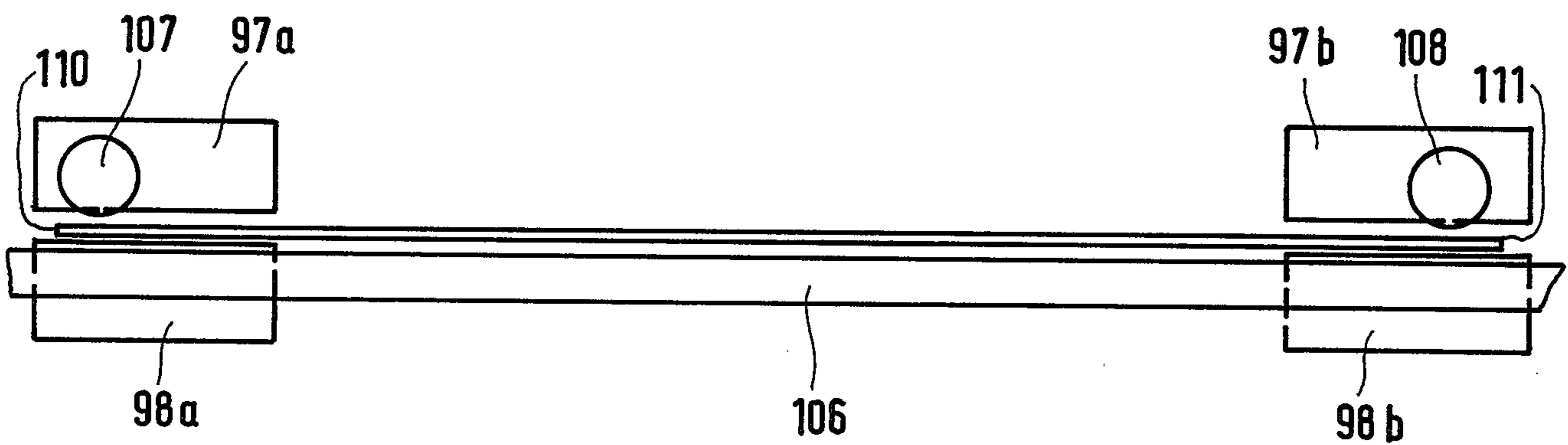


FIG. 14b

