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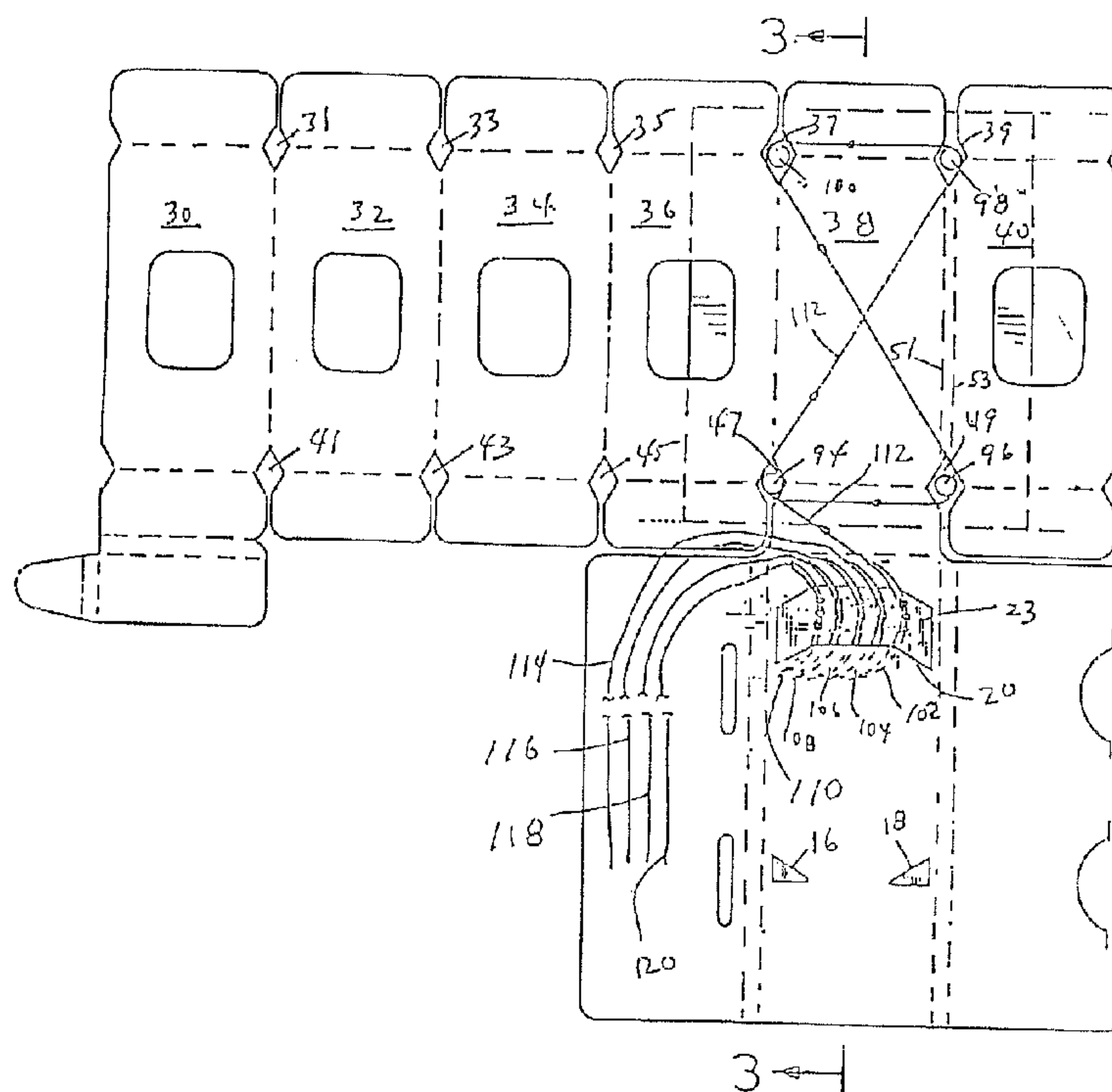
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(54) Title: PACKAGE FOR MULTIPLE SUTURES



(57) Abrégé/Abstract:

A suture package is disclosed which is formed of a plurality of panels foldably connected to each other and arranged to fold upon each other to form a suture compartment between pairs of adjacent panels. A generally planar insert member includes portions cut out and lifted from the plane of the insert, respective pluralities of the cut portions being dimensioned and positioned to engage respective portions of a plurality of suture needles positioned thereon to retain the needles in respective fixed spaced positions within the package such that the needles are positioned in one needle compartment and individual flexible suture portions connected to the needles are respectively positioned in individual compartments formed by the remaining adjacent folded panels. In one embodiment portions of certain panels are cut away to reduce the girth of the folded package when loaded. Such portions may either be circular cut-outs or may be provided by dimensioning the length of certain panels less than the others. Apertures are preferably provided to provide access means for packing fluids into the package.

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ABSTRACT OF THE DISCLOSURE

5 A suture package is disclosed which is formed of a plurality of panels foldably connected to each other and arranged to fold upon each other to form a suture compartment between pairs of adjacent panels. A generally planar insert member includes portions cut out and lifted from the plane of the insert, respective pluralities of the cut portions being dimensioned and positioned to engage
10 respective portions of a plurality of suture needles positioned thereon to retain the needles in respective fixed spaced positions within the package such that the needles are positioned in one needle compartment and individual flexible suture portions connected to the needles are
15 respectively positioned in individual compartments formed by the remaining adjacent folded panels. In one embodiment portions of certain panels are cut away to reduce the girth of the folded package when loaded. Such portions may either be circular cut-outs or may be provided by dimensioning the
20 length of certain panels less than the others. Apertures are preferably provided to provide access means for packing fluids into the package.

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PACKAGE FOR MULTIPLE SUTURES

10 This invention relates to packages for multiple sutures whereby a plurality of panels define one individual compartment for the needles and a plurality of panels separate the flexible suture portions.

2. Description of the Prior Art

15 Packaging of surgical needles and sutures requires that the needles be secured properly to prevent displacement, as well as being simply and quickly removable from their packages for use by the surgeon. Jarring or displacement of such sharp needles will tend to dull their edges and reduce their effectiveness while increasing trauma
20 to the patient during use.

Also it is desirable to package the needle/suture combinations in a manner where they are sufficiently separated for ready access to the user when they are needed. Moreover, the suture packages must be capable of receiving
25 and holding sutures of various sizes while generally not affecting the quality, shape or strength of the suture in any way.

In general, a most significant objective in suture packaging is to store and maintain the relatively delicate
30 ligatures in some form of spaced relation to each other so that access and removal of the suture may be readily

1 available without adversely affecting the ligature or the
needle as noted hereinabove. The present invention is
directed to a suture package wherein a plurality of sutures
5 may be stored in a single package while maintaining the
individuality of each suture with respect to the others.

SUMMARY OF THE INVENTION

10 A suture package is provided which comprises a
plurality of panel members foldably connected to each other
and arranged to fold upon each other to form at least two
individual suture compartments between pairs of adjacent
panels. Needle holding means associated with at least one
15 of the panel members to retain at least two suture needles
in respective fixed positions whereby the needles are
positioned in generally spaced relation and individual
flexible suture portions are respectively positioned in the
individual suture compartments formed by the remaining
adjacent folded panels.

20 Preferably, the needle holding means is a planar
resilient plastic insert member having portions cut out and
lifted from the plane of the insert, with respective
pluralities of the cut portions dimensioned and positioned
thereon to retain the needles in the respective fixed
25 positions.

30 The individual flexible portion of each suture is
wound individually in a separate compartment formed by
adjacent panels folded upon each other. Preferably the
planar insert member is of resilient plastic material and is
attached to one of the panel members.

1 The planar insert member is preferably retained in
position on the one panel member by insertion of corner
portions thereof into slits in the one panel member. The
5 plastic member is preferably of generally rectangular
configuration.

 The one panel member contains at least four slits
positioned and dimensioned for reception of corner portions
of the plastic insert member therein to retain the plastic
10 insert member thereon. Preferably the cut-out portions of
the plastic insert member are "V" shaped cuts whereby
material surrounded by the "V" shaped cuts is lifted out of
the plane of said insert member to retain each needle on the
insert member. Preferably, the cut-out portions of the
15 plastic insert member are numbered and respectively
positioned to retain a plurality of curved suture needles.
Five needle/suture combinations are preferred.

 The suture package includes at least two rows of
generally rectangular panels connected to each other, at
least one of the rows containing a plurality of rectangular
20 panels connected to each other on the longer sides. The
second row also includes a plurality of panels connected to
each other on the longer sides. The two rows of panels are
respectively connected to each other on the shorter sides of
at least one panel in each row. At least one of the rows
25 contains at least six panels and the other of the rows
contains at least three panels. Certain of the panels
define apertures generally centrally positioned to reduce
the girth of the package. Each panel contains at least four
notches, at least two notches on one panel facing the
30 notches on the next adjacent panel, and dimensioned and

1 positioned for reception of suture winding pins therethrough
for winding the flexible suture portions therearound. At
least one of the panels of the first row contains an end
5 flap on a shorter side. The end flap has a generally
tapered end portion and is adapted to be folded over one
shorter side to protect the sutures. The second row of
panels includes three panels, a first centrally positioned
panel to support the plastic needle insert and two adjacent
10 panels foldably connected to the first central panel. Each
panel of the second row is generally rectangular and is
connected to the next adjacent panel on a longer side.

Preferably the package is structured to receive at
least five curved needles supported beneath the "V" shaped
15 lift tabs of the insert panel, a first flexible suture
portion being wound in a coiled configuration and positioned
between a first panel and the next adjacent second panel,
and a second flexible suture portion connected to the second
needle being positioned in coiled configuration between the
20 second panel and the next adjacent third panel. A third
flexible suture portion is connected to the third needle and
is positioned in coiled configuration between the third
panel and the next adjacent end panel and a fourth flexible
suture portion is positioned in coiled configuration between
25 the end panel and a fourth panel connected to the third
panel. A fifth flexible suture portion is positioned in
coiled configuration between the fourth panel and a fifth
panel connected to the fourth panel.

In one embodiment the suture package comprises a
first row of six generally rectangular shaped panels
30 connected to each other by fold lines along the longer

1 sides, a second row of three generally rectangular shaped
panels connected to each other by fold lines along the
longer sides, the central panel of the second row being
5 connected to a second panel of the first row by a fold line
along the shorter sides thereof. The central panel of the
second row defines a plurality of cuts for reception of a
generally rectangular needle retainer panel. A flexible
plastic needle retainer panel is attached to the central
10 panel of the second row by insertion of the corner portions
into the cuts in the panel having a plurality of "V" shaped
cut-outs adapted to be defined out of the plane of the
insert for retaining five curved suture needles thereon.
The panels are respectively folded in a manner to form
15 compartments between adjacent panels, each compartment
containing at least one flexible suture portion therein in a
wound configuration. The panels are finally folded to form
a generally rectangular suture package. Each flexible
suture portion is wound in the respective compartment in a
20 figure "8" configuration.

In another embodiment, each panel contains a
rectangular aperture to reduce the girth of the package,
whereas in still another embodiment a plurality of generally
elongated tapered apertures are provided to facilitate
25 loading the package with needled sutures on a suture winding
fixture and to provide access for fluids to the compartment.

In still another embodiment certain of the panels
are fabricated of less material by dimensioning such panels
approximately one half of the length of the other panels.
30 In each embodiment a needle protective end flap may be
foldably attached to one of the panels in either row to be

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1 folded over the suture/needle connection portion of the
needle to cover and to protect the needle.

5 Still another embodiment of the suture package
comprises a plurality of panel members foldably connected to
each other and arranged to fold upon each other to form a
suture compartment between pairs of adjacent panels, at
least two panel members having a generally central portion
10 cut away to reduce the girth of the combined sutures and
panels. A generally planar insert member has portions cut
out and lifted from the plane of the insert, respective
pluralities of said cut portions being dimensioned and
positioned to engage respective portions of at least two
suture needles positioned thereon to retain said needles in
15 respective fixed position within the package whereby said
needles are positioned in generally spaced relation in one
compartment and individual flexible suture portions are
respectively positioned in individual compartments formed by
the remaining adjacent folded panels.

20 The package is preferably formed from a sheet of
Tyvek brand 5 to 10 point polyolefin spun fibers which
provides sufficient slip to smoothly withdraw the suture
strands. Alternatively, surgical paper such as uncoated 5
point Kraft paper may be used.

25 In another preferred embodiment of the present invention
includes the steps of loading a suture package with a
plurality of sutures, each having a flexible suture portion
and a surgical needle attached to one end, the suture
package having a first row of generally rectangular shaped
30 panels connected to each other along fold lines extending
along the longer sides thereof, at

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least one panel of the second row connected along the shorter side thereof to the shorter side of one panel of the first row of panels, and needle retaining means on at least one of the panels of the second row for releasably retaining surgical needles in spaced relation, and provides for the steps of:

- a) positioning at least two surgical needles on the needle retaining means;
- b) aligning the first row opposite the needle retainer panel on a winding fixture such that winding pins thereof extend upwardly adjacent one panel of the first row;
- c) winding the flexible suture portion connected to the first needle about the winding pins until the suture portion is coiled upon itself within the periphery of the panel;
- d) folding the adjacent panel of the first row over the coiled suture portion;
- e) winding the flexible suture portion attached to the next adjacent needle about the winding pins until the suture portion is coiled within the periphery of the folded panel; and
- f) repeating steps d and e sufficient to position each needle and to coil and position each flexible suture portion within a respective compartment defined by adjacent panels of the first row.

Desirably, the above embodiment includes the steps of:

- g) folding the second row of panels onto the first row of panels along the fold line connecting the first and second row;
- h) folding a third panel of the second row of panels onto the folded first row of panels;
- i) folding a first panel of the second row of

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panels onto the folded first row of panels
and onto the third panel of the second row;
and

- 5 j) securing the first panel of the second row to
the third panel of the second row to form the
fully folded suture package.

10 In a further desirable embodiment of the above, an end flap
is connected to one panel of the first row and the steps are
followed by folding the end flap over the suture connecting
portion of the needles to cover and protect the needles.

15 Preferably, an end flap is connected to one panel of the
second row and the steps are followed by folding the end
flap over the suture connecting portion of the needles to
cover and protect the needles.

20 According to another embodiment of the present invention, at
least two flexible suture portions, each having at least one
needle attached thereto, which comprises:

- 25 a) a plurality of panel members foldably connected to each
other and arranged to fold upon each other to form at least
two individual suture compartments between pairs of adjacent
panels; and
b) a needle holding insert member attached to one of the
panel members and retaining all such suture needles in
respective fixed spaced positions wherein all such needles
are positioned in generally spaced relation on the insert
30 member and the individual flexible suture portions are
respectively positioned in the individual suture
compartments formed by the remaining adjacent folded panels.

It is a further embodiment of the above that each individual

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flexible suture portion is individually wound in a separate suture compartment formed by adjacent panels folded upon each other.

- 5 In another preferred embodiment of the present invention, there is provided
- a) at least two rows of generally rectangular panels connected to each other and arranged to fold upon each other to form at least two individual suture compartments between
 - 10 pairs of adjacent panels; and
 - b) a substantially planar insert member supported by one of the panel members and having portions cut out and lifted from the plane of the insert member, respective pluralities of the cut portions being dimensioned and positioned to
 - 15 engage respective portions of suture needles to retain such needles in respective fixed positions whereby such needles are positioned in generally spaced relation and individual flexible suture portions are respectively positioned in individual compartments formed by the remaining adjacent
 - 20 folded panels.

A particularly preferred embodiment of the above is that at least one row of the panels contains a plurality of rectangular panels connected to each other on the

25 longitudinal sides thereof, the second row includes a plurality of panels connected to each other on the longitudinal sides thereof, the at least two rows of panels are respectively connected to each other on the short sides of at least one panel in each row and a first row of panels

30 contains at least six panels.

Moreover, the second row of panels contains at least three panels, at least one of the panels are formed of less material than the others to reduce the girth of the package,

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the three panels of the second row of panels includes a first centrally positioned panel to support the insert member and two adjacent panels foldably connected to the first central panel, each panel of the second row is

5 generally rectangular and is connected to the next adjacent panel on a longer side, the adjacent panels of the second row are connected to the central panel by a double fold line each of which defines edge panels to encompass the remaining panels in their folded condition, and at least one panel of

10 the first row is foldably connected to the next adjacent panel by a double fold line to define a second edge panel of width sufficient to encompass the panels and sutures in the folded and assembled condition.

15 Additionally, an embodiment of the present invention comprises

a) a first row of a plurality of generally rectangular panels foldably connected to each other on the longitudinal sides thereof and arranged to fold upon each other to form

20 at least two individual suture compartments between pairs of adjacent panels, each the panel containing at least four notches, at least two notches on at least one panel facing the notches on the next adjacent panel in the same row, in their folded condition, the notches being dimensioned and

25 positioned for reception of suture winding pins therethrough for winding the flexible suture portions therearound;

b) a second row of a plurality of generally rectangular panels foldably connected to each other on the longitudinal sides thereof;

30 c) needle holding means associated with one of the panels of the second row of panels to retain at least two suture needles in respective fixed positions on the one panel whereby the needles are positioned in generally spaced relation and individual flexible suture portions are

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respectively positioned in the individual suture compartments formed by the remaining adjacent folded panels; and

- 5 d) the first row of panels being connected to the second row of panels on the short sides of at least one panel in each row.

10 A further embodiment of the above is where at least one of the panels of the first row contains an end flap on a short side, and the end flap has a generally tapered end portion and the end flap is adapted to be folded over one shorter side to protect the sutures.

- 15 In another embodiment of the present invention is where a) a first row of a plurality of generally rectangular panels foldably connected to each other on the longitudinal sides thereof and arranged to fold upon each other to form at least two individual suture compartments between pairs of adjacent panels;
- 20 b) a second row of a plurality of generally rectangular panels foldably connected to each other on the longitudinal sides thereof, the second row of panels including a first centrally positioned panel and two adjacent panels foldably connected to the first central panel, the central panel
- 25 supporting a plastic needle insert with at least two needles being supported thereof, a first flexible suture portion connected to a first needle and being wound in a coiled configuration and positioned between a first panel and the next adjacent second panel of the first row, and, a second
- 30 flexible suture portion connected to a second needle being positioned in coiled configuration between the second panel and the next adjacent third panel of the first row; and
- c) the first row of panels being connected to the second row of panels on the shorter sides of at least one panel in each

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row.

5 Preferably, the second row of folded panels is folded along the shorter side defining a fold line between the panels of each row of panels, the adjacent panels of the second row being respectively folded around the folded panels and sutures, the adjacent panels of the second row of panels include means for connecting the panels together, the connecting means in the adjacent panels of the second row
10 comprise at least two slots in one of the end panels and at least two arcuate cuts in the other end panel to define arcuate tabs, the arcuate tabs being positioned and dimensioned for entry into the slots in the other adjacent panel to retain the panels in closed positions about the panels of the first row and the sutures positioned
15 therebetween, certain of the panels each define at least one aperture to reduce the girth of the package when fully loaded, and certain of the panels define apertures to permit introduction of fluid into the compartments defined thereby.

20

It is an embodiment of the present invention where
a) a first row of a plurality of generally rectangular shaped panels connected to each other by fold lines along the longer sides thereof;
25 b) a second row of at least three generally rectangular shaped panels connected to each other by fold lines along the longer sides thereof, one of the panels of the second row being a connector panel connected to a panel of the first row by a fold line along the shorter sides thereof;
30 c) needle retaining means associated with the connector panel of the second row; and
d) the panels of the first row being respectively foldable in a manner independent from the panels of the second row to form compartments between adjacent panels, each compartment

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adapted to contain at least one flexible suture portion
therein in a wound configuration, each suture attached to a
needle held by the needle retaining means, the panels being
finally foldable to form a generally rectangular suture
5 package.

It is desirable of the present invention where the needle
retaining means comprises an insert member having portions
cut out and lifted from the plane of the insert, respective
10 pluralities of the cutout portions being dimensioned and
positioned to engage respective portions of the suture
needles, the planar insert member is of resilient material,
the resilient material is plastic, the planar insert member
is retained in position on the central panel member of the
15 second row by insertion of marginal portions thereof into
slits in the central panel member.

In addition to the above embodiment, the planar insert
member is of generally rectangular configuration, the
20 central panel member contains at least four slits positioned
and dimensioned for reception of corner portions of the
insert member therein to retain the insert member thereon,
the cut-out portions of the plastic insert member are "V"
shaped cuts whereby material surrounded by the "V" shaped
25 cuts is lifted out of the plane of the insert member at
least two of the "V" shaped cut-out portions are provided on
the plastic insert member to retain each needle thereon, and
the cut-out portions on the plastic insert member are
respectively positioned to retain curved suture needles.

30 Furthermore, at least three of the cut-out portions are
provided in the plastic insert member to retain each curved
suture needle, the plastic insert needle retainer is
dimensioned and includes sufficient cut-out portions to

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retain at least two curved suture needles thereon, and the plastic insert needle retainer is dimensioned and contains sufficient cut-out portions to retain at least five curved needles thereon.

5

Preferably, at least two rows of panels are respectively connected to each other by an intermediate panel, the intermediate panel attached to the short sides of one panel in each row, and the first row contains at least six panels.

10

It is desirable of the above embodiment that at least two panels of the first row have a generally central portion cut away to reduce the girth of the combined sutures and panels, the lengths of at least two of the panels of the first row of panels are approximately one-half the lengths of the remaining panels to reduce the girth of the package when the panels are fully folded, the first row of panels possesses three such half panels, and at least one of the panels of the first row contains an end flap on a shorter side.

20

Further, the shorter panels are connected to each other and one longer panel is connected to one end of the shorter panels on one side of the row and two of the longer panels are connected to another of the shorter panels on the opposite side, and the one longer end panel has an end flap connected to a shorter side thereof such that when the panels are respectively folded with a plurality of needles positioned in the compartment and the flexible suture portions connected thereto respectively positioned in individual compartments formed by adjacent panels, the end flap is foldable over the needle compartment to cover and protect the upper end portions of the needles.

30

In a further preferred embodiment, the plurality of panels

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of the first row have apertures configured to receive pins for winding sutures thereof, the apertures have a generally tapered configuration, the tapered apertures extend across the fold line between adjacent panels, at least five panels of the first row each contain two tapered apertures, and at least one panel on the first row contains a circular aperture to permit fluid to be added to the package.

Desirably, at least one of the panels of the second row contains an end flap foldably connected along a shorter side, and an end panel is connected to one end panel of the second row such that when the panels are respectively folded within a plurality of needles positioned in the needle retaining means and the flexible suture portions connected thereto are respectively positioned in individual compartments formed by folded adjacent connected panels of the first row, the end flap is foldable over the needle compartment to cover and protect the upper end portions of the needles.

There is provided, in another preferred embodiment of the present invention, a method of loading a suture package with a plurality of sutures, each suture having a flexible suture portion and a surgical needle attached to one end, the suture package having a first row of generally rectangular shaped panels connected to each other along fold lines extending along the longer sides thereof, a second row of generally rectangular shaped panels connected to the first row, the panels of the second row being connected to each other along fold lines extending along the longer sides thereof, a needle retainer panel attached to at least one of the panels of the second row for releasably retaining the surgical needles in spaced relation, and a needle protective end flap connected to the shorter side of at least one of

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- the rectangular panels, the method comprising the steps of:
- a) positioning at least two of the needles on the needle retainer panel;
 - b) aligning the panels of the first row opposite the needle retainer panel on the winding fixture such that winding pins thereof extend upwardly adjacent the panel of the second row;
 - c) winding the flexible suture portion connected to the first needle about the winding pins until the suture portion is coiled upon itself within the periphery of the panel;
 - d) folding the next adjacent panel of the second row over the coiled suture portion;
 - e) winding the flexible suture portion attached to the next adjacent needle about the winding pins until the suture portion is coiled within the periphery of the folded panel;
 - f) repeating steps a), b), c) and d) sufficient to position each needle and to coil and position each flexible suture portion within a respective compartment defined by adjacent panels; and
 - g) folding the end flap over the suture connecting portion of the needles to cover and protect the needles.

- A further embodiment of the present invention is where
- a) a first row of a plurality of generally rectangular shaped panels connected to each other by fold lines along the longer sides thereof, at least two panels having a generally central portion cut away to reduce the girth of the combined sutures and panels when the package is in a folded condition;
 - b) a second row of at least three generally rectangular shaped panels connected to each other by fold lines along the longer sides thereof, at least one panel of the second row being a connector panel connected to a panel of the first row by a fold line along the shorter sides thereof;

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c) needle retaining means attached to the connector panel of the second row; and

5 d) the panels of the first row being respectively foldable in a manner to form compartments between adjacent panels, each compartment adapted to contain at least one flexible suture portion therein in a wound configuration, each suture attached to a needle held by the needle retaining means, the panels being finally foldable to form a generally rectangular suture package.

10

In another embodiment of the present invention

a) a first row of a plurality of generally rectangular shaped panels connected to each other by fold lines along the longer sides thereof, at least two of the panels being approximately one-half the length of the remaining panels to reduce the girth of the package when the panels are in the fully folded condition.

15 b) a second row of at least three generally rectangular shaped panels connected to each other by fold lines along the longer sides thereof, at least one of the panels of the second row being a connector panel connected to a panel of the first row by a fold line along the shorter sides thereof;

20 c) needle retaining means associated with the connector panel of the second row; and

d) the panels of the first row being respectively foldable in a manner to form compartments between adjacent panels, each compartment adapted to contain at least one flexible suture portion therein in a wound configuration, each suture attached to a needle held by the needle retaining means, the panels being finally foldable to form a generally rectangular suture package.

30

An embodiment of the present invention is also provided where

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- a) a first row of a plurality of generally rectangular shaped panels connected to each other by fold lines along the longer sides thereof;
- 5 b) a second row of at least three generally rectangular shaped panels connected to each other by fold lines along the longer sides thereof, one of the panels of the second row being a connector panel connected to a panel of the first row by a fold line along the shorter sides thereof;
- 10 c) an end flap foldably connected to a shorter side of at least one of the panels of the second row;
- d) needle retaining means associated with the connector panel of the second row; and
- 15 e) the panels of the first row being respectively foldable in a manner independent from the panels of the second row to form compartments between adjacent panels, each compartment adapted to containing at least one flexible suture portion therein in a wound configuration, each suture attached to a needle held by the needle retaining means, the panels being finally foldable to form a generally rectangular suture
- 20 package.

Another preferred embodiment of the present invention is

- a) a first row of generally rectangular shaped panels connected to each other by fold lines along the longer sides
- 25 thereon, the panels having apertures to receive pins for winding sutures therein, each the apertures having a generally tapered configuration and extending across the fold line between adjacent panels;
- b) a second row of at least three generally rectangular
- 30 shaped panels connected to each other by fold lines along the longer sides thereof, one of the panels of the second row being a connector panel connected to a panel of the first row by a fold line along the shorter sides thereof;
- c) needle retaining means associated with the connector

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panel of the second row; and

5 d) the panels of the first row being respectively foldable in a manner independent from the panels in the second row to form compartments between adjacent panels, each compartment adapted to contain at least one flexible suture portion therein in a wound configuration, each suture attached to a needle held by the needle retaining means, the panels being finally foldable to form a generally rectangular suture package.

10

Another preferred embodiment of the present invention is

15 a) a plurality of panel members foldably connected to each other and arranged to fold upon each other to form at least two individual suture compartments between pairs of adjacent panels; and

20 b) a substantially planar insert member formed of a resilient material and attached to one of the panel members and having portions cut and lifted from the plane of the insert member, respective pluralities of the cut portions being dimensioned and positioned to engage respective portions of at least two suture needles to retain such needles in respective fixed positions, wherein such needles are positioned in generally spaced relation and individual flexible suture portions attached to such needles are each individually wound and positioned in a separate suture compartment formed by adjacent panels folded upon each other.

30 It is also desirable that a preferred embodiment of the present invention is provided where suture portions, each having at least one needle attached thereto, which comprises:

a) a plurality of panel members foldably connected to each other and arranged to fold upon each other to form at least

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two individual suture compartments between pairs of adjacent panels; and

- 5 b) a needle holding insert sheet attached to one of the panel members and adapted to retain all such suture needles in respective fixed spaced positions whereby all such needles may be positioned in generally spaced relation on the insert sheet and the individual flexible suture portions are respectively positioned in the individual suture compartments formed by the remaining adjacent folded panels.

10

BRIEF DESCRIPTION OF THE DRAWINGS

Preferred embodiments of the invention are described hereinbelow with reference to the drawings wherein:

15

Fig. 1A is a perspective view from the left side, of a package for multiple sutures constructed according to

1 the present invention with all but one suture removed and illustrating removal of the last suture;

5 Fig. 1B is a plan view of a blank sheet constructed according to the invention defining a plurality of panel members foldably connected to each other;

10 Fig. 2A is a view similar to Fig. 1B with a needle retaining planar insert member with five needles in position and illustrating the procedure to wind the first of the sutures about winding pins of a suture wrapping fixture;

Fig. 2B is an enlarged fragmentary view illustrating a portion of a needle retaining planar insert member constructed according to the invention, with one exemplary needle retained in position thereon;

15 Fig. 3 is a cross-sectional view taken along lines 3-3 of Fig. 2A illustrating the needle and the corresponding procedure to wind the suture about suture winding pins of a suture winding apparatus;

20 Fig. 4 is a view similar to Fig. 2A, with the first panel folded over the second suture being wound about suture winding pins into the second compartment formed between the panels;

25 Fig. 5 is a view similar to Fig. 4 showing the third panel folded over the previously folded panels and illustrating the procedure for winding the third suture about winding pins into its respective compartment;

30 Fig. 6 is a view similar to Fig. 5 with the side panel folded over the previously folded panels and illustrating the procedure for winding the fourth suture about winding pins into its respective compartment;

1 Fig. 7 is a view similar to Fig. 6 with the fourth ,
panel folded over the previously folded panels and
illustrating the procedure for winding the fifth suture into
5 its respective compartment;

Fig. 8 is a view similar to Fig. 7 with the fifth
and last panel folded over the previously folded panels into
its final folded position;

10 Fig. 9 is a view illustrating the combined panels
and sutures folded in position behind the face panel and
illustrating the needle butt end cover tab in the last
folded position;

Fig. 10 is a frontal view of the package for
multiple sutures with the left hand panel folded behind the
15 package;

Fig. 11 is a frontal view of the completed suture
package of Fig. 10 with the right hand - and final - panel
folded in position at the rear of the package;

20 Fig. 12 is a rear view of the folded suture
package of Fig. 11 illustrating the locking tab feature
which retains the package in its final folded position;

Fig. 13 is an enlarged cross-sectional view taken
along lines 13-13 of Fig. 11 illustrating the individual
panels which form the compartments for the sutures (not
25 shown in this Fig.);

Fig. 14 is a plan view of an alternative
embodiment of the blank sheet shown in Fig. 1B;

Fig. 15 is a plan view of another alternative
embodiment of the blank sheet shown in Fig. 1B;

1 Fig. 16 is a frontal view of the embodiment of
Fig. 15 in a partially folded condition with the end tab in
the unfolded condition;

5 Fig. 17 is a frontal view of the embodiment of
Fig. 15 in the fully folded condition;

 Fig. 18 is a plan view of another alternative
embodiment of the blank sheet shown in Fig. 1B;

10 Fig. 19 is a plan view of still another
alternative embodiment of the blank sheet shown in Fig. 1B;
and

 Fig. 20 is a plan view of still another
alternative embodiment of the blank sheet shown in Fig. 1B.

15 DESCRIPTION OF THE PREFERRED EMBODIMENTS

 Referring initially to Fig. 1A a five needle
suture package 10 constructed according to the present
invention is illustrated. The package is shown with all
sutures except one removed for convenience of illustration.
20 The last suture is shown partially removed from the package.
Fig. 1B is a plan view of a blank sheet constructed
according to the invention and defining a plurality of panel
members foldably connected to each other to form individual
suture compartments. When folded and provided with a needle
holder insert panel as will be described, the suture package
25 of Fig. 1B will appear as shown in Fig. 1A.

 Referring once again to Fig. 1B, the blank sheet
12 is illustrated including panel 14 having cuts 16, 18, 20,
22, and 24 which are dimensioned, oriented and positioned to
receive a resilient plastic needle retainer sheet 26 shown
30 in Figs. 1A and 2B. The needle retainer sheet 26 is a

1 planar sheet of plastic material having generally "V" shaped
cuts 24 which define tabs which respectively alternate in
direction and which are conveniently positioned to be lifted
5 so as to receive and retain a plurality of curved suture
needles in position as shown in Fig. 2B by exemplary needle
28. The plastic insert sheet 26 is rectangular in shape and
is inserted into position in panel 14 such that the lower
cuts 16, 18, retain the lower corners and the upper cuts 22,
10 24 retain the upper corners. The upper mid-portion of the
sheet extends through cut 20 such that the upper portions of
the sheet and needles are exposed as shown in Figs. 1A and
2A.

Referring once again to Fig. 1B, the blank sheet
12 includes separate and individual panels connected to each
15 other as shown. An upper row of panels 30, 32, 34, 36, 38
and 40 are provided with individual respective cut out
portions 42, 44, 46, 48 and 50 to reduce the girth of the
package. In addition, with the rear panel opened, the
20 sutures may be viewed through the cut out portions as will
be appreciated below. Panels 52 and 54 - being the rear
panels of suture package 10 - do not include a cut out
portion and therefore provide cover protection for the
sutures.

Each panel 30, 32, 34, 36 and 38 is connected to
25 the next adjacent panel by a single fold line, with front
panel 14 being connected to rear panels 52 and 54 by double
fold lines 56, 58, 60 and 62 to accommodate the thickness of
the package and sutures. Intermediate encompassing panel 40
30 is also connected to the next adjacent panel 38 by double
fold lines 51 and 53 to accommodate the girth of the first

1 three panels - i.e. 38, 36, and 34 as will be seen in the
description which follows.

5 Referring further to Fig. 1B, slotted cut outs 64,
66 are provided in panel 52 and correspondingly positioned
arcuate cuts 68 and 70 are provided in panel 54. These cut-
outs and cuts are intended to close the package.

10 Referring once again to Fig. 1B, the upper row of
panels includes a foldable end flap 76 connected to panel 30
by double fold line 73, 80 to accommodate the thickness of
the package. This end flap includes a generally tapered
extension 90 which functions to lock the package in the
final folded condition as will be described. Each panel 30,
32, 34, 36, 38 and 40 includes "V" shaped cuts at the top
and bottom side portions to form, with the next adjacent
15 panel, diamond shaped openings 31, 33, 35, 37, 39, 41, 43,
45, 47, 49 to accommodate winding the suture as will be
described.

20 Referring now to Fig. 3, a cross-sectional view of
a suture wrapping fixture 92 is illustrated for packaging
sutures in the package of the present invention. The
wrapping fixture 92 includes upstanding pins, 94, 96, 98 and
100, which are dimensioned, configured and spaced for entry
into the diamond shaped openings 31, 33, 35, 37, 39, 41, 43,
25 45, 47 and 49 formed by the adjacent "V" cuts on the sides
of the panels as shown in Figs. 2A and 3. The wrapping
fixture is configured to receive the flat sheet of panels
for wrapping sutures as set forth hereinbelow.

30 The flat sheet 12 of multiple panels as shown is
preferably cut from a suitable package paper which is rigid
yet flexible, and which is of sufficient thickness to

1 separate and isolate the individual sutures from each other.
It has been found that a paper panel material approximately
5 .005 inch thickness is suitable and desirable. The flat
sheet is preferably formed from a spun bonded polyolefin,
free of any impurities which would adversely affect the
sutures. A preferred material is 5 point to 10 point Tyvek
brand spun bonded polyolefin sheet marketed by DuPont
DeNemours, Wilmington, Delaware. Tyvek brand sheet has
10 lower frictional properties for example, than conventional
paper materials and thus permits ease of removal of the
needles. Other preferred materials include paper or
paperboard material such as 5 point uncoated surgical Kraft
paper, also free of impurities which would adversely affect
15 the sutures. Such a preferred paper material is uncoated
surgical Kraft paper, about 5 point in weight.

As shown in Fig. 2A in conjunction with Fig. 2B, a
plastic needle holder sheet 23 is inserted into cut 20 in
panel 14 with upper corners inserted beneath upper cuts 22,
24 and the lower corners inserted beneath lower cuts 16, 18.
20 Individual suture needles 102, 104, 106, 108 and 110 are
positioned beneath respective tapered lift tabs 28 to retain
the needles in position as shown in Fig. 2A, with each tab
alternately facing the next adjacent tab. The points of the
needles face downwardly and are protected by the lower
25 portion of package material defined by cut 20. The
ligatures of the sutures are temporarily gathered and set
aside as shown in Fig. 2A except for the first ligature 112
which is connected to needle 102. This ligature 112 is
wound into a figure "8" pattern around pins 94, 96, 98, 100
30 as shown.

1 Referring further to Fig. 2A, ligature 112 is
alternately and continuously wrapped about pins 94, 96, 98,
100 as shown until completely wound about the pins.

5 Thereafter, panel 36 (with the remaining panels 34, 32, 30)
is folded to the right over panel 38 and ligature 112 is
shown in Fig. 4, such that ligature 114 connected to needle
104 may be alternately and continuously wrapped about pins
94, 96, 98, 100 until completely wound into a figure "8"
10 pattern. Next, panel 34 (and the remaining panels) is
folded to the left over panel 36 as shown in Fig. 5 whereby
ligature 114 connected to needle 106 may be alternately and
continuously wrapped around pins 94, 96, 98 and 100 to form
a figure "8" pattern as shown in Fig. 5.

15 Referring now to Fig. 6, end panel 40 is then
folded to the left over panel 34 and ligature 114 such that
the relatively narrow side panel 51a defined by the double
fold lines 51, 53 may encompass the combined side edges of
the previously folded panels 38, 36 and 34. After folding
20 panel 40 as shown in Fig. 6, the ligature 116 connected to
needle 106 is wrapped about pins 94, 96, 98, 100 as shown
until complete wound. Thereafter, panel 32 is folded over
the ligature 116 as shown in Fig. 7 whereby ligature 118
attached to needle 108 may be wound in a Fig. "8" pattern
25 about pins 94, 96, 98, 100 until completely wound. Finally,
remaining panel 30 is folded over the last ligature as shown
in Fig. 8.

Referring now to Fig. 9, the suture package is
illustrated with the entire folded suture panels and
ligatures folded downwardly behind the front panel 14.
30 Thereafter, panel 52 is folded along the double fold lines

1 56, 58 such that the relatively narrow edge panel 56a
encompasses all of the folded panels along the left side.
Then side panel 54 is similarly folded along the double fold
5 lines 60, 62 as shown such that the narrow edge side panel
60a encompasses the previously folded panels along the right
side. Arcuate tabs 72, 74 of rear panel 54 are then
inserted into slots 64, 66 of rear panel 52 to retain the
panel in a closed condition. Rear panel 54 also serves to
10 retain the tapered end flap 90 of end tab 76 in position as
shown in Fig. 12 which is a rear view of the suture package.
Fig. 10 illustrates a front view of the package prior to
folding the final rear panel 30 into position.

Referring now to Fig. 13 there is shown a cross-
15 section of the suture package taken along lines 13-13 of
Fig. 11, illustrating the panel folding sequence described
above. For example, from panel 14 and plastic insert 22 are
shown in cross section. Panels 38, 36, 34, 40 are shown in
their folding sequence as described hereinabove. Rear
20 panels 52, 54 are also illustrated.

Referring now to Fig. 14, there is illustrated an
alternative embodiment of the blank sheet of panels 12 shown
in Fig. 1B. In the embodiment 120 shown in Fig. 14, the
panels and tabs are shaped to provide additional relief at
the fold lines. For example, tab 90 of blank sheet 12 shown
25 in Fig. 1B is defined by straight tapered sides, whereas
corresponding tab 122 in the blank sheet shown in Fig. 14
includes arcuately configured side 122a to provide more
convenient folds. Further, for example, the face panel 124
includes cuts 126, 128, 130 and 132 as shown to provide an
30 alternative means for retaining the plastic needle retainer

1 insert. An additional side panel flap 144 is provided and
connected by double fold lines 146, 148 to the side edge of
panel 30. Flap 144 is dimensioned and adapted to assist the
5 operator during removal of the loaded package from the
winding fixture, and is folded over and pressed against the
loaded suture panels to hold the sutures in place while the
loaded pins are withdrawn. An extra end flap 134 is also
provided and connected by double fold lines 140, 142, as
10 shown, for the purpose of providing closure of the bottom
edge of the package prior to folding the last and the
penultimate panels 136 and 138. This feature provides
additional protection for the sutures. Tab 122, which
corresponds to tab 90 of blank sheet 12 shown in Fig. 1B,
15 includes arcuately configured side 122a which provides
additional relief at the fold line and for a more convenient
fold. Face panel 124 includes cuts 126, 128, 130 and 132 as
shown to provide an alternate means for retaining the
plastic needle retainer insert. In other respects the blank
20 sheet of folding panels shown in Fig. 14 is essentially the
same as the first described embodiment.

Referring now to Fig. 15, there is illustrated
another embodiment of the present invention. In this
embodiment, panel 180 and the upper row of panels 152, 154,
25 156, 158 and 160 are provided with individual respective
cut-out circular apertures 162, 164, 166, 168 and 170 to
allow packing fluid, i.e., isopropyl alcohol, to be added to
the package when the package is in the folded condition.
Panel 150 - being the rear most panel of the upper row of
30 panels when the package is in the folded condition - is not
provided with a circular aperture to prevent the packing

1 fluid from escaping the suture retaining area of the
package. The top edges of panels 152, 154, 156 and 160 have
been lowered as shown as compared to the top edges of the
embodiments of Figs. 1B and 14. Such lowering provides
5 distinct advantages in terms of suture-needle visibility and
decreased bending stress on the suture. As best illustrated
by Fig. 16, the upper portion of the package is open and
unobstructed thereby providing greater access to the needle
and suture. The top of the package also provides a greater
10 area for the suture to curve away from the needle, resulting
in less stress on the suture and needle attachment while
also providing a neater appearance.

Referring again to Fig. 15, panel 180 is adjoined
15 to panel 158 of the first row of panels by intermediate
panel 188. Intermediate panel 188 is folded over upon
itself along fold line 184 when folding the upper row of
panels against the lower row of panels. This folded
arrangement of panel 188 provides a double layer of panels
20 between panel 180 and the upper row of panels which in
effect spaces panel 180 away from the upper row of panels to
provide additional clearance between the needle holding
panel and the loaded suture portion of the package. Such
clearance aids in providing needle visibility and access
during operating procedures and also reduces the bending
25 stress on the suture portion neighboring the needle. The
upper portion of the package when folded is open and
unobstructed, thereby providing good visibility and access
to the needles and sutures. Another feature of this
embodiment is the length of end tab 190 which is extended to
30 completely cover the needles when the suture package is in

1 the final folded condition as shown in Fig. 17. Fig. 16
shows the package prior to folding end tab 190 over in the
final position.

5 Alternative embodiments will now be described as
shown in Figs. 18-20. In connection with these embodiments
the folding sequence is the same as described with respect
to the previous embodiments and are therefore not repeated
herein for the sake of brevity.

10 Referring now to Fig. 18, another embodiment of
the present invention is described. In this embodiment,
panels 200, 204, 206, 208 and 210 are each provided with two
tapered oval apertures. Similar to the circular apertures
of the embodiment of Fig. 15, the tapered oval apertures
15 212, 214, 216, 218, 220, 222, 224, 226, 228 and 230 serve as
a means to permit packing fluid, i.e., isopropyl alcohol, to
be added to the package when the package is in the folded
condition. The apertures also are positioned and configured
to receive the suture winding pins for suture wrapping, thus
20 replacing the diamond shaped openings 31, 33, 35, 37, 39,
41, 43, 45, 47 and 49 of the embodiment of Fig. 1B.

The tapered oval apertures in Fig. 18 provide a
distinct advantage during suture winding and loading.
Specifically, the length of the tapered oval apertures
25 facilitates folding of the panels on the winding fixture by
providing a clearance such that each panel can be folded
over without engagement of the portion of the panel adjacent
to the suture winding pin with the winding pin. For
example, during suture winding of panel 202, the suture
winding pins project upwardly through the plane of the panel
30 and through the tapered apertures. When the suture is

1 completely wound on the panel, panel 204 is folded onto
panel 202. The length of apertures 214 and 224 permit the
portions of panel 204 neighboring the winding pins to clear
5 the tops of the suture winding pins and fold onto panel 202
without interference of the pins with the panel during the
folding process. As panel 204 is folded over panel 202,
apertures 216 and 226 align with portions of apertures 212
and 222 and receive the winding pins on the opposite side of
10 panel 202. Similar alignment of the winding pins and the
tapered apertures occurs during subsequent folding steps
without interference therebetween.

Referring now to Fig. 19, another embodiment of
the present invention is described. In this embodiment,
15 half panels 234, 236 and 238 are provided to reduce the
overall bulk of the suture package when the package is in
the completely folded condition. The half panels also
prevent the loaded sutures from catching on the packing
fluid aperture.

Referring now to Fig. 20, another embodiment of
20 the present invention is illustrated. In this embodiment
the end closure tab is moved from its original location
wherein it is attached to the first panel on the first row
of panels (compare panel 244 of Fig. 19) to an alternative
location wherein it is configured as shown at 246 and
25 attached to panel 174 of the second row of panels by double
fold lines 250, 252 to allow for the thickness of the
package when folded over in the final position. This
feature ensures that upon the lifting of end tab 248 to
30 expose the loaded needles, the lifting motion of the end tab
-- which is now secured to the second row of panels -- will

1 prevent inadvertent removal of the interior first row of
panels from the closed suture package which might otherwise
occur as a result of the reduced dimensions of interior
5 panels 234, 236, 238. Another feature of this embodiment is
that the length of flap 246 is sufficiently extended to
assist the operator during removal of the loaded package
from the winding fixture, and to hold the sutures in place
while the loaded pins are withdrawn.

10 The above embodiments have been shown and
described as examples of the present invention, and other
modifications and embodiments are contemplated within the
spirit of scope of the present invention as defined by the
following claims.

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THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE
PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:

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1. A suture package which comprises:

a) a plurality of panel members foldably

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connected to each other and arranged to fold upon each other
to form at least two individual suture compartments between
pairs of adjacent panels; and

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b) needle holding means associated with at least
one of said panel members to retain at least two suture
needles in respective fixed positions whereby said needles
are positioned in generally spaced relation and individual
flexible suture portions are respectively positioned in said
individual suture compartments formed by the remaining
adjacent folded panels.

15

2. The suture package according to claim 1
wherein each said individual flexible suture portions is
individually wound in a separate suture compartment formed
by adjacent panels folded upon each other.

20

3. The suture package according to claim 2
wherein said needle folding means comprises a substantially
planar insert member having portions cut out and lifted from
the plane of the insert, respective pluralities of said cut
portions being dimensioned and positioned to engage
respective portions of said suture needles to retain said
needles in position.

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4. The suture package according to claim 3
wherein said planar insert member is of resilient material.

5. The suture package according to claim 4
wherein said resilient material is plastic.

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1 6. The suture package according to claim 5
wherein said planar insert member is attached to one of said
panel members.

5 7. The suture package according to claim 6
wherein said planar insert member is retained in position on
said one panel member by insertion of marginal portions
thereof into slits in said one panel member.

10 8. The suture package according to claim 7
wherein said planar insert member is of generally
rectangular configuration.

15 9. The suture package according to claim 8
wherein said one panel member contains at least two slits
positioned and dimensioned for reception of marginal
portions of said planar insert member therein to retain said
planar insert member thereon.

20 10. The suture package according to claim 4
wherein said cut-out portions of said planar insert member
are "V" shaped cuts whereby material surrounded by said "V"
shaped cuts is lifted out of the plane of said insert
member.

25 11. The suture package according to claim 10
wherein at least two of said "V" shaped cut-out portions are
provided on said plastic insert member to retain each needle
thereon.

30 12. The suture package according to claim 11
wherein said at least two of said slits are positioned for
respective reception of corner portions of said planar
insert member.

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1 13. The suture package according to claim 12
wherein said cut-out portions on said plastic insert member
are respectively positioned to retain curved suture needles.

5 14. The suture package according to claim 13
wherein at least three of said cut-out portions are provided
in said plastic insert member to retain each curved suture
needle.

10 15. The suture package according to claim 14
wherein said plastic insert needle retainer is dimensioned
and includes sufficient cut-out portions to retain at least
two curved suture needles thereon.

15 16. The suture package according to claim 15
wherein said plastic insert needle retainer is dimensioned
and contains sufficient cut-out portions to retain at least
five curved needles thereon.

 17. The suture package according to claim 1
wherein at least two rows of generally rectangular panels
are connected to each other.

20 18. The suture package according to claim 17
wherein at least one row of said panels contains a plurality
of rectangular panels connected to each other on the
longitudinal sides thereof.

25 19. The suture package according to claim 18
wherein the second row includes a plurality of panels
connected to each other on the longitudinal sides thereof.

30 20. The suture package according to claim 19
wherein said at least two rows of panels are respectively
connected to each other on the short sides of at least one
panel in each row.

1 21. The suture package according to claim 20
wherein a first row of panels contains at least six panels.

5 22. The suture package according to claim 21
wherein a second row of panels contains at least three panels.

 23. The suture package according to claim 22
wherein at least one of said panels are formed of less
material than the others to reduce the girth of the package.

10 24. The suture package according to claim 21
wherein each said panel of said first row contains at least
four notches, at least two notches on at least one panel
facing the notches on the next adjacent panel in the same
row, in their folded condition, said notches being
dimensioned and positioned for reception of suture winding
15 pins therethrough for winding the flexible suture portions
therearound.

 25. The suture package according to claim 24
wherein at least one of said panels of said first row
contains an end flap on a shorter side.

20 26. The suture package according to claim 25
wherein said end flap has a generally tapered end portion
and said end flap is adapted to be folded over one shorter
side to protect the sutures.

25 27. The suture package according to claim 22
wherein said second row of panels includes three panels, a
first centrally positioned panel to support needle holding
means and two adjacent panels foldably connected to said
first central panel.

30 28. The suture package according to claim 27
wherein each panel of said second row is generally

1 rectangular and is connected to the next adjacent panel on a
longer side.

29. The suture package according to claim 28
5 wherein said adjacent panels of said second row are
connected to said central panel by a double fold line each
of which defines edge panels to encompass said remaining
panels in their folded condition.

30. The suture package according to claim 28
10 wherein at least one panel of said first row is foldably
connected to the next adjacent panel by a double fold line
to define a second edge panel of width sufficient to
encompass said panels and sutures in the folded and
assembled condition.

31. The suture package according to claim 30
15 wherein said central panel of said second row supports a
plastic needle insert and at least two needles are supported
thereon, a first flexible suture portion connected to a
first needle and being wound in a coiled configuration and
20 positioned between a first panel and the next adjacent
second panel of said first row, and, a second flexible
suture portion connected to a second needle being positioned
in coiled configuration between said second panel and the
next adjacent third panel of said first row.

32. The suture package according to claim 31
25 wherein said second row of folded panels is folded along
said shorter side defining a fold line between said panels
of each row of panels, said adjacent panels of said second
row being respectively folded around the folded panels and
30 sutures.

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1 33. The suture package according to claim 32
wherein said adjacent panels of said second row of panels
include means for connecting said panels together.

5 34. The suture package according to claim 33
wherein said connecting means in said adjacent panels of
said second row comprise at least two slots in one of said
end panels and at least two arcuate cuts in said other end
panel to define arcuate tabs, said arcuate tabs being
10 positioned and dimensioned for entry into said slots in said
other adjacent panel to retain said panels in closed
positions about said panels of said first row and said
sutures positioned therebetween.

15 35. The suture package according to claim 34
wherein certain of said panels each define at least one
aperture to reduce the girth of the package when fully
loaded.

20 36. The suture package according to claim 35
wherein certain of said panels define apertures to permit
introduction of fluid into the compartments defined thereby.

20 37. A suture package which comprises:

a) a first row of a plurality of generally
rectangular shaped panels connected to each other by fold
lines along the longer sides thereof;

25 b) a second row of at least three generally
rectangular shaped panels connected to each other by fold
lines along the longer sides thereof, the central panel of
said second row being connected to a panel of said first row
by a fold line along the shorter sides thereof;

30 c) needle retaining means attached to said
central panel of said second row; and

1 d) said panels of said first row being
respectively foldable in a manner to form compartments
between adjacent panels, each compartment adapted to contain
5 at least one flexible suture portion therein in a wound
configuration, each suture attached to a needle held by said
needle retaining means, said panels being finally foldable
to form a generally rectangular suture package.

38. The suture package according to claim 37
10 wherein said needle retaining means comprises an insert
member having portions cut out and lifted from the plane of
the insert, respective pluralities of said cutout portions
being dimensioned and positioned to engage respective
portions of said suture needles.

39. The suture package according to claim 38
15 wherein said planar insert member is of resilient material.

40. The suture package according to claim 39
wherein said resilient material is plastic.

41. The suture package according to claim 38
20 wherein said planar insert member is retained in position on
said central panel member of said second row by insertion of
marginal portions thereof into slits in said central panel
member.

42. The suture package according to claim 41
25 wherein said planar insert member is of generally
rectangular configuration.

43. The suture package according to claim 42
wherein said central panel member contains at least four
slits positioned and dimensioned for reception of corner
portions of said insert member therein to retain said insert
30 member thereon.

1 44. The suture package according to claim 43
wherein said cut-out portions of said plastic insert member
are "V" shaped cuts whereby material surrounded by said "V"
5 shaped cuts is lifted out of the plane of said insert
member.

 45. The suture package according to claim 38
wherein at least two of said "V" shaped cut-out portions are
provided on said plastic insert member to retain each needle
10 thereon.

 46. The suture package according to claim 45
wherein said cut-out portions on said plastic insert member
are respectively positioned to retain curved suture needles.

 47. The suture package according to claim 46
15 wherein at least three of said cut-out portions are provided
in said plastic insert member to retain each curved suture
needle.

 48. The suture package according to claim 47
wherein said plastic insert needle retainer is dimensioned
and includes sufficient cut-out portions to retain at least
20 two curved suture needles thereon.

 49. The suture package according to claim 47
wherein said plastic insert needle retainer is dimensioned
and contains sufficient cut-out portions to retain at least
25 five curved needles thereon.

 50. The suture package according to claim 37
wherein said at least two rows of panels are respectively
connected to each other by an intermediate panel, said
intermediate panel attached to the short sides of at least
30 one panel in each row.

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1 51. The suture package according to claim 37
wherein said first row contains at least six panels.

5 52. The suture package according to claim 37
wherein said plurality of panels of said first row have
apertures configured to receive pins for winding sutures
thereof.

 53. The suture package according to claim 52
wherein said apertures have a generally tapered configuration.

10 54. The suture package according to claim 53
wherein said tapered apertures extend across the fold line
between adjacent panels.

 55. The suture package according to claim 37
wherein at least one panel on said first row contains a
circular aperture to permit fluid to be added to said
15 package.

 56. The suture package according to claim 51
wherein at least two panels of said first row have a
generally central portion cut away to reduce the girth of
the combined sutures and panels.
20

 57. The suture package according to claim 53
wherein at least five panels of said first row each contain
two tapered apertures.

 58. The suture package according to claim 51
wherein said first row of panels possesses a plurality of
25 panels approximately one-half the length of the remaining
panels to reduce the girth of the package when the panels
are fully folded.

 59. The suture package according to claim 58
wherein said first row of panels possesses three such half
30 panels.

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1 60. The suture package according to claim 59
wherein at least one of said panels of said first row
contains an end flap on a shorter side.

5 61. The suture package according to claim 37
wherein at least one of said panels of said second row
contains an end flap foldably connected along a shorter
side.

10 62. The suture package according to claim 59
wherein said shorter panels are connected to each other and
one longer panel is connected to one end of said shorter
panels on one side of said row and two of said longer panels
are connected to another of said shorter panels on the
opposite side.

15 63. The suture package according to claim 62
wherein said one longer end panel has an end flap connected
to a shorter side thereof such that when said panels are
respectively folded with a plurality of needles positioned
in the compartment and the flexible suture portions
20 connected thereto respectively positioned in individual
compartments formed by adjacent panels, said end flap is
foldable over said needle compartment to cover and protect
the upper end portions of said needles.

25 64. The suture package according to claim 37
wherein an end panel is connected to one end panel of said
second row such that when said panels are respectively
folded within a plurality of needles positioned in said
needle retaining means and the flexible suture portions
connected thereto are respectively positioned in individual
30 compartments formed by folded adjacent connected panels of
said first row, said end flap is foldable over said needle

1 compartment to cover and protect the upper end portions of
said needles.

65. A suture package which comprises:

5 a) a plurality of panel members foldably
connected to each other and arranged to fold upon each other
to form a suture compartment between pairs of adjacent
panels, at least two panel members having a generally
central portion cut away to reduce the girth of the combined
sutures and panels; and

10 b) a generally planar insert member having
portions cut out and lifted from the plane of the insert,
respective pluralities of said cut portions being
dimensioned and positioned to engage respective portions of
at least two suture needles positioned thereon to retain
15 said needles in respective fixed position within the package
whereby said needles are positioned in generally spaced
relation in one compartment and individual flexible suture
portions are respectively positioned in individual
compartments formed by the remaining adjacent folded panels.

20 66. The suture package according to claim 65
wherein each panel member has a generally central portion
cut away to reduce the girth of the combined sutures and
panels.

67. A suture package which comprises:

25 a) a first row of six generally rectangular
shaped panels connected to each other by fold lines along
the longer sides;

30 b) a second row of three generally rectangular
shaped panels connected to each other by fold lines along
the longer sides, the central panel of said second row being

1 connected to a second panel of said first row by a fold line
along the shorter sides thereof, said central panel of said
second row defining a plurality of cuts for reception of a
generally rectangular needle retainer panel;

5 c) a flexible plastic needle retainer panel
attached to said central panel of said second row by
insertion of the corner portions thereof into said cuts in
said panel and having a plurality of "V" shaped cut-outs
10 adapted to be defined out of the plane of said insert for
retaining five curved suture needles thereon; and

d) said panels being respectively folded in a
manner to form compartments between adjacent panel, each
compartment containing at least one flexible suture portion
therein in a wound configuration, said panels being finally
15 folded to form a generally rectangular suture package.

68. The suture package according to claim 67
wherein said flexible suture portions are each wound in
their respective compartment in a Figure "8" configuration.

20 69. The suture package according to claim 68
wherein an end flap is connected to at least one of said
panels and adapted to be folded over said needles when
positioned on said needle retainer panel, said end flap
dimensioned and configured to cover and protect at least the
needle portion connecting the flexible suture portions.

25 70. The suture package according to claim 69
wherein said first row is connected to said second row by
two panels foldably connected to each other, each said panel
connected to each respective row along a fold line.

30 71. A method of loading a suture package with a
plurality of sutures, each suture having a flexible suture

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1 portion and a surgical needle attached to one end, said
suture package having a first row of generally rectangular
shaped panels connected to each other along fold lines
5 extending along the longer sides thereof, a second row of
generally rectangular shaped panels connected to each other
along fold lines extending along the longer sides thereof,
and a needle retainer panel attached to at least one of
said panels of said second row for releasably retaining the
10 surgical needles in spaced relation, comprising:

a) positioning at least two of said needles on
said needle retainer panel;

b) aligning the panel of said first row opposite
said needle retainer panel on the winding fixture such that
15 winding pins thereof extend upwardly adjacent said panel of
said second row;

c) winding the flexible suture portion connected
to the first needle about the winding pins until the suture
portion is coiled upon itself within the periphery of said
20 panel;

d) folding the next adjacent panel of said second
row over said coiled suture portion;

e) winding the flexible suture portion attached
to the next adjacent needle about said winding pins until
25 the suture portion is coiled within the periphery of said
folded panel; and

f) repeating steps a), b), c) and d) sufficient
to position each needle and to coil and position each
flexible suture portion within a respective compartment
30 defined by adjacent panels.

1 72. The method of loading a suture package
according to claim 69 wherein a needle protective end flap
is connected to the shorter side of at least one of said
5 rectangular panels whereby said steps are followed by
folding said end flap over the suture connecting portion of
the needles to cover and protect the needles.

10 73. A method of loading a suture package with a
plurality of needled sutures into a suture package on a
suture wrapping fixture having upstanding suture winding
pins wherein said suture package includes a first row of
generally rectangular shaped panels connected to each other
by fold lines along the longer sides, a second row of
generally rectangular shaped panels connected to each other
15 by fold lines along the longer sides, the central panel of
said second row being connected to a second panel of said
first row by a fold line along the shorter sides thereof,
said central panel of said second row having means to
attachment of a needle retainer panel;

20 a needle retainer panel attached to said central
panel of said second row and adapted to removably retain a
plurality of needles comprising:

25 a) securing said first curved needle to a first
group of "V" shaped cuts of said needle retainer panel and
winding the flexible suture portion onto the second panel of
said first row of panels;

 b) folding a third panel of said first row of
panels onto said second panel to form a compartment for the
flexible suture portion wound on said second panel;

30 c) securing said second curved needle to a second
group of "V" shaped cuts of said needle retainer panel

1 and winding the flexible suture portion thereof onto the rear side of said third panel of said first row of panels;

5 d) folding a fourth panel of said first row of panels onto said third panel to form a compartment for the flexible portion suture wound on said third panel;

10 e) securing said third curved needle to a third group of "V" shaped cuts of said needle retainer panel and winding the flexible suture portion onto the fourth panel of said first row of panels;

f) folding a first panel of said first row of panels onto said fourth panel to form a compartment for the flexible suture portion wound on said fourth panel;

15 g) securing said fourth curved needle to a fourth group of "V" shaped cuts of said needle retainer panel and winding the flexible suture portion onto the rear side of said first panel of said first row of panels;

20 h) folding a fifth panel of said first row of panels onto said first panel to form a compartment for the flexible suture portion wound on said first panel;

i) securing said fifth curved needle to a fifth group of "V" shaped cuts of said needle retainer panel and winding the flexible suture onto the rear side of said fifth panel of said first row of panels;

25 j) folding a sixth panel of said first row of panels onto said fifth panel to form a compartment for the suture wound on said fifth panel;

30 k) folding said second row of panels onto said first row of panels along said fold line connecting said first and second row;

1 l) folding a third panel of said second row of
panels onto said folded first row of panels;

5 m) folding a first panel of said second row of
panels onto said folded first row of panels and onto said
third panel of said second row; and

 n) securing said first panel of said second row
to said third panel of said second row to form said fully
folded suture package.

10 74. The method of loading a suture package
according to claim 71 wherein an end flap is connected to
one panel of said first row and said steps are followed by
folding said end flap over the suture connecting portion of
the needles to cover and protect the needles..

15 75. The method of loading a suture package
according to claim 71 wherein an end flap is connected to
one panel of said second row and said steps are followed by
folding said end flap over the suture connecting portion of
the needles to cover and protect the needles.

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76. The method of loading a suture package with a plurality of sutures, each having a flexible suture portion and a surgical needle attached to one end, said suture package having a first row of generally rectangular shaped panels connected to each other along fold lines extending along the longer sides thereof, at least one panel of said second row connected along the shorter side thereof to the shorter side of one panel of said first row of panels, and needle retaining means on at least one of said panels of said second row for releasably retaining surgical needles in spaced relation, comprising:

- a) positioning at least two surgical needles on said needle retaining means;
- b) aligning said first row opposite said needle retainer panel on a winding fixture such that winding pins thereof extend upwardly adjacent one panel of said first row;
- c) winding the flexible suture portion connected to the first needle about the winding pins until the suture portion is coiled upon itself within the periphery of said panel;
- d) folding the adjacent panel of said first row over said coiled suture portion;
- e) winding the flexible suture portion attached to the next adjacent needle about said winding pins until the suture portion is coiled within the periphery of said folded panel; and
- f) repeating steps d and e sufficient to position each needle and to coil and position each flexible suture portion within a respective compartment defined by adjacent panels of said first row.

77. The method of claim 76 further comprising the steps of:

- g) folding said second row of panels onto said first row of panels along said fold line connecting said first and second row;
- h) folding a third panel of said second row of panels onto said folded first row of panels;
- i) folding a first panel of said second row of panels onto said folded first row of panels and onto said third panel of said second row; and
- j) securing said first panel of said second row to said third panel of said second row to form said fully folded suture package.

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78. The method of loading a suture package according to claim 77 wherein an end flap is connected to one panel of said first row and said steps are followed by folding said end flap over the suture connecting portion of the needles to cover and protect the needles.

79. The method of loading a suture package according to claim 77 wherein an end flap is connected to one panel of said second row and said steps are followed by folding said end flap over the suture connecting portion of the needles to cover and protect the needles.

80. A suture package storing at least two flexible suture portions, each having at least one needle attached thereto, which comprises:

- a) a plurality of panel members foldably connected to each other and arranged to fold upon each other to form at least two individual suture compartments between pairs of adjacent panels; and
- b) a needle holding insert member attached to one of said panel members and retaining all such suture needles in respective fixed spaced positions wherein all such needles are positioned in generally spaced relation on said insert member and the individual flexible suture portions are respectively positioned in said individual suture compartments formed by the remaining adjacent folded panels.

81. The suture package according to claim 80 wherein each said individual flexible suture portion is individually wound in a separate suture compartment formed by adjacent panels folded upon each other.

82. A suture package which comprises:

- a) at least two rows of generally rectangular panels connected to each other and arranged to fold upon each other to form at least two individual suture compartments between pairs of adjacent panels; and
- b) a substantially planar insert member supported by one of said panel members and having

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portions cut out and lifted from the plane of the insert member, respective pluralities of said cut portions being dimensioned and positioned to engage respective portions of suture needles to retain such needles in respective fixed positions whereby such needles are positioned in generally spaced relation and individual flexible suture portions are respectively positioned in individual compartments formed by the remaining adjacent folded panels.

83. The suture package according to claim 82 wherein at least one row of said panels contains a plurality of rectangular panels connected to each other on the longitudinal sides thereof.

84. The suture package according to claim 83 wherein the second row includes a plurality of panels connected to each other on the longitudinal sides thereof.

85. The suture package according to claim 84 wherein said at least two rows of panels are respectively connected to each other on the short sides of at least one panel in each row.

86. The suture package according to claim 85 wherein a first row of panels contains at least six panels.

87. The suture package according to claim 86 wherein said second row of panels contains at least three panels.

88. The suture package according to claim 87 wherein at least one of said panels are formed of less material than the others to reduce the girth of the package.

89. The suture package according to claim 88 wherein said three panels of said second row of panels includes a first centrally positioned panel to support said insert member and two adjacent panels foldably connected to said first central panel.

90. The suture package according to claim 89, wherein each panel of said second row is generally rectangular and is connected to the next adjacent panel on a longer side.

91. The suture package according to claim 90 wherein said adjacent panels of said second row are connected to said central panel by a double fold line each of which defines edge panels to

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encompass said remaining panels in their folded condition.

92. The suture package according to claim 91 wherein at least one panel of said first row is foldably connected to the next adjacent panel by a double fold line to define a second edge panel of width sufficient to encompass said panels and sutures in the folded and assembled condition.

93. A suture package which comprises:

a) a first row of a plurality of generally rectangular panels foldably connected to each other on the longitudinal sides thereof and arranged to fold upon each other to form at least two individual suture compartments between pairs of adjacent panels, each said panel containing at least four notches, at least two notches on at least one panel facing the notches on the next adjacent panel in the same row, in their folded condition, said notches being dimensioned and positioned for reception of suture winding pins therethrough for winding the flexible suture portions therearound;

b) a second row of a plurality of generally rectangular panels foldably connected to each other on the longitudinal sides thereof;

c) needle holding means associated with one of said panels of said second row of panels to retain at least two suture needles in respective fixed positions on said one panel whereby said needles are positioned in generally spaced relation and individual flexible suture portions are respectively positioned in said individual suture compartments formed by the remaining adjacent folded panels; and

d) said first row of panels being connected to said second row of panels on the short sides of at least one panel in each row.

94. The suture package according to claim 93 wherein at least one of said panels of said first row contains an end flap on a short side.

95. The suture package according to claim 94 wherein said end flap has a generally tapered

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end portion and said end flap is adapted to be folded over one shorter side to protect the sutures.

96. A suture package which comprises:

a) a first row of a plurality of generally rectangular panels foldably connected to each other on the longitudinal sides thereof and arranged to fold upon each other to form at least two individual sutures compartments between pairs of adjacent panels;

b) a second row of a plurality of generally rectangular panels foldably connected to each other on the longitudinal sides thereof, said second row of panels including a first centrally positioned panel and two adjacent panels foldably connected to said first central panel, said central panel supporting a plastic needle insert with at least two needles being supported thereof, a first flexible suture portion connected to a first needle and being wound in a coiled configuration and positioned between a first panel and the next adjacent second panel of said first row, and, a second flexible suture portion connected to a second needle being positioned in coiled configuration between said second panel and the next adjacent third panel of said first row; and

c) said first row of panels being connected to said second row of panels on the shorter sides of at least one panel in each row.

97. The suture package according to claim 96 wherein said second row of folded panels is folded along said shorter side defining a fold line between said panels of each row of panels, said adjacent panels of said second row being respectively folded around the folded panels and sutures.

98. The suture package according to claim 97 wherein said adjacent panels of said second row of panels include means for connecting said panels together.

99. The suture package according to claim 98 wherein said connecting means in said adjacent panels of said second row comprise at least two slots in one of said end panels and at least two

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arcuate cuts in said other end panel to define arcuate tabs, said arcuate tabs being positioned and dimensioned for entry into said slots in said other adjacent panel to retain said panels in closed positions about said panels of said first row and said sutures positioned therebetween.

100. The suture package according to claim 99 wherein certain of said panels each define at least one aperture to reduce the girth of the package when fully loaded.

101. The suture package according to claim 100 wherein certain of said panels define apertures to permit introduction of fluid into the compartments defined thereby.

102. A suture package which comprises:

- a) a first row of a plurality of generally rectangular shaped panels connected to each other by fold lines along the longer sides thereof;
- b) a second row of at least three generally rectangular shaped panels connected to each other by fold lines along the longer sides thereof, one of said panels of said second row being a connector panel connected to a panel of said first row by a fold line along the shorter sides thereof;
- c) needle retaining means associated with said connector panel of said second row; and
- d) said panels of said first row being respectively foldable in a manner independent from said panels of said second row to form compartments between adjacent panels, each compartment adapted to contain at least one flexible suture portion therein in a wound configuration, each suture attached to a needle held by said needle retaining means, said panels being finally foldable to form a generally rectangular suture package.

103. The suture package according to claim 102 wherein said needle retaining means comprises an insert member having portions cut out and lifted from the plane of the insert, respective pluralities of said cutout portions being dimensioned and positioned to engage respective portions of said suture needles.

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104. The suture package according to claim 103 wherein said planar insert member is of resilient material.
105. The suture package according to claim 104 wherein said resilient material is plastic.
106. The suture package according to claim 103 wherein said planar insert member is retained in position on said central panel member of said second row by insertion of marginal portions thereof into slits in said central panel member.
107. The suture package according to claim 106 wherein said planar insert member is of generally rectangular configuration.
108. The suture package according to claim 107 wherein said central panel member contains at least four slits positioned and dimensioned for reception of corner portions of said insert member therein to retain said insert member thereon.
109. The suture package according to claim 108 wherein said cut-out portions of said plastic insert member are "V" shaped cuts whereby material surrounded by said "V" shaped cuts is lifted out of the plane of said insert member.
110. The suture package according to claim 103 wherein at least two of said "V" shaped cut-out portions are provided on said plastic insert member to retain each needle thereon.
111. The suture package according to claim 110 wherein said cut-out portions on said plastic insert member are respectively positioned to retain curved suture needles.
112. The suture package according to claim 111 wherein at least three of said cut-out portions are provided in said plastic insert member to retain each curved suture needle.
113. The suture package according to claim 112 wherein said plastic insert needle retainer is dimensioned and includes sufficient cut-out portions to retain at least two curved suture needles thereon.

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114. The suture package according to claim 112 wherein said plastic insert needle retainer is dimensioned and contains sufficient cut-out portions to retain at least five curved needles thereon.

115. The suture package according to claim 102 wherein said at least two rows of panels are respectively connected to each other by an intermediate panel, said intermediate panel attached to the short sides of one panel in each row.

116. The suture package according to claim 102 wherein said first row contains at least six panels.

117. The suture package according to claim 116 wherein at least two panels of said first row have a generally central portion cut away to reduce the girth of the combined sutures and panels.

118. The suture package according to claim 116 wherein the lengths of at least two of said panels of said first row of panels are approximately one-half the lengths of the remaining panels to reduce the girth of the package when the panels are fully folded.

119. The suture package according to claim 118 wherein said first row of panels possesses three such half panels.

120. The suture package according to claim 119 wherein at least one of said panels of said first row contains an end flap on a shorter side.

121. The suture package according to claim 119 wherein said shorter panels are connected to each other and one longer panel is connected to one end of said shorter panels on one side of said row and two of said longer panels are connected to another of said shorter panels on the opposite side.

122. The suture package according to claim 121, wherein said one longer end panel has an end flap connected to a shorter side thereof such that when said panels are respectively folded with a plurality of needles positioned in the compartment and the flexible suture portions connected

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thereto respectively positioned in individual compartments formed by adjacent panels, said end flap is foldable over said needle compartment to cover and protect the upper end portions of said needles.

123. The suture package according to claim 102 wherein said plurality of panels of said first row have apertures configured to receive pins for winding sutures thereof.

124. The suture package according to claim 123 wherein said apertures have a generally tapered configuration.

125. The suture package according to claim 124 wherein said tapered apertures extend across the fold line between adjacent panels.

126. The suture package according to claim 124 wherein at least five panels of said first row each contain two tapered apertures.

127. The suture package according to claim 102 wherein at least one panel on said first row contains a circular aperture to permit fluid to be added to said package.

128. The suture package according to claim 102 wherein at least one of said panels of said second row contains an end flap foldably connected along a shorter side.

129. The suture package according to claim 102 wherein an end panel is connected to one end panel of said second row such that when said panels are respectively folded within a plurality of needles positioned in said needle retaining means and the flexible suture portions connected thereto are respectively positioned in individual compartments formed by folded adjacent connected panels of said first row, said end flap is foldable over said needle compartment to cover and protect the upper end portions of said needles.

130. A method of loading a suture package with a plurality of sutures, each suture having a flexible suture portion and a surgical needle attached to one end, said suture package having a first row of generally rectangular shaped panels connected to each other along fold lines extending along the longer sides thereof, a second row of generally rectangular shaped panels

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connected to said first row, said panels of said second row being connected to each other along fold lines extending along the longer sides thereof, a needle retainer panel attached to at

least one of said panels of said second row for releasably retaining the surgical needles in spaced relation, and a needle protective end flap connected to the shorter side of at least one of said rectangular panels, the method comprising the steps of:

- a) positioning at least two of said needles on said needle retainer panel;
- b) aligning the panels of said first row opposite said needle retainer panel on the winding fixture such that winding pins thereof extend upwardly adjacent said panel of said second row;
- c) winding the flexible suture portion connected to the first needle about the winding pins until the suture portion is coiled upon itself within the periphery of said panel;
- d) folding the next adjacent panel of said second row over said coiled suture portion;
- e) winding the flexible suture portion attached to the next adjacent needle about said winding pins until the suture portion is coiled within the periphery of said folded panel;
- f) repeating steps a), b), c) and d) sufficient to position each needle and to coil and position each flexible suture portion within a respective compartment defined by adjacent panels; and
- g) folding said end flap over the suture connecting portion of the needles to cover and protect the needles.

131. A suture package which comprises:

- a) a first row of a plurality of generally rectangular shaped panels connected to each other by fold lines along the longer sides thereof, at least two panels having a generally central portion cut away to reduce the girth of the combined sutures and panels when the package is in a folded condition;

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- b) a second row of at least three generally rectangular shaped panels connected to each other by fold lines along the longer sides thereof, at least one panel of said second row being a connector panel connected to a panel of said first row by a fold line along the shorter sides thereof;
- c) needle retaining means attached to said connector panel of said second row; and
- d) said panels of said first row being respectively foldable in a manner to form compartments between adjacent panels, each compartment adapted to contain at least one flexible suture portion therein in a wound configuration, each suture attached to a needle held by said needle retaining means, said panels being finally foldable to form a generally rectangular suture package.

132. A suture package which comprises:

- a) a first row of a plurality of generally rectangular shaped panels connected to each other by fold lines along the longer sides thereof, at least two of said panels being approximately one-half the length of the remaining panels to reduce the girth of the package when the panels are in the fully folded condition.
- b) a second row of at least three generally rectangular shaped panels connected to each other by fold lines along the longer sides thereof, at least one of said panels of said second row being a connector panel connected to a panel of said first row by a fold line along the shorter sides thereof;
- c) needle retaining means associated with said connector panel of said second row; and
- d) said panels of said first row being respectively foldable in a manner to form compartments between adjacent panels, each compartment adapted to contain at least one flexible suture portion therein in a wound configuration, each suture attached to a needle held by said needle retaining means, said panels being finally foldable to form a generally rectangular suture package.

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133. A suture package which comprises:

- a) a first row of a plurality of generally rectangular shaped panels connected to each other by fold lines along the longer sides thereof;**
- b) a second row of at least three generally rectangular shaped panels connected to each other by fold lines along the longer sides thereof, one of said panels of said second row being a connector panel connected to a panel of said first row by a fold line along the shorter sides thereof;**
- c) an end flap foldably connected to a shorter side of at least one of said panels of said second row;**
- d) needle retaining means associated with said connector panel of said second row; and**
- e) said panels of said first row being respectively foldable in a manner independent from said panels of said second row to form compartments between adjacent panels, each compartment adapted to containing at least one flexible suture portion therein in a wound configuration, each suture attached to a needle held by said needle retaining means, said panels being finally foldable to form a generally rectangular suture package.**

134. A suture package which comprises:

- a) a first row of generally rectangular shaped panels connected to each other by fold lines along the longer sides thereon, said panels having apertures to receive pins for winding sutures therein, each said apertures having a generally tapered configuration and extending across the fold line between adjacent panels;**
- b) a second row of at least three generally rectangular shaped panels connected to each other by fold lines along the longer sides thereof, one of said panels of said second row being a connector panel connected to a panel of said first row by a fold line along the shorter sides thereof;**

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- c) needle retaining means associated with said connector panel of said second row; and
- d) said panels of said first row being respectively foldable in a manner independent from said panels in said second row to form compartments between adjacent panels, each compartment adapted to contain at least one flexible suture portion therein in a wound configuration, each suture attached to a needle held by said needle retaining means, said panels being finally foldable to form a generally rectangular suture package.

135. A suture package which comprises:

- a) a plurality of panel members foldably connected to each other and arranged to fold upon each other to form at least two individual suture compartments between pairs of adjacent panels; and
- b) a substantially planar insert member formed of a resilient material and attached to one of said panel members and having portions cut and lifted from the plane of the insert member, respective pluralities of said cut portions being dimensioned and positioned to engage respective portions of at least two suture needles to retain such needles in respective fixed positions, wherein such needles are positioned in generally spaced relation and individual flexible suture portions attached to such needles are each individually wound and positioned in a separate suture compartment formed by adjacent panels folded upon each other.

136. A suture package for storing a plurality of flexible suture portions, each having at least one needle attached thereto, which comprises:

- a) a plurality of panel members foldably connected to each other and arranged to fold upon each other to form at least two individual suture compartments between pairs of adjacent panels; and
- b) a needle holding insert sheet attached to one of said panel members and adapted to retain all such suture needles in respective fixed spaced positions whereby all such needles may be positioned in generally spaced relation on said insert sheet and the individual flexible suture

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portions are respectively positioned in said individual suture compartments formed by the remaining adjacent folded panels.

** TOTAL PAGE.21 **

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203-238 CIP

(1-17)

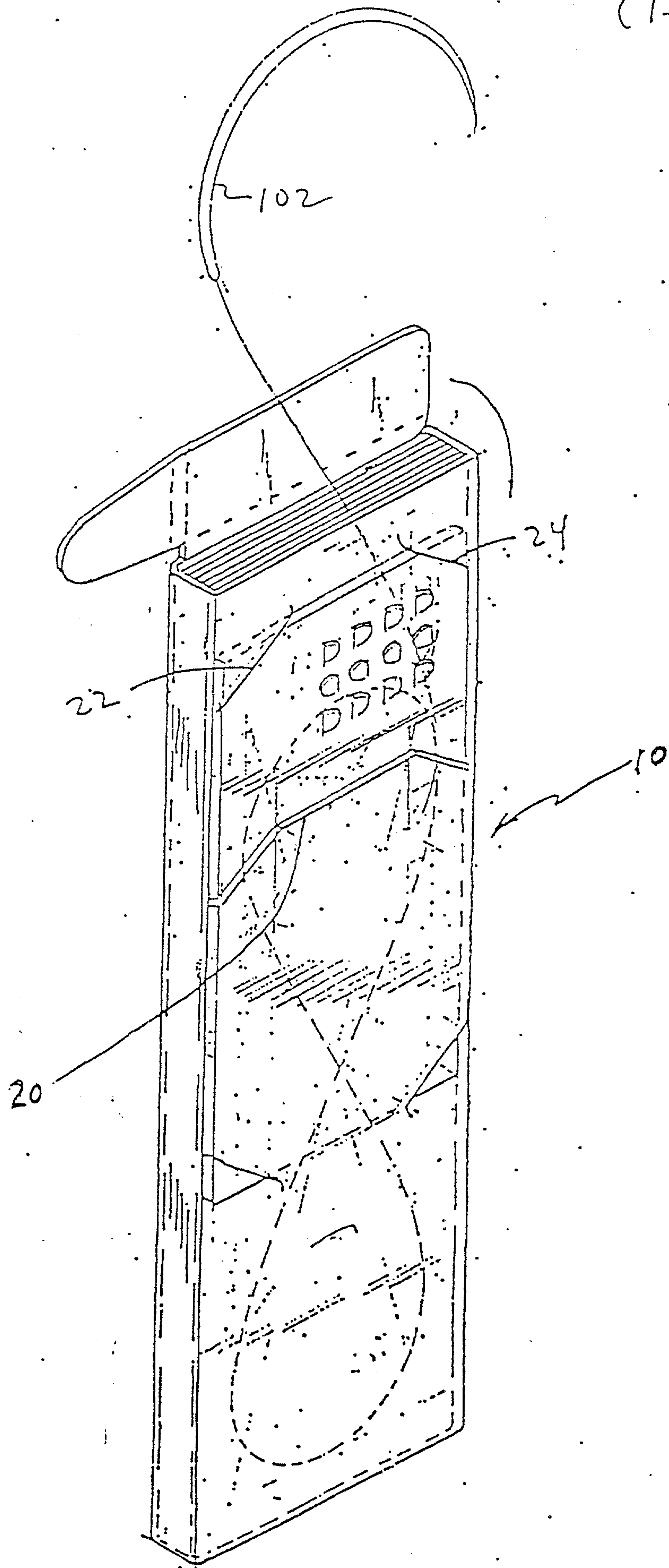
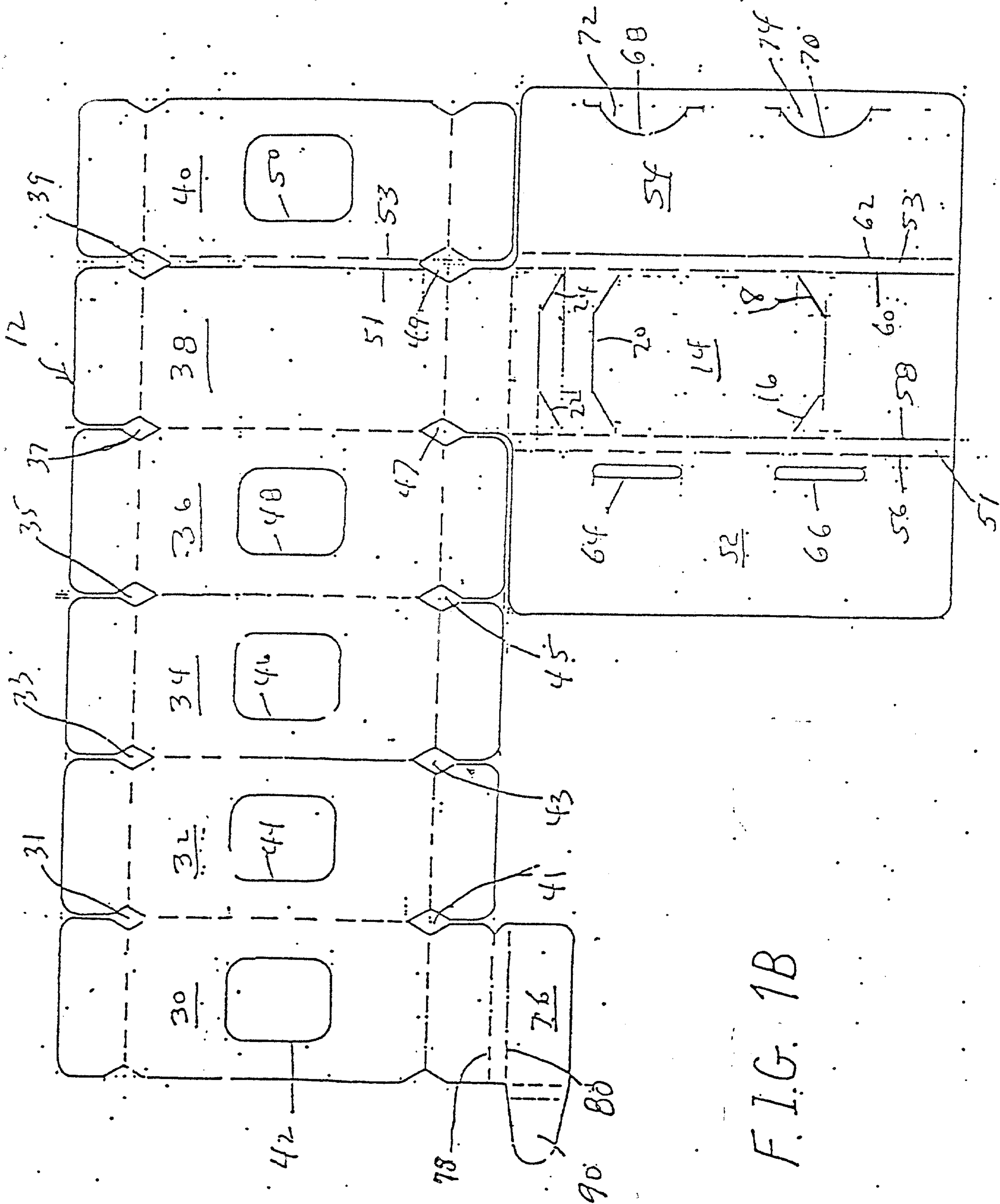


FIG. 1A



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203-238 EIP
(3-17)

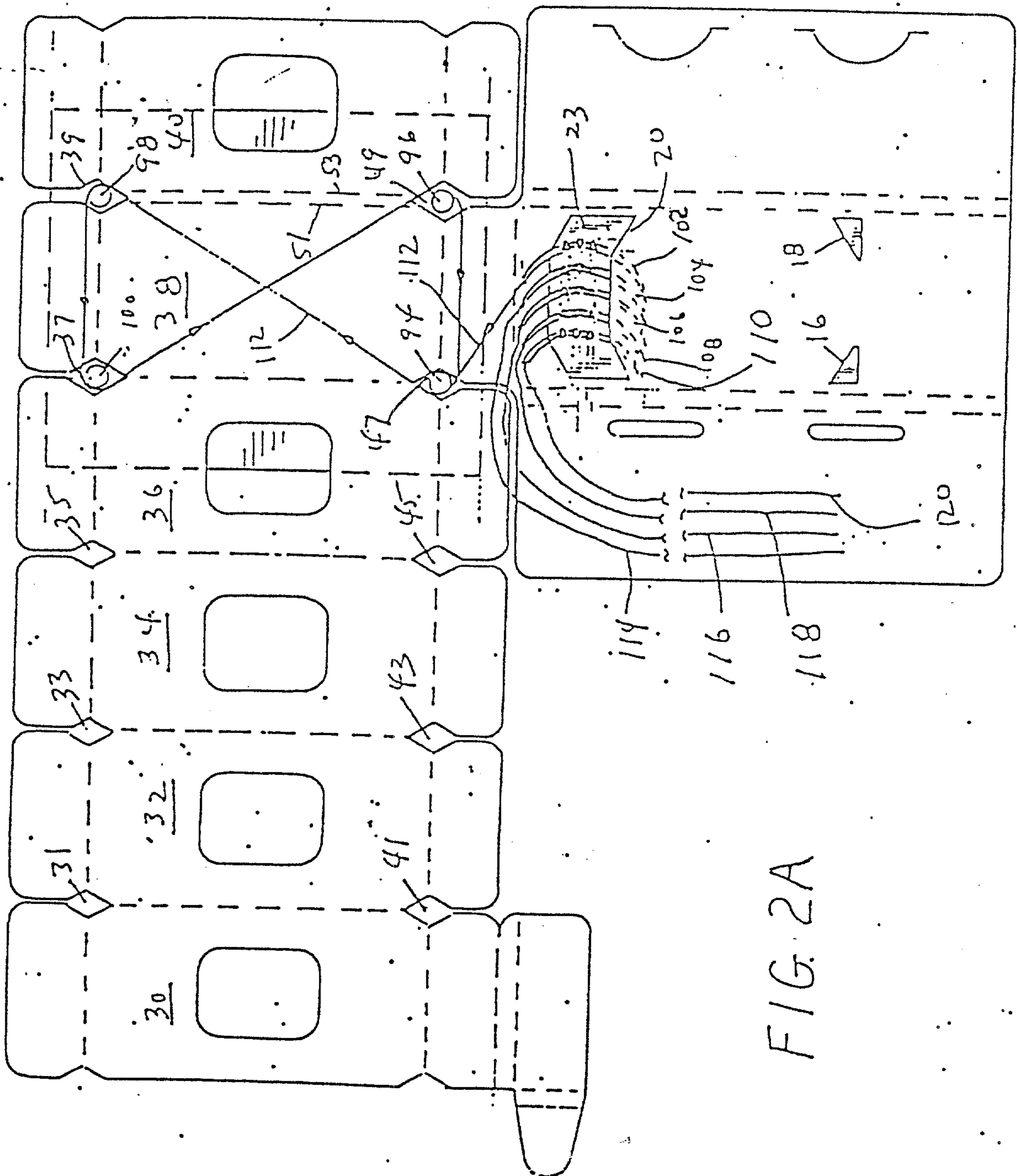


FIG. 2A

2054902

203-238 CIP
(4-17)

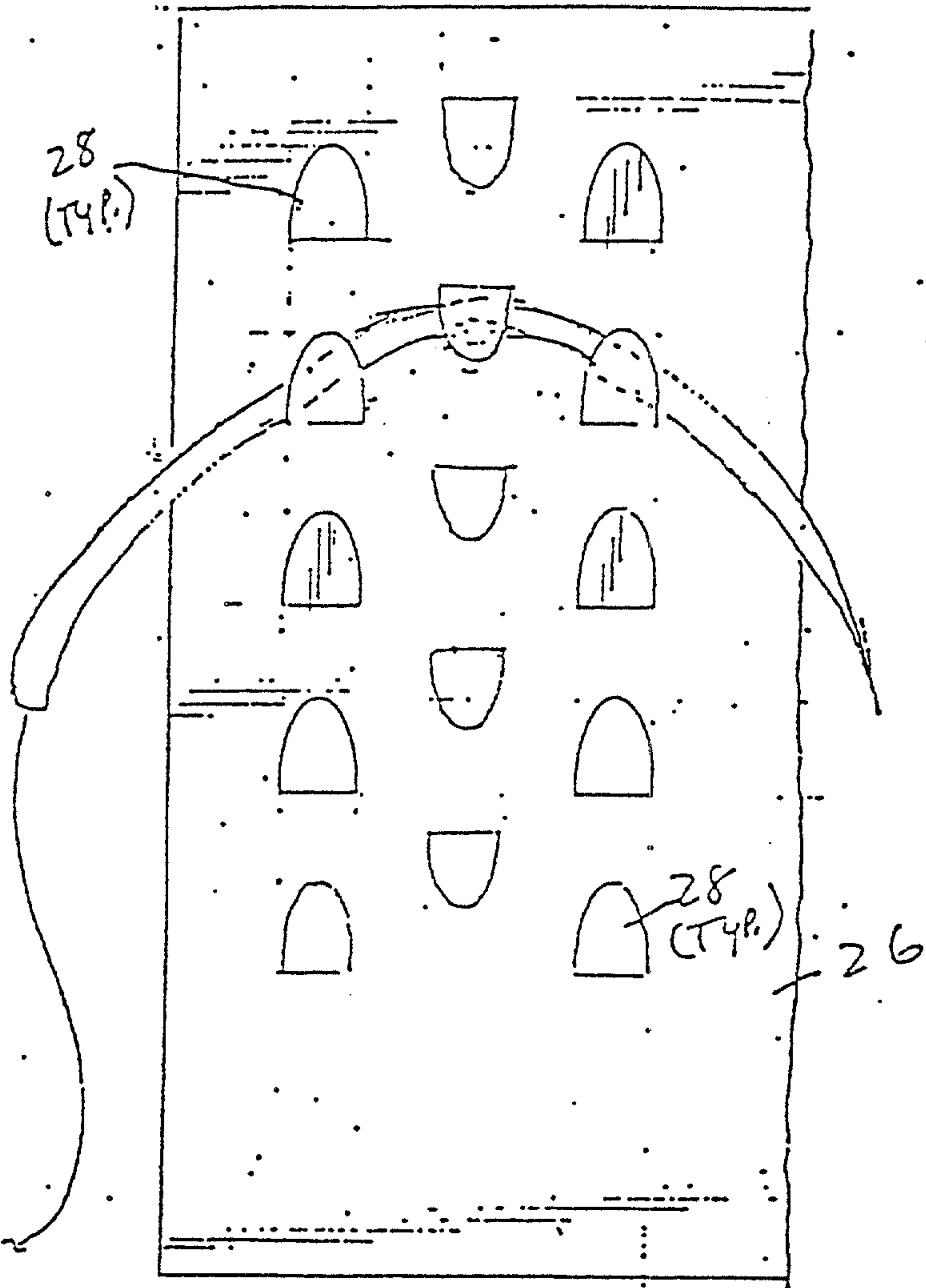


FIG 2B

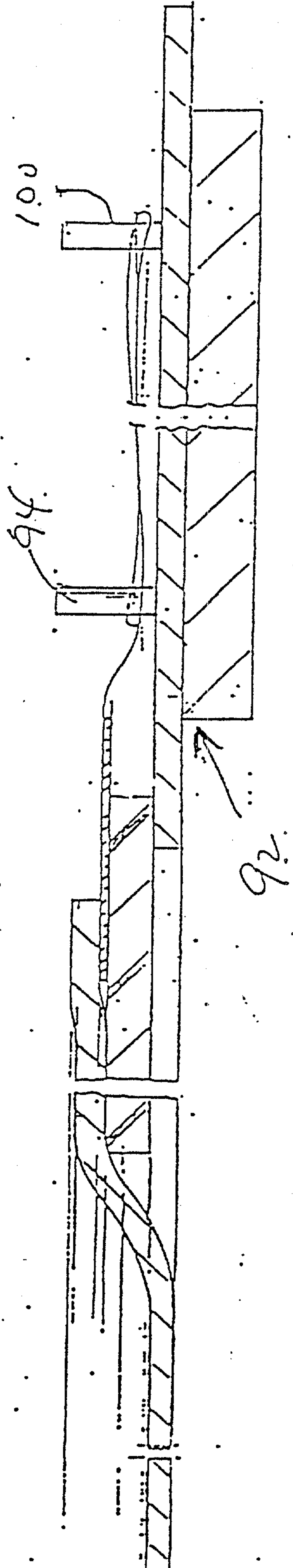
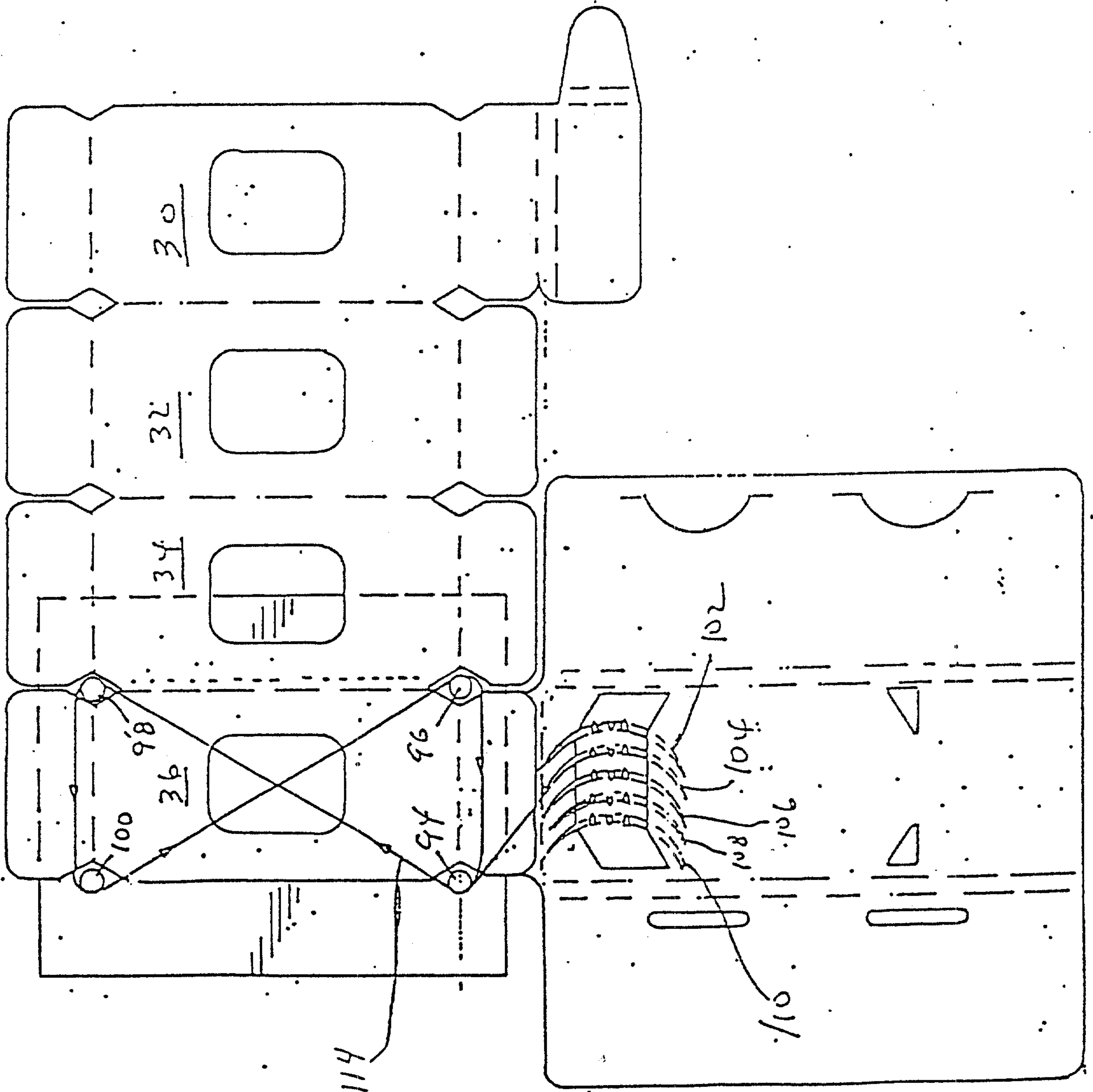


FIG 3

2054902

203-238CIP
(5-17)

FIG. 4



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203-238C1P
(6-17)

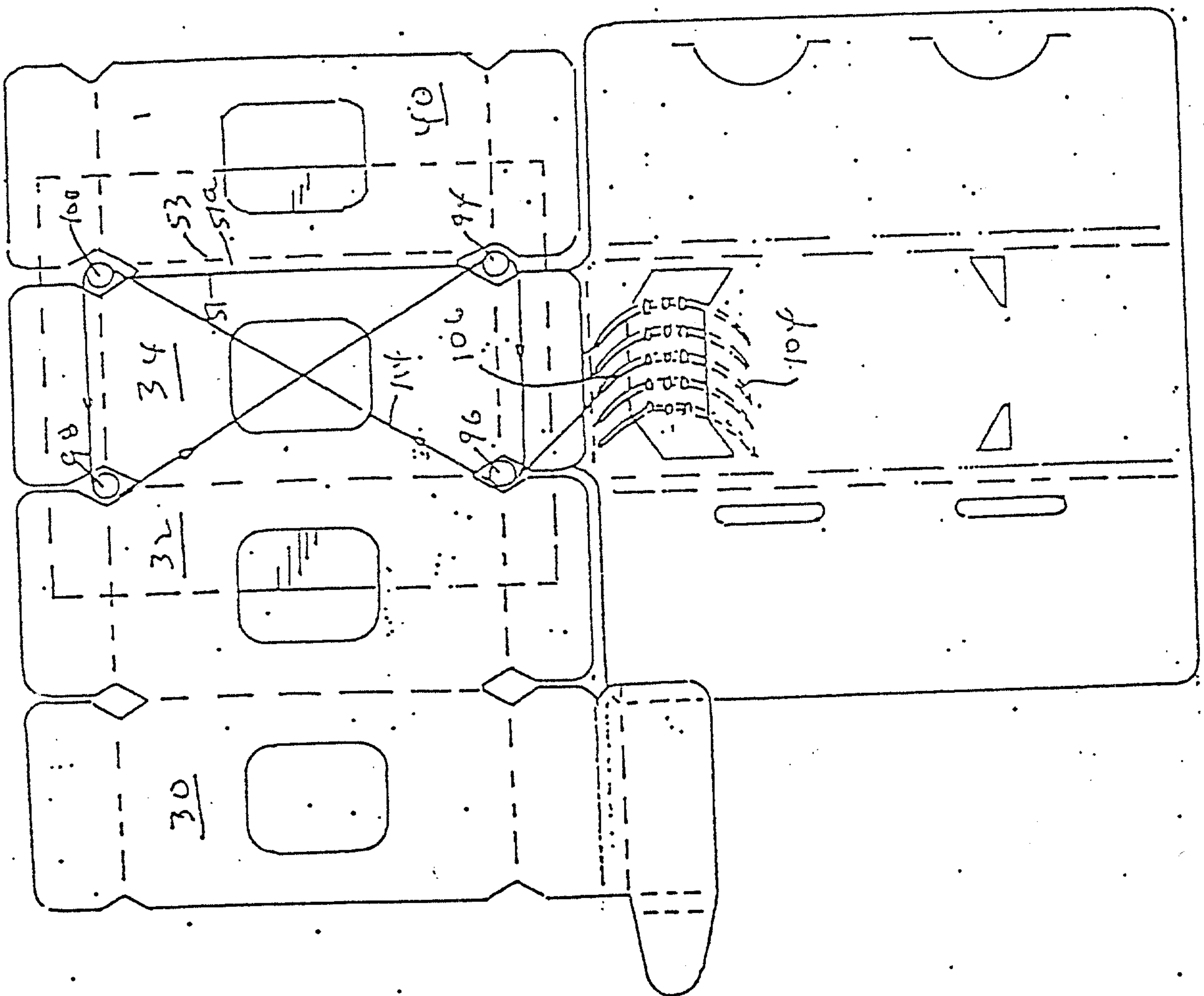


FIG 8

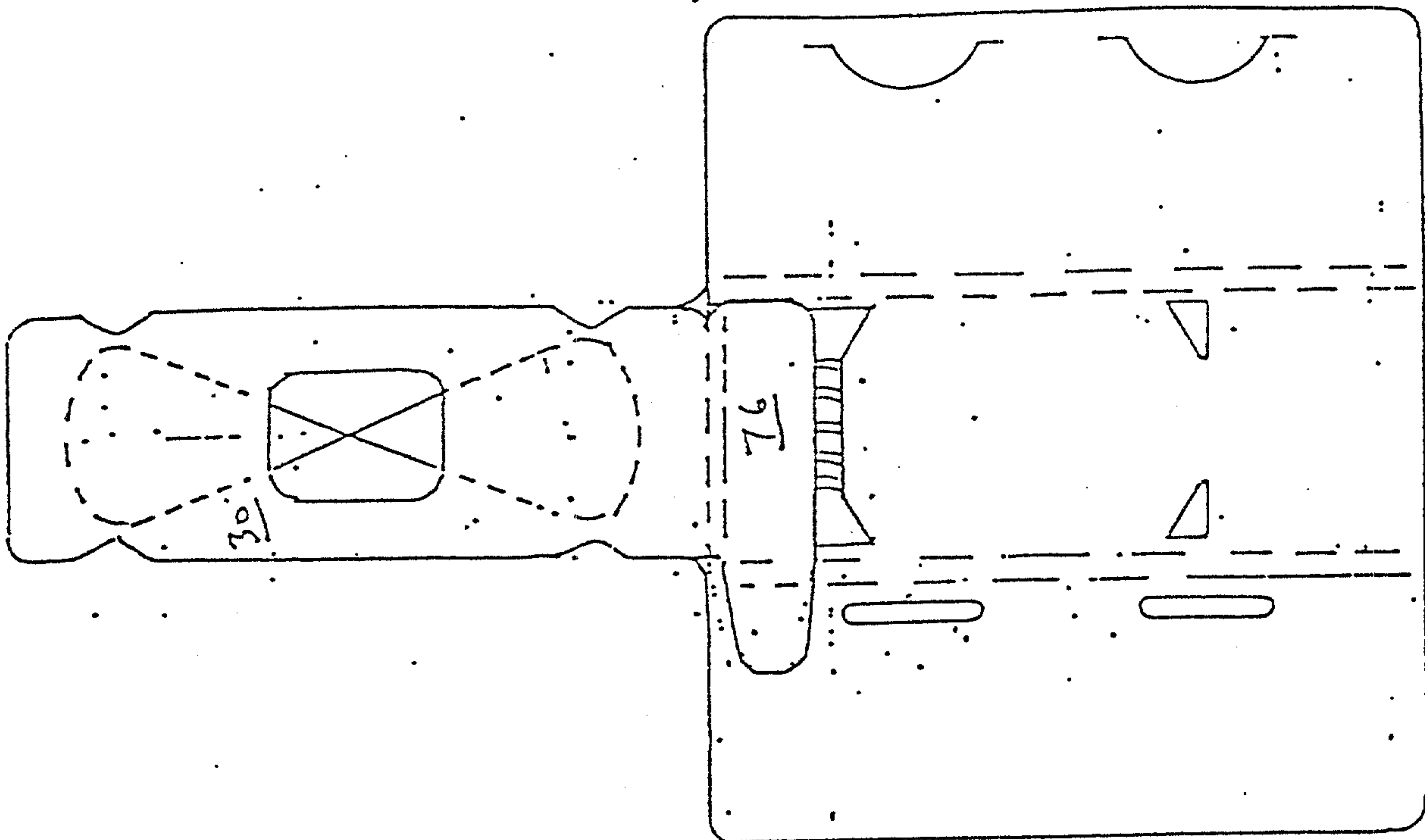


FIG. 7

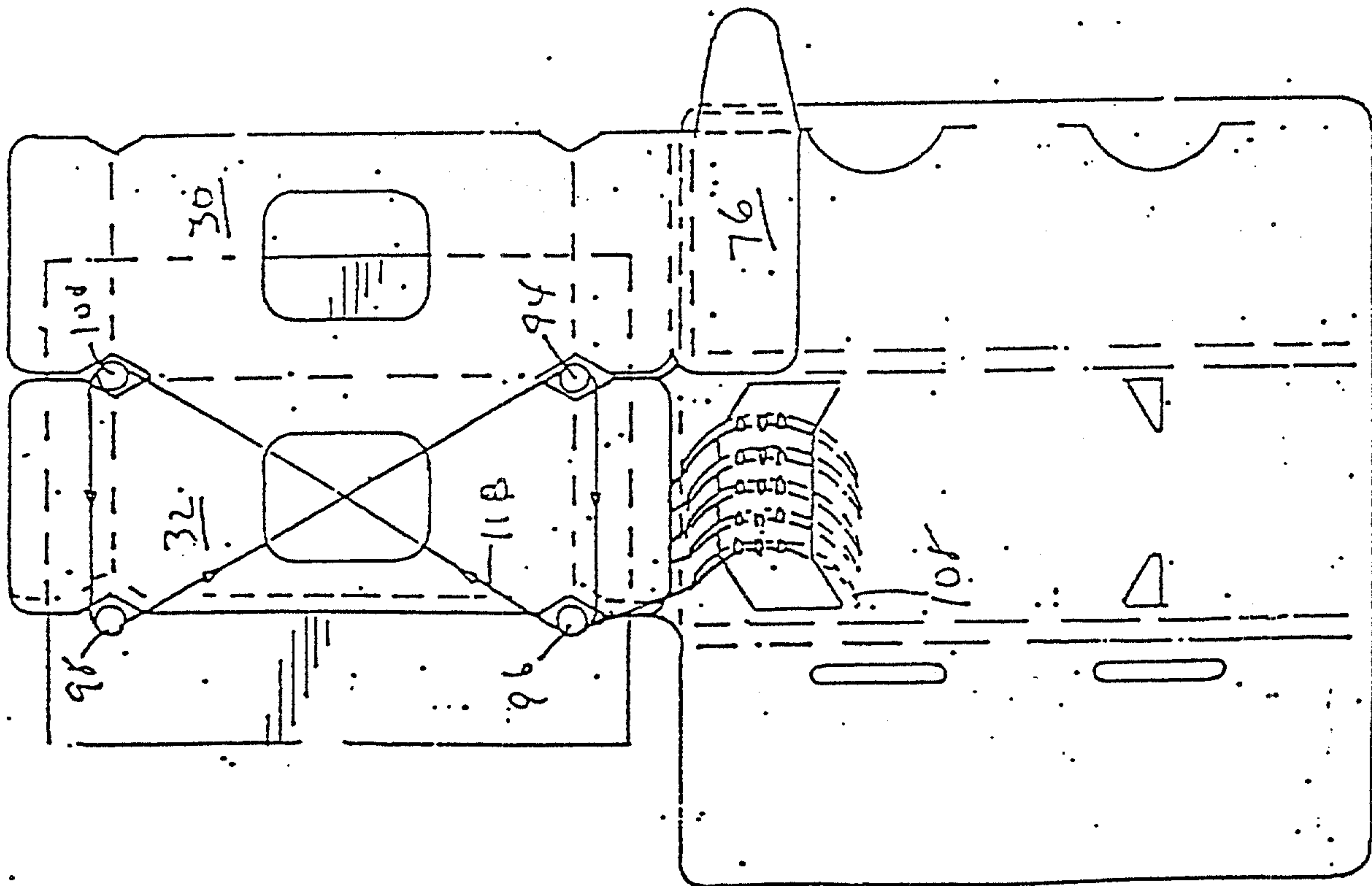


FIG. 9

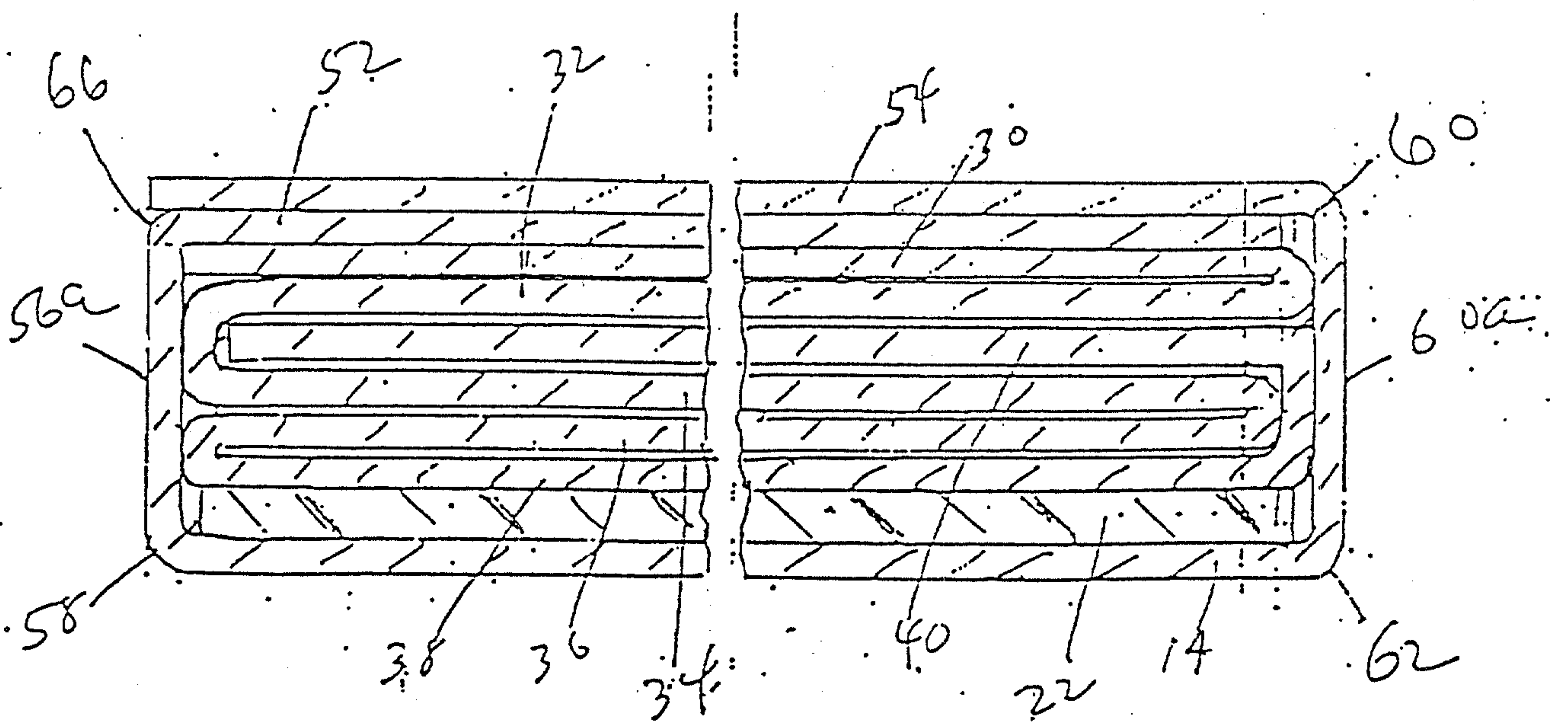
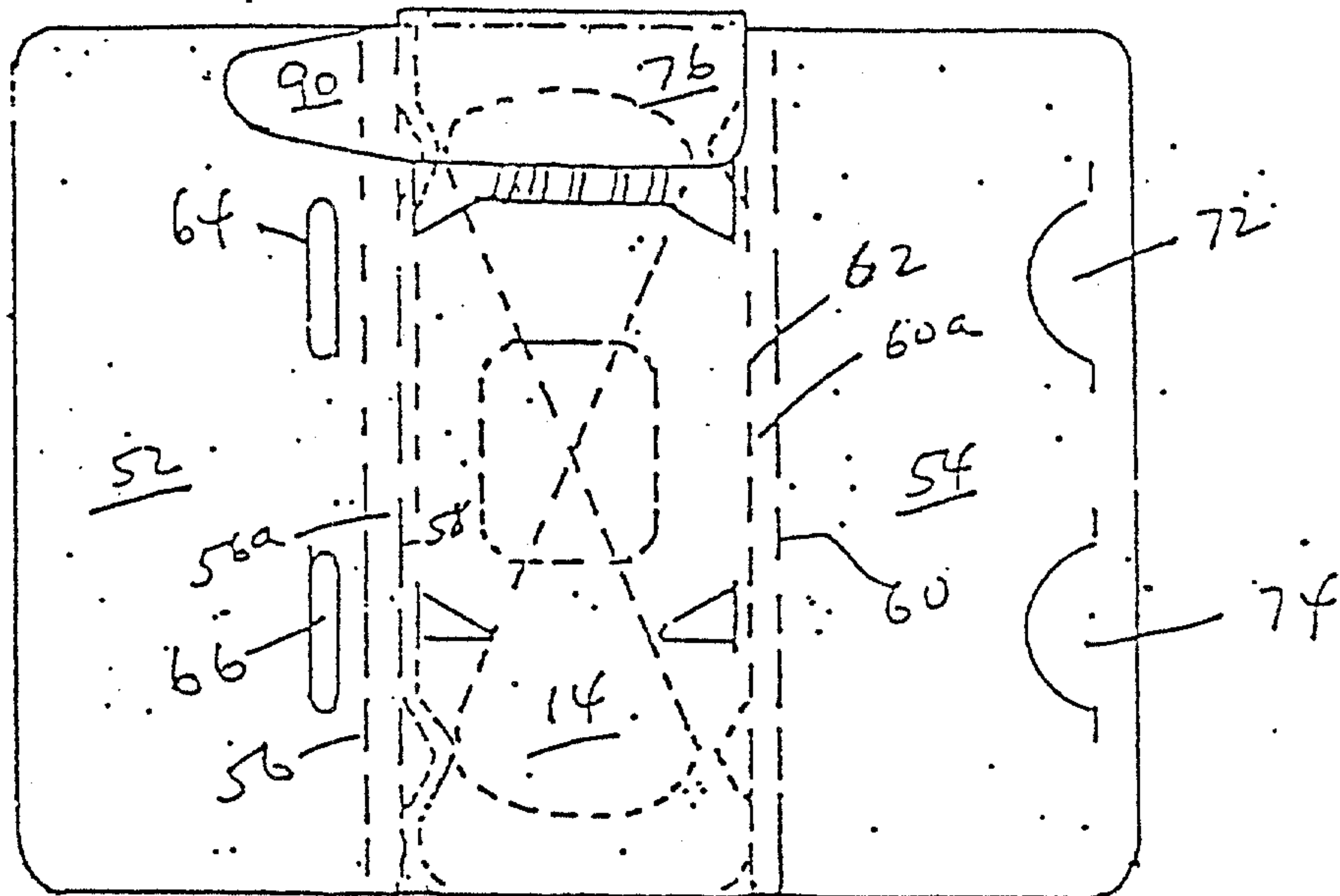


FIG. 13

203-238C.P.
(10-17)

FIG. 12

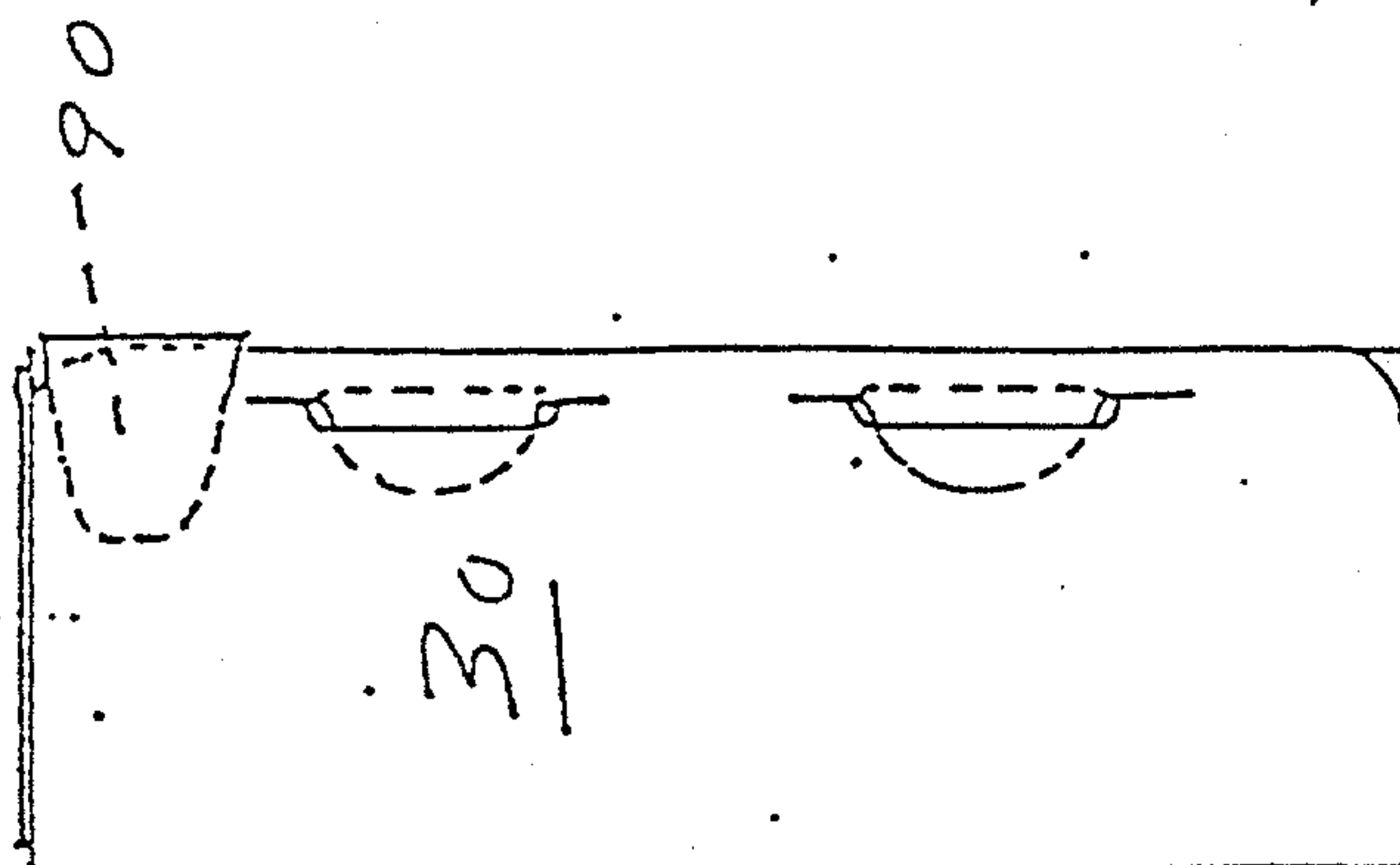


FIG. 11

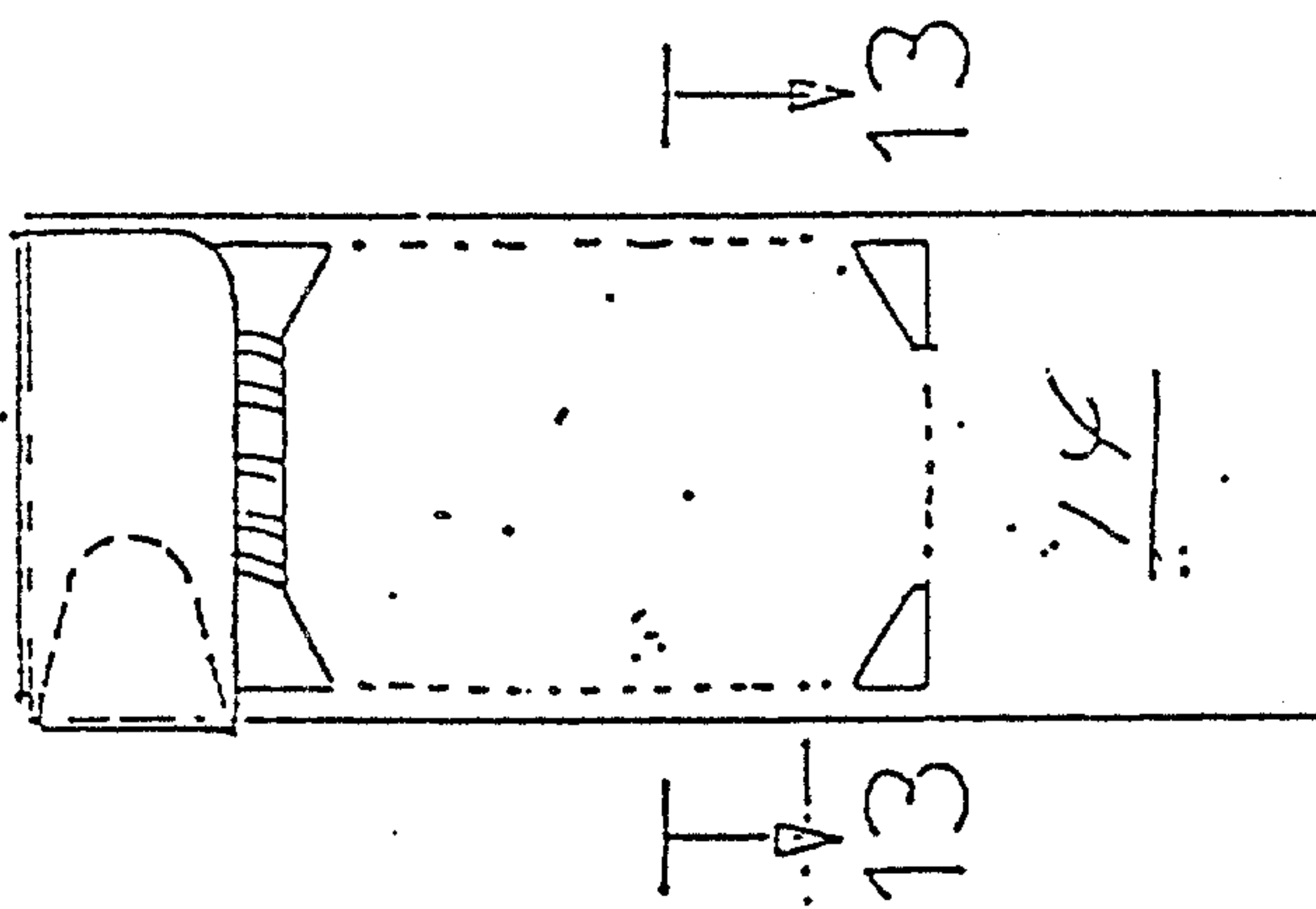
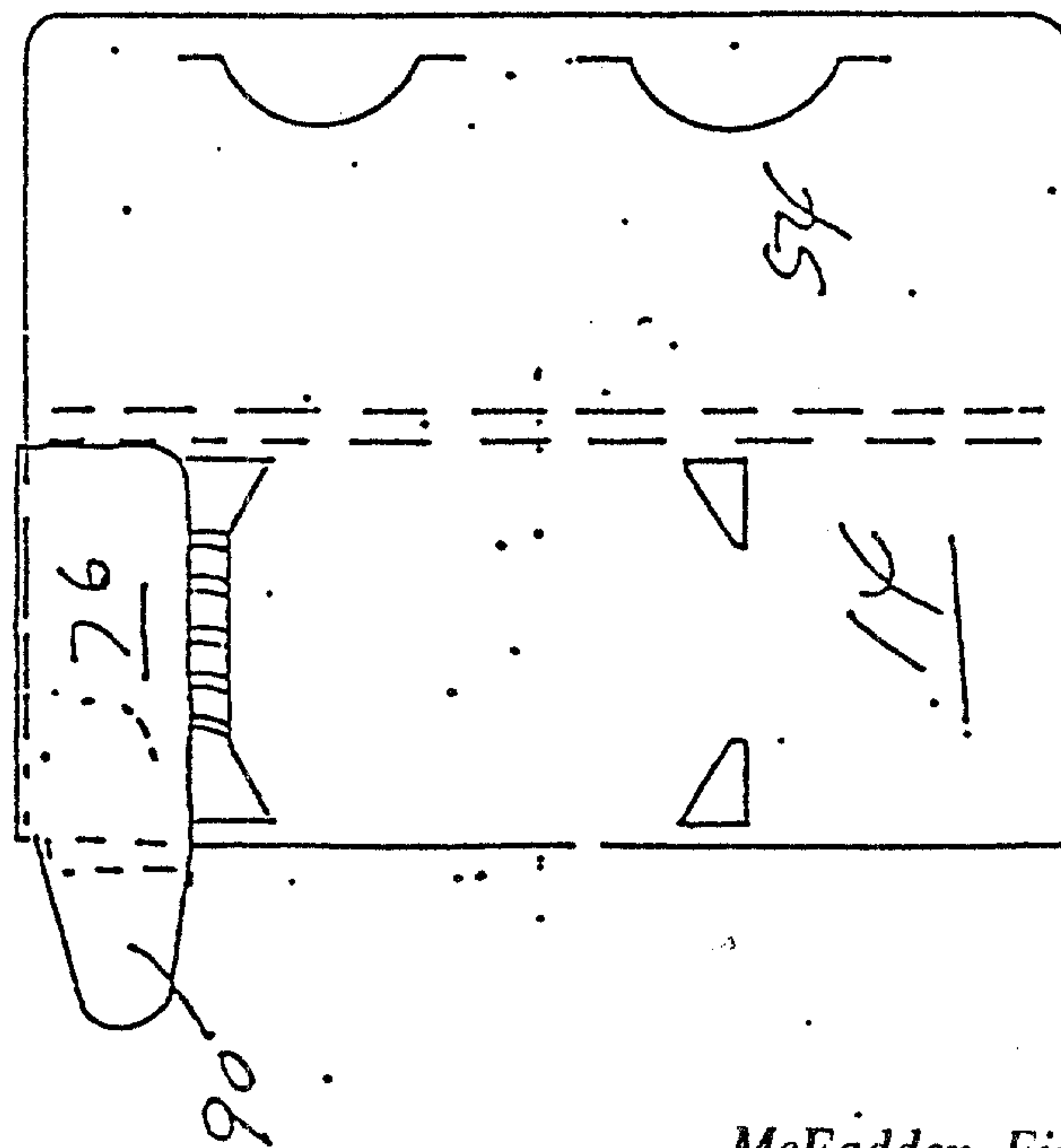


FIG. 10



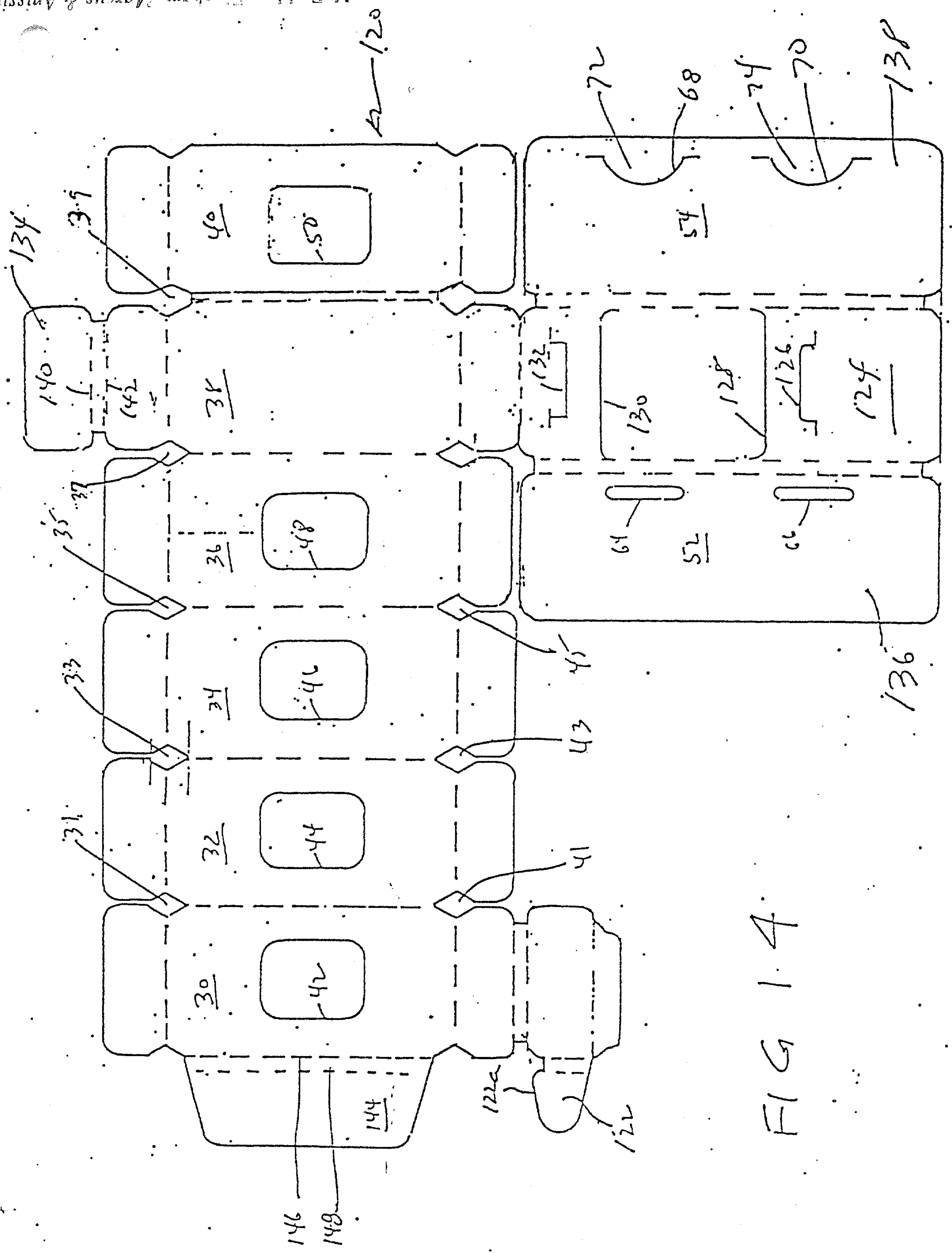


FIG 1.4

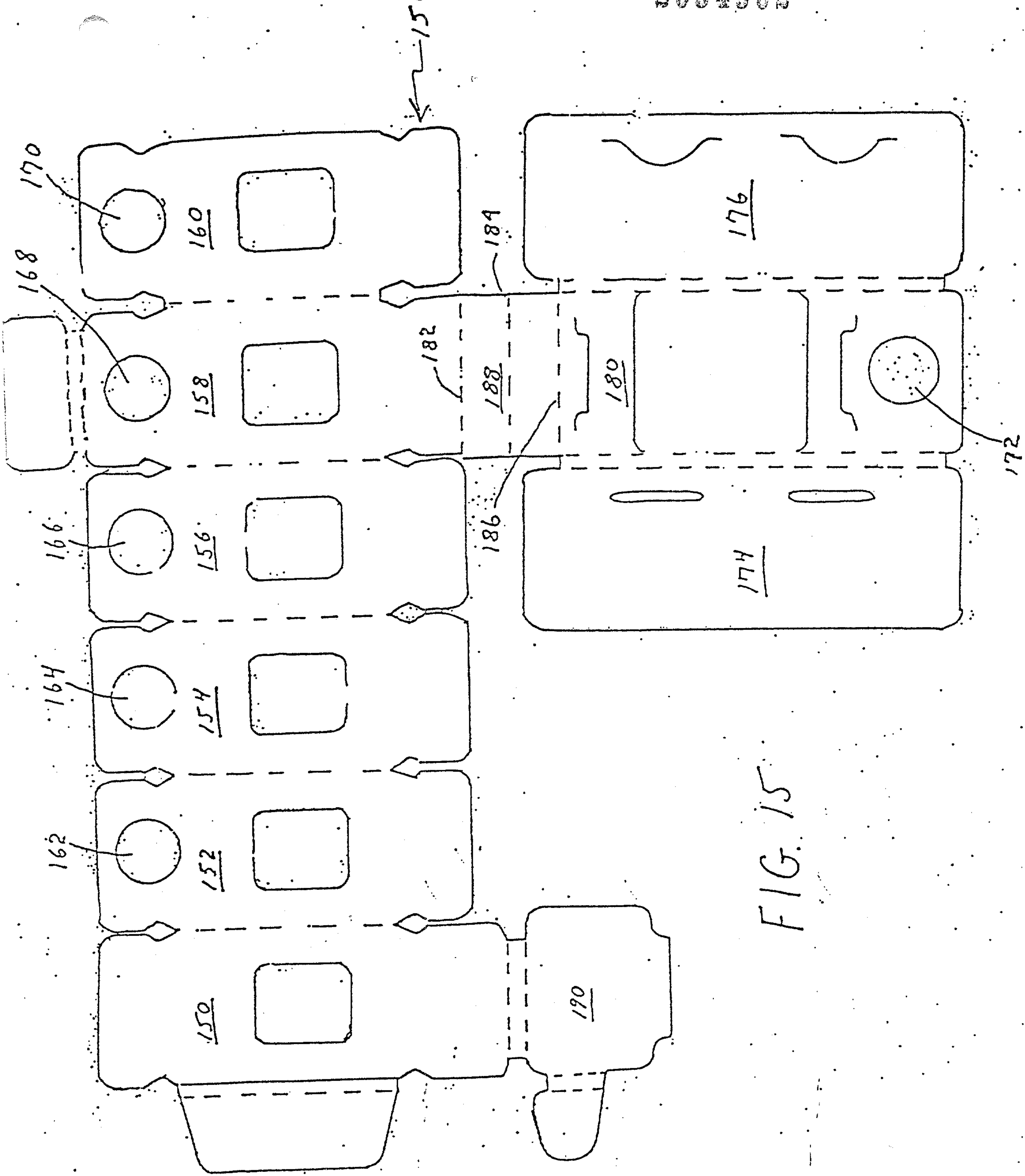
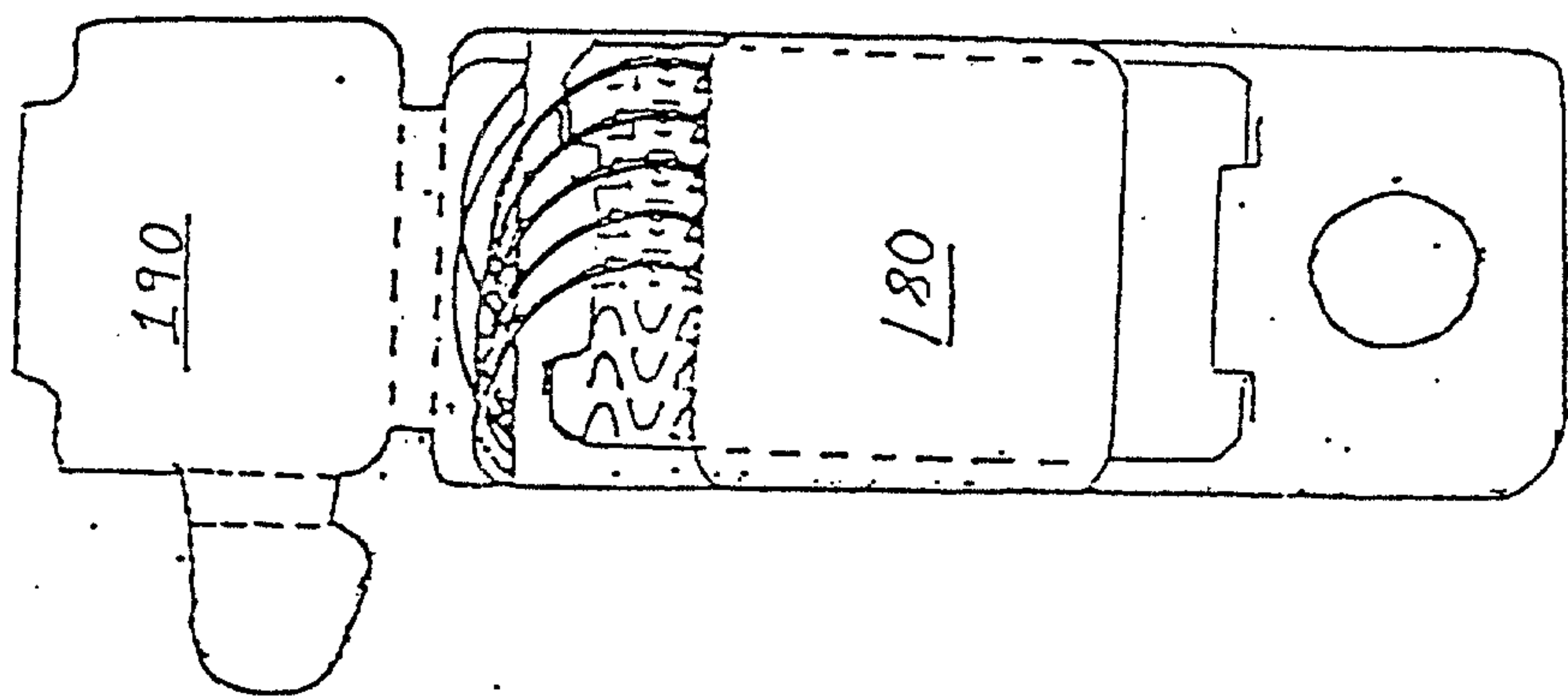


FIG. 15



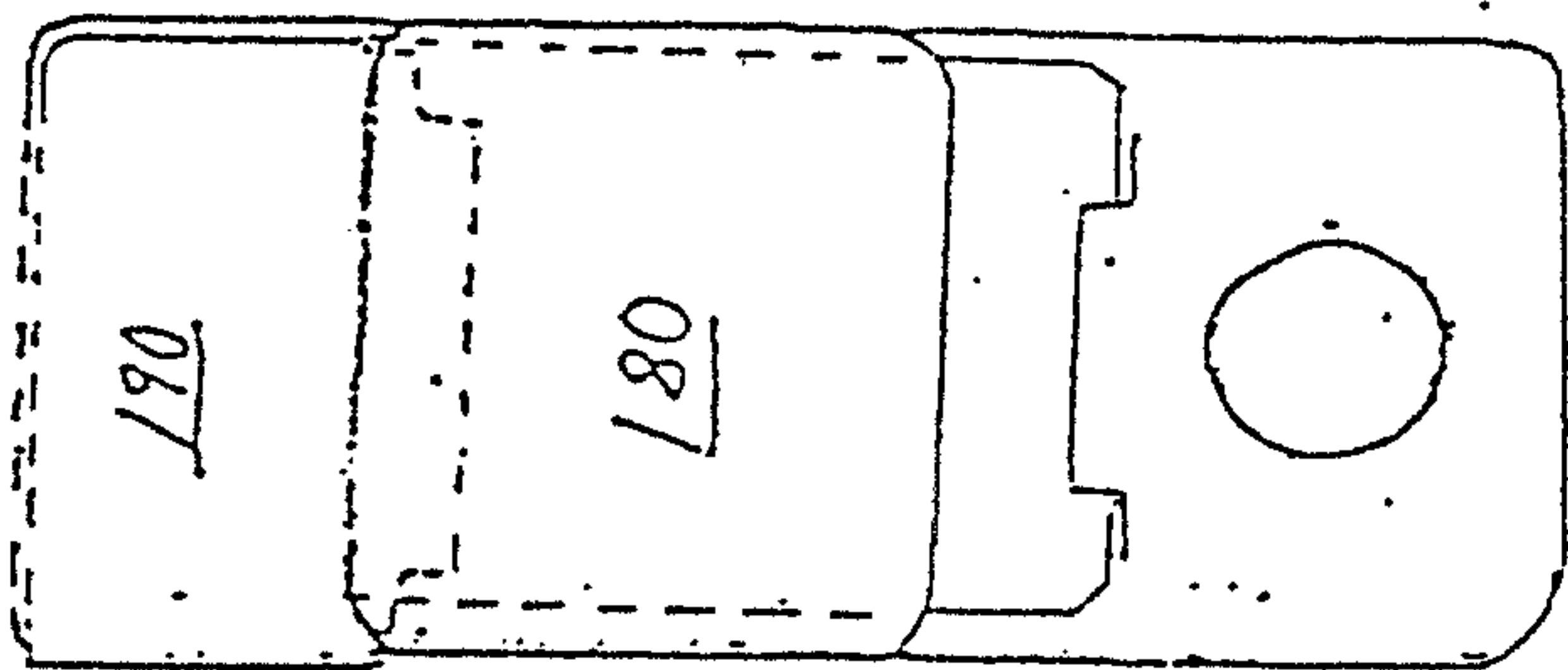


FIG. 17

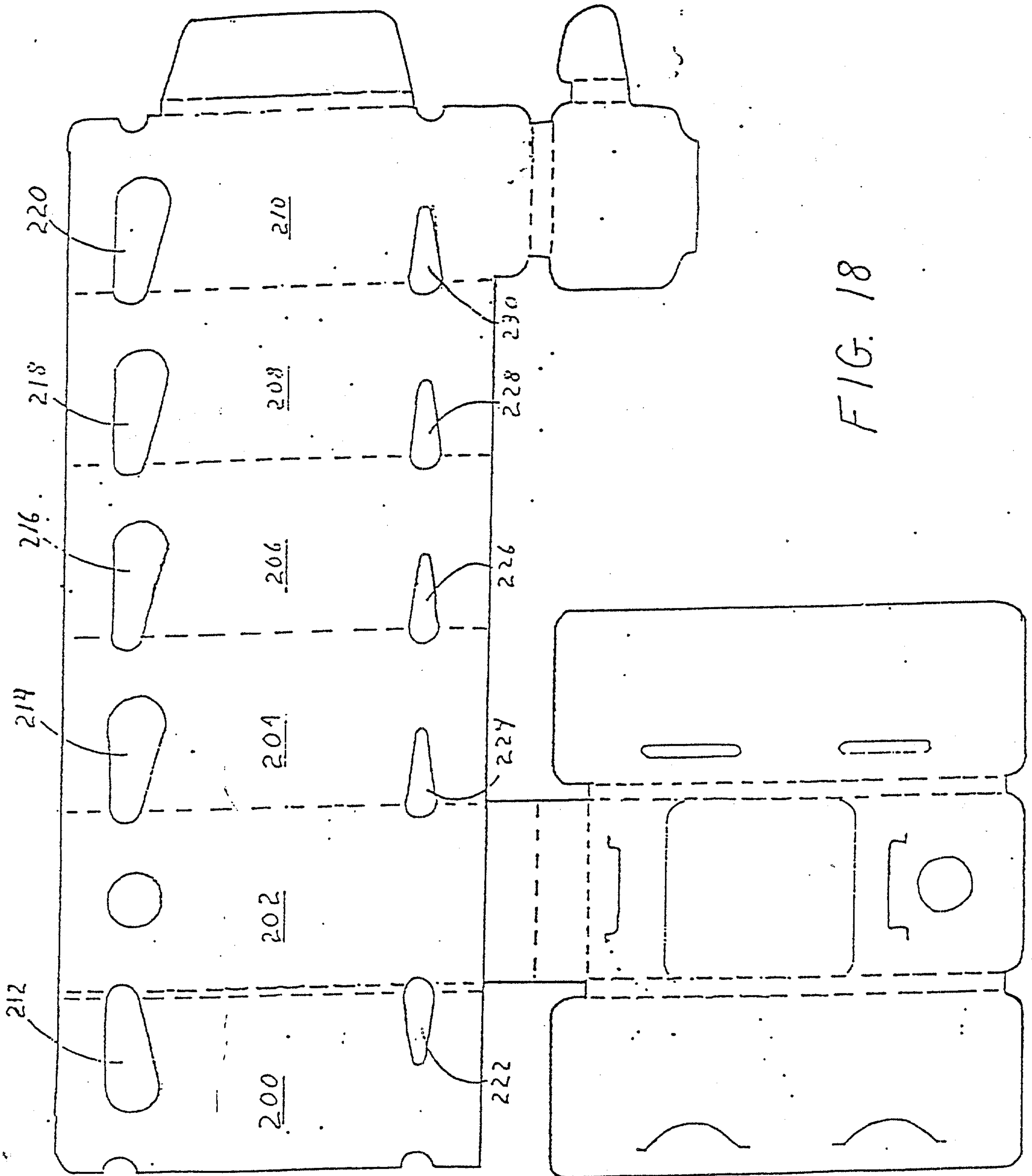


FIG. 18

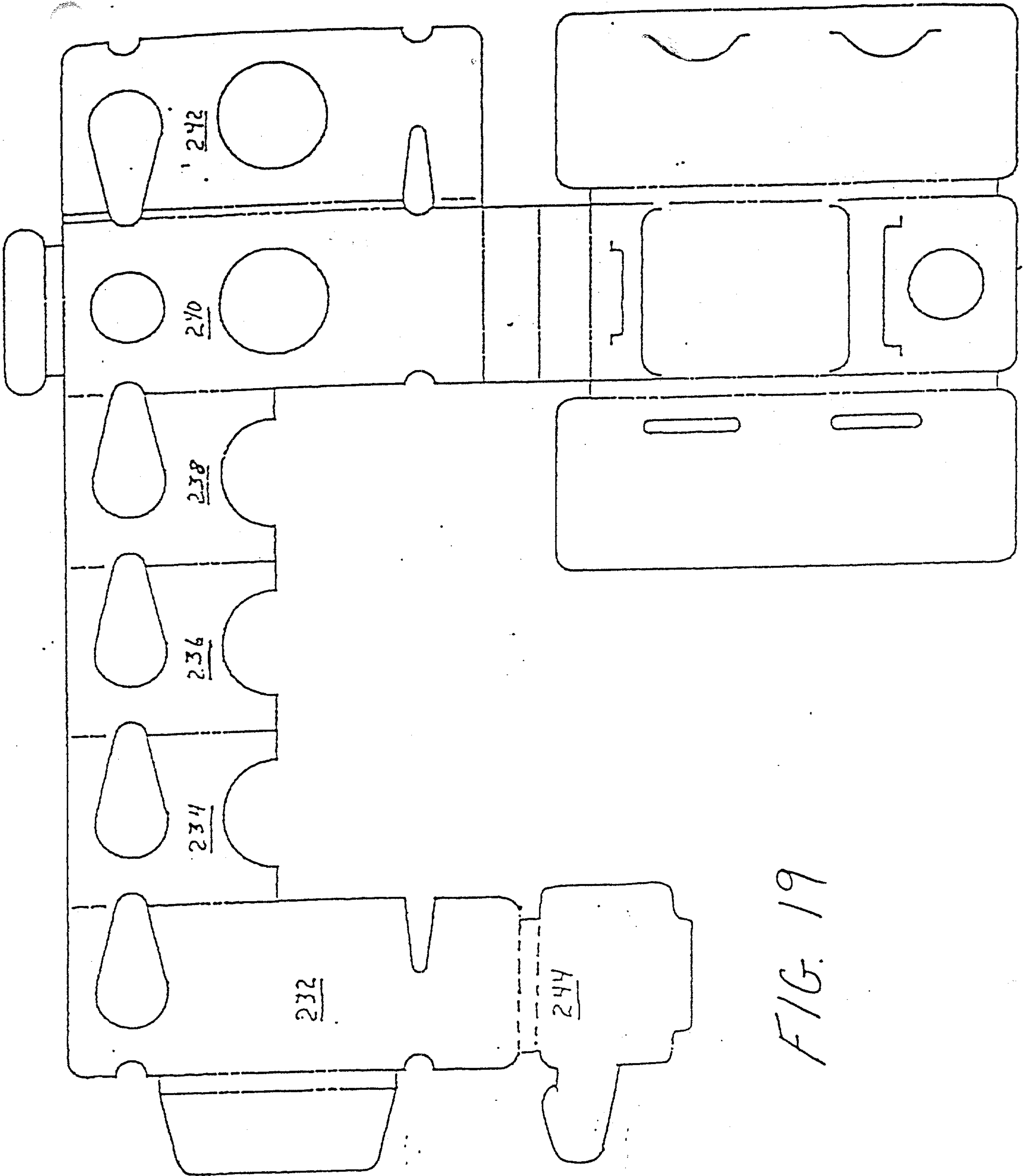


FIG. 19

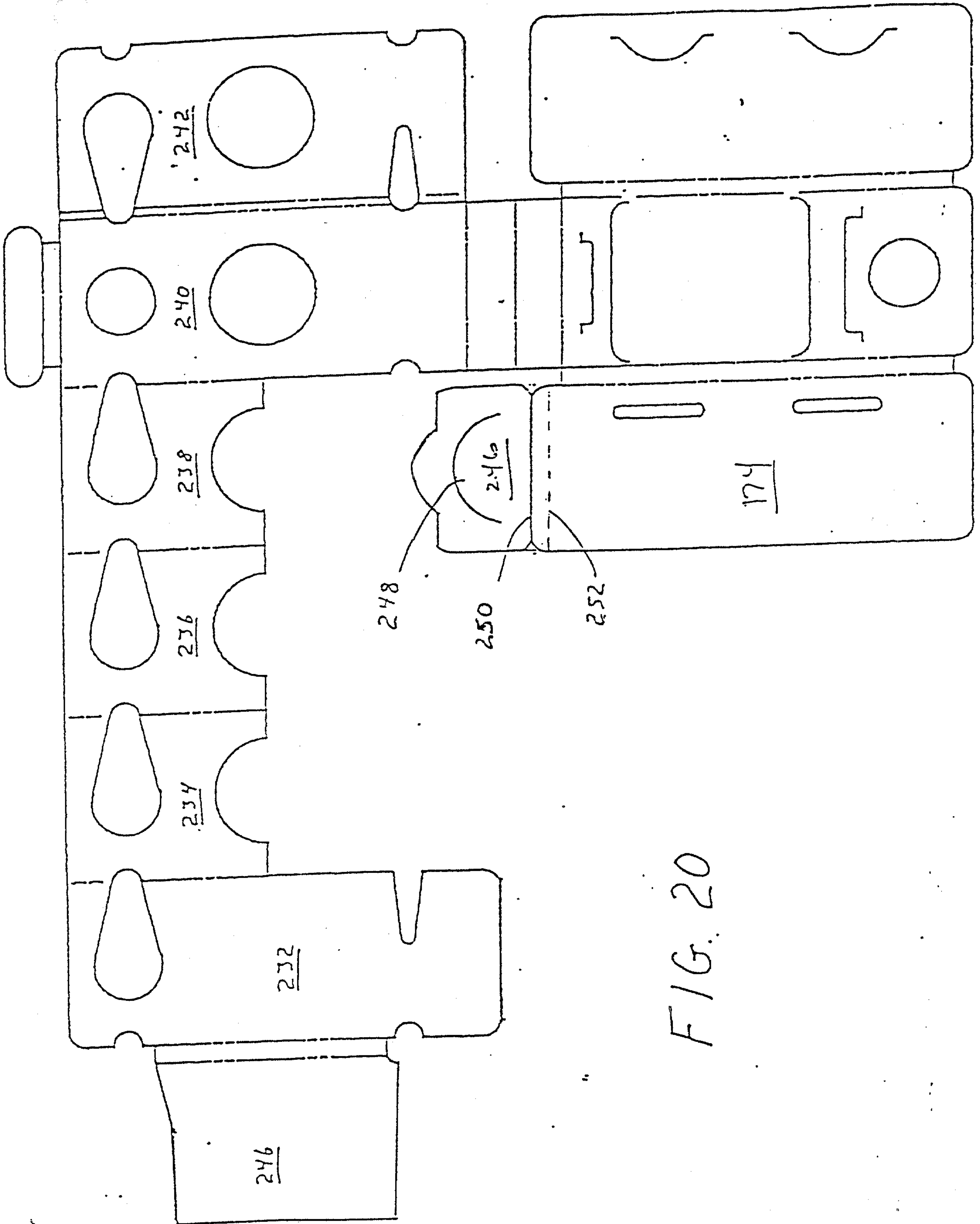
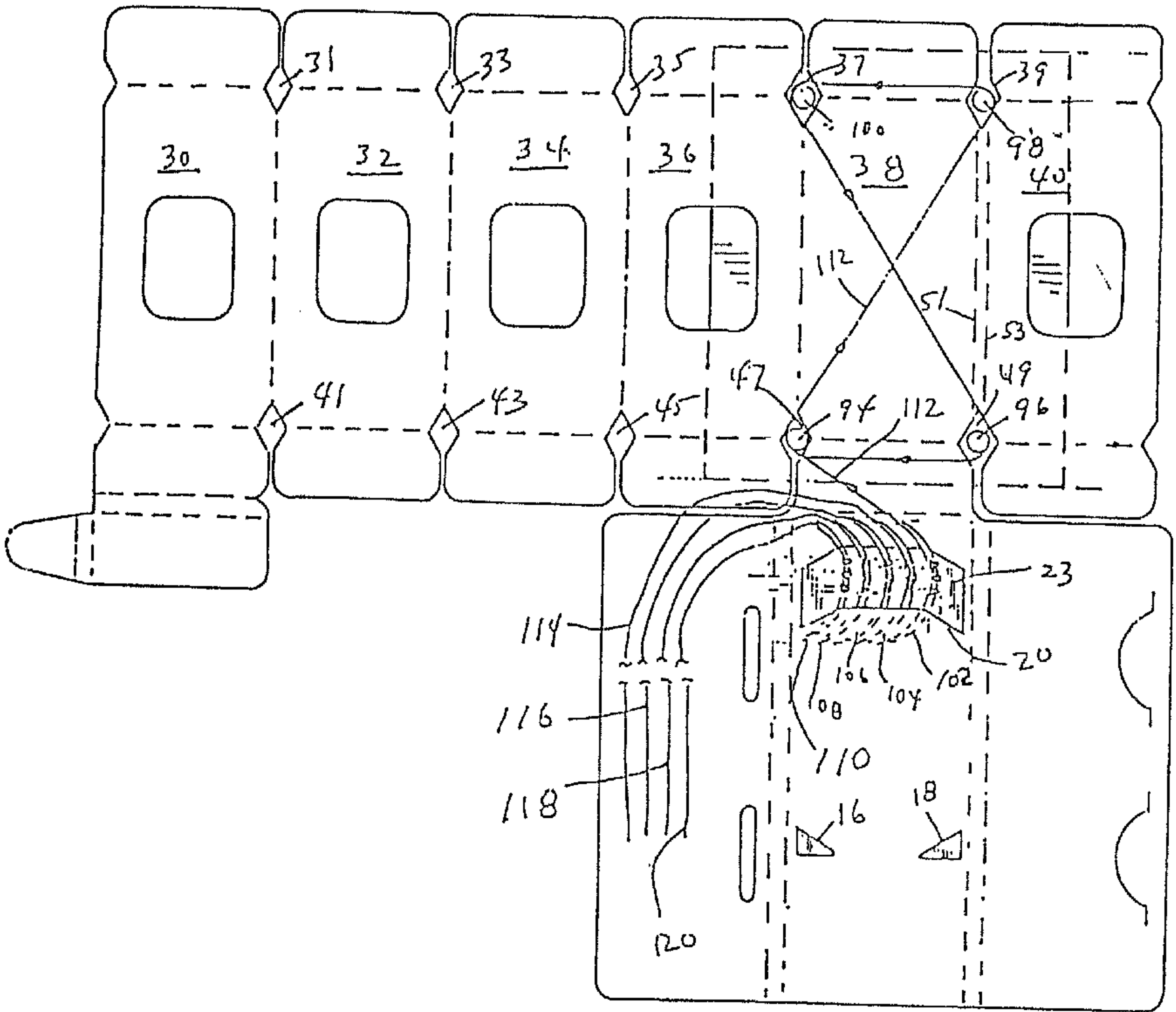


FIG. 20

3-4-1



3-4-1