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(54) Storage container

(57) A storage container (10) comprising a base (20), two side walls (24A,24B), a front wall (30), a rear wall (32) and a top cover (12), the top cover is pivotally hinged to a frame member (18) and at an assembled position of the container the walls are erect and a bottom edge (26) of the walls is articulated to the base and a top edge of the walls is articulated to the frame member and at a collapsed position the base is articulated with the frame member and the walls are received in a space between the base and the top cover.

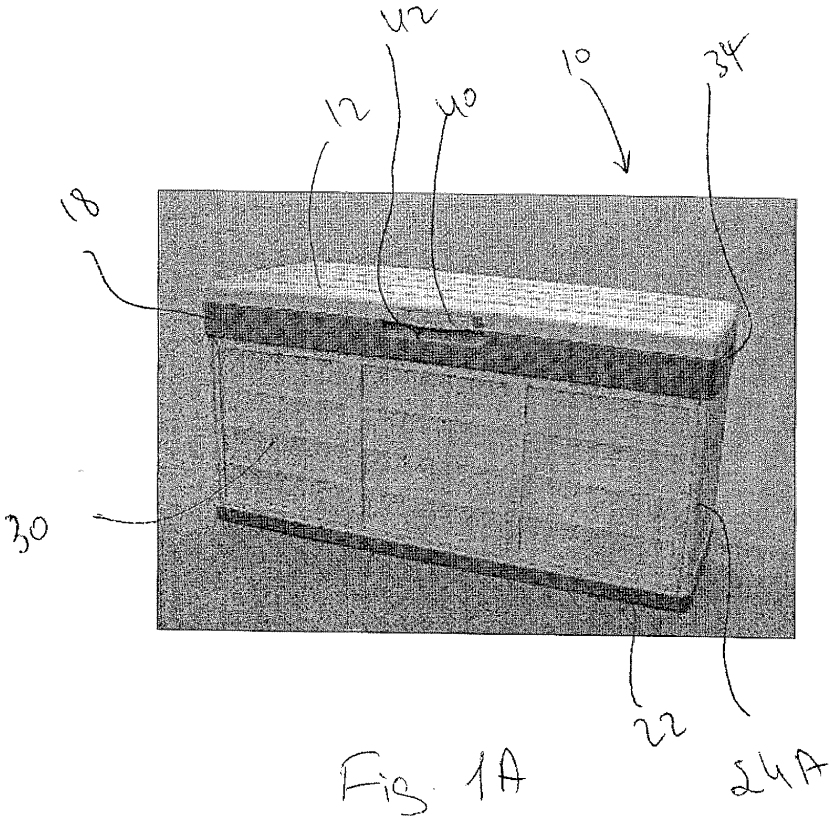

Fig. 1A

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Description

FIELD OF THE INVENTION

[0001] The present invention relates to storage containers and more particularly to such storage containers which are collapsible into a compact size for storage and shipment.

BACKGROUND OF THE INVENTION

[0002] Collapsible storage containers are commonly used in a variety of applications and are in particular convenient for storage of large capacities and their transportation, and on the other hand are conveniently 'knocked-down' into collapsed positions for minimum space consumption, used for storage of the container or shipment thereof.

[0003] For example, US Patent No. 4,863,056 discloses a folding container comprising an upper frame having two pairs of opposing frame portions each having an engagement portion; a bottom frame with a closed end and having opposing frame portions which respectively correspond to those of the upper frame, each frame portion of the bottom frame having a pivotally support portion; two side plates pivotally supported at their lower end portions by the pivotally support portions, respectively, which are formed on one of the two pairs of frame portions of the bottom frame so that the side plates are able to pivot upward, each side plate being slidably supported at both lateral end portions thereof by the upper frame, the upper end portions of the side plates being engaged with the respective engagement portions formed on one of the two pairs of frame portions of the upper frame; and two end plates pivotally supported at their lower end portions by the pivotally support portions, respectively, which are formed on the other pair of frame portions of the bottom frame, the upper end portions of the end plates being engaged with the respective engagement portions formed on the other pair of frame portions of the upper frame.

[0004] A different type of collapsible container is disclosed in US Patent No. 6,913,161 directed to a collapsible shipping/storage box having a rectangular floor, a pair of parallel side walls having lower edges pivoted on the floor and movable between erect positions projecting upward from the floor and collapsed positions close to and generally parallel with the floor, and a pair of parallel end walls having lower edges pivoted on the floor between the side walls and movable between erect positions projecting upward from the floor and collapsed positions close to and generally parallel with the floor. A rigid annular top frame has side members at upper edges of the side walls and end members at upper edges of the end walls. Respective pivots or hinges are provided between the upper edges of the side walls and the side members. Latches secure the upper edges of the end walls to the end members only in the erect positions of the end walls.

[0005] A collapsible container is disclosed also in US Patent No. 5,501,354 formed from a single sheet of a plastic material to form a box. The container has a bottom panel and first and second pairs of like wall panels integrally hingedly connected to the bottom panels so that the walls can be erected from a collapsed position to an upright position and vice versa. The end panels include hinged locking flaps formed with locking ribs to releasable engage with the adjacent edges of the side panels.

SUMMARY OF THE INVENTION

[0006] According to the present invention there is provided a collapsible storage container which is easily erected and assembled into its operative assembled position and into its collapsed position, without the need of any tools and wherein the assemblage is self-contained.

[0007] The invention calls for a storage container comprising a base, two side walls, a front wall, a rear wall and a top cover (lid), wherein said top cover is pivotally hinged to a frame member, wherein at an assembled position of the container said walls are erect and a bottom edge of the walls is articulated to the base and a top edge of said walls is articulated to the frame member; and a collapsed position wherein the base is articulated with the frame member and wherein the walls are received in a space between the base and the top cover.

[0008] The container is typically made of molded plastic material and the side walls, front wall and rear wall (collectively referred to as *'walls'),* as well as the, the base and the top cover are rigid and solid boards. The term 'solid' denotes uniform, homogeneous boards of material. Even more so, the walls ant the top cover are reinforced so as to be competent of bearing load, e.g. of a person sitting on the container at the assembled position, etc.

[0009] The container of the present invention may comprise any one or more of the following features and characteristics:

- at the collapsed position the base is substantially received within the frame member;
- the base comprises an upwardly extending rim whereby at the collapsed position the side walls extend flush over an upside surface of the base and do not exceed the rim;
- at the collapsed position the side walls are folded over the base and the front wall and the rear wall are detached from the base and are received within the frame;
- a lock mechanism is provided for securing the container at the collapsed position, so as to secure the base to the frame member and the top cover at the closed position so as to prevent spontaneous opening of the collapsed container;
- at the assembled position side edges of the side walls are detachably engaged with corresponding

side edges of the front wall and the rear wall; such engagement may be for example a projection formed at the front wall and the rear wall slidingly engagable within corresponding slots of the side walls;

- the side walls are pivotally articulated at their bottom edge to the base and are detachably articulable at their top edge to the frame member;
- the front wall and the rear wall are detachably articulable at their bottom edge to the base and at their top edge to the frame member;
- alternatively, the front wall and the rear wall are pivotally articulated at their bottom edge to the base and are detachably articulable at their top edge to the frame member; and respectively the side walls are detachably articulable at their bottom edge to the base and at their top edge to the frame member;
- articulation of the walls with the respective frame member and base is facilitated by readily detachable means, e.g. a snap-type engagement, etc.
- at least one carrying handle is fitted at the top cover, wherein at the assembled position said at least one handle functions as a handle to facilitate opening the top cover and at the collapsed position the at least one handle serves for carrying the collapsed assembly;
- at least one of the at least one carrying handle functions as a lock to secure the assemblage at its collapsed position and prevent spontaneous opening thereof while carrying;
- the walls are detachably articulable at their respective edges to the frame member and the base by snap-type attachment;
- at the collapsed position the thickness of the assemblage does not exceed the thickness of the frame member. However, if the top cover has a thickness projecting from the frame member, thus the thickness of the of the assemblage does not exceed the thickness of the frame member with articulated cover;
- the height of the side walls is substantially half or less its length, whereby at the collapsed position the side walls lie flush over a top surface of the base with neighboring top edges;
- the frame member is formed at side portions thereof with carrying handles;
- the top cover is pivotally secured to the frame member by at least two hinges fitted at rear edges thereof;
- at least some of the walls and the top cover are formed with reinforcement ribs for rigidifying thereof;
- at the collapsed position of the container, all the components of the container are contained within the collapsed assemblage;
- the frame member may be a uniform solid annular member or may be integrated into a uniform annular member.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] In order to understand the invention and to see how it may be carried out in practice, an embodiment will now be described, by way of a non-limiting example only, with reference to the accompanying drawings, in which:

Fig. 1A illustrates the container according to the present invention at an erect, operative position, with the top cover closed;
Fig. 1B is the same as Fig. 1A, with the top cover open;
Figs. 2A to **2C** are consecutive steps illustrating how the frame member and articulated cover are detached from the container;
Figs. 3A to **3E** are consecutive steps illustrating how the walls of the container are knocked down;
Figs. 4A to **4E** are consecutive steps illustrating how the collapsed container is compacted into its self contained, collapsed position;
Fig. 4F is a longitudinal section through the collapsed container;
Figs. 5A to **5C** illustrate hoe the container is carried in its collapsed position;
Fig. 5D is a side view of the container at its collapsed position;
Figs. 6A to **6C** are consecutive steps illustrating how the collapsed container is opened;
Fig. 6D is an enlargement of the portion marked D in Fig. 4F;
Fig. 7 illustrates sub assemblies of the container at their respective flooded position;
Figs. 8A to **8E** are consecutive steps illustrating how the collapsed container is erected;
Figs. 9A to **9E** are further consecutive steps illustrating how the container is erected into its useful position; **Figs. 10A to 10C** are consecutive final steps of assembling the container; and
Fig. 10D is a section taken along line X-X in Fig. 10B.

DETAILED DESCRIPTION OF EXEMPLARY EMBODIMENTS

[0011] A container in accordance with the present invention is generally designated **10** and is illustrated in its assembled, operative position in Figs. 1A and 1B wherein Fig. 1B illustrates the container with its top cover/lid **12** open and prevented from falling backwards by a pair of strands **14** articulated at one end and to the cover **12** and at another end to the frame member **18** as will be discussed hereinafter.

[0012] As can be seen, with reference being made also to Fig. 7, the container **10** comprises a base **20** integrally formed with a peripherally extending annular rim **22,** upwardly expanding from the base **20.** A pair of side walls **24A** and **24B** are pivotally articulated to the base **20** at their respective bottom edge **26,** as will be explained with more detail hereinafter. The container **10** is formed with

a front wall **30** and a rear wall **32,** which like the side walls **24A** and **24B** are rigid and solid panels and have their edges adjoining with the side edges of the side walls. For sake of practicality and manufacturing convenience, side edges of the side walls and of the front and rear walls are identical and are adapted for easy engagement with mating edges, as will be explained hereinafter.

[0013] As can be noted in the drawings, at the unassembled (knocked down) position of the container the side walls **24A** and **24B** remain articulated to the base **20** and the cover **12** remains assembled to the frame member **18,** the latter being a uniform and solid annular member fitted at its opposite side with indentions **34,** serving as carrying handles. As can further be noted, the top cover **12** is fitted with a carrying handle assembly generally designated **40** and retractable into an indention **42** composed of adjoining indentions in the top cover **12** and the frame member **18.**

[0014] Further attention is now directed to Figs. 2A to 2C illustrating a first sequence of steps for knocking down the container. At a first step, the frame member **18** is detached from the side walls **24A** and **24B** and from the front wall **30** and the rear wall **32** by releasing a pair of snap engagements **48** whereby the support member **18** is now detached from the four walls and may be separated therefrom (Fig. 2B) and may be set aside together with the pivotally articulated top cover (Fig. 2C).

[0015] The next step in the sequence for knocking down the container is illustrated in Figs. 3A to 3C. First, the interlocking engagement between the front and rear walls **30** and **32** respectively, and the base **20** is disengaged by releasing a snap fastener **50.** Then, the front wall and the rear wall **30** and **32** respectively are disengaged from the side walls **24A** and **24B** by disengagement of the snap fastener **54** (Fig. 3D) allowing for the removal of the front wall **30** and the rear wall **32** (Fig. 3C). The side walls **24A** and **24B** remain at their upright position owing to a snap-type pivot and retention arrangement (in the form of a projecting ridge **53** adapted foe arresting edge **55** at the bottom side edge of the side walls **24A** and **24B,** as seen in Fig. 8C). In order to collapse the side walls **24A** and **24B** to the position seen in Fig. 3E, moderate force has to be applied (Fig. 3C) to overcome the projecting ridge **53.**

[0016] It is noticed that in the position of Fig. 3E, the side walls **24A** and **24B** extend flush over the inside surface of the base **20** such that they do not exceed the top edge of the annular rim **22** of base **20-.**

[0017] The sub-assembly **49** consisting of the frame member **18** and top cover **12** is then placed upside down (Fig. 4A) in a position suitable for receiving the front wall **30** (Fig. 4B) and the rear wall **32** (Fig. 4C), however, leaving sufficient space within the frame member **18** to receive sub-assembly **51** consisting of the base **20** and the two side walls **24A** and **24B** articulated thereto, which are placed such that the side walls **24A** and **24B** are laid over the rear wall **32** (Fig. 4D) and finally as seen in Figs. 4E and 4F, the collapsed container is self-contained such that the base **20** is fully received within the frame member **18** and whereby the thickness of the collapsed container is substantially that of the frame member **18** and the top cover **12.** It is further appreciated that the sub-assembly **51** is snappingly arrested within the frame member **18** so as to prevent its spontaneous departing therefrom and further, is retained in place by means of the locking handle assembly **40,** as will be discussed hereinafter.

[0018] In Fig. 4F, the container **10** is illustrated in its knocked-down, i.e. collapsed position wherein it is fully self-contained as discussed hereinabove. As can further be noticed, in Figs. 4E and 4F, the base **20** is fitted, adjacent one of its side edges with a pair of wheels **60** to facilitate locomoting the container in its assembled position, even when it is loaded with equipment, however, it is appreciated that the wheels **60** barely project from the bottom surface of the base **20** and thus do not constitute an obstacle in storage of the container and inspecting thereof.

[0019] Fig. 4G illustrates the sub-assembly **51** snappingly arrested within frame member **18** so as to prevent spontaneous departing therefrom. Furthermore, snaps **64** extending from the base **20** (Fig. 6A) retain snaps **48** extending from the frame member **18.**

[0020] Pulling out the handle assembly **40** in direction of arrow **61** in Fig. 5A results in locking engagement of the top cover **12** with the frame member **18** and of the sub-assembly **51** within the sub-assembly **49** whereby the collapsed container may be carried by handle **40** and may be conveniently carried and displaced like a suitcase (Fig. 5C).

[0021] Attention is now directed to Figs. 6 to 10 illustrating how the collapsed container is reassembled into its erect, operative storage position.

[0022] First, as seen in Figs..6A to 6C, the sub-assembly **51** consisting of the base **20** and the side walls **24A** and **24B** are detached from the sub-assembly **49** consisting of the frame member **18** with the associated top cover **12.** This is facilitated by disengagement of the snap-type engagement mechanism as in Figs. 6A and 6B by depressing latches **64** in direction of arrows **66** and lifting the sub-assembly **51** and placing it aside of the sub-assembly **49.**

[0023] Then the sub-assembly **51** is turned over into the position as illustrated in Fig. 7 and the side walls **24A** and **24B** are erected by displacing in direction of arrow **68** (Fig. 8a) into the position of Fig. **8B,** overcoming the snap-type retention mechanism (in the form of projecting ridge **53** adapted for arresting edge **55** at the bottom side edge of the side walls **24A** and **24B,** as seen in Fig. 8C), so as to retain the side walls at their substantially upright position (Fig. 8D).

[0024] Once the bottom sub-assembly **51** has been erected into the position of Fig. 8D, the front wall **30** and the rear wall **32** can be assembled as well by placing the panels of the front and rear walls between the respective edges of the side walls **24A** and **24B** whereby a lateral projection **72** extending along at least a portion of each

of the front walls **30** and the back wall **32** is slidingly engaged with a corresponding longitudinal groove **74** (Fig. 9B) of the side walls and then, upon fully inserting each of the front wall **30** and rear wall **32** they will engage in a snapping manner with the snap fastener **50** of the base **20** (Fig. 8E), thereby each of the front wall and the rear wall become engaged at their respective bottom edge to the base **20** and at their respective sides to the respective side walls **24A** and **24B.** Thus, forming together a rigid closed boxed-like structure (in Fig. 9E illustrated an instant before completing the assembly).

[0025] At the next step, the cover sub-assembly **49** has to be securely placed and articulated over the walls as illustrated in Figs. **10A** and **10B.** This is carried out by snap-engagement of the snap engagements **48** at each of the side portions of the frame member with the respective side walls, thereby rigid defining the structure of the assembled container to an extent where it can bear loads, e.g. of a person sitting on the top cover **12,** etc.

[0026] The container is now ready for storage and can also be rolled over a surface by aid of the rollers **60** formed at the bottom surface of the container.

[0027] Knocking down the container is carried out, as discussed hereinabove, in a reversed sequence of operations.

[0028] While there has been shown a preferred embodiment of the invention, it is to be understood that many changes may be made therein without departing from the spirit of the invention.

Claims

1. A storage container comprising a base, two side walls, a front wall, a rear wall and a top cover, wherein said top cover is pivotally hinged to a frame member, wherein at an assembled position of the container said walls are erect and a bottom edge of the walls is articulated to the base and a top edge of said walls is articulated to the frame member; and at a collapsed position the base is articulated with the frame member and wherein the walls are received in a space between the base and the top cover.

2. A storage container according to claim 1, wherein at the collapsed position the base is substantially received within the frame member.

3. A storage container according to claim 1, wherein the base comprises an upwardly extending rim whereby at the collapsed position the side walls extend flush over an upside surface of the base and do not exceed the rim.

4. A storage container according to claim 1, wherein at the collapsed position the side walls are folded over the base and the front wall and the rear wall are detached form the base and are received within the frame.

5. A storage container according to claim 1, wherein a lock mechanism is provided for securing the container at the collapsed position, so as to secure the base to the frame member and the top cover at the closed position so as to prevent spontaneous opening of the collapsed container.

6. A storage container according to claim 1, wherein at the assembled position side edges of the side walls are detachably engaged with corresponding side edges of the front wall and the rear wall.

7. A storage container according to claim 1, wherein the side walls, the front wall and the rear wall are rigid and solid boards.

8. A storage container according to claim 1, wherein the side walls are pivotally articulated at their bottom edge to the base and are detachably articulable at their top edge to the frame member.

9. A storage container according to claim 1, wherein the front wall and the rear wall are detachably articulable at their bottom edge to the base and at their top edge to the frame member.

10. A storage container according to claim 1, wherein the front wall and the rear wall are pivotally articulated at their bottom edge to the base and are detachably articulable at their top edge to the frame member.

11. A storage container according to claim 1, wherein the side walls are detachably articulable at their bottom edge to the base and at their top edge to the frame member.

12. A storage container according to claim 1, wherein the base, the walls, the frame member and the top cover are made of molded plastic.

13. A storage container according to claim 1, wherein at least one carrying handle is fitted at the top cover, wherein at the assembled position said at least one handle functions as a handle to facilitate opening the top cover and at the collapsed position the at least one handle serves for carrying the collapsed assembly.

14. A storage container according to claim 13, wherein at least one of the at least one carrying handle functions as a lock to secure the assemblage at its collapsed position and prevent spontaneous opening thereof while carrying.

15. A storage container according to claim 1, wherein

the walls are detachably articulable at their respective edges to the frame member and the base by snap-type attachment.

16. A storage container according to claim 1, wherein at the collapsed position the thickness of the assemblage does not exceed the thickness of the frame member with articulated cover.

17. A storage container according to claim 1, wherein the height of the side walls is substantially half or less its length, whereby at the collapsed position the side walls lie flush over a top surface of the base with neighboring top edges.

18. A storage container according to claim 1, wherein the frame member is formed at side portions thereof with carrying handles.

19. A storage container according to claim 1, wherein the top cover is pivotally secured to the frame member by at least two hinges fitted at rear edges thereof.

20. A storage container according to claim 1, wherein at least some of the walls and the top cover are formed with reinforcement ribs for rigidifying thereof.

21. A storage container according to claim 1, wherein at the collapsed position of the container, all the components of the container are contained within the collapsed assemblage.

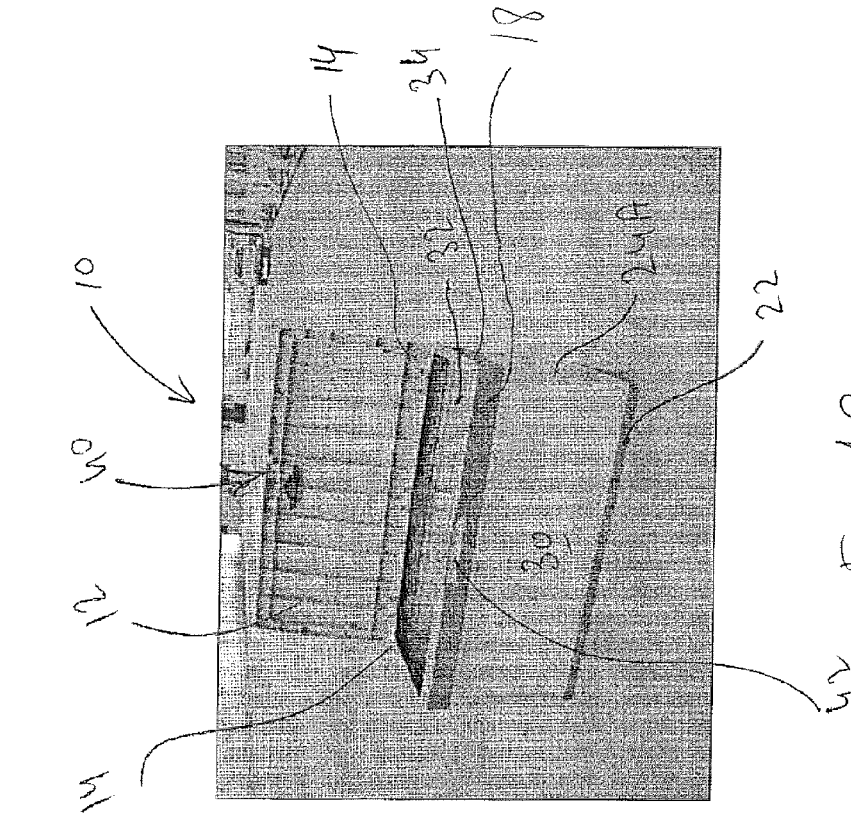


Fig. 1B

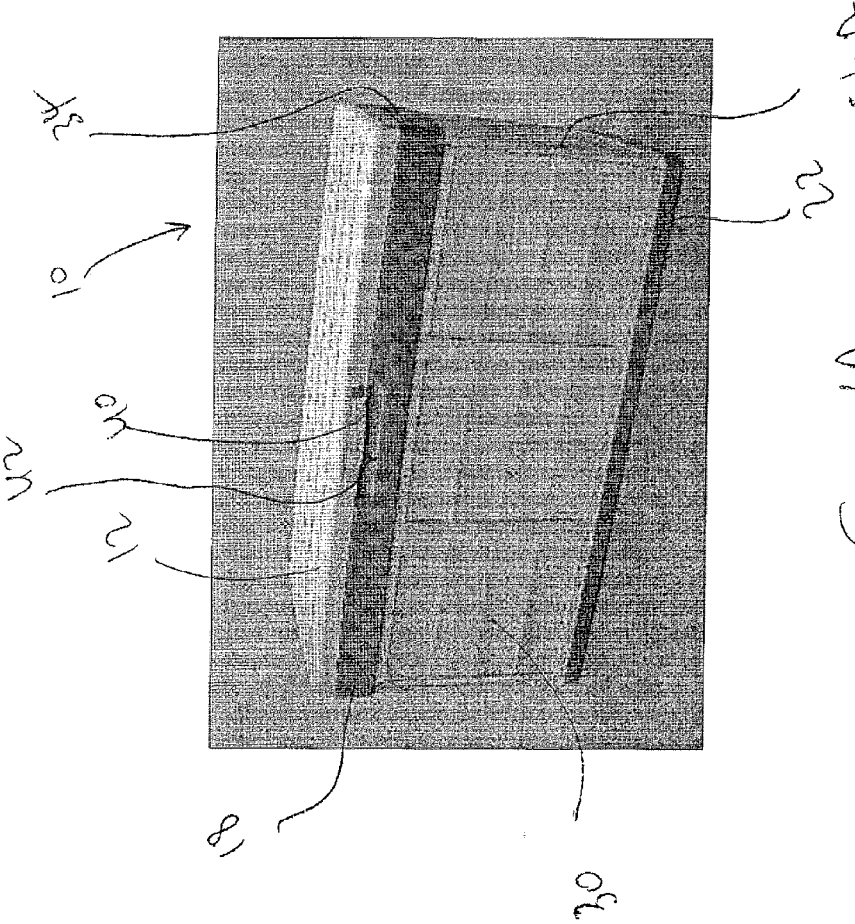


Fig. 1A

Fig 2B

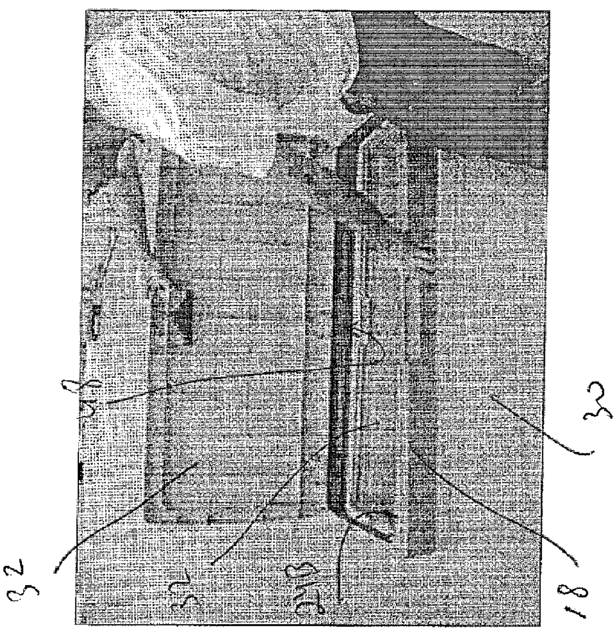


Fig. 2C

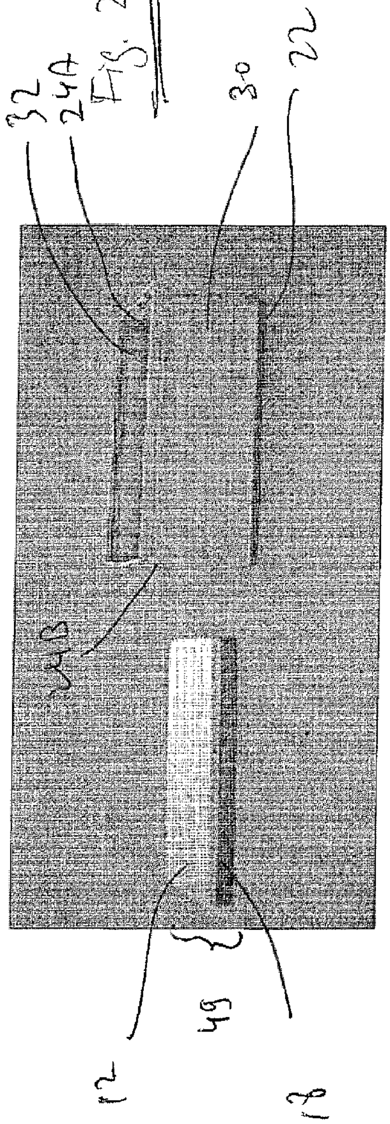
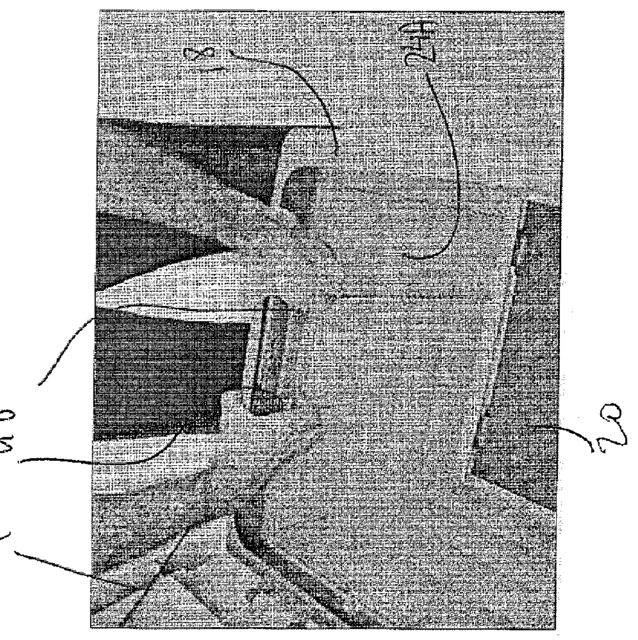


Fig 2A



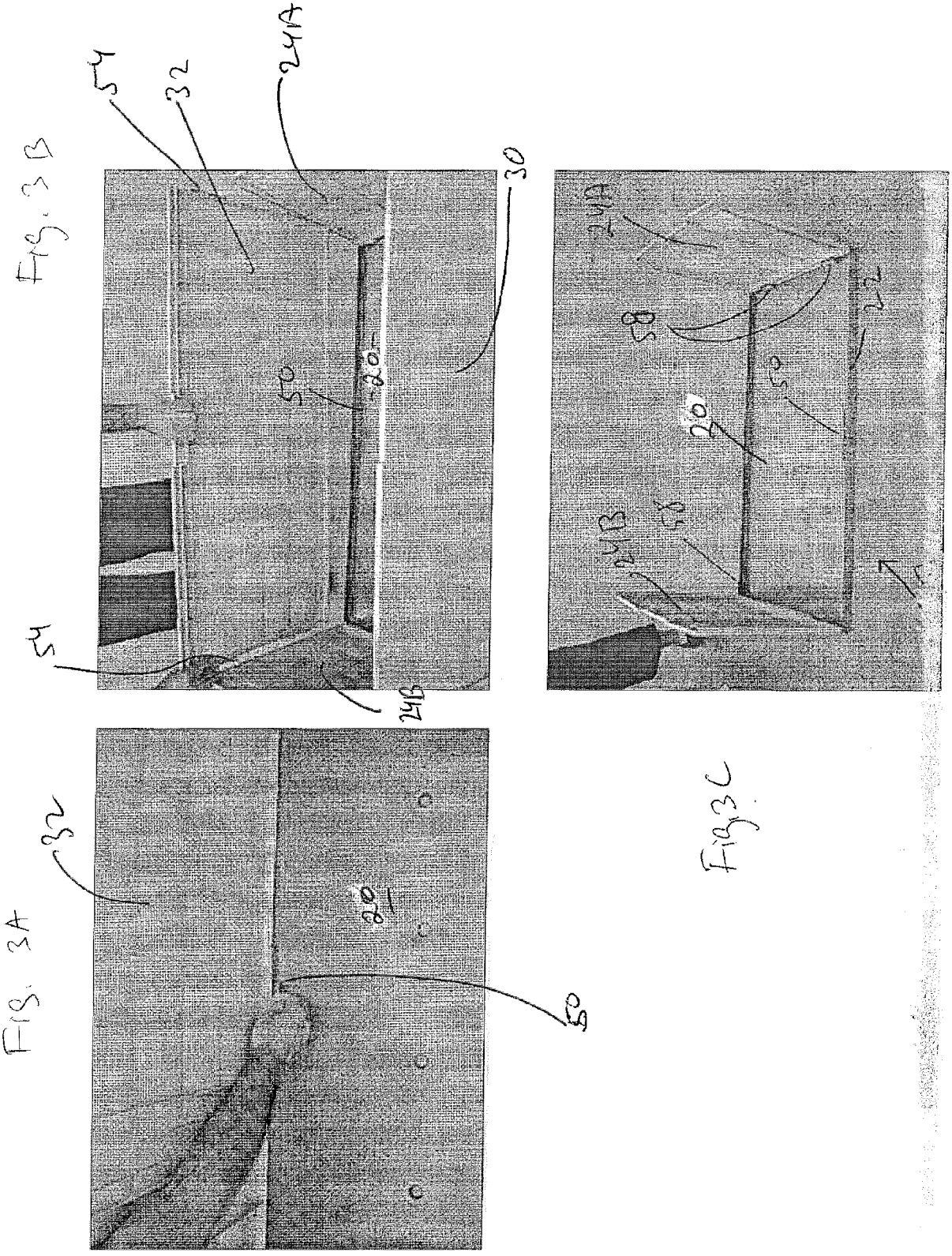

54
32
24A
30
50
20
24B
Fig. 3B
32
20
50
Fig. 3A
24A
58
22
20
50
24B
54
Fig. 3C

Fig 3E

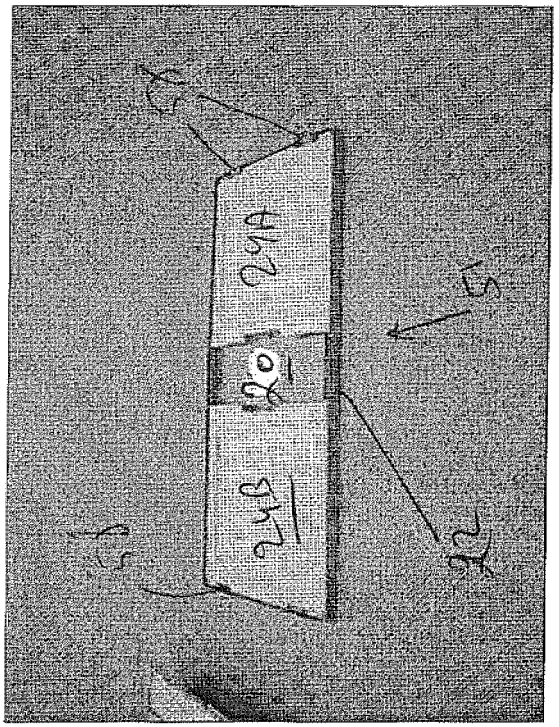
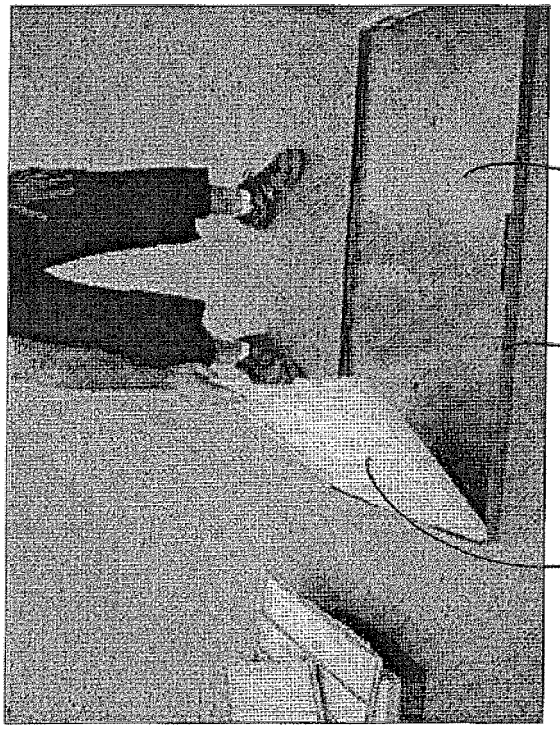


Fig. 3D



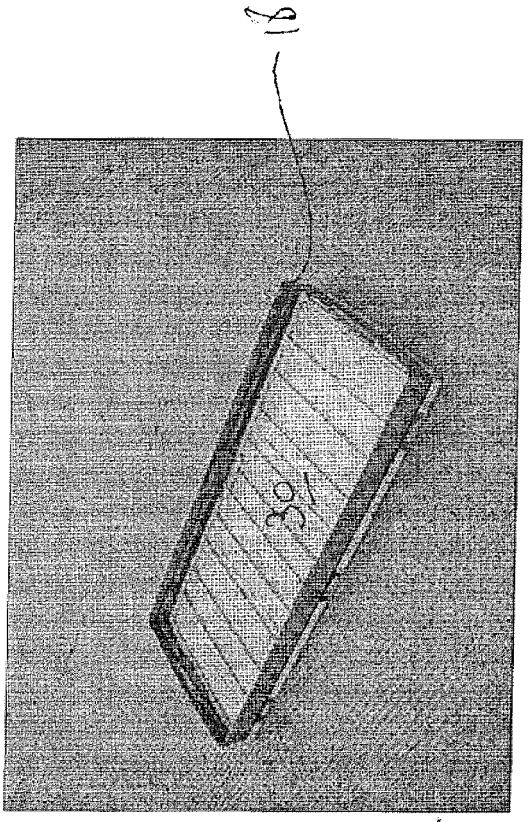


Fig. 4B

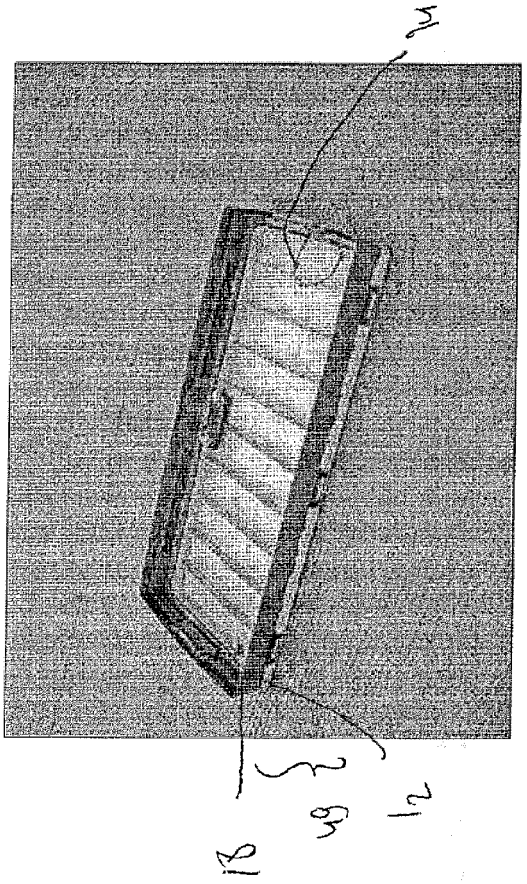


Fig. 4A

FIG. 4B

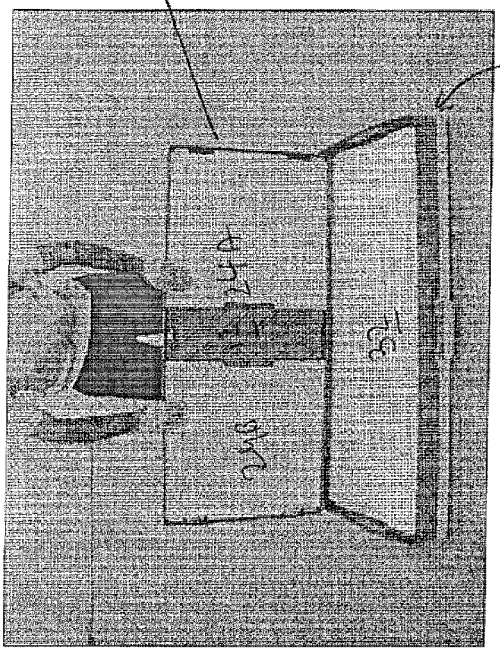


FIG. 4C

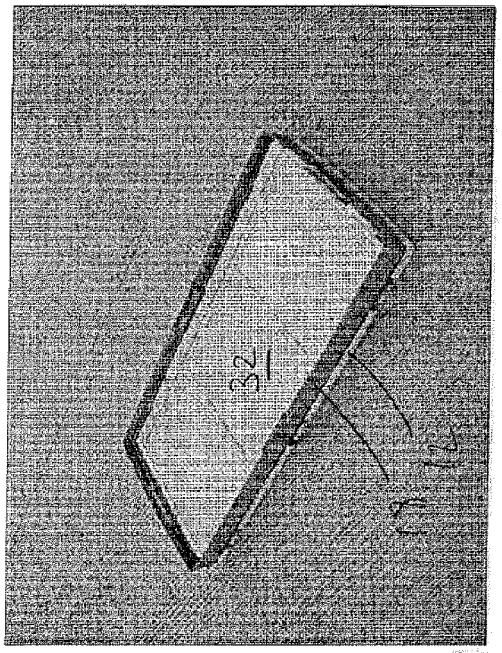
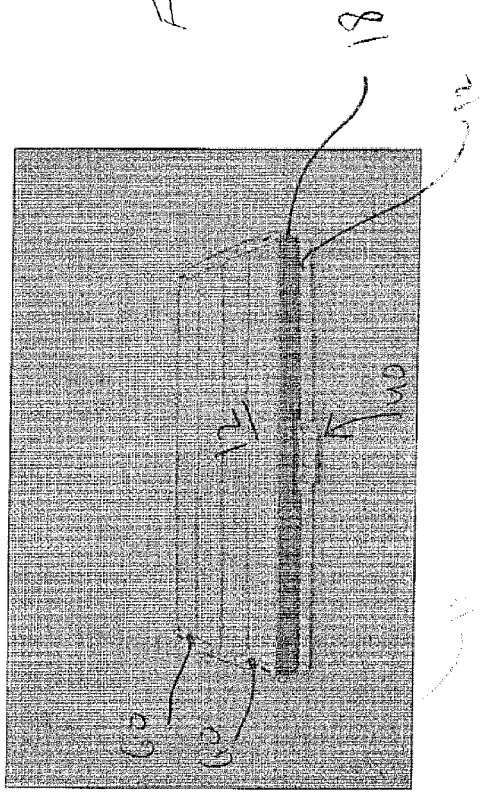


FIG. 4E



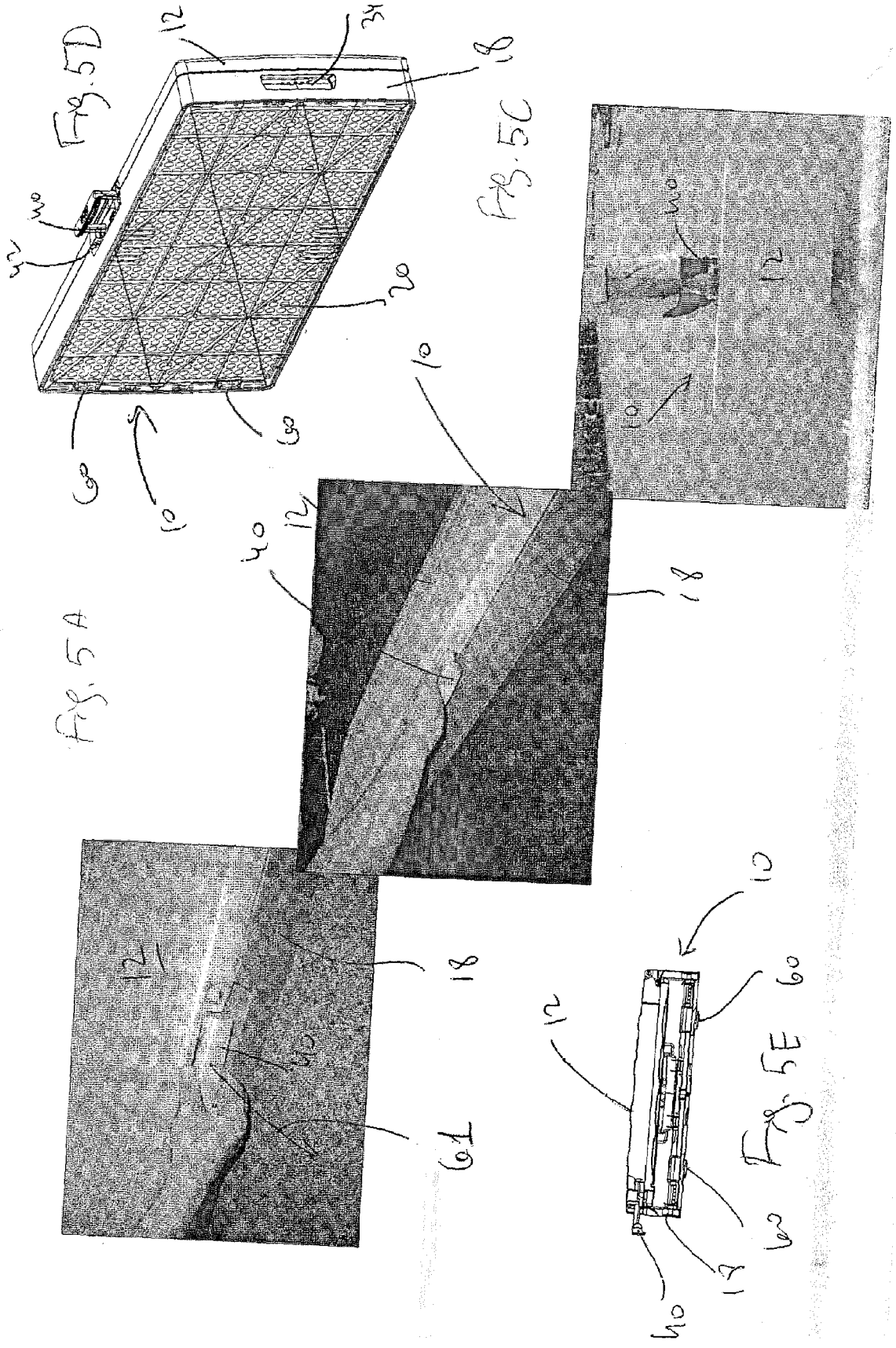


Fig. 5D
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Fig. 5C
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Fig. 5A
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Fig. 5E
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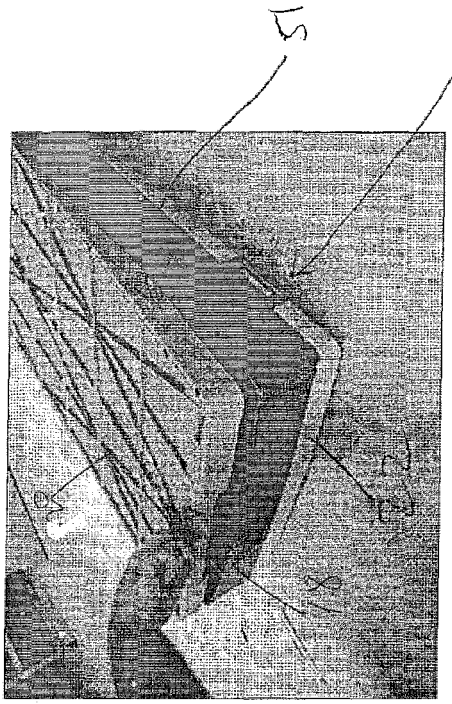


Fig. 6B

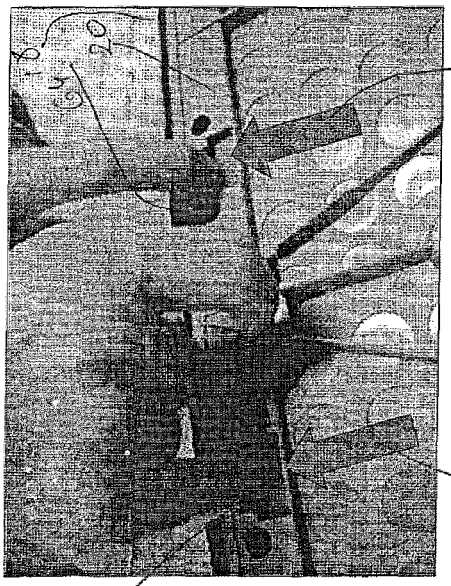


Fig. 6A

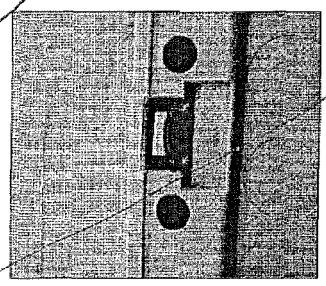


Fig. 6C

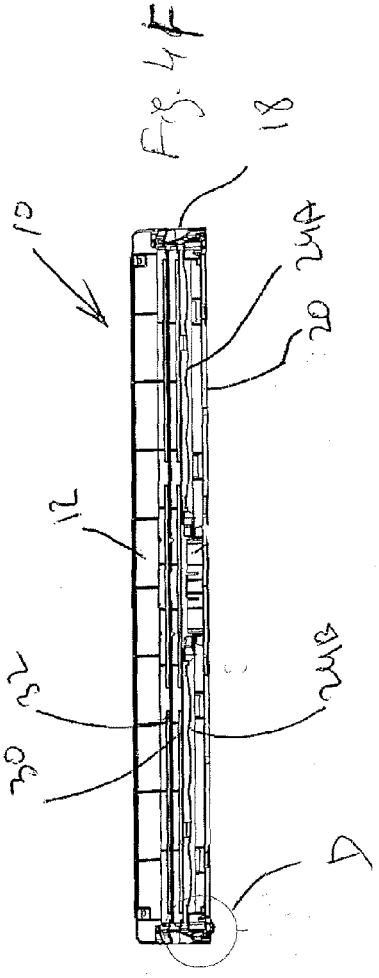


Fig. 4E

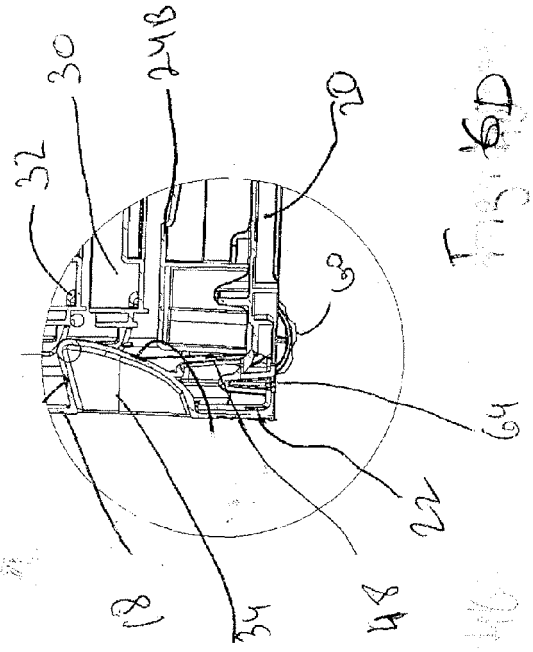


Fig. 6D

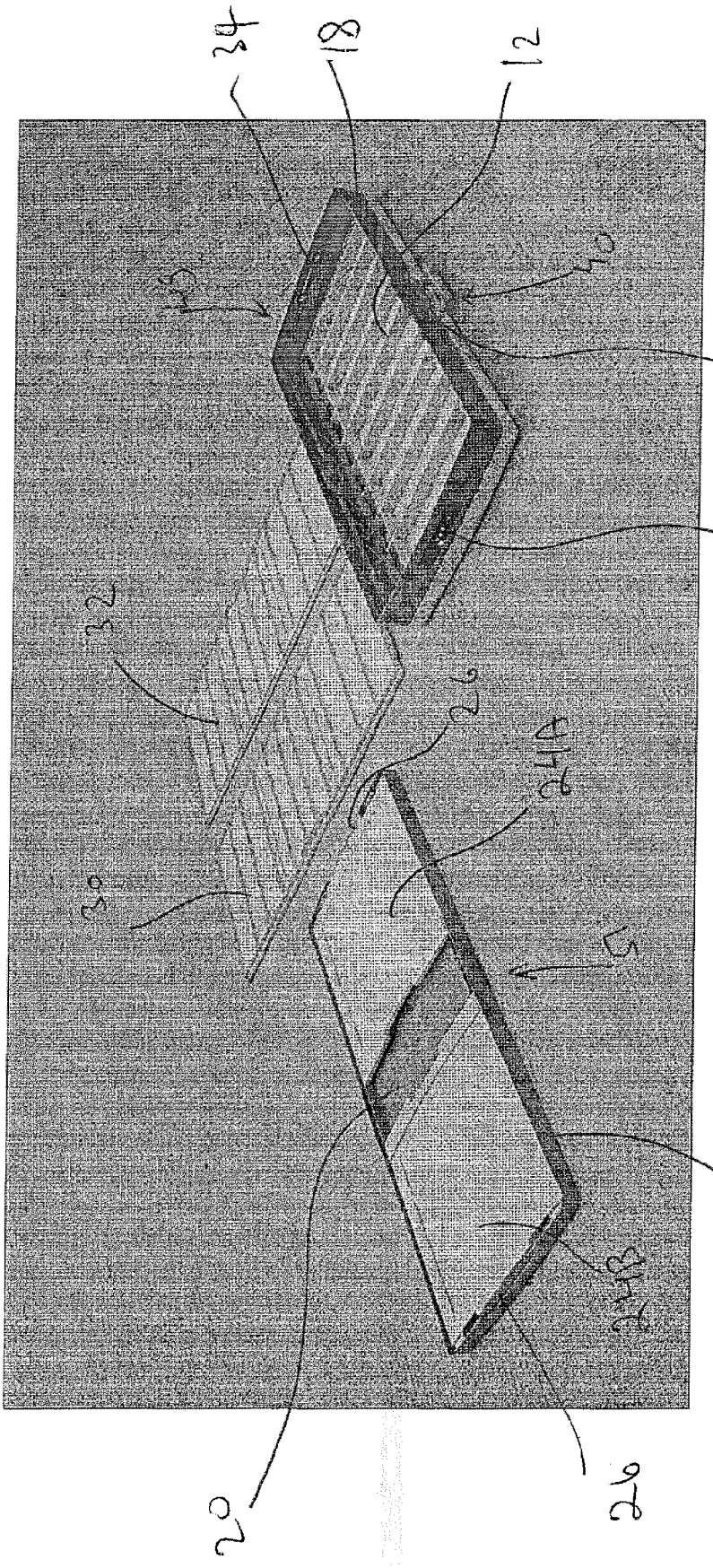
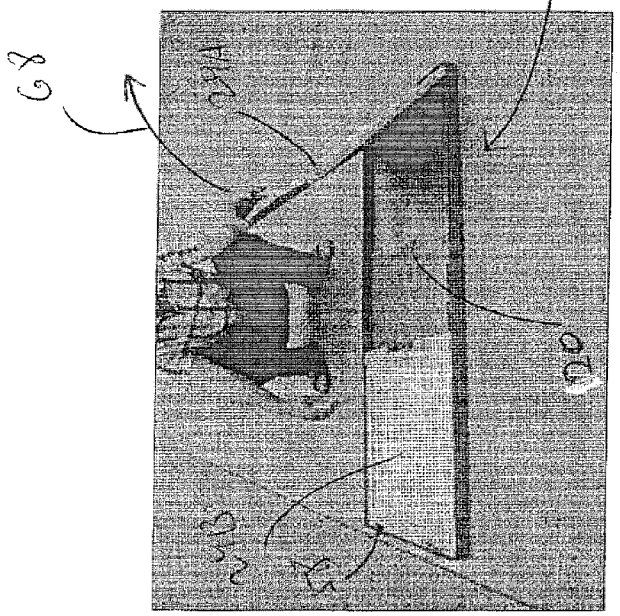
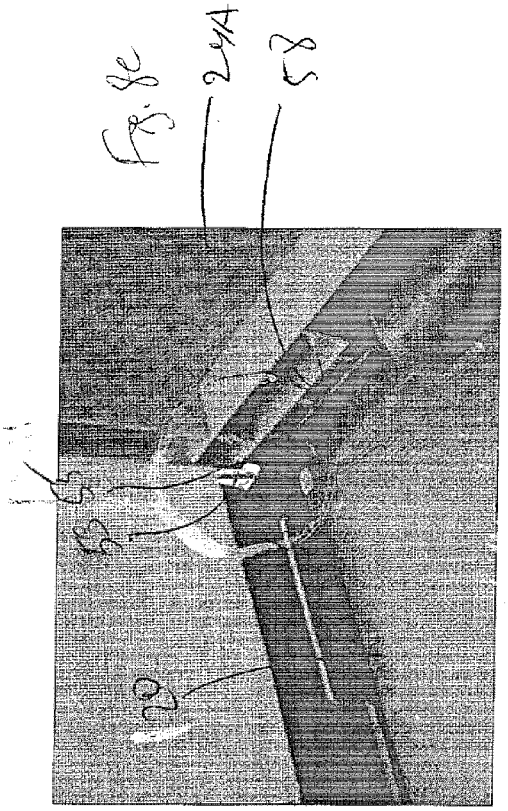


Fig. 7





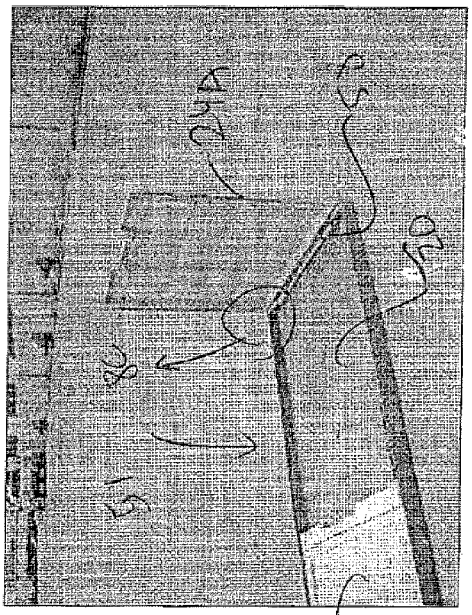


Fig. 8C

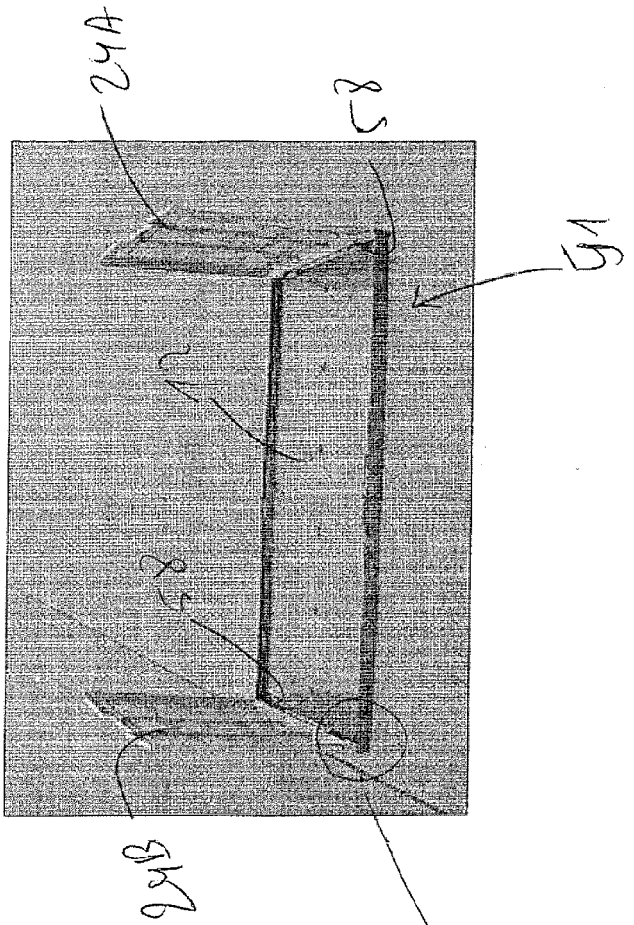


FIG 8D

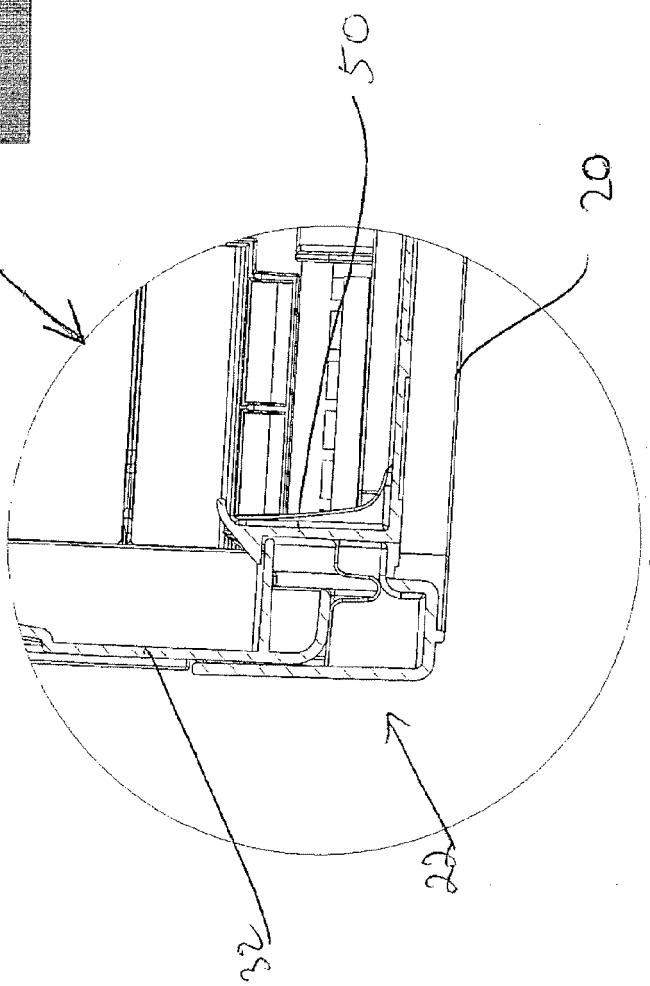
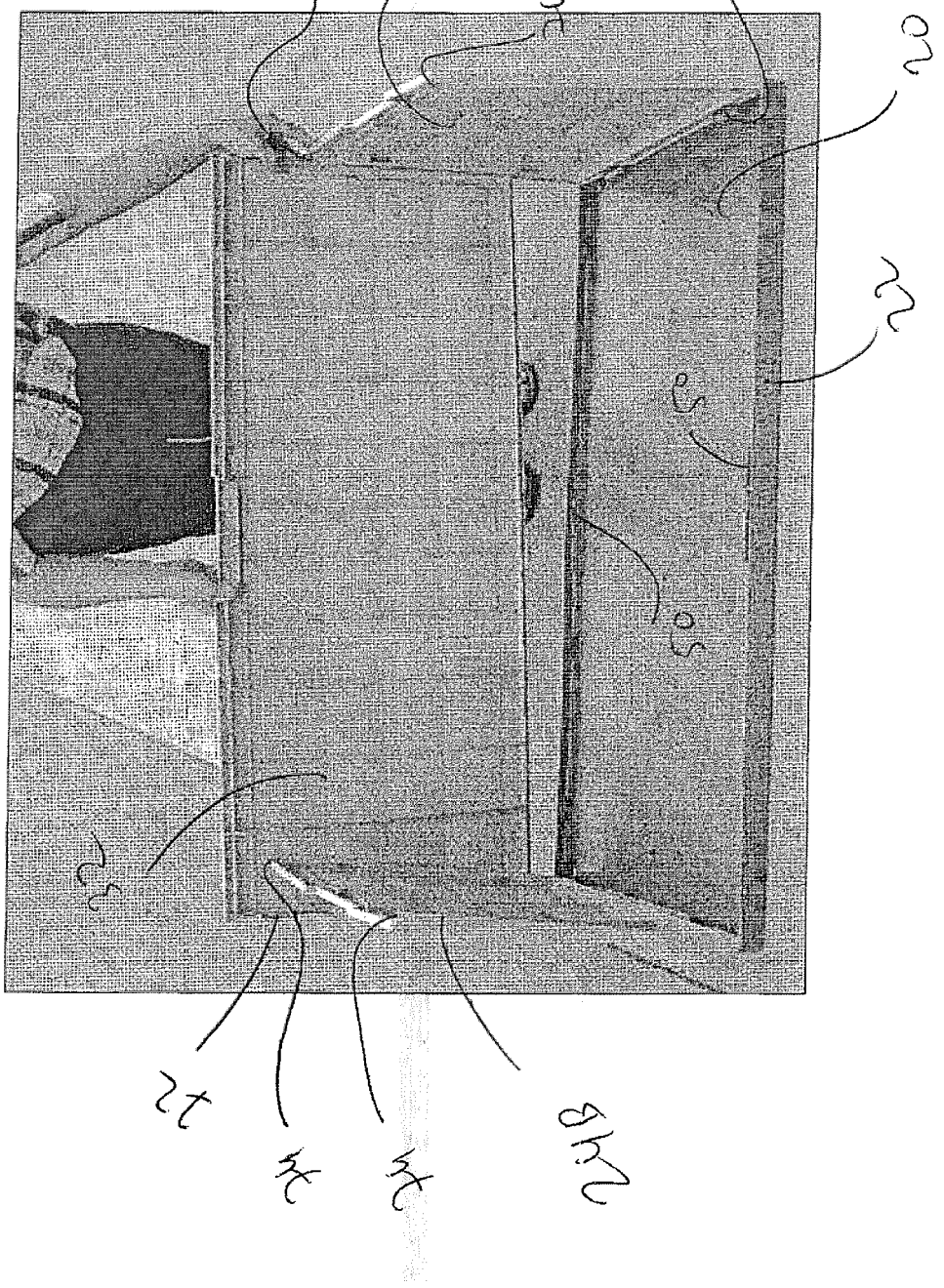


FIG 8E

Fig. 9A



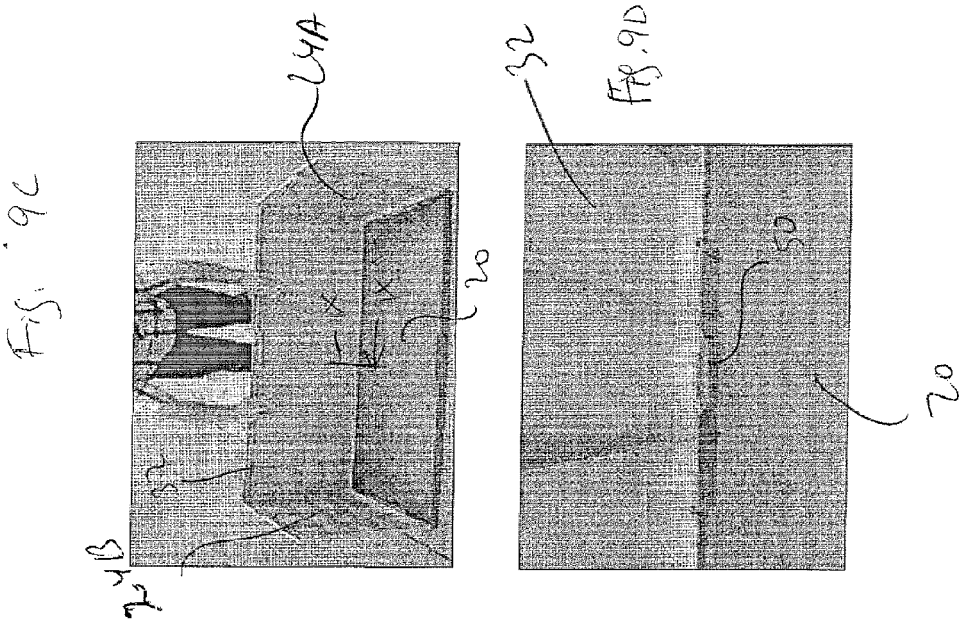


Fig. 9C
24A
24B
20
Fig. 9D
32
30
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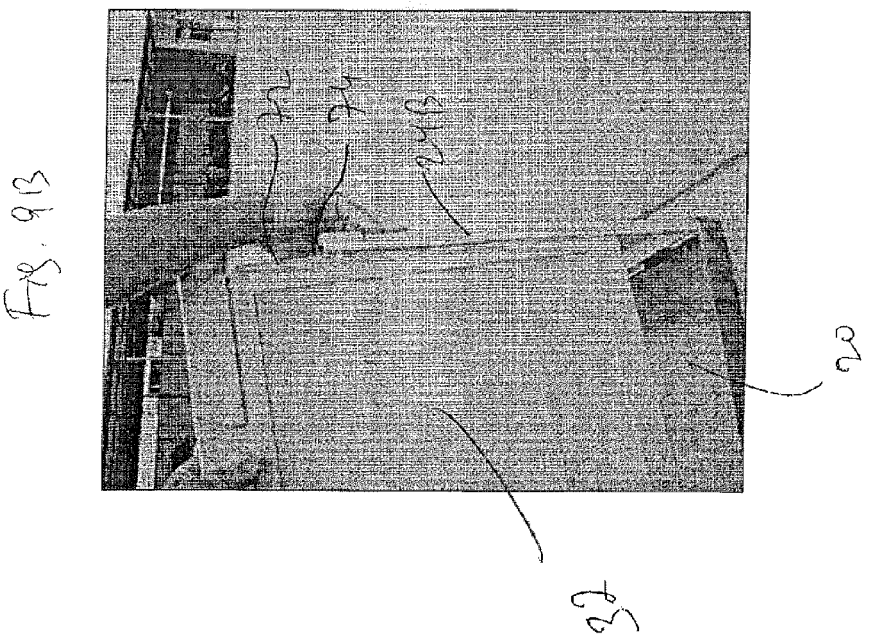
Fig. 9B
22
22'
24A
24B
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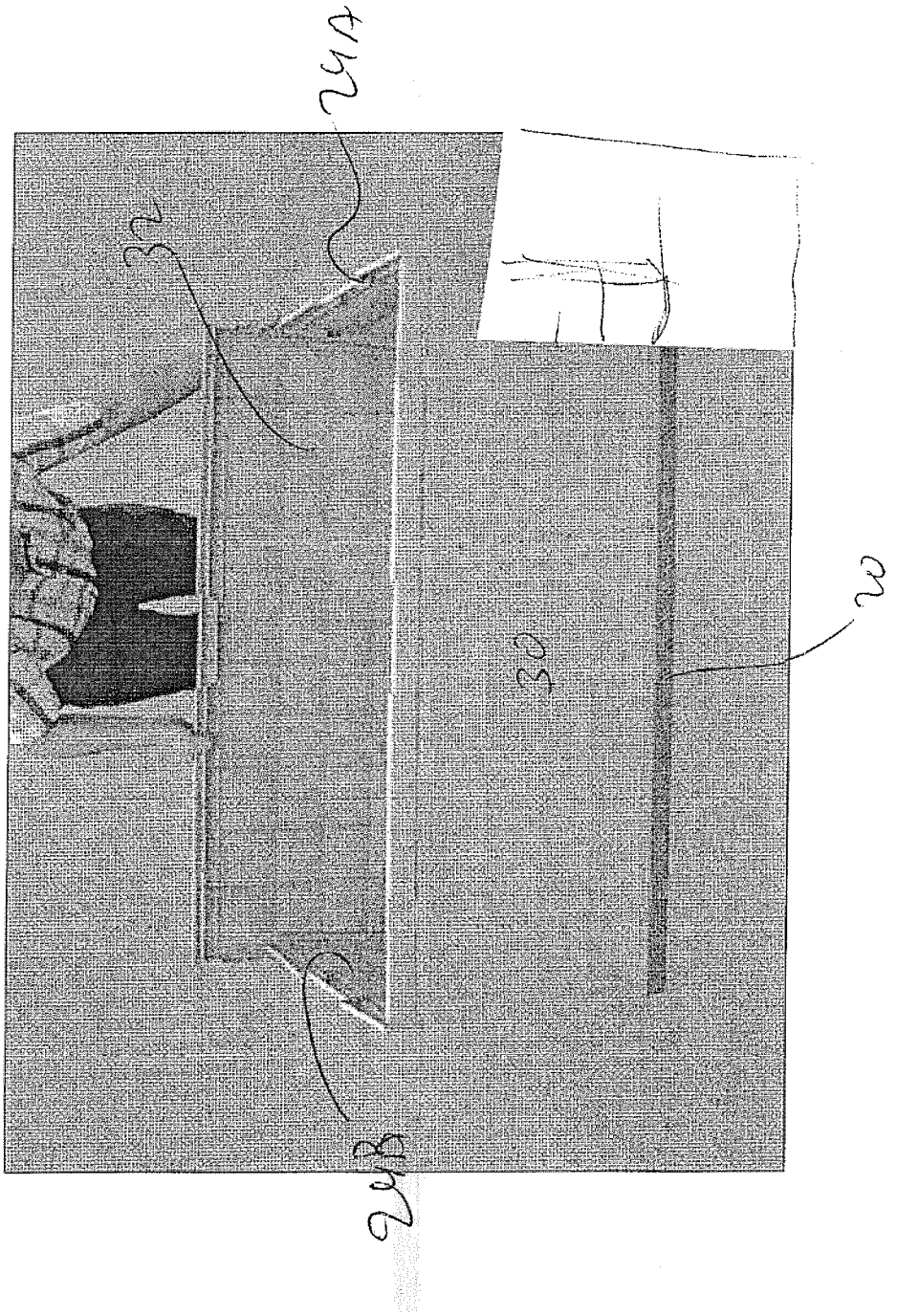
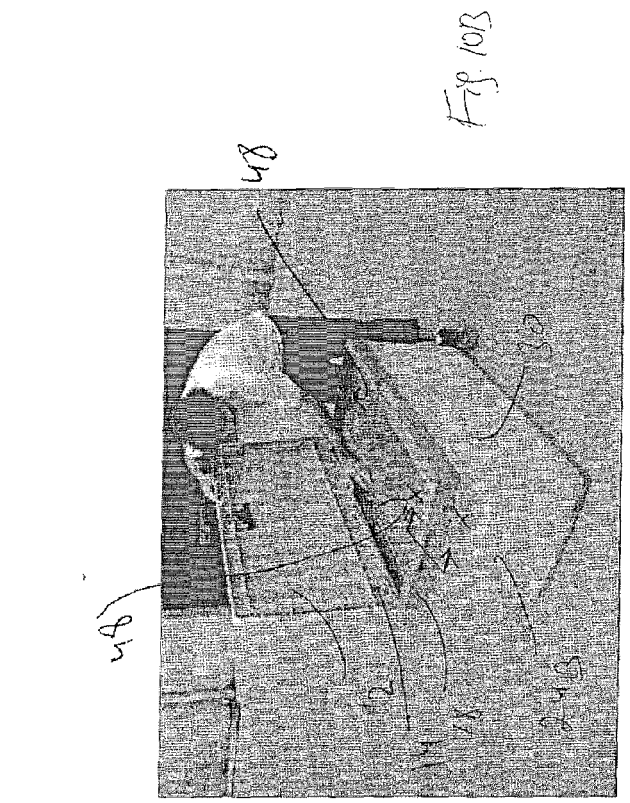
Fig. 9B

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48
Fig. 10B

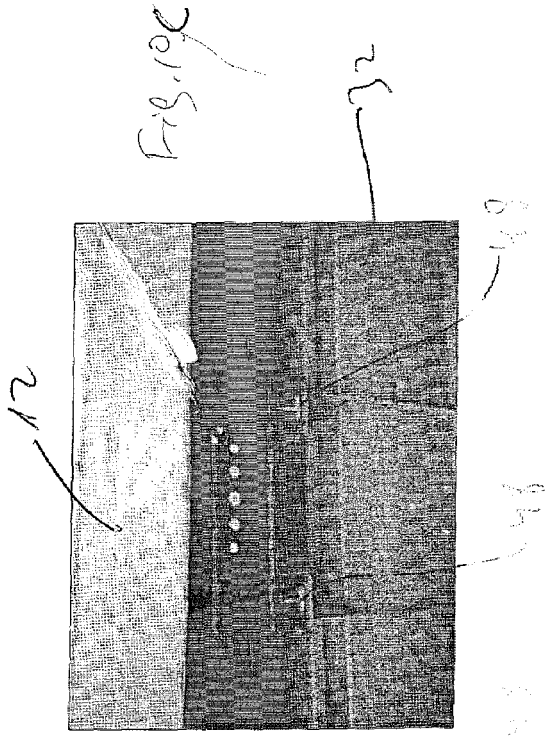
Fig. 10C
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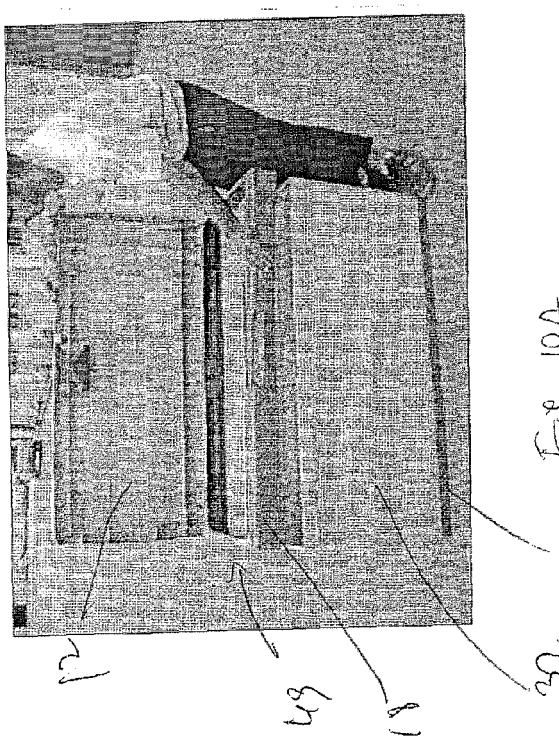
Fig. 10A
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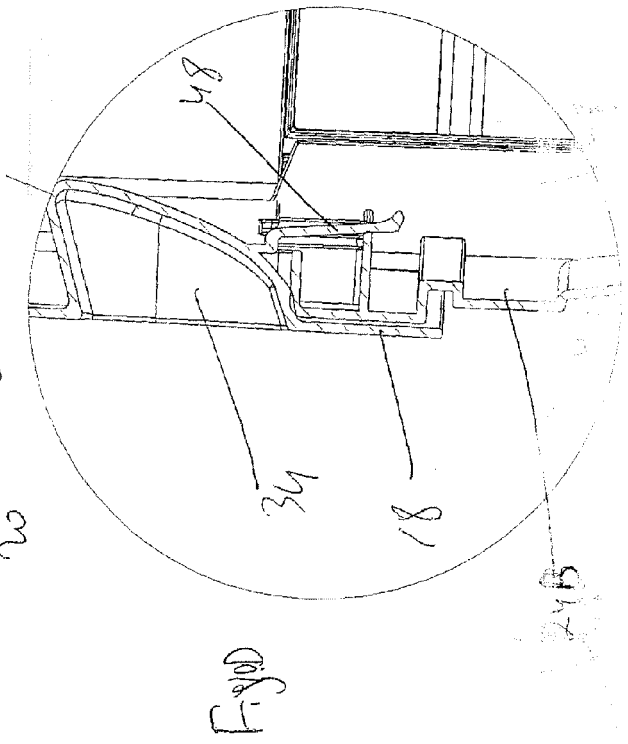
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Fig. 10D

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EUROPEAN SEARCH REPORT

Application Number
EP 07 25 0148

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 1 637 462 A (MAINA GERMANO [IT]) 22 March 2006 (2006-03-22) * paragraph [0012] - paragraph [0030]; claims 1-3,9; figures 1-8 *	1-4,7,8, 10-12, 19-21	INV. B65D6/18
A	EP 1 418 130 A1 (UTZ GEORG HOLDING AG [CH]) 12 May 2004 (2004-05-12) * paragraph [0027] - paragraph [0034]; claim 1; figures 1-13 *	1	
A	US 3 955 703 A (ZEBARTH RALPH S) 11 May 1976 (1976-05-11) * column 2, line 65 - column 4, line 33 * * column 4, line 66 - column 5, line 15 * * column 6, line 18 - column 7, line 41; claim 1 *	1	

TECHNICAL FIELDS SEARCHED (IPC)

B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	31 May 2007	Janosch, Joachim

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31-05-2007

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1637462 A	22-03-2006	NONE	
EP 1418130 A1	12-05-2004	AT 356035 T	15-03-2007
		PL 363201 A1	17-05-2004
		US 2004084447 A1	06-05-2004
US 3955703 A	11-05-1976	NONE	

EPO FORM P0459

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Patent documents cited in the description

- US 4863056 A **[0003]**
- US 6913161 B **[0004]**
- US 5501354 A **[0005]**