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71 Applicant: **GRAFICHE DOTTI S.a.s. di DOTTI Natale & Fratelli, Via Cinque Giornate 38, I-22012 Cernobbio (Como) (IT)**

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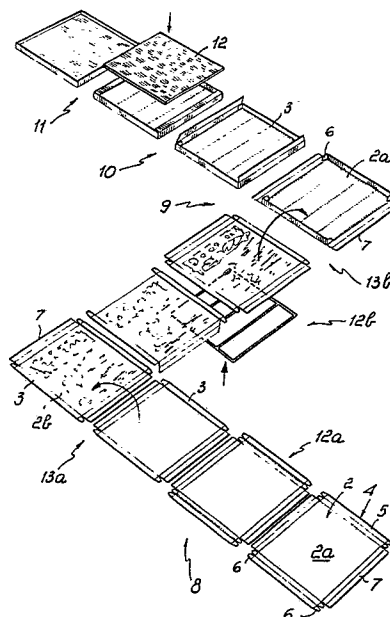
72 Inventor: **Dotti, Angelo, Via Per la Svizzera, 14, I-22012 Cernobbio Como (IT)**

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74 Representative: **Benedusi, Delfo, Internazionale Brevetti S.r.l. Ing. Maranesi - Quartaroli & C. Via Meravigli 18, I-20123 Milano (IT)**

54 **System and method of forming flattened boxes, in particular for containing disk records.**

57 The box forming system comprises an auxiliary processing line (15) and a main processing line (16) interconnected by a box forming sheet turnover device, the auxiliary processing line comprises a sheet loading station (17), sheet entraining chains (18), glueing members (19) effective to apply a glue to first lateral bands of the sheet and folding members (20) which, by acting on the moving sheets on-the-fly while being entrained by the entraining chains (18), force the first lateral bands thereof to fold upon themselves and adhere closely. Then the sheet, with the first lateral bands already folded upon themselves but still substantially coplanar with its base is positioned on the starting station of the main processing line with the second lateral bands parallel to the direction of advance of this main line, in such a way as to be pre-folded and then brought to a situation of coplanarity with the box base or bottom.



This invention relates to a system and a method of forming flattened boxes, in particular for containing disk records.

As is known in the art, boxes intended for
5 packaging disk records therein are required to possess high structural and aesthetic features, since they perform the dual function of attracting potential buyers of the disk records through the high quality of their appearance, and of protecting from shocks and
10 incidental drops a fragile and sometimes very expensive item, such as a disk record can be. Besides such basic requisites, disk record packaging boxes must have some desirable features, such as resistance to crushing, thereby they can be stacked without
15 trouble or incidentally put under some heavier object, and low cost, in order for the cost of the box not to affect appreciably the cost of the packaged product.

In an effort to meet all these requirements, boxes of various types have been made and sold in the
20 past, generally formed from some cardboard, and having their edges simply folded over and stapled together, or even secured together by means of adhesive tape or glues. Moreover, such cardboard boxes are generally lined both on the inside and outside thereof. In
25 particular, the outer lining is finished with the application of a printed label identifying the record contained in the box and glued to the latter.

Such prior boxes are rather complicated to manufacture, mostly involving manual operations, and
30 are weak construction-wise and poorly finished from an

aesthetic standpoint. The outer sheet, in fact, is often only imperfectly aligned with the box periphery. Accordingly, new boxes have been proposed which have their outer surfaces suitable for overprinting and edges which are interconnected by jointing and glueing. Furthermore, an inside liner has been provided which is formed from an expanded plastics or the like, having good smoothness surface characteristics and being cemented directly to the box inside. Of course, boxes have been made wherein the box body and lid are structurally the same, except for the overall dimension.

These boxes have several advantages over the previous ones; they are stronger but light, less expensive, and better finished, since the overprinting of either the cardboard body or lid sheet affords excellent results both from the graphical standpoint and that of an accurate alignment of the overprint. However, the procedures involved in the manufacture of such boxes have remained mostly traditional, with a prevailing utilization of manual labor during all those steps which start with blank die-cut sheets and end with the finished box. For this reason, the cost of the boxes is still comparatively high, and the production rate relatively low.

Thus the task of the invention is to provide a thorough solution to the foregoing problems, by providing a system and method which can afford a fully automated production of boxes for containing records and the like.

Within this task it is possible to arrange that

the invention provides a system and method for the production of said boxes which also lend themselves to the partial utilization of manual labor, depending on circumstances and preference.

5 It is further possible to arrange that the invention provides a system as indicated, which can be operatively split in several separate and variously located parts, thereby allowing, in addition to the cited utilization of manual labor, an optimum layout
10 of the various parts of the system within a manufacturing plant.

These and other objects are all achieved by a method of forming flattened configuration cartons or cases for containing disk records and the like,
15 wherein both the carton containing bottoms and covers are formed from flat quadrangular semi-rigid sheets peripherally die-cut to present along two opposed sides a first pair of lateral bands extending into tongues at both ends, and a second pair of lateral
20 bands being arranged alternately with said first pair of lateral bands and having no tongues, the method comprising, according to the invention, the following steps:

a first step wherein the flat die-cut sheet
25 intended to either form said bottoms, or said covers, or both in a single piece, is caused to advance against stationary folding members operative to fold over said first band pair to overlie each other and secure them permanently;

30 a second step wherein one face of said sheet is

coated with an adhesive or cement by means of substantially grid-like dispensing and spreading members, and wherein said first bands, as folded over and secured to each other, are folded to raise
5 perpendicularly from the sheet plane, thereby two first opposed sides of the carton are formed, whilst the respective tongues are held flexed, by means of movable folding members, in the direction of lay of the adjacent second lateral bands;

10 a third step wherein said second tongue-less lateral bands are folded over to overlie each other and secure to each other such as to enclose said tongues as previously flexed and form the remaining opposed sides of the carton; and

15 a final step wherein all of the carton sides and the carton bottom are stiffened and settled through the insertion, between said carton sides and bottom, of flat plates shaped to size with respect to said bottoms and covers.

20 Advantageously, the system according to the invention which implements the foregoing method is characterized in that it comprises an auxiliary processing line provided substantially with members for continuously entraining said flat die-cut sheets
25 in a parallel direction to said first lateral bands with tongues, cementing members and ramp-like folding members adapted to cause said first lateral bands to adhere to themselves by acting with a sweeping action on the moving sheets, and in that it
30 comprises a main processing line having first

entraining devices effective to translate said sheets,
with said first bands being pre-folded, in a parallel
direction to said second lateral bands, a cementing
station provided with grid-like dispensing members
5 and adapted to act on those faces of said sheets
which will lay on the inside of the carton or case
being formed, folding devices operative to position
and secure said lateral bands together, and inserting
means effective to cause a plate and said carton or
10 case bottom to adhere and become secured together.

Further features and advantages will be more
clearly understood from the following description
of a preferred, though not limitative, embodiment
of the invention, as illustrated by way of example in
15 the accompanying drawings, where:

Figure 1 illustrates diagrammatically the method
of forming a box from a flat and die-cut semi-rigid
sheet;

20 Figures 2 and 2a are detail views, respectively
of a flat die-cut semi-rigid sheet in plan view
representation, and of the box portion obtained with
said sheet in perspective representation;

Figures 3 and 3a are, respectively, a plan view
of a die-cut sheet blank for producing a complete
25 carton or case in one piece, and a perspective view
of the completed carton or case as formed from said
sheet;

Figures 4 and 5 are general views of the system
implementing the method illustrated in Figure 1;

30 Figures 6 and 7 are elevation and plan views

showing schematically a portion of the machine schematically illustrated in Figure 5;

Figure 8 is a plan view of the processing stations diagrammatically shown in Figures 6 and 7,
5 with reference to the semi-rigid sheets of Figure 2;

Figure 9 is a sectional diagrammatic side view of a portion of the machine of Figure 5 following that of Figures 6 to 8;

Figure 10 is a plan view of the machine portion
10 of Figure 9 and of a successive portion thereof;

Figure 11 is a general, simplified front view of the terminating portion of the machine of Figure 5;

Figures 12 to 17 illustrate, partly in perspective, partly in plan view, and partly in section,
15 the processing steps which take place at the final box folding station, and the members involved in the folding operation; and

Figures 18 to 20 show in section how, at said final box folding station, a shaped plate is inserted
20 on the box inside, as well as the members utilized to insert said plate, also shown in Figures 5 and 11.

With reference to the drawing figures, both the method and the system according to this invention are adapted for manufacturing flattened configuration
25 boxes having substantially identical bottom bodies and lids, excepting for their dimensions and graphical representations. Figure 2a in particular shows a bottom body 1 having a square profile (although it will be appreciated that other profiles may be preferred).
30 The body 1 of Figure 2a has a base or bottom 2 of

large dimensions which is surrounded by sides 3 extending at 90° with the base 2.

Figures 3 and 3a illustrate a completed carton or case, also suitable for production with the method and system according to the invention throughout; in fact, both the bottom 1a and cover 1b can be formed from a single flexible sheet 4a (Figure 3), which is die-cut substantially in the same manner as the sheet 4, the only difference being in the portion 4b interconnecting the bottom with the cover and essentially constituting the connective and rear side of both bodies 1a and 1b with the carton in the closed condition. The pairs of lateral bands 5a and 7a are lined up with each other and identical to the bands 5 and 7 of Figure 2, thereby the complete carton 1a-1b can also be formed with the method and system of this invention, with the obvious exception of some suitable modifications in the number and dimensions of the cement-applying means and plate inserting means, which will be twice in number as those required to form a single bottom or single cover.

The description which follows will thus be restricted to the formation of a separate bottom, as illustrated in Figures 1, 2-2a and 4 to 20.

The containing body or bottom of a carton is formed, as mentioned hereinabove, from a semi-rigid sheet 4, as shown in Figure 2; it has first lateral bands 5 provided with end tabs 6, and second lateral bands 7 which alternate with the former and have no tabs. The method according to the invention for

forming the semi-rigid sheet 4 into the bottom 1 of Figure 2a comprises, as shown in Figure 1, a first step 8 wherein the first lateral bands 5 are folded, a second step 9 wherein the first bands 5 are
5 positioned and the tabs folded, a third step 10 wherein the second lateral bands 7 are folded, and a final step 11 wherein the bands are set with the insertion of a shaped plate 12. Also provided are auxiliary steps 12a and 12b, wherein the semi-rigid
10 sheet 4 is coated with a glue, and connection steps 13a and 13b wherein the sheet is turned over such as to allow the completion of all the folding operations of the lateral bands 5 and 7 by raising the bands above the supporting surfaces.

15 The box forming process is carried out continuously, with the semi-rigid sheets 4 kept moving, and accordingly and advantageously the lateral bands being folded will always be the ones arranged parallel to the direction of movement of the semi-
20 rigid sheets. Therefore, it will be necessary to vary the directions of movement of the semi-rigid sheets 4 such as to involve all the lateral bands, as shown in Figure 1.

25 The foregoing method, which provides for the assembling of the boxes in question by manipulating separately and sequentially the lateral bands, and with displacements and turnovers of the sheets such as to enable manipulation by raising the lateral
bands themselves and acting on-the-fly thereon,
30 makes possible the realization of a potentially fully

automated system, for implementing said method. In fact, the invention provides, as shown in Figures 4 to 20, for the boxes in question being formed completely by means of a series of automated operations carried
5 out on machines which can be grouped together to form a single continuous production line.

In particular, there may be noted (Figure 4) an auxiliary processing line 15 which carries out said first step, and a main processing line 16 (Figure 5)
10 which carries out the subsequent steps. The two processing lines, 15 and 16, may be closely interconnected, without any break, by a turnover element, not shown, adapted to perform said connection step 13a. In detail, the machine which defines the auxiliary
15 processing line 15 of the system substantially comprises, as shown in Figure 4, a loading station 17 whereat the semi-rigid sheet 4 of Figure 4 is laid down positioned with the first lateral bands 5 parallel to the direction of lay of the line 15 itself. The
20 sheet 4 is caused to advance by entraining members 18, shown schematically, which comprise, for example, entrainment chains. In its movement, the sheet 4 moves from the loading station 17 to glueing members 19 which are constructed to apply a glue or cement to the
25 first lateral bands 5, as taught in the cited auxiliary step 12a. The glueing members 19 are controlled, for example, by a sensor which detects the passing and exiting of the sheet 4.

Also provided are folding members 20 which, by
30 acting on the moving sheets on-the-fly while being

entrained by the entraining members 18, force the first lateral bands 5 to fold upon themselves and adhere closely. The structure of these folding members 20 may be any one, and in particular may be similar to that of the pre-folding elements which will be described with reference to the main processing line 16. At the loading station 17, the sheet 4 is arranged with its face 2a, which is intended to remain on the box inside, facing upwards, and the first lateral bands 5 are obviously folded such that the outer face 2b prevails on the inner face 2a. It follows that, for the transition from the auxiliary processing line 15 to the main processing line 16, there must be inserted a turnover device if the transition is carried out in an automated manner. In the event of manual transition from the auxiliary processing line 15 to the main processing line 16, the sheet 4, with the first lateral bands 5 already folded upon themselves but still substantially coplanar with the base 2, must be positioned by an operator onto a starting station 21, with the second lateral bands 7 parallel to the direction of advance on the line 16 and the outer face 2b facing upwards.

Figures 6 and 7 show how from the starting station 21 the sheet 4 is inserted, by means of a reciprocating translator element 22, to contact first entrainment devices 23 of the chain type which force the sheet to advance. During the advance movement, the second lateral bands 7 contact pre-folding elements 24, shown schematically in Figures 6 and 7, as well as

in Figure 5, which strain-relieve the folds in the lateral bands 7. These pre-folding elements are shown in detail in Figure 8; they comprise first guides 24a so warped relatively to one another as to fold the second lateral bands 7 in two; first straighteners 24b, which substantially bring the second lateral bands back to a situation of coplanarity with the base or bottom 2 and are defined by bearings arranged to press on the folds; second guides 24c which fold the second lateral bands at their bordering line with the base 2; and second straighteners 24d. It may be seen that, as mentioned, the cited folding members 20 are similar to the pre-folding elements 24, e.g. comprising guides so warped as to fold the first lateral bands 5 and bearings which confirm by a squeezing action the prepared fold.

The first entrainment devices 23, and the pre-folding elements 24, are terminated at a glueing station 25. At this station, the semi-rigid sheet 4, with the first lateral bands 5 folded and glued, and the second lateral bands 7 strain-relieved along the folding lines, is held above a grid 26 where through a grid-like template 27 can be raised which is wetted with glue. Said sheet is positioned with its inner face 2a facing the grid 26, and the exact position is ensured, where the first entrainment devices 23 are terminated at a distance from the glueing station, by a pusher element, not shown.

The particular configuration of the quadrangular grid template 27 has proved itself to be suitable to

create a concentration of cement or adhesive along the creasing (fold) lines of the carton sides, which concentration enables the carton sides, as folded perpendicularly to the sheet, to be stiffened, and
5 accordingly to impart high strength features to the completed carton.

Figure 9 shows in particular that the template 27 is carried on a stem 28 which can be controlled to move upwards by a fluid-dynamically operated
10 cylinder. An accurate and strong contact between the template 27, wet with glue, and sheet 4 is provided by the backing action of a turnover element 29, more clearly visible in Figures 9 and 10.

More specifically, the turnover element 29
15 comprises a tilting plate equipped with suction cups 30, which plate, by rotation about a substantially horizontal pivot pin, can move from a position whereat it rests onto the sheet 4, at the glueing station 25, to a fully tilted position with the suction cups upside
20 down. In its rotational movement, the turnover element 29 entrains the sheet 4 therealong, by virtue of the suction cups 30, thus moving the sheet from the glueing station 25 to a delivery station 31 defined by the turnover element itself, in its turned over
25 condition. The sheet 4 is presented into the delivery station 31 with its outer face facing up and arranged along a transverse line of movement to the one followed up to that moment, as shown in particular in Figure
5. Moreover, the sheet 4 is inserted, as it is
30 entrained by said suction cups, between first side

ridges 33 which force the first lateral bands 5, previously folded over and glued, to arrange themselves at 90° to the base or bottom 2.

At the delivery station 31, there operates a carriage pusher 32 actuated by a fluid-dynamic cylinder and shown particularly in Figures 10 and 11. The carriage pusher 32 is reciprocated along a parallel direction to the first lateral bands 5 and first side ridges 33, thus carrying the sheet 4 to either of two final stations 34, whereat the box forming process is completed, as shown in Figures 11 to 20.

It should be noted that the turnover element 29 and carriage pusher 32 define second entrainment devices.

As shown in Figures 11 to 20, at the stations 34, there are provided linkages and detent elements which alternate operatively to one another, and inserter means effective to apply said shaped plate 12. In detail, at each final station 34, said linkages and detent elements are defined by second side ridges 35 arranged as an extension from the first side ridges 33 and being overlapped by strips 36 set to protrude partially such as to prevent the raising of the sides defined by the first lateral bands 5; by pin-type pushers 37 located at the ends of the second side ridges 35 and movable transversely thereto; by tiltable sides 38 extending transversely to the second side ridges 35; by a stop 39 intersecting the tiltable sides 38; and by folding arms 40 which oscillate and are positionable with their working ends above the tiltable sides 38,

when the latter are in their raised position. The pin
pushers 37 are provided, as shown in Figures 12 and
13, to fold the tabs 6 inwardly and set them aligned
with the second lateral bands 7. The pin pushers 37 are
5 controlled to retract upon the tiltable sides 38 being
raised as shown in Figure 14, thus forcing the second
lateral bands 7 to arrange themselves substantially
at 90° to the base or bottom 2 of the sheet being folded.
It is to be noted that before operating the pin pushers
10 37 and tiltable sides 38, the semi-rigid sheet 4 is
properly positioned by a stop 39 which is partly
inserted through a slit in the sides 38.

The semi-rigid sheet 4, folded as shown in
Figure 14 and in plan view in Figure 15, is acted upon
15 by said arms 40, shown more clearly in Figures 16 to
18. These arms carry out the folding of the end flaps
of the second lateral bands 7 prior to the operation
of the cited inserter means. The latter, as shown
particularly in Figures 11, 18, 19 and 20, are in the
20 form of rocker paddles 41 having suction cup elements
42 for supporting the shaped plates 12 and inserting
them between the sides 3 of the box.

The paddles 41 are so constructed as to perform
themselves the final folding of the second lateral
25 bands 7. As shown in Figure 18, as the paddles 41 are
inserted, the arms 40 are retracted and (Figure 19)
the shaped plates 12 fully fold upon themselves the
second lateral bands 7, thus enveloping the tabs.

Furthermore and advantageously, above the paddles
30 41, fluid-dynamically controlled pressers 43 are

provided which (Figure 20) squeeze the second lateral bands 7 such as to enhance the fold, and then move back to a retracted position in order to permit the raising of the paddle which supports them.

5 The method and system according to the invention fully achieve their objects.

In fact, not only a method has been made available which can be fully implemented on an automated machine, but also a system made up of several
10 lines which may be separated from one another and independently controlled.

The invention as described and illustrated is susceptible to many modifications and variations without departing from the purview of the instant
15 inventive concept. Thus, as an example, the system may include a number of auxiliary members, such as a perfuser 44 at the glue supply and others, the final stations 34 being in any desired number.

In practicing the invention, the materials used,
20 the number and dimensions of the various members, as well as their relative positions, may vary in accordance with the size of the die-cut sheet blank, it being contemplated, according to the invention, that said sheet may be made substantially square to form a cover
25 and bottom separately, or rectangular for the formation of a carton or case.

C L A I M S

1 1. A method for forming flattened configuration
2 boxes, in particular for containing disk records, in
3 which both the box bottom and lid or cover portions
4 are formed from flat semi-rigid sheets having first
5 lateral bands which extend at both ends into tabs, and
6 second lateral bands which alternate with said first
7 lateral bands and have no tabs, characterized in that
8 it comprises for forming said bottom and lid or cover
9 portions:

10 a first step wherein the flat die-cut sheet
11 intended to either form said bottoms, or said covers,
12 or both in a single piece, is caused to advance
13 against stationary folding members operative to fold
14 over said first band pair to overlies each other and
15 secure them permanently;

16 a second step wherein one face of said sheet
17 is coated with an adhesive or cement by means of
18 substantially grid-like dispensing and spreading
19 members, and wherein said first bands, as folded over
20 and secured to each other, are folded to raise
21 perpendicularly from the sheet plane, thereby two
22 first opposed sides of the carton are formed, whilst
23 the respective tongues are held flexed, by means of
24 movable folding members, in the direction of lay of the
25 adjacent second lateral bands;

26 a third step wherein said second tongue-less
27 lateral bands are folded over to overlies each other
28 and secure to each other such as to enclose said tongues

29 as previously flexed and form the remaining opposed
30 sides of the carton; and

31 a final step wherein all of the carton sides and
32 the carton bottom are stiffened and settled through the
33 insertion, between said carton sides and bottom, of
34 flat plates shaped to size with respect to said
35 bottoms and covers.

1 2. A method according to Claim 1, characterized
2 in that said cement or adhesive being spread over the
3 sheet is applied substantially along grid-like lines
4 with said cement or adhesive concentrating more along
5 the creasing or fold lines of said carton sides
6 relatively to the sheet plane.

1 3. A system for forming flattened configuration
2 boxes from semi-rigid sheets having a pair of first
3 lateral bands parallel to each other and extending into
4 tabs at both ends, and a pair of second lateral bands
5 parallel to each other and alternating with said first
6 lateral bands, characterized in that it comprises an
7 auxiliary processing line (15) having, substantially,
8 members (18) for continuously entraining said sheets (4)
9 along a parallel direction to said first lateral bands
10 (5), cement or glue applying members (19) and folding
11 members (20) operative to cause said first lateral
12 bands (5) to adhere to themselves by acting on the
13 moving sheets (4) on-the-fly, and in that it comprises
14 a main processing line (16) having first entraining de-
15 vices (23) operative to transport said sheets (4) along
16 a parallel direction to said second lateral bands (7),
17 a glueing or cement applying station (25) acting on the

18 internal faces of said sheets (4) to the box being
19 formed, folding devices (24) effective to position said
20 lateral bands (5, 7) and inserting means operative to
21 cause a plate to adhere between said folded over
22 bands, at the glue or cement coated face of said sheets.

1 4. A system according to Claim 3, characterized
2 in that said glue or cement applying station (25)
3 comprises a movable grid template (27) or similar, from
4 a position whereat it is dipped into a bath of glue or
5 cement to a raised position whereat it contacts said
6 sheet (4).

1 5. A system according to Claim 4, characterized
2 in that second entrainment devices (22, 29) are provided
3 operative to bring said sheet from said glue or cement
4 applying station (25) to said folding devices and said
5 inserting means.

1 6. A system according to Claim 5, characterized
2 in that said second entrainment devices (22, 29)
3 comprise a sheet tilting element (29) having suction
4 cups (30) and being arranged adjacent said glue or
5 cement applying station (25).

1 7. A system according to Claim 6, characterized
2 in that said entrainment devices (22, 29) are sided by
3 pre-folding elements adapted to strain-relieve the fold
4 lines of said second lateral bands (7).

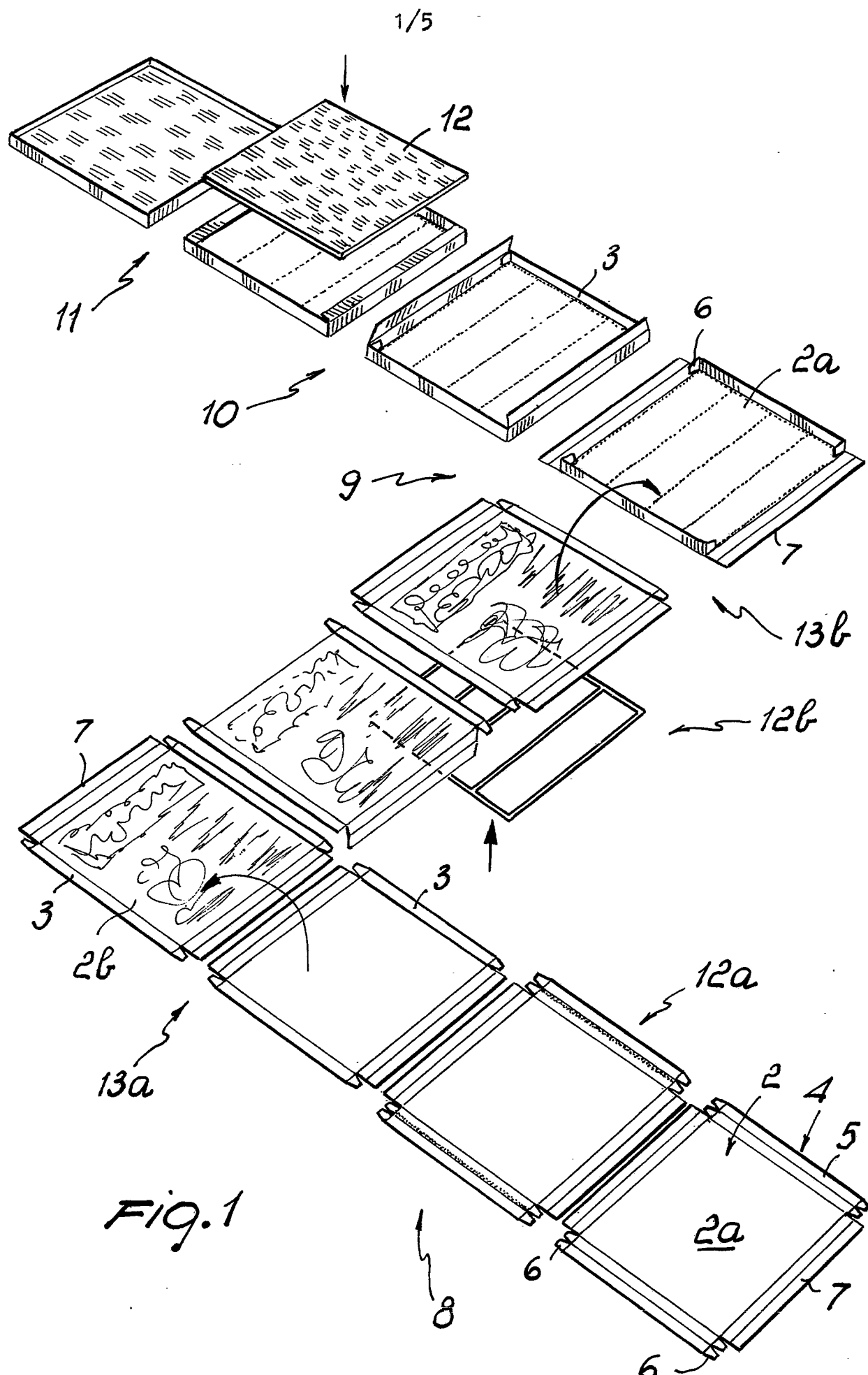
1 8. A system according to one or more of the
2 preceding claims, characterized in that said second
3 entrainment devices (22, 29) comprise a carriage pusher
4 (32) driven of reciprocating motion and adapted to
5 alternately move in opposite directions said sheets (4)

6 being carried by said tilting device (29).

1 9. A system according to Claim 8, characterized
2 in that said folding devices and inserting means (41)
3 define two identical final box forming stations (34)
4 alternately fed into by said carriage pusher (32).

1 10. A system according to one or more of the
2 preceding claims, characterized in that said inserting
3 means (41) comprise at each said final station (34) an
4 oscillating paddle (41) adapted to support, through
5 suction cup elements (42), a shaped plate (12) and to
6 bring said shaped plate (12) in between said folded over
7 sides (3), and in that each said paddle (41) carries
8 expandable pressers (43) operative to force the fold
9 lines of said second lateral bands (7) in their folded
10 over condition.

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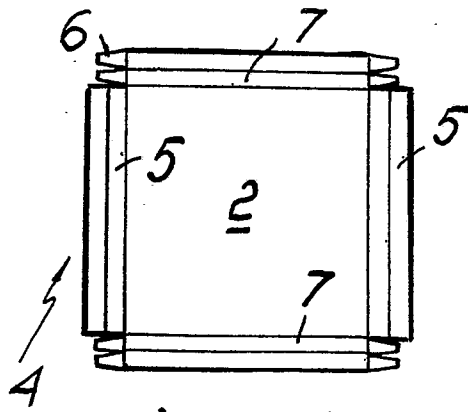


FIG. 2

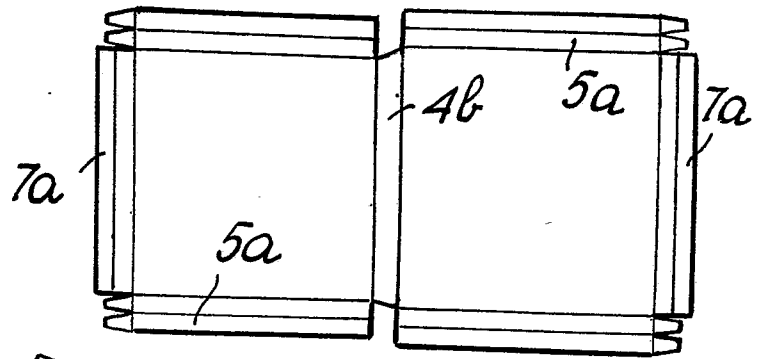


FIG. 3

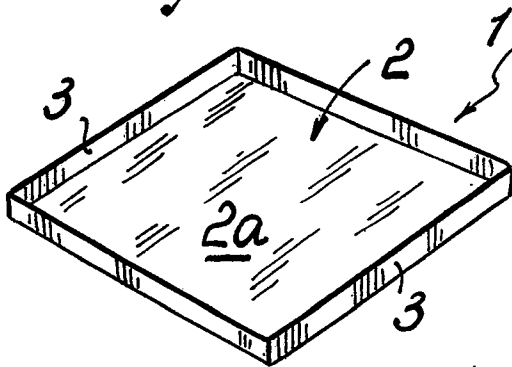


FIG. 2a

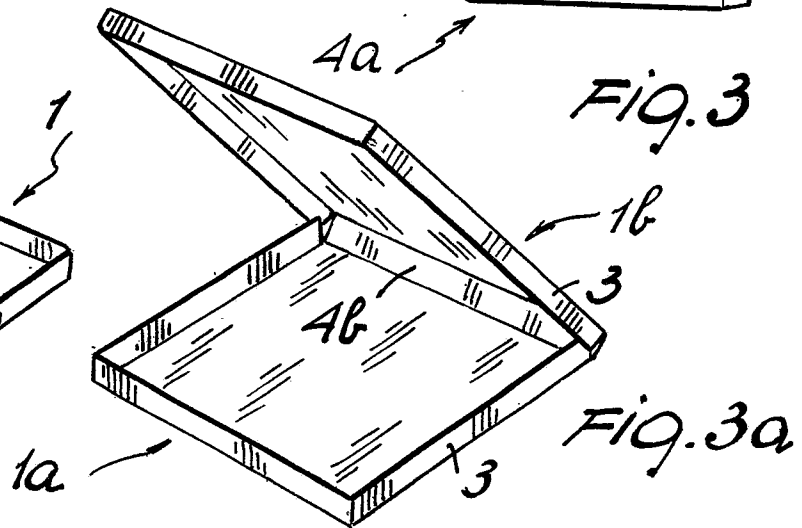


FIG. 3a

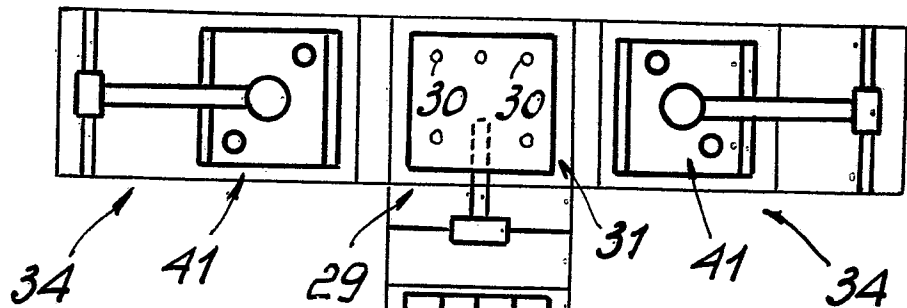


FIG. 4

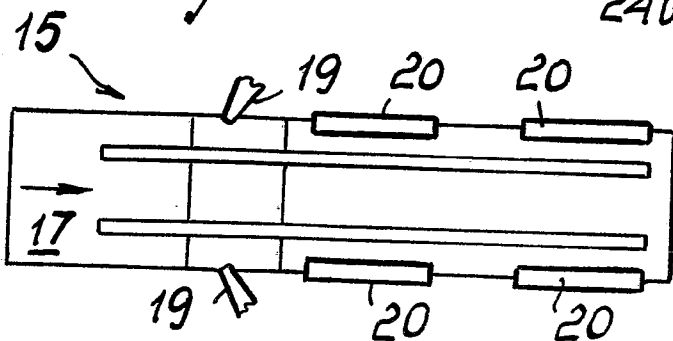
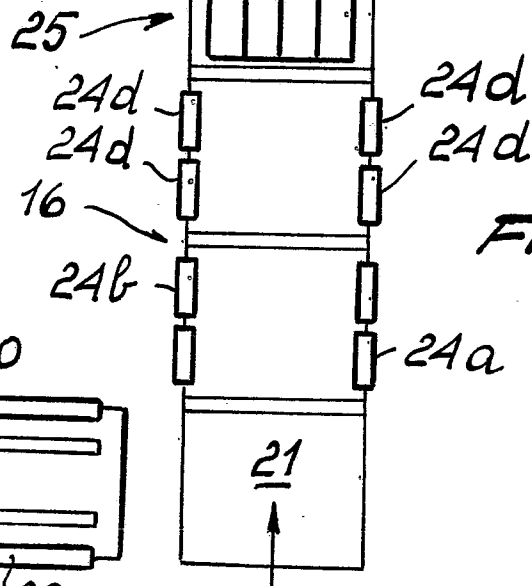
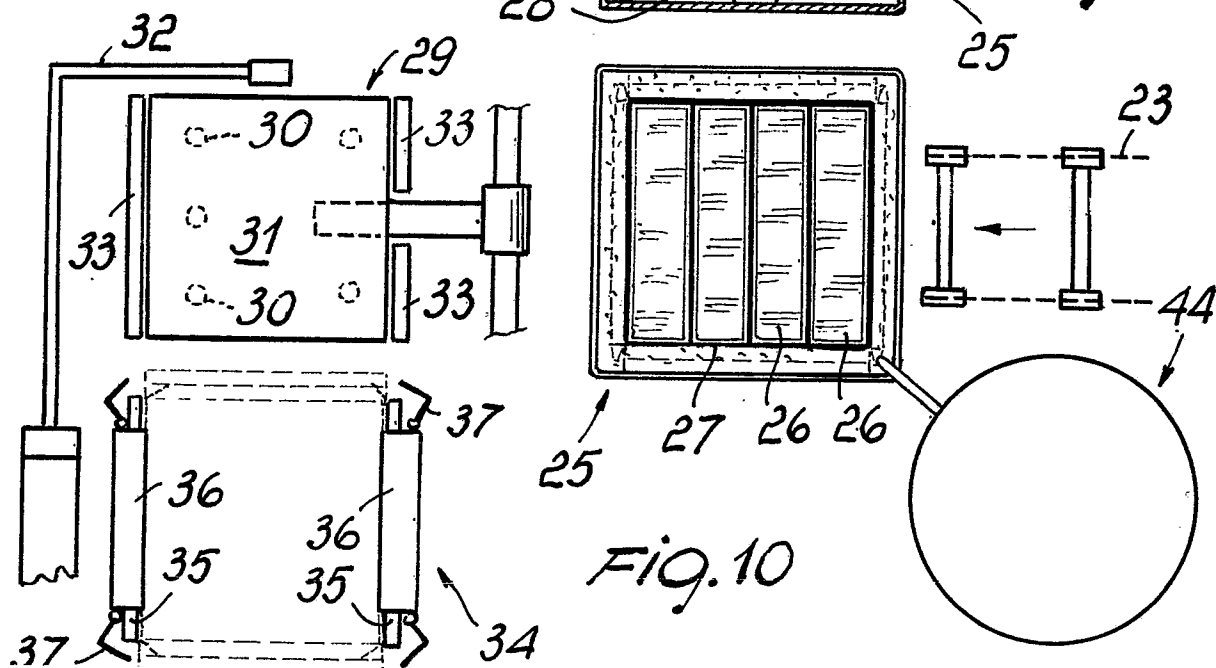
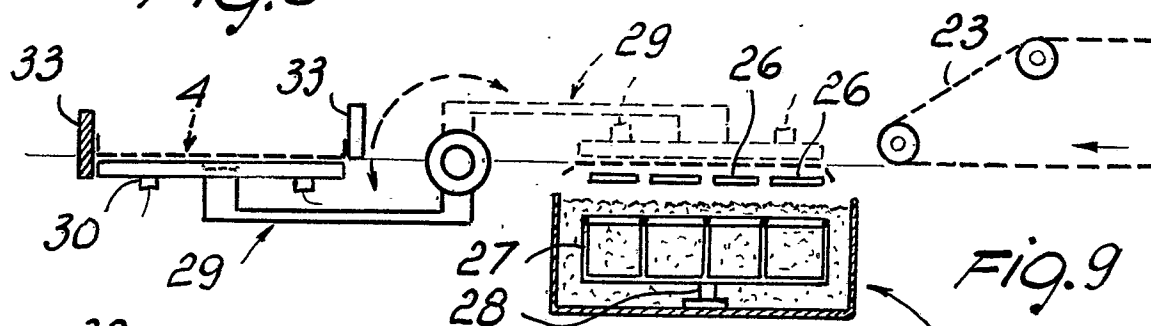
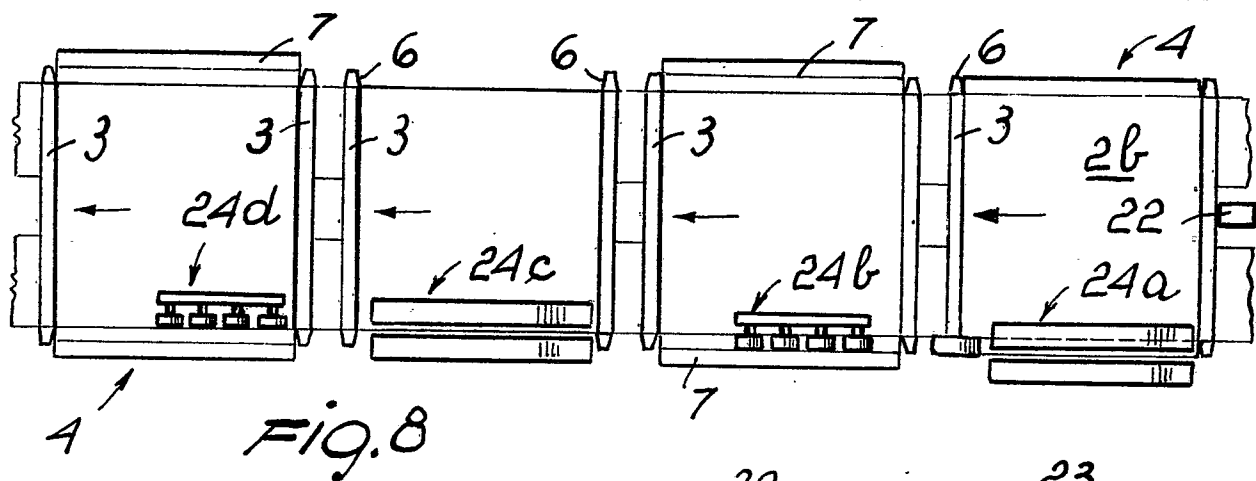
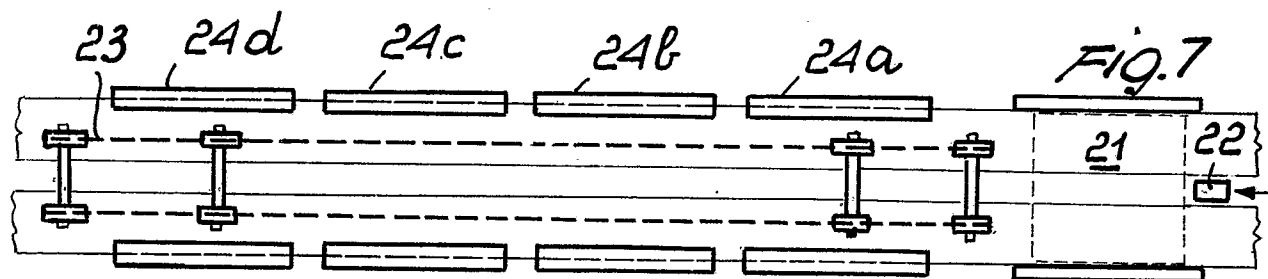
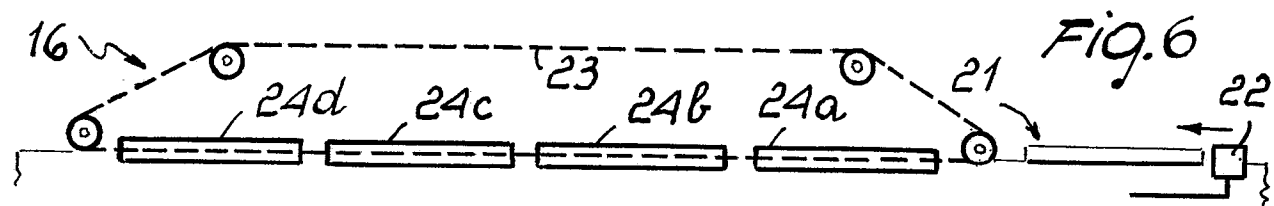


FIG. 5





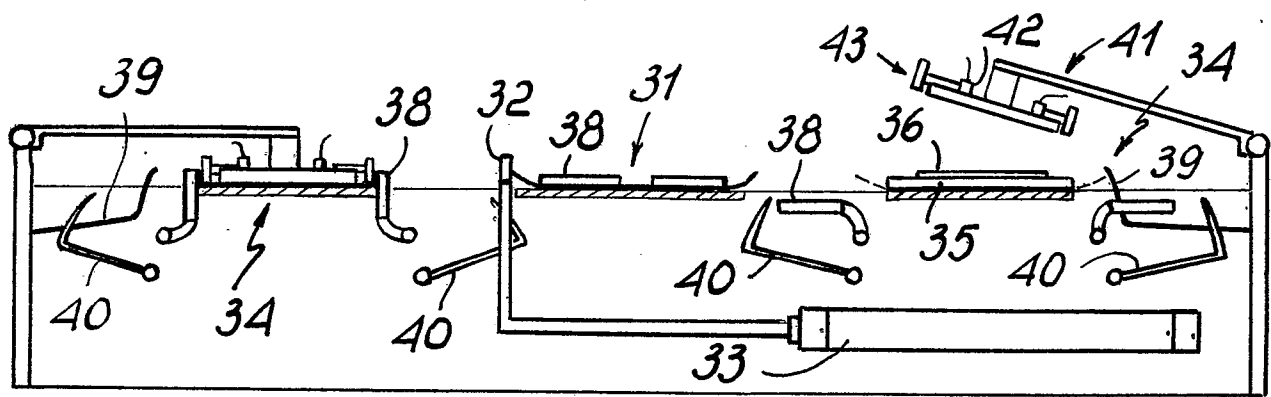


Fig. 11

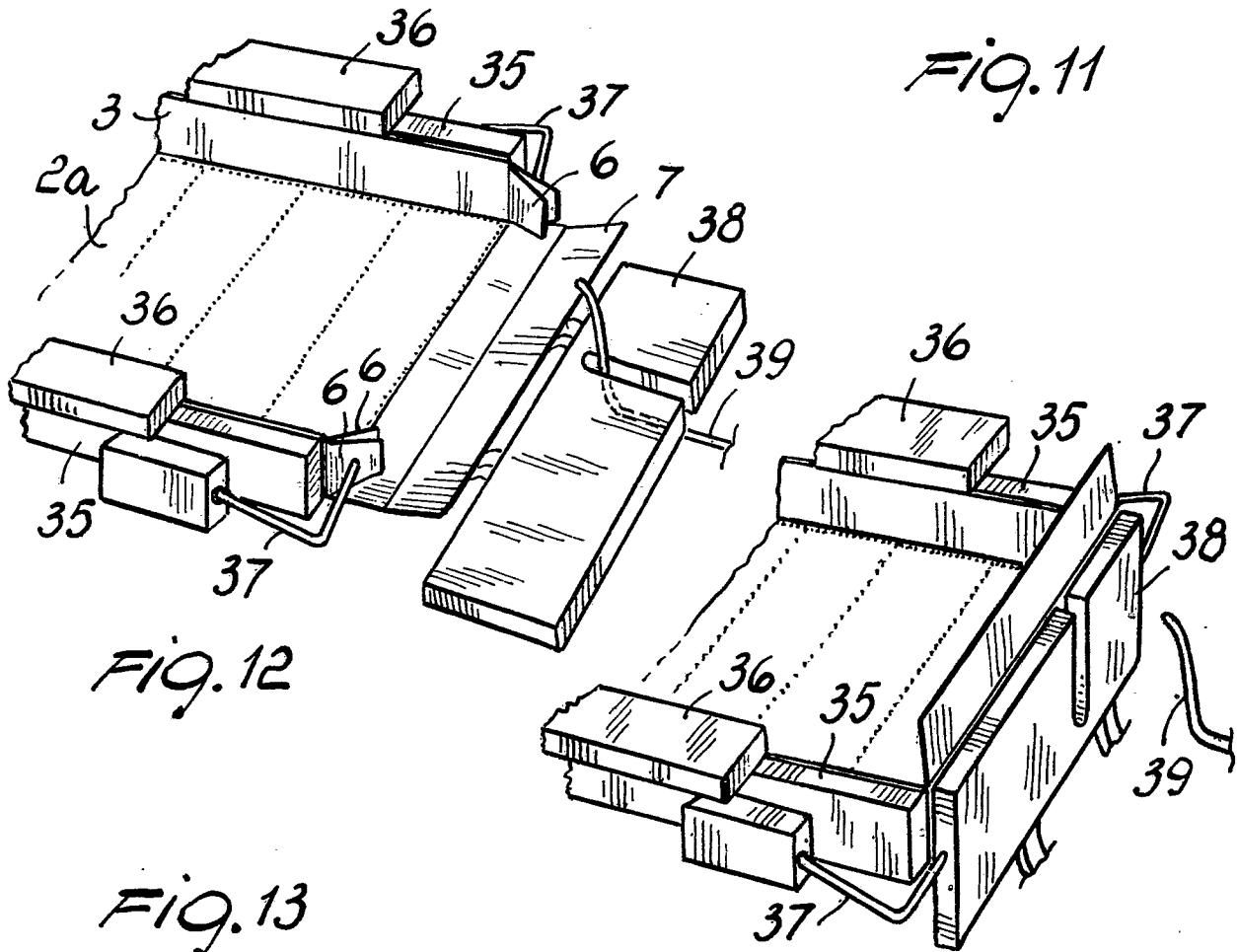


Fig. 12

Fig. 13

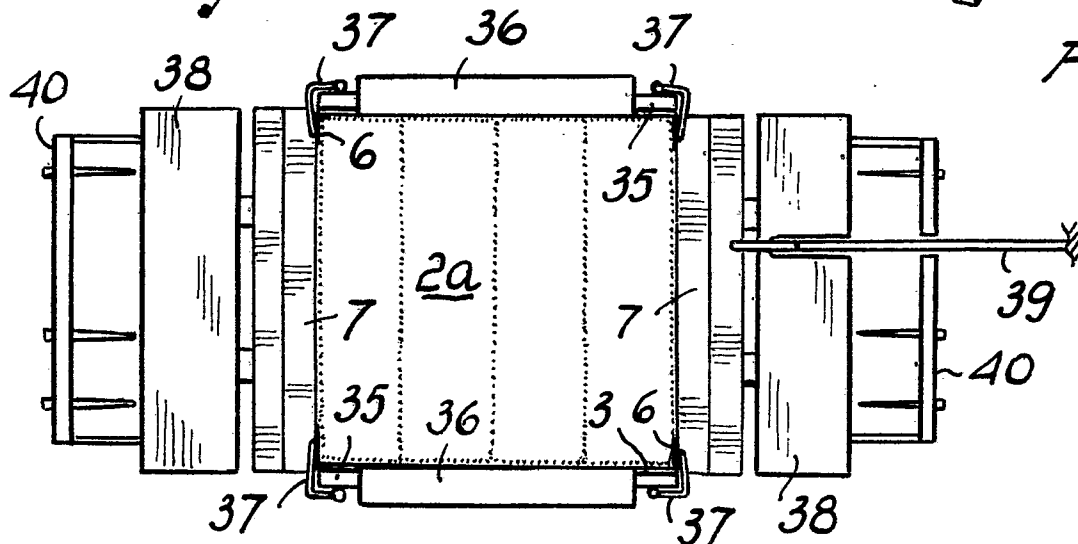


Fig. 14

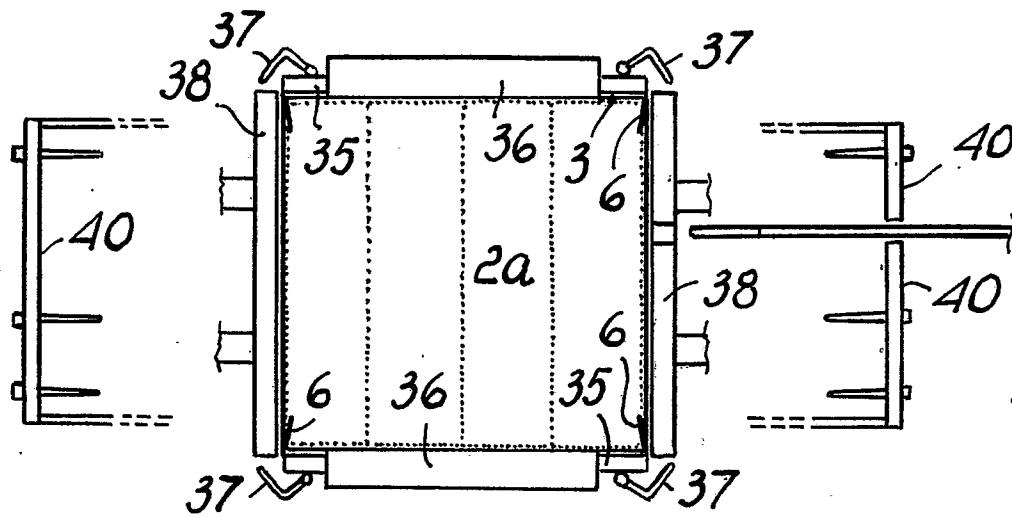


Fig. 15

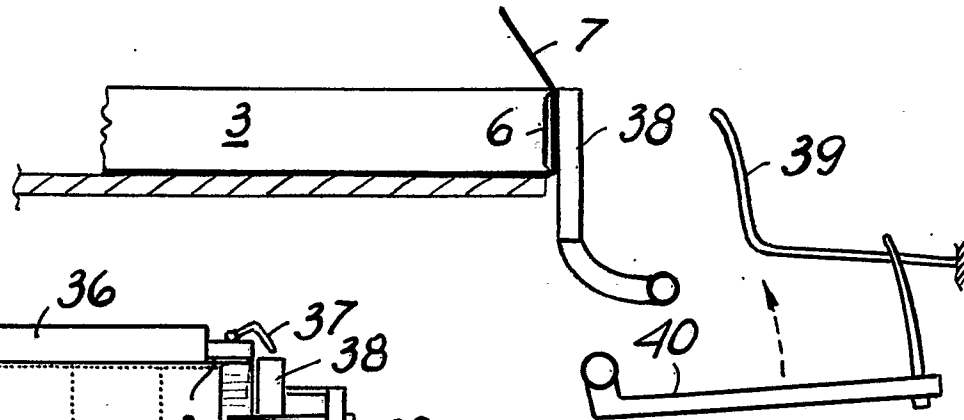


Fig. 16

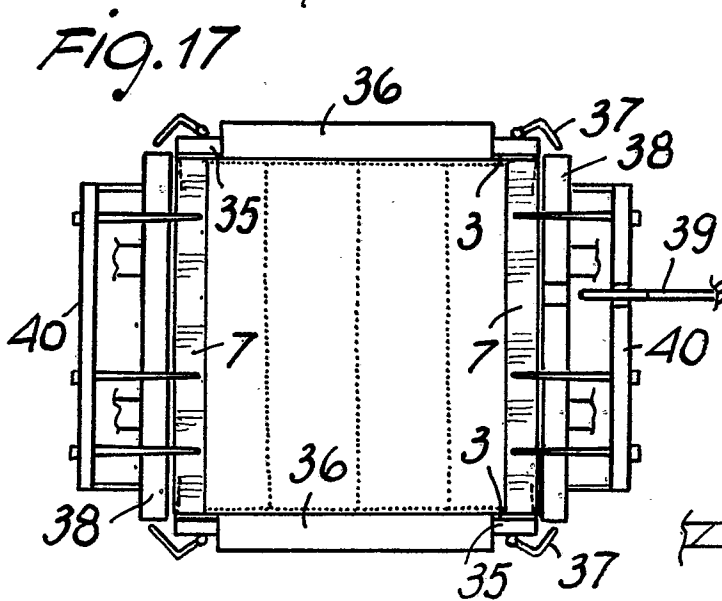


Fig. 17

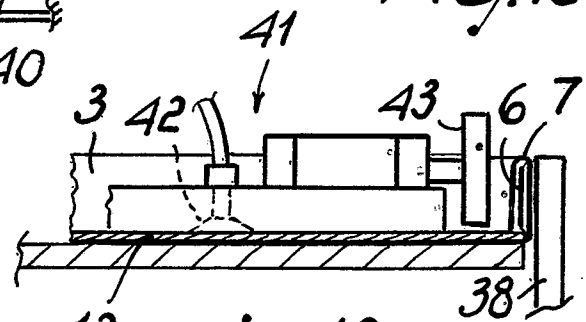


Fig. 19

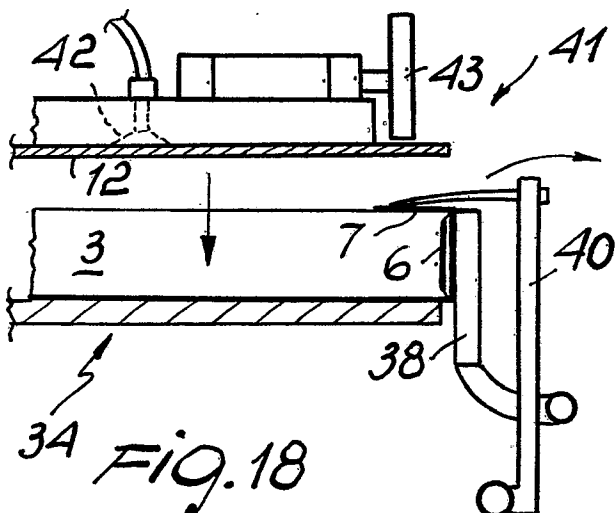


Fig. 18

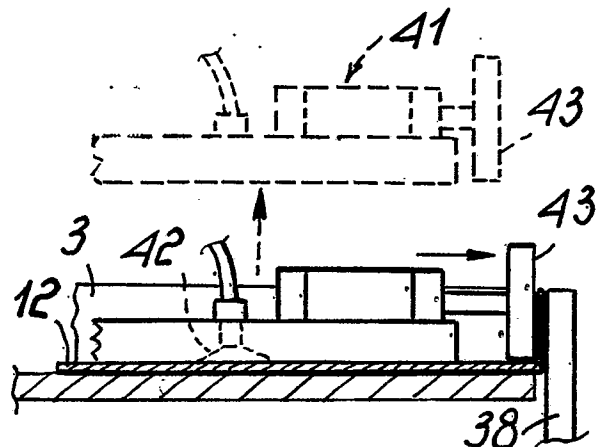


Fig. 20



European Patent
Office

EUROPEAN SEARCH REPORT

0048824
Application number
EP 81106691.9

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int. Cl. 3)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
	<u>AT - B - 356 499 (ASTRA-WERKE)</u> * Claims; fig. 1-3 * & GB-A-1 494 778 --	1,3,5-8	B 31 B 17/60
	<u>DE - A - 2 019 132 (SCHWERDTLE & SCHANTZ KG)</u> * Page 4 - page 7; fig. 1 * --	1,3,5-8	
	<u>DE - A - 2 729 483 (WILLIAMS)</u> * Pages 18-26; fig. 3-10 * --	3	TECHNICAL FIELDS SEARCHED (Int. Cl. 3)
	<u>US - A - 1 355 924 (STOKES)</u> * Claims; fig. 1-6 * --	1	B 31 B 15/00 B 31 B 17/00
	<u>GB - A - 11 289/1915 (MARKS)</u> * Pages 2-4; fig. 1-16 * ----	1	
			CATEGORY OF CITED DOCUMENTS
			X: particularly relevant A: technological background O: non-written disclosure P: intermediate document T: theory or principle underlying the invention E: conflicting application D: document cited in the application L: citation for other reasons
			&: member of the same patent family, corresponding document
X	The present search report has been drawn up for all claims		
Place of search		Date of completion of the search	Examiner
VIENNA		26-11-1981	HOFMANN