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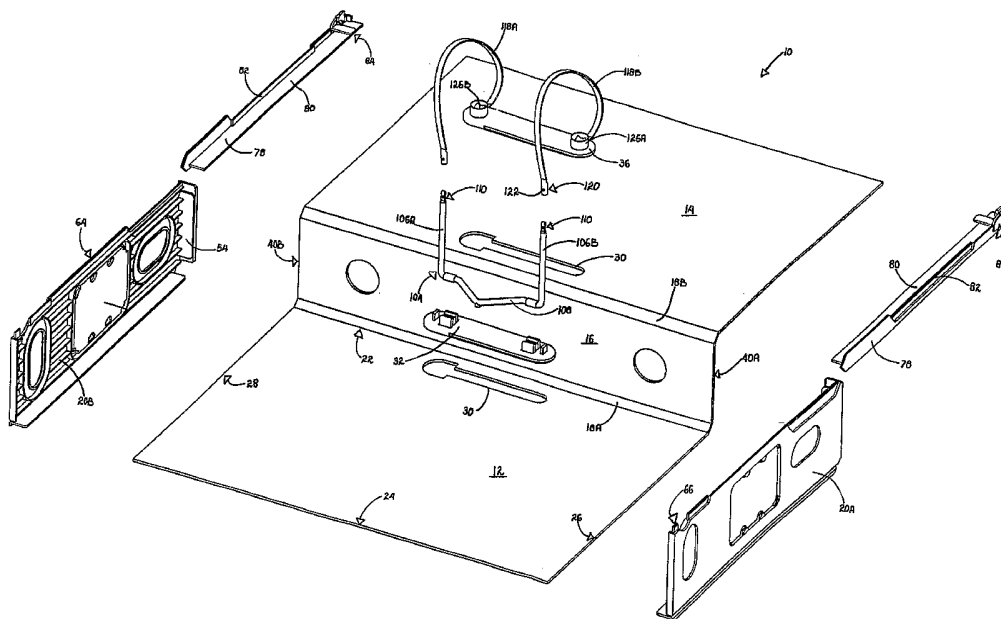
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(54) Title: A FILING DEVICE



(57) Abstract: A file (10) which includes a first cover member (12) with a first slot (30), a second cover member (14) which is opposed to and connected to the first cover member (12) and which has a second slot (30) and a binding mechanism (34) which has a base member (32) which is slidably engageable with the first slot (30), a locating member (36) which is slidably engageable with the second slot (30) and a tie formation with first and second ends which extends between the base member and the locating member.

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A FILING DEVICEBACKGROUND OF THE INVENTION

[0001] This invention relates to a filing device for the storage of documentation as well as a binding mechanism and a file rigidifying member used with the filing device.

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[0002] It is common to store documentation in hard cover lever arch and ring binding files. These files are normally stored in an upright position with spines of the files extending in a vertical direction.

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[0003] In order to improve the stability of a hard cover file stored in this vertical configuration it is known to engage a file stiffener with the leading ends of the opposing file covers of the file so that the file stiffener opposes the spine of the file and holds the covers apart in a parallel configuration.

[0004] In order to save space it is often necessary to store a hard cover file in a position wherein the leading ends of the opposing covers rest on a horizontal supporting surface with the spine spaced from the supporting surface and extending in a horizontal direction.

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[0005] Additionally documentation stored in a lever arch or ring binding file placed in the vertical configuration tends to collapse under its own weight which results in untidiness of the documentation and in extreme cases the tearing of the documentation from the binding mechanism. Documents stored in hard cover files arranged in the horizontal configuration hang vertically from the binding mechanism which improves the condition of the documentation.

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5 **[0006]** When a file is stored in this horizontal configuration the file covers tend to move apart causing the file to collapse. A file stiffener engaged with the leading ends of the opposing covers only provides limited relief as a file rigidified in this manner and stored in the horizontal configuration often tends to tilt sideways under the weight of documentation contained therein causing the file to collapse in a parallelogram
10 configuration. This collapsing action is enhanced if the file stiffener is hinged to any one of the opposing covers.

[0007] The Applicant has found that conventional lever arch and ring binding mechanisms are often not suitable for use in a file stored in the horizontal configuration as the weight of the documentation suspended from the binding mechanism is often
15 carried by only a single cover or the spine of the file.

[0008] In cases where the binding mechanism is attached to a single cover the weight of the documentation on the binding mechanism might cause the binding mechanism to pivot and distort the cover. In extreme cases the binding mechanism might shear from the cover. The pivot movement of the binding mechanism and shear forces exerted on
20 the cover by the binding mechanism also increase the susceptibility of the file to collapse when stored in the horizontal configuration.

[0009] Where the binding mechanism is attached to the spine the weight of the documentation might cause distortion and damage to the spine.

[0010] Additionally conventional lever arch and ring binding mechanisms take up
25 substantial space inside a file.

5 SUMMARY OF THE INVENTION

[0011] The aim of this invention is to provide an alternative filing device, a file rigidifying member and a binding mechanism which might alleviate some of the aforementioned problems.

10 [0012] The invention provides a binding mechanism, for use with a file which has first and second opposing covers, which mechanism includes a base member which is slidably engageable with the first cover, a locating member which is slidably engageable with the second cover and a tie formation with first and second ends which extends between the base member and the locating member.

15 [0013] The base member may include an elongate first floor formation. The first floor formation may include a slotted guide channel and a stop formation.

[0014] The base member may include at least one seat formation and at least one end stop attached to the first floor formation. Preferably the base member has two spaced seat formations and two end stops respectively located at opposite ends of the first floor formation.

20 [0015] The seat formation may be resiliently deformable and may include opposing lock formations. Preferably the first end of the tie formation is movably engageable with the seat formation.

[0016] The locating member may include an elongate second floor formation. The second floor formation may include a slotted guide channel and a stop formation. At

5 least one engagement formation may be formed on the second floor formation. Preferably the engagement formation is an upstanding formation with a central recess. The recess may be funnel shaped.

10 [0017] At least a part of the tie formation may be locatable in the engagement formation and the second end of the tie formation may be attached to the locating member.

15 [0018] The tie formation may include a hanger member with two spaced apart prongs and a cross member extending between the prongs. Each prong may include a connection point with an upstanding spigot. The cross member may be V-shaped and may include an abutment formation and at least one biasing formation. The biasing formation may be square shaped in cross-section and engageable with the seat formation.

20 [0019] The tie formation may include at least one lace member extending between the hanger and the locating member. The lace member may be flexible and attached to the locating member. Preferably the lace member includes a connection formation at its leading end. The connection formation may include an aperture and is preferably releasably interengageable with the connection point.

 [0020] The invention also provides a file which includes a first cover member with a first slot, a second cover member opposed to and connected to the first cover member and a binding mechanism which is slidably engageable with the first slot.

5 **[0021]** Preferably the second cover includes a second slot and the binding mechanism is slidably engageable with the second slot.

[0022] The binding mechanism may be of the aforementioned kind.

10 **[0023]** The invention also provides a first cover member with a first slot, a second cover member which is opposed to and connected to the first cover member and which has a second slot and a binding mechanism which has a base member which is slidably engageable with the first slot, a locating member which is slidably engageable with the second slot and a tie formation with first and second ends which extends between the base member and the locating member.

15 **[0024]** The invention further provides a file rigidifying member, for use with a file which has rigid first and second opposed covers and a rigid spine which is hinged to each of the first and second covers and spaces the first and second covers apart, which rigidifying member includes a rigid spacer body, an attachment formation hinged to the body which is attachable to the first cover and a mounting means attached to the body which is engageable with the spine.

20 **[0025]** The body may include a display formation to which labelling is attachable. Preferably the display formation includes a recessed shelf.

[0026] The body may include at least one window formation to allow inspection of the space between the opposing first and second covers.

5 [0027] Preferably the body is rectangular in outline and has opposing first and second sides and opposing first and second ends. The attachment formation may be hinged to the first side and the mounting means may be attached to the first end so that the attachment formation and mounting means are at a right angle relatively to one another.

10 [0028] The body may include a stepped guide formation on the second side and a foot member extending from the second end.

[0029] The body may include a catch member which is preferably on the second side of the body.

[0030] The body is preferably made from an appropriate plastics material and may have a plurality of reinforcing ribs extending at least partially across the body.

15 [0031] The attachment formation may have a first attachment flange which is preferably L-shaped in cross-section. The first attachment flange may be attachable in any appropriate manner to a periphery of the first cover.

20 [0032] The mounting means may include a groove formation formed by two upstanding and opposing flanges. Preferably the mounting means is integrally formed with the body and is engageable with a portion of a periphery of the spine which extends between the first and second covers.

[0033] The file rigidifying member may include a clip formation which is attachable to the second cover.

5 **[0034]** The clip formation may be releasably connectable to the body. The clip formation may include a second attachment flange and a rail member extending from the second attachment flange. The rail member may be stepped and complementary to the guide formation on the body. Preferably the clip formation is T-shaped in cross-section.

10 **[0035]** The clip formation may include a latch formation which is engageable with a snap action with the catch member. The latch formation may be resiliently deformable and may include a barb attached to a tab.

15 **[0036]** The second attachment flange may be attachable in any appropriate manner to a periphery of the second cover and the clip formation is preferably releasably connectable with the second side of the body.

20 **[0037]** The invention further provides a file which includes a first rigid cover member, a second rigid cover member opposed to and spaced from the first cover member, each of the first and second cover members being rectangular in profile with opposing first and second side peripheries and opposing first and second end peripheries, a rigid spine formation which is hinged to the first side peripheries of the respective first and second cover members, and at least one file rigidifying member of the aforementioned kind which is attached to the first end periphery of the first cover and which is releasably engageable with the spine.

25 **[0038]** Preferably the spacer body of the file rigidifying member is movable relatively to the first cover and is releasably attachable to the first end periphery of the second cover.

5 **[0039]** Preferably the file includes first and second file rigidifying members respectively attached to the first and second end peripheries of the first cover.

10 **[0040]** The first or second cover may include a first slot with which a binding mechanism may be slidably engageable. Preferably both the first and second covers include a respective slot and a locating member may be slidably engageable with either of the slots and a base member may be slidably engageable with the other slot.

[0041] The binding mechanism may be of the aforementioned kind.

BRIEF DESCRIPTION OF THE DRAWINGS

[0042] The invention is further described by way of example with reference to the accompanying drawings in which:

15 Figure 1 is a perspective view of a file according to the invention;

Figure 2 is a side view of the file of Figure 1;

Figure 3 is a sectioned side view on the line 3-3 of the file of Figure 2;

Figure 4 is a perspective view of the file of Figure 1 in a partially opened position;

Figure 5 is a perspective view of the file of Figure 1 in an open position;

20 Figure 6 is an exploded perspective view of the file of Figure 4;

Figure 7 is a plan view of a spacer used in the file of Figure 1;

5 Figure 8 is a cross-sectional side view on the line 8-8 of the spacer of Figure 7;

Figure 9 is a perspective view of a clip formation used in the file of Figure 1 together with an enlargement of a latch thereof;

Figure 10 is a perspective view of a base plate used in the file of Figure 1;

Figure 11 is a perspective view of a hanger used in the file of Figure 1; and

10 Figure 12 is a perspective view of a locating plate used in the file of Figure 1.

DESCRIPTION OF PREFERRED EMBODIMENT

[0043] Figures 1 to 6 show a file 10 which has a first rigid cover 12, a second rigid cover 14 which opposes the first cover 12 and is spaced from the first cover 12, a rigid spine 16 which is located between and hinged to the respective first and second covers 12, 14 at respective hinge points 18A, B and first and second file stiffeners 20A, B which
15 opposes one another. The file stiffeners 20A, B respectively extend between the first and second covers 12, 14 and are releasably engageable with the spine 16.

[0044] The first and second covers 12, 14 are mirror images and only the first cover 12 is described. The first cover 12 is made of board in a known manner and is rectangular
20 in outline with opposing first and second side peripheries 22, 24 and opposing first and second end peripheries 26, 28. The spine 16 is hinged to the first side periphery 22 and the file stiffeners 20A, B are respectively attached to the first and second end peripheries 26, 28.

5 **[0045]** An elongate slot 30 is formed in the first cover 12 close to the first side periphery 22.

[0046] A base plate 32 of a binding mechanism 34 is slidingly engaged with the slot 30 in the first cover 12 and a locating member 36 of the binding mechanism 34 is slidingly engaged with the slot 30 on the second cover 14.

10 **[0047]** As is evident from Figure 1 which shows the file 10 in a closed position, the respective second side peripheries 24 of the first and second covers 12, 14, 24 rest on an horizontal support surface 38. The spine 16 is spaced from the surface 38 and extends in a horizontal direction and parallel to the surface 38.

[0048] The spine 16 is of rectangular shape and has two finger gripping holes 39A, B. Opposing peripheral portions 40A, B of the spine 16 extend between the first cover 12 and second cover 14 at the respective first and second end peripheries 26, 28 thereof.

15 **[0049]** As is shown in Figure 4, which illustrates the file 10 in a partially opened position, Figure 5 which illustrates the file 10 in a completely open position, and Figure 6, the first and second stiffeners 20A, B are mirror images and only the first stiffener 20A is therefor described.

20 **[0050]** The stiffener 20A which is also shown in Figures 7 and 8 rigidifies the file 10 and has a rigid, rectangular body 42 with opposing first and second sides 44, 46 and opposing first and second ends 48, 50.

5 **[0051]** An L-shaped attachment formation 52 is hinged to the first side 44. The attachment formation 52 is attached to the first end periphery 26 of the first cover 12.

10 **[0052]** A mounting means 54 is integrally formed with the body 42 at the first end 48 so that the attachment formation 52 and the mounting means 54 extend at a right angle relatively to one another. The mounting means 54 has an upstanding outer flange 56 and an opposing upstanding inner flange 58. A groove 60 is formed between the outer and inner flanges 56, 58. The peripheral portion 40A is releasably engageable with the groove 60 of the mounting means 54.

15 **[0053]** A foot 62 is integrally formed with the body 42 at the second end 50.

20 **[0054]** A stepped guide 64 is formed on the second side 46 and a recessed catch 66 is also formed on the second side 46 next to the guide 64.

25 **[0055]** A display formation 68 in the form of a recessed shelf and two inspection windows 72A, B are formed in an outer, planar section 70 of the body 42.

30 **[0056]** The body 42 is injection moulded from an appropriate plastics material and has a plurality of reinforcing ribs 74 extending at least partially across the body 42 on an inner planar section 76 thereof.

35 **[0057]** The stiffener 20A also has a clip formation 78 which is shown in Figure 9 and which is T-shaped in cross section. The clip 78 has a second attachment flange 80 which is attached, in any appropriate manner, to the first end periphery 22 of the second cover 14. A stepped rail 82 extends from the second attachment flange 80. The rail 82

5 is complementary to and interengageable with the guide 64. A latch 84 which is resiliently deformable is formed on the clip 78 next to the rail 82 and has a barb 86 which is attached to a finger engaging tab 88. The latch 84 is engageable by way of a snap action with the catch 66.

10 [0058] The binding mechanism 34 has a tie formation 89 extending between the base plate 32 and the locating plate 36.

[0059] As is shown in Figure 10 the base plate 32 has an elongate first floor formation 90 which has a slotted guide channel 92 which extends at least partially around the periphery of the first floor formation 90 and a stop formation 94 which is formed at one end of the first floor formation 90. The base plate 32 is slidably engageable with the slot 30 by way of the channel 92 and the stop formation 94 locks the base plate 32 in place on the first cover 12.

[0060] Opposing upstanding end stops 96A, B extend from opposite ends of the base plate 32. Identical and opposing seats 98A, B are formed on the first floor formation 90. Each seat 98 is resiliently deformable and has two opposing lock formations 99A, B.

20 [0061] The tie formation 89 has a first end 100 which is movably engaged with the base plate 32 and a second end 102 which is attached to the locating plate 36.

[0062] The first end 100 consists of a U-shaped hanger 104 which is shown in Figure 11. The hanger 104 has two spaced apart prongs 106A, B and a cross member 108 which extends between the respective prongs 106. Each prong 106 terminates in a connection point 110 which has an upstanding spigot 112. The cross member 108 is V-

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5 shaped and has an abutment formation 114 at the base of the V-shape. On either side of the cross member 108, where the cross member 108 meets each prong 106, a biasing formation 116 is formed which is square shaped in cross section. Each biasing formation 116 is movably engageable with a respective seat 98.

10 [0063] The second end 102 of the tie formation 89 has two flexible laces 118A, B which respectively extend between a prong 106A, B and the locating plate 36. Each lace 118 is made from an appropriate plastics material and as is evident from Figure 12, one end of each lace 118 is attached to the locating plate 36 and the opposite end terminates in a tubular connection formation 120. The connection formation 120 has an aperture 122 and the connection point 110 and spigot 112 are releasably
15 interengageable with the connection formation 120 and aperture 122.

[0064] The locating plate 36 has a second floor formation 124 identical to the first floor formation 90 which allows the locating plate 36 also to be slidingly engageable with the slot 30 on the second cover 14. The laces 118A, B are attached to the second floor formation 124. Two upstanding engagement formations 126A, B extend upwardly from
20 the second floor formation 124. Each of the engagement formations 126 is circular in cross section and has a central recess 128 shaped in the form of a funnel.

[0065] As is shown in Figure 3 each connection point 110 is receivable in a respective recess 128 so that the hanger 104 is engaged with both the base plate 32 and the locating plate 36. The hanger 104 therefor extends between the first and second covers
25 12, 14 and is parallel with the spine 16 when the file 10 is in the closed position.

5 **[0066]** The base plate 32, locating plate 36 and clip 78 are all injection moulded from appropriate plastics materials. The hanger 104 is made from metal or is alternatively made from an appropriate plastics material.

10 **[0067]** In use the file 10 is stored in the horizontal configuration showed in Figures 1, 2 and 3 on a shelf (not shown) or in a box (not shown). In this horizontal configuration the stiffeners 20A, B lock the first and second covers 12, 14 and the spine 16 to one another so that the file 10 is rigidified and in the form of a rectangular container. Parallelogram type movement of the first and second covers 12, 14 and the spine 16 relatively to one another is discouraged as the first attachment formation 52, the mounting means 54 and the clip 78 lock each respective cover 12, 14 at right angles to
15 the spine 16. The file 10 therefore has a stable structure.

20 **[0068]** When the file 10 is stored in a box the file 10 can be lifted from the box by picking the file 10 up by means of the finger gripping holes 39A, B. When the file 10 is stored on a shelf one of the stiffeners 20A, B faces outwardly. Identification indicia or labelling (not shown) is attached to the recessed shelf 68. The windows 72A, B allows
25 limited inspection of an interior 130 of the file 10.

[0069] As can best be seen in Figure 3 documentation 132 (shown in dotted outlines) hangs vertically from the prongs 106 which extend horizontally. The prongs 106 are supported on both the first and second covers 12, 14 and the weight of the documentation 132 is distributed between the first and second covers 12, 14. This
weight distribution improves the stability of the file 10.

5 [0070] In order to access the documentation 132 and to open the file 10 the file is turned so that the first cover 12 lies on the surface 38. Both tabs 88 on the first and second stiffeners 20A, B are pushed inwardly by a user (not shown) using his fingers (not shown). As the latches 84 are resiliently deformable the respective barbs 86 are disengaged from the respective catches 66. This allows the clip formations 78 to be released and disconnected from the respective bodies 42. The second cover 14 is pivoted about the hinge point 18B which allows the connection points 110 to disengage from the engagement formations 126.

[0071] The file 10 is now in the partially opened position shown in Figure 4. It is important to note that in this position the attachment formations 52 and mounting means 54 of the respective stiffeners 20A, B keep the first cover 12 and spine 16 at a right angle relatively to one another. The documentation on the hanger 104 can now be inspected and in order to remove the documentation the respective connection formations 120 are disengaged and released from the respective connection points 110 whereafter the documentation 132 is removed in a known manner.

20 [0072] The respective bias formations 116 are locked to the respective seats 98A, B by the lock formations 99A, B. Each biased formation 116 fits snugly between the respective lock formations 99 of a seat 98A, B. As the hanger 104 pivots in a direction 136 towards the second cover 14 each bias formations 116 rotates between the lock formations 99. As the lock formations 99 are resiliently deformable rotation of the bias formation 116 forces the lock formations 99 apart. This rotation is countered by the resilience of the lock formations 99 and the hanger 104 is biased towards an upright position shown in Figure 4. Any pivot of the hanger 104 in a direction 138 which is

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5 opposite to the direction 136 is prevented by the abutment formation 114 and cross member 108 which abuts with the first cover 12. The biasing of the hanger 104 towards the upright position facilitates the engagement of the prongs 106 with the engagement formations 126 when the second cover 14 is closed and brought into interlocking engagement with the respective bodies 42.

10 **[0073]** The end stops 96 limit lateral movement of the hanger 104 on the base plate 32 to ensure that the alignment of the prongs 106 relative to the engagement formations 126 remains correct.

15 **[0074]** In order to completely open the file 10 the respective bodies 42 are pivoted away from the spine 16 so that the respective mounting means 54 disengage from the spine 16. The spine 16 is then pivoted about the hinge point 18A so that the file covers 12, 14 and spine 16 move to lie in a single plane as is shown in Figure 5. In this position the laces 118 exert a pull force on the connection points 110 which causes the hanger 104 to pivot on the seats 98 in the manner previously described.

20 **[0075]** While the laces 118 are connected to the prongs 106 a user can page through the documentation 132 in a known manner by sliding the documentation 132 over the tie formation 88.

25 **[0076]** In order to close the file 10 the spine 16 is moved to a position wherein the spine 16 is at a right angle with the first cover 12. While in this position the respective bodies 42 are pivoted towards the spine 16 to engage the respective mounting means 54 with the spine 16. The file 10 is now again in the partially opened position shown in Figure 4. Thereafter the second cover 14 is pivoted towards the first cover 12 so that

5 the respective rails 82 engage with the respective guides 64. The first and second covers 12, 14 are pressed closed at the corners of the second side periphery 24 and the respective first and second end peripheries 26, 28 so that each latch 84 and corresponding catch 66 engage with a snap action to lock the first and second covers 12, 14 to one another. As the second cover 14 is closed the prongs 106 engage the engagement formations 126 and each connection point 110 is located in a recess 128.
10 The file 10 is now again ready for storage in the horizontal configuration shown in Figure 1.

[0077] It is important to note that although it is preferable for the connection formations 120 to be interengaged with the connection points 110 before the second cover 14 is closed this is not essential as the connection points 110 will engage with the engagement formations 126 when the second cover 14 is closed whether or not the connection formations 120 are engaged with the connection points 110.
15

[0078] Once the second cover 14 is closed and the prongs 106 are engaged with the locating plate 36 the documentation 132 is trapped between the first and second covers 12, 14 and cannot be released from the binding mechanism 34 without opening the file 10.
20

[0079] The binding mechanism 34 can be removed from the first and second covers 12, 14 by sliding the base plate 32 and locating plate 36 from the slots 30. This facilitates the transfer of the documentation 132 between files as well as the replacement of a damaged binding mechanism 34.
25

5 **[0080]** It is also important to note that the space requirement between the spine 16 and the binding mechanism 34 is limited to the distance between an edge of the documentation and punch holes (not shown) in the documentation. This allows for a reduction of the width W of the first and second covers 12, 14 which results in space and material savings.

5 CLAIMS

1. A binding mechanism, for use with a file which has first and second opposing covers, which mechanism includes a base member which is slidingly engageable with the first cover, a locating member which is slidingly engageable with the second cover and a tie formation with first and second ends which extends between the base member and the locating member.

2. A binding mechanism according to claim 1 wherein the base member includes an elongate first floor formation.

3. A binding mechanism according to claim 2 wherein the first floor formation includes a slotted guide channel and a stop formation.

4. A binding mechanism according to claim 2 or 3 wherein the base member includes at least one seat formation and at least one end stop attached to the first floor formation.

5. A binding mechanism according to claim 4 wherein the base member includes two spaced seat formations and two end stops respectively located at opposite ends of the first floor formation.

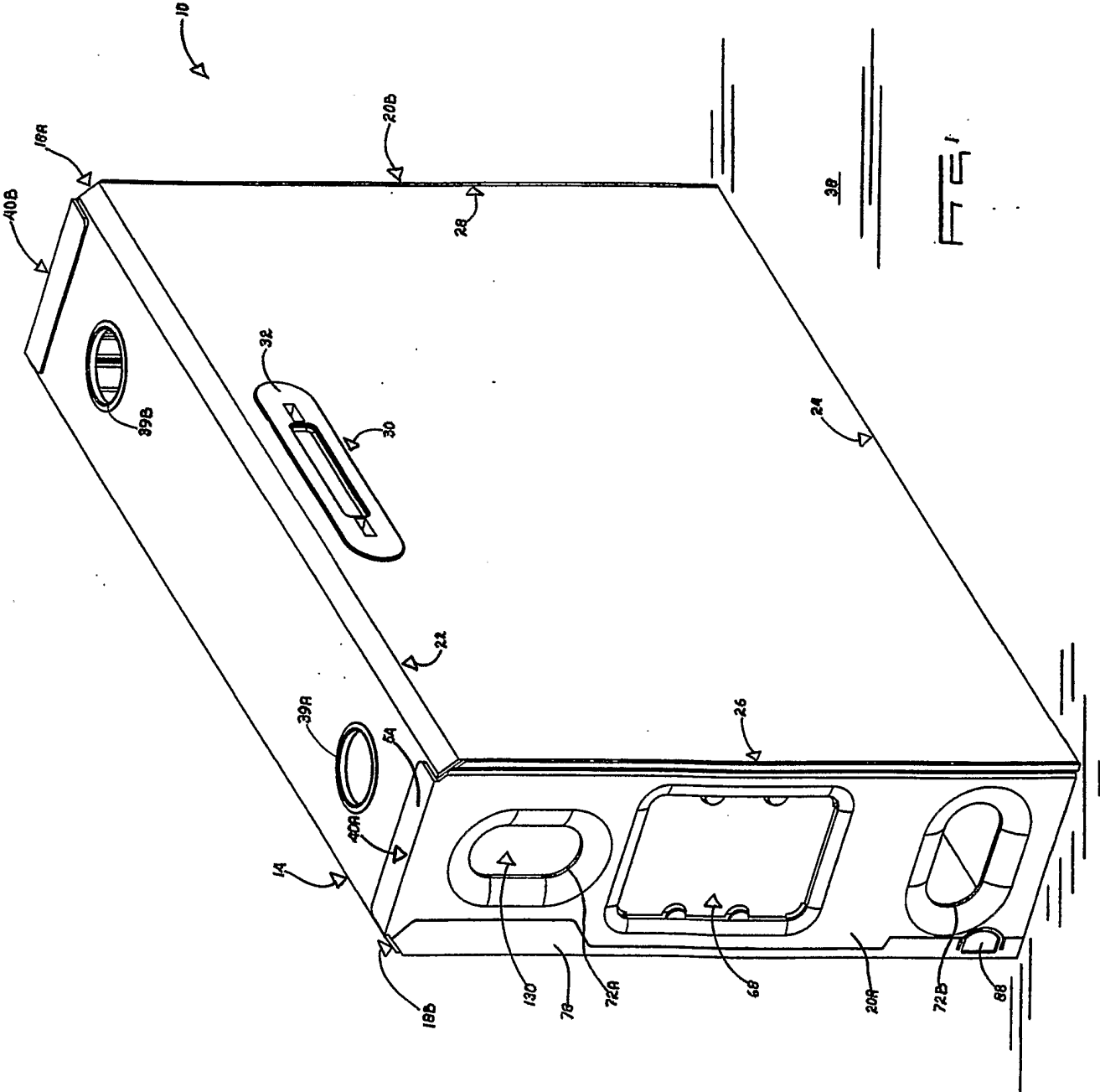
6. A binding mechanism according to claim 4 or 5 wherein the seat formation is resiliently deformable.

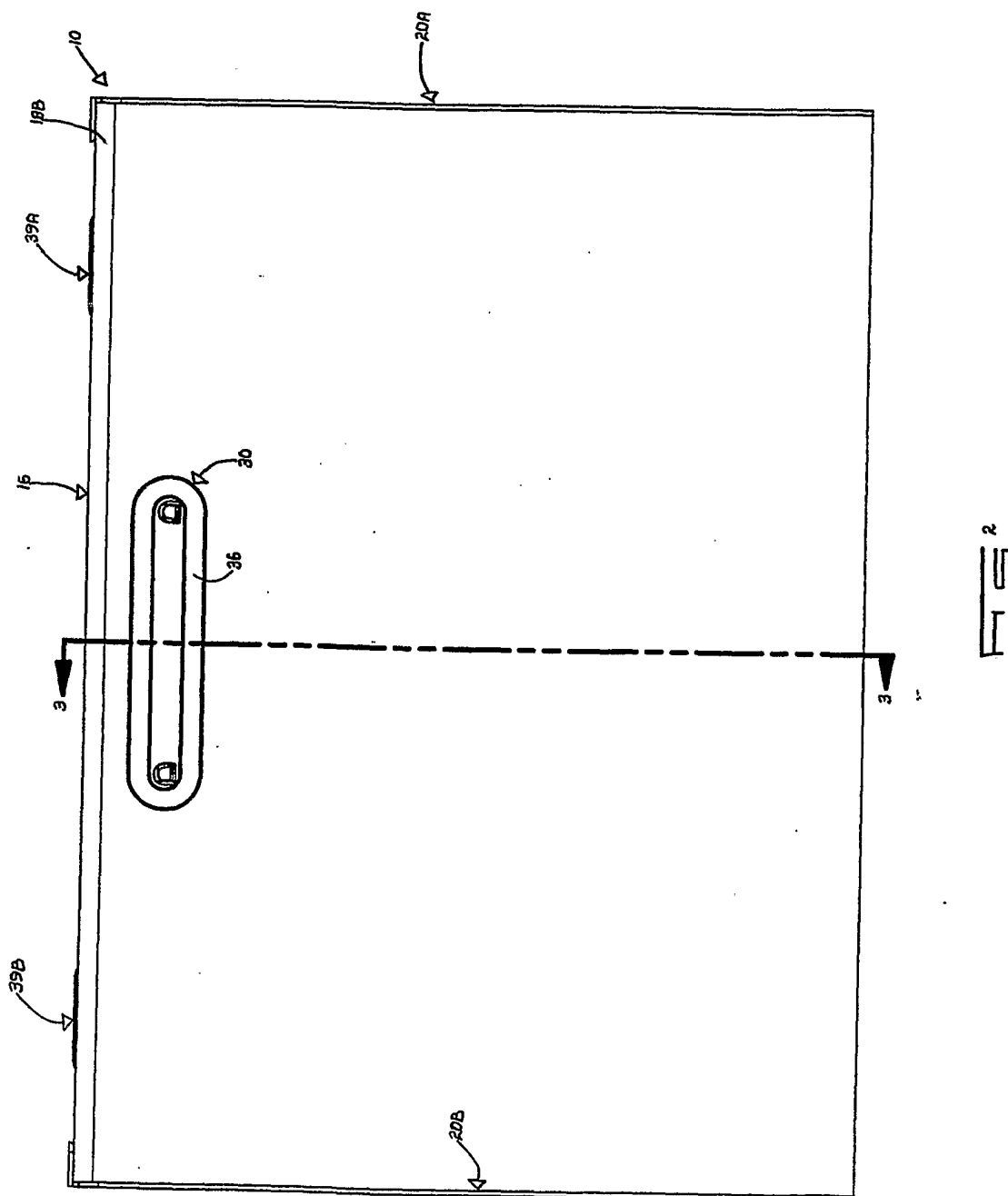
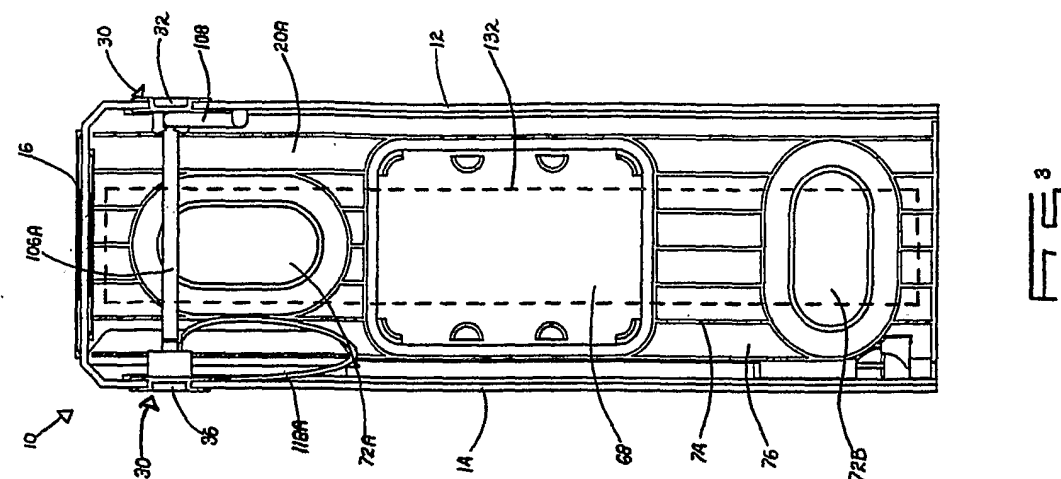
7. A binding mechanism according to claim 4, 5 or 6 wherein the seat formation includes opposing lock formations.

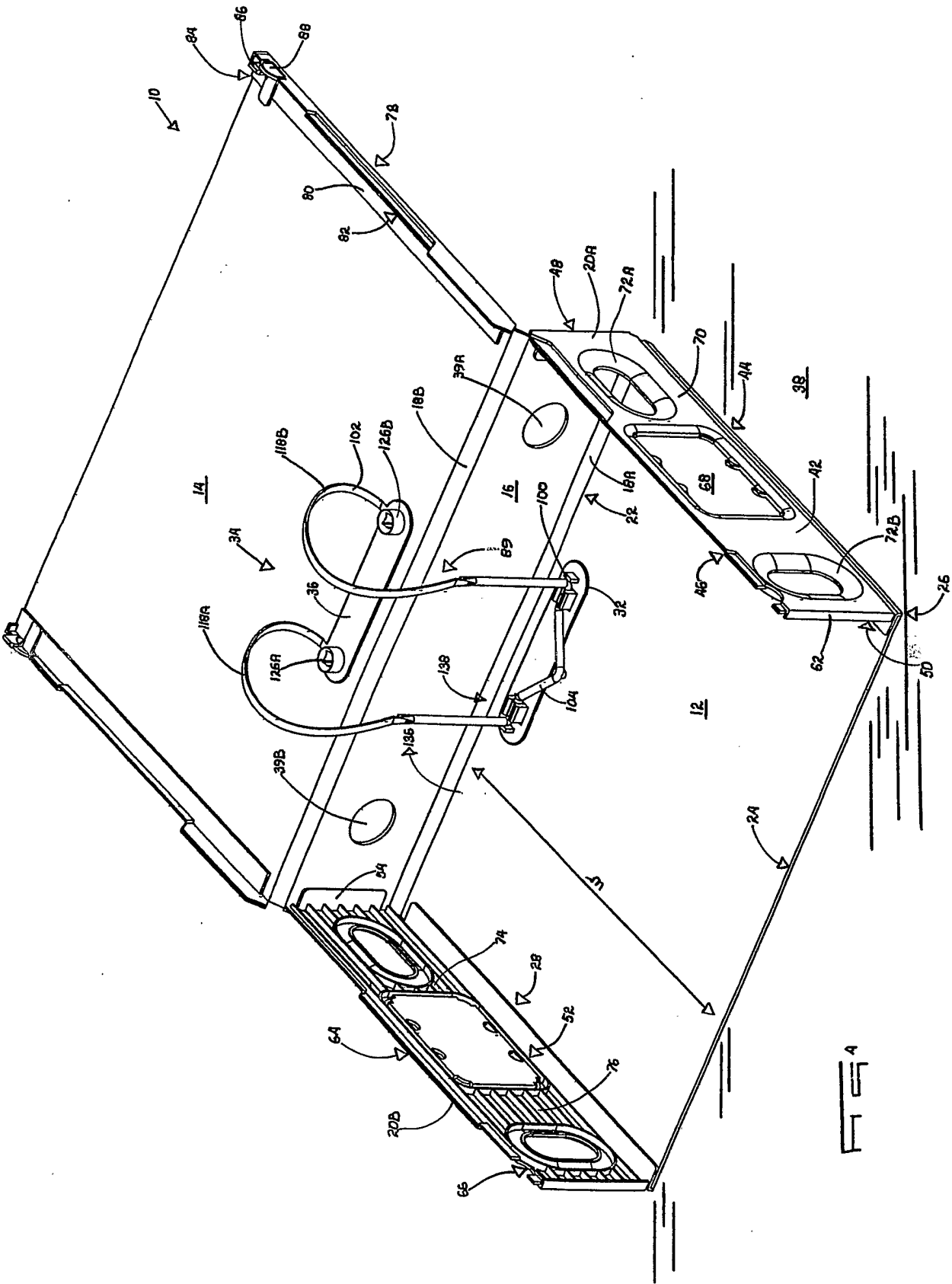
- 5 8. A binding mechanism according to any one of claims 4 to 7 wherein the first end
 of the tie formation is movably engageable with the seat formation.
9. A binding mechanism according to any one of claims 1 to 8 wherein the locating
 member includes an elongate second floor formation.
- 10 10. A binding mechanism according to claim 9 wherein the second floor formation
 includes a slotted guide channel and a stop formation.
11. A binding mechanism according to claim 9 or 10 which includes at least one
 engagement formation formed on the second floor formation.
12. A binding mechanism according to claim 11 wherein the engagement formation
 includes an upstanding formation with a central recess.
- 15 13. A binding mechanism according to claim 12 wherein the recess is funnel
 shaped.
14. A binding mechanism according to claim 11, 12 or 13 wherein the tie formation
 is locatable in the engagement formation and the second end of the tie
 formation is attached to the locating member.
- 20 15. A binding mechanism according to any one of claims 1 to 14 wherein the tie
 formation includes a hanger member with two spaced apart prongs and a cross
 member extending between the prongs.

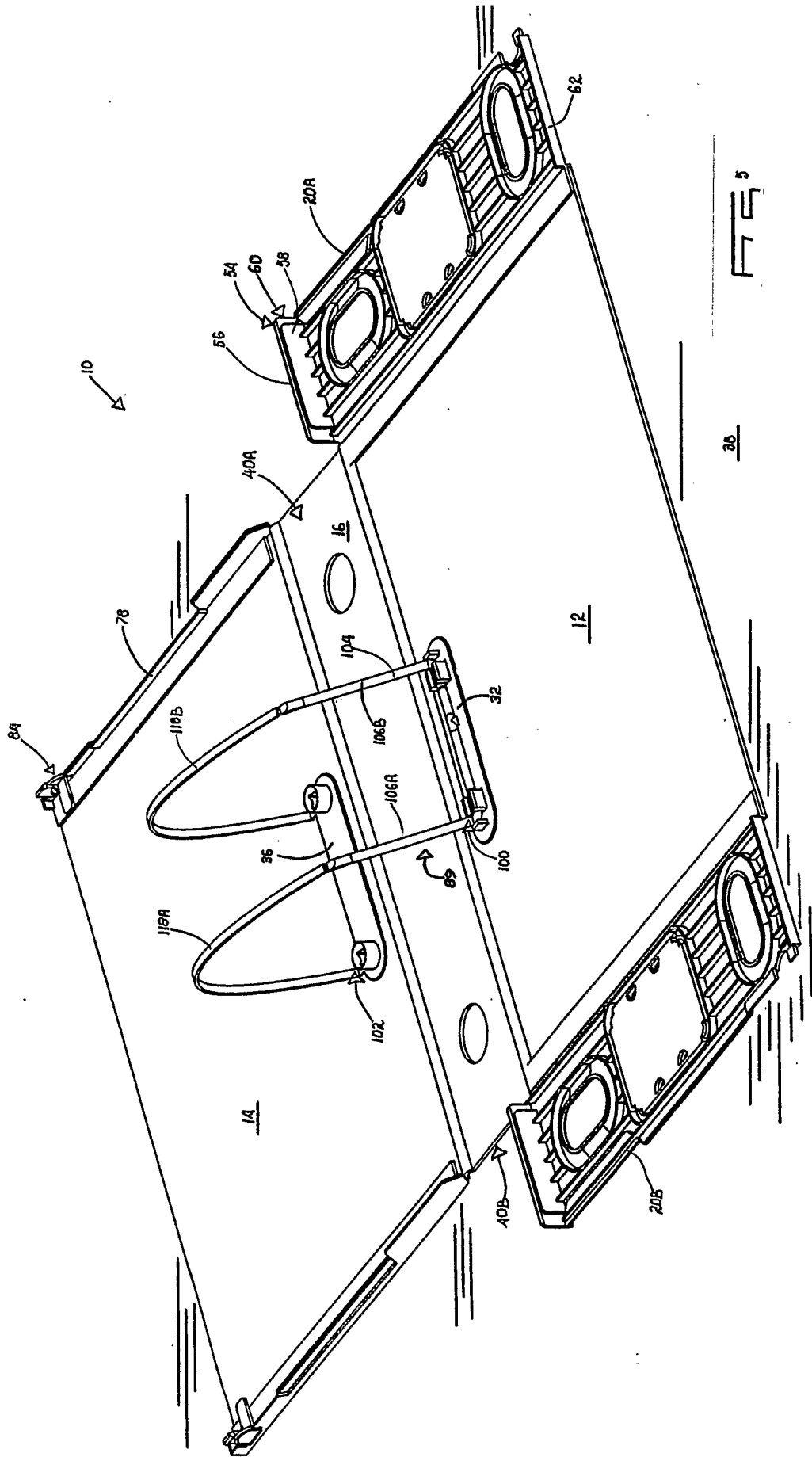
- 5 16. A binding mechanism according to claim 15 wherein each prong includes a connection point with an upstanding spigot.
17. A binding mechanism according to claim 15 or 16 wherein the cross member is V-shaped.
- 10 18. A binding mechanism according to claim 15, 16 or 17 wherein the cross member includes an abutment formation and at least one biasing formation.
19. A binding mechanism according to claim 18 wherein the biasing formation is square shaped in cross-section.
- 15 20. A binding mechanism according to any one of claims 15 to 19 wherein the tie formation includes at least one lace member extending between the hanger and the locating member.
21. A binding mechanism according to claim 20 wherein the lace member is flexible and attached to the locating member.
22. A binding mechanism according to claim 20 or 21 wherein the lace member includes a connection formation at its leading end.
- 20 23. A binding mechanism according to claim 22 wherein the connection formation includes an aperture.
24. A file which includes a first cover member with a first slot, a second cover member opposed to and connected to the first cover member and a binding

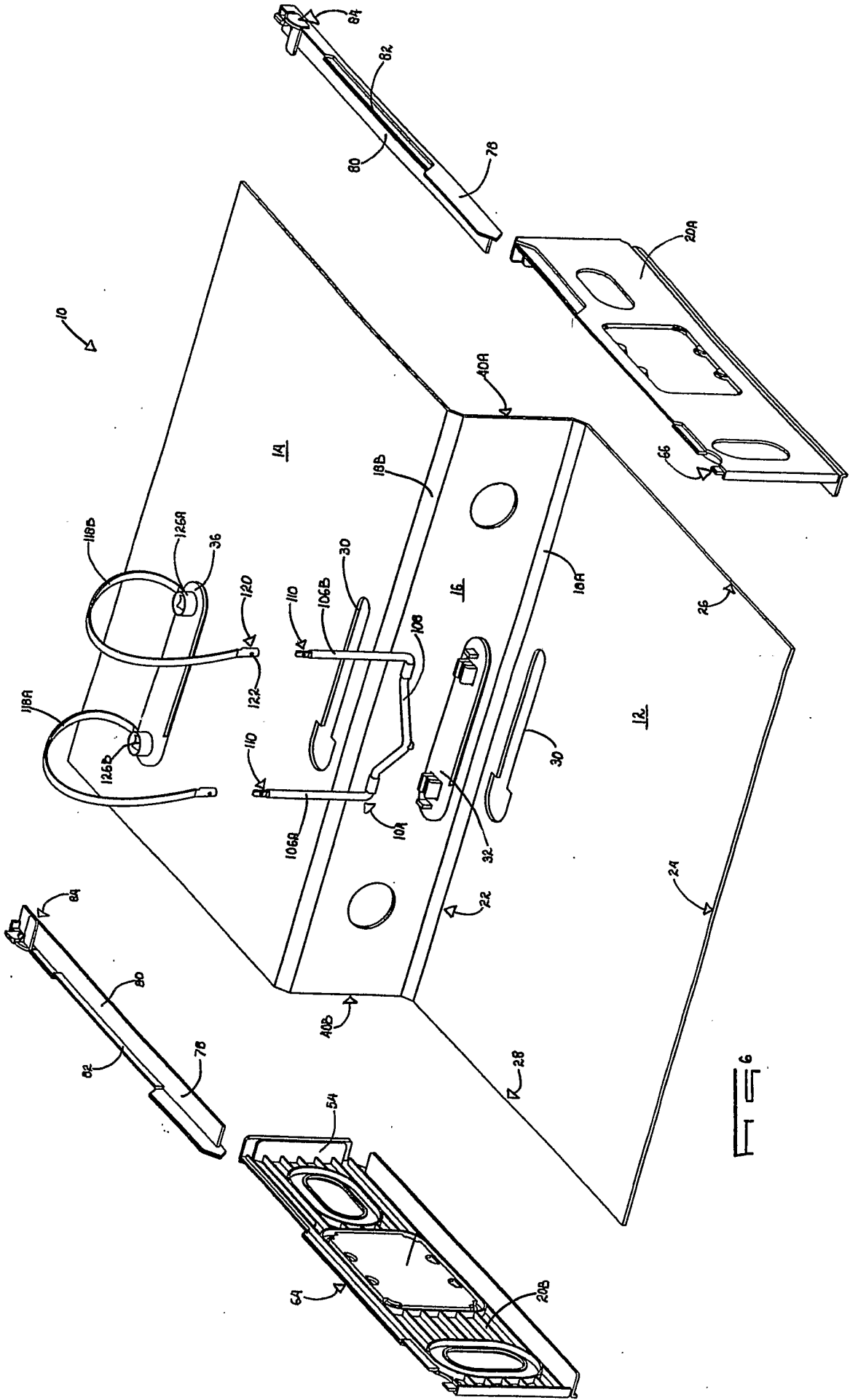
- 5 mechanism according to any one of claims 1 to 23 which is slidingly engageable with the first slot.
25. A file according to claim 24 wherein the second cover includes a second slot with which the binding mechanism is slidingly engageable.
- 10 26. A file which includes a first cover member with a first slot, a second cover member which is opposed to and connected to the first cover member and which has a second slot and a binding mechanism which has a base member which is slidingly engageable with the first slot, a locating member which is slidingly engageable with the second slot and a tie formation with first and second ends which extends between the base member and the locating member.
- 15











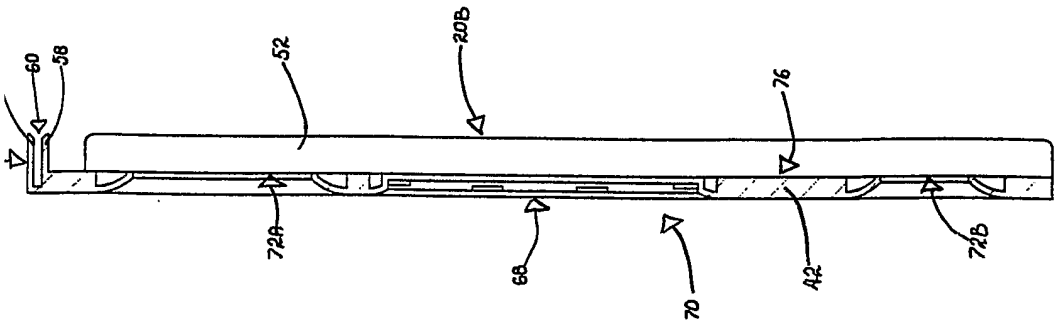


FIG. 6

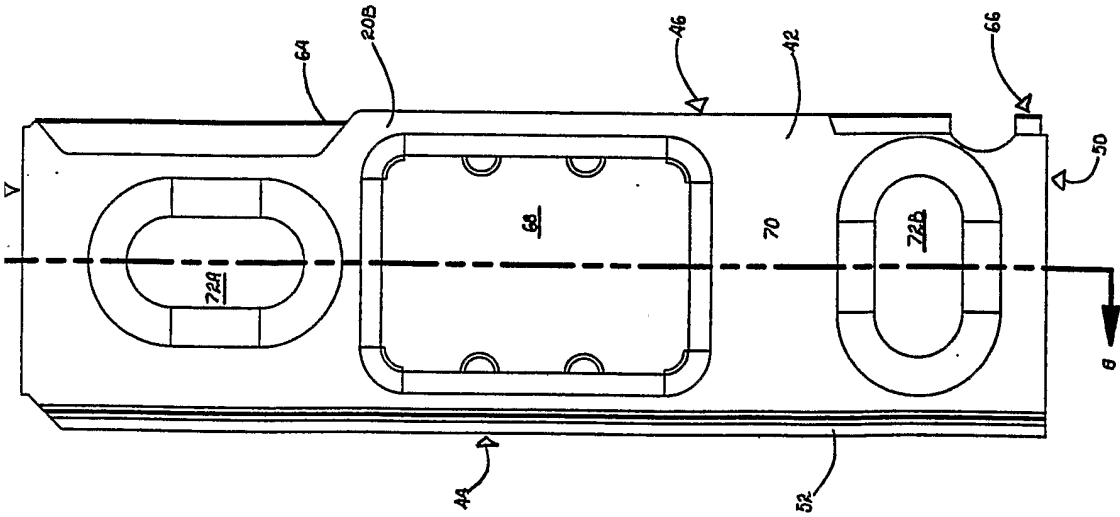


FIG. 7

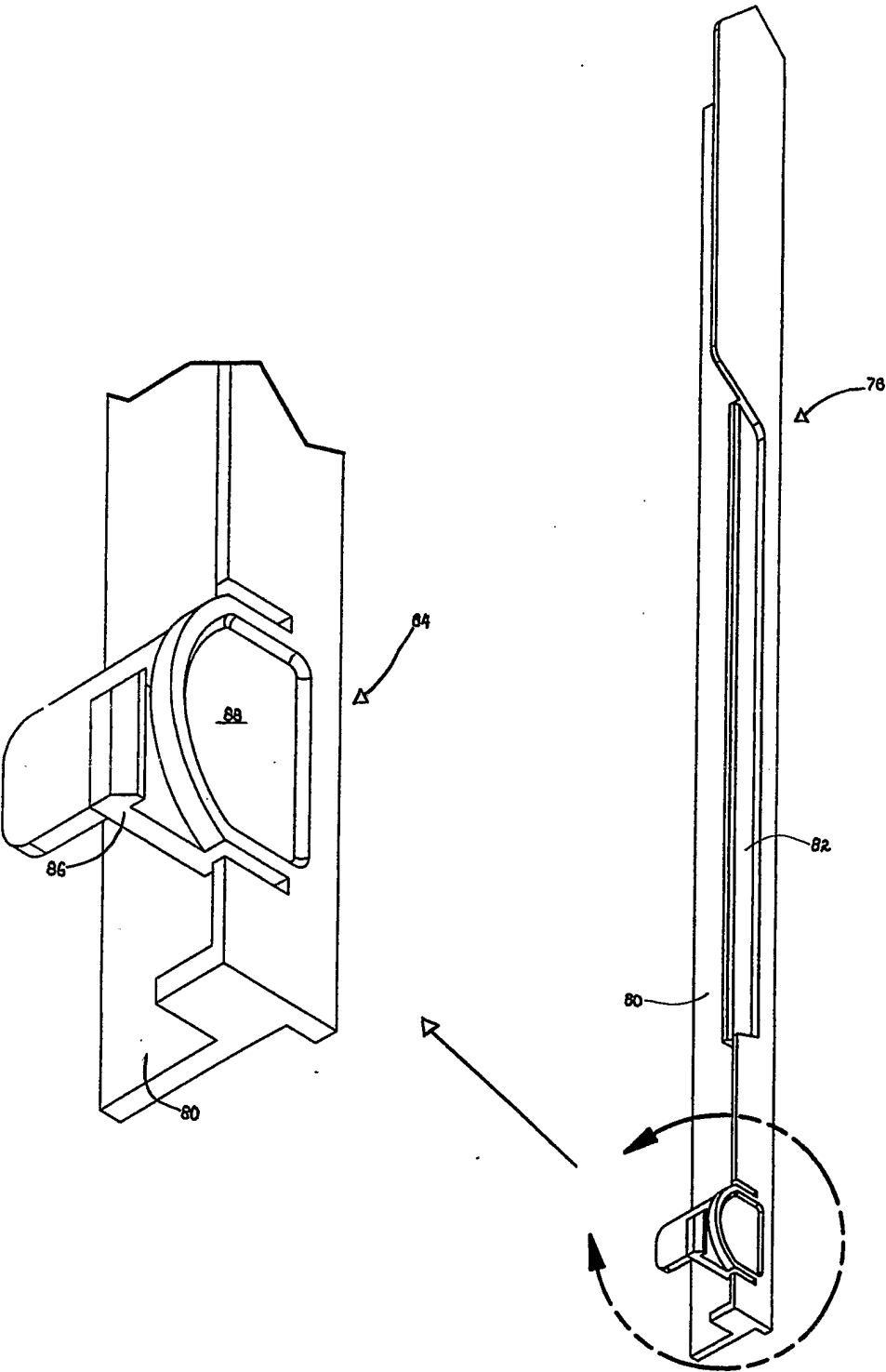
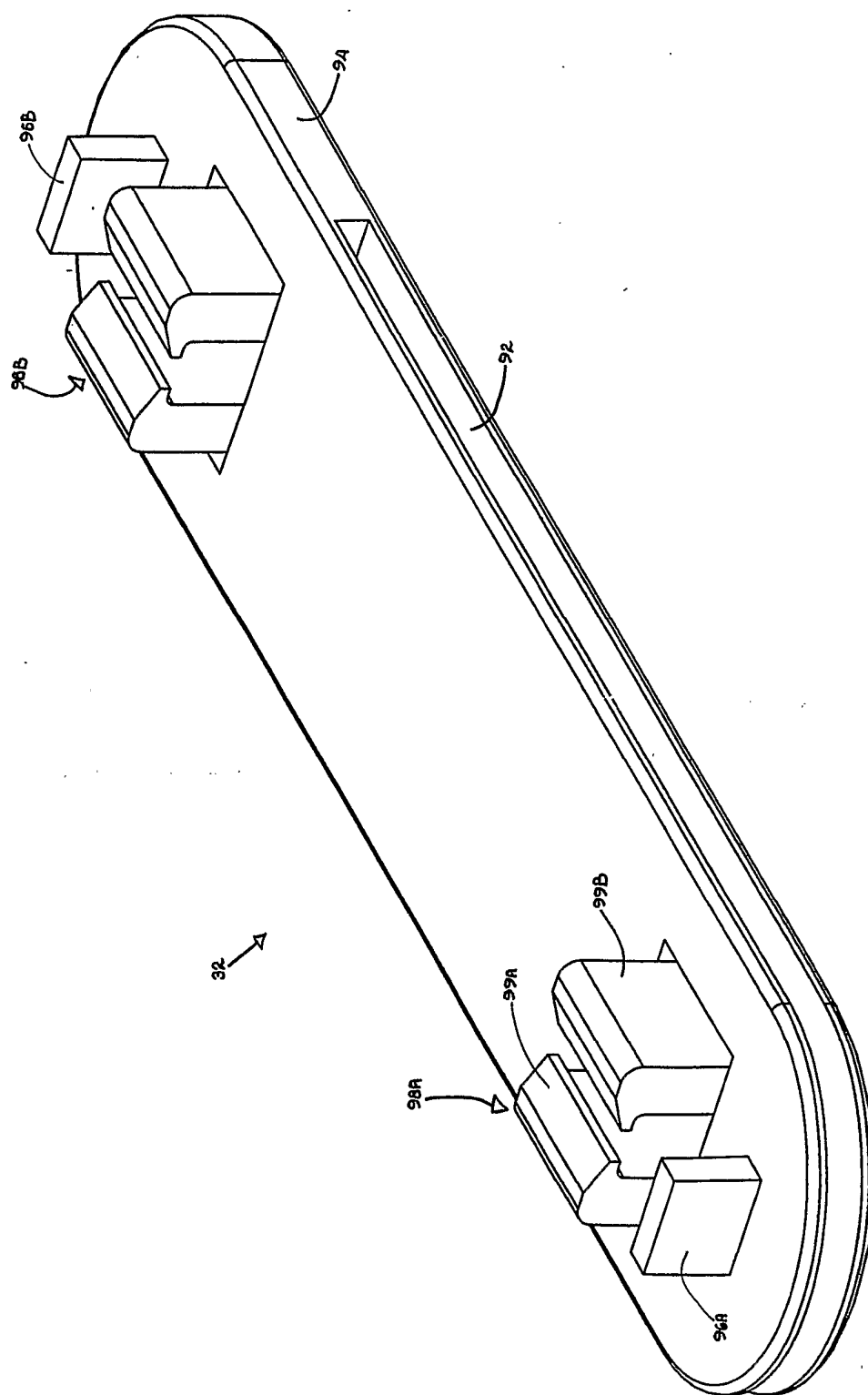
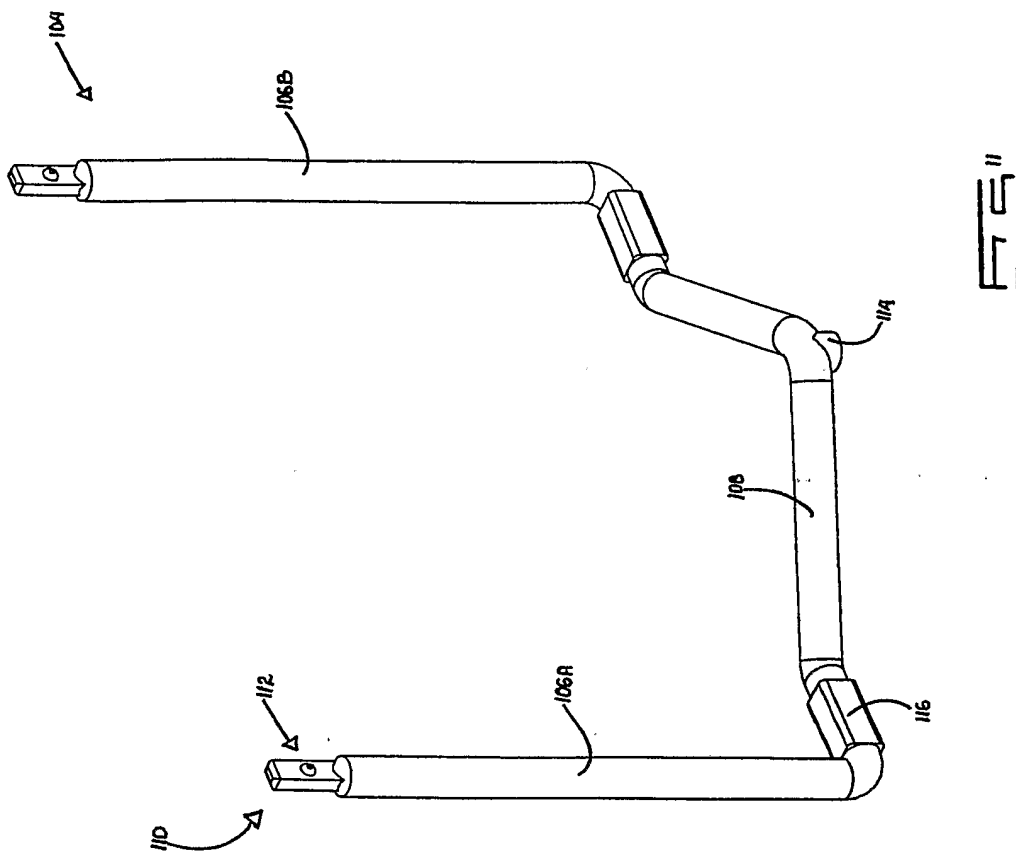


Fig. 9



10



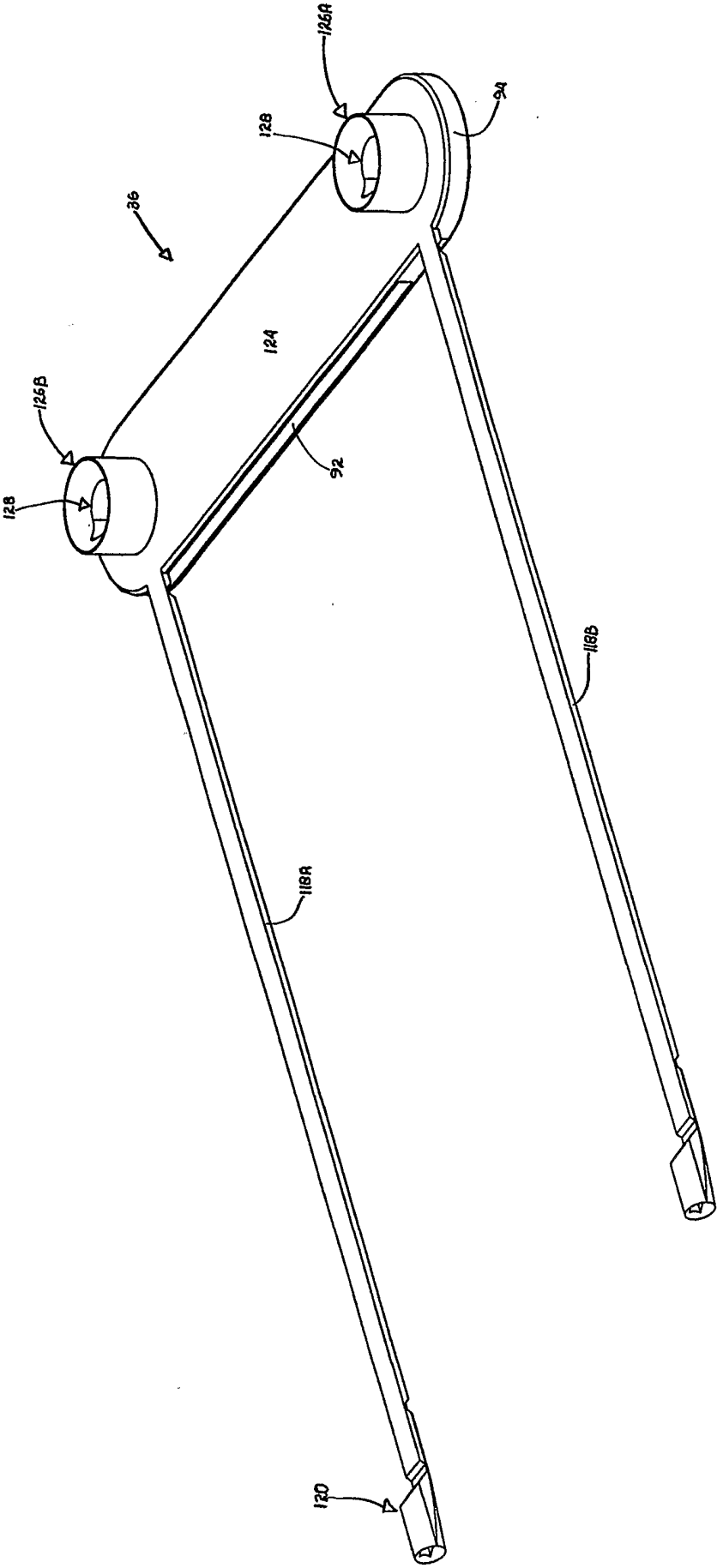


FIG 12

INTERNATIONAL SEARCH REPORT

national Application No

T/ZA2004/000062

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 B42F13/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 B42F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	FR 1 283 215 A (BECKER OTTO ALFRED) 2 February 1962 (1962-02-02) page 3, column 2, line 1 -page 9, column 2, line 7; figures ----	1,26
X	DE 553 067 C (WERNER EICHHORST) 21 June 1932 (1932-06-21) the whole document ----	1,26
A	GB 917 356 A (DAVID ASKEW) 6 February 1963 (1963-02-06) page 1, line 75 -page 2, line 89; figures -----	1,26

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

° Special categories of cited documents :

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O document referring to an oral disclosure, use, exhibition or other means

P document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

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Date of the actual completion of the international search

17 September 2004

Date of mailing of the international search report

28/10/2004

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Louvion, B

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/ZA2004/000062

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
FR 1283215	A	02-02-1962	NONE	
DE 553067	C	21-06-1932	NONE	
GB 917356	A	06-02-1963	NONE	