



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification⁶:

A47F 7/14, A47B 87/02

A1

(11) International Publication Number:

WO 96/18330

(43) International Publication Date:

20 June 1996 (20.06.96)

(21) International Application Number: PCT/CA95/00692

(22) International Filing Date: 15 December 1995 (15.12.95)

(30) Priority Data:

08/359,274	16 December 1994 (16.12.94)	US
08/467,215	6 June 1995 (06.06.95)	US

(71)(72) Applicant and Inventor: SMED, Ole, F. [CA/CA]; 12 Willow Park Green Southeast, Calgary, Alberta T2J 3L1 (CA).

(74) Agent: WOOD, Max, R.; Scott & Aylen, 60 Queen Street, Ottawa, Ontario K1P 5Y7 (CA).

(81) Designated States: AM, AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TT, UA, UG, UZ, VN, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG), ARIPO patent (KE, LS, MW, SD, SZ, UG).

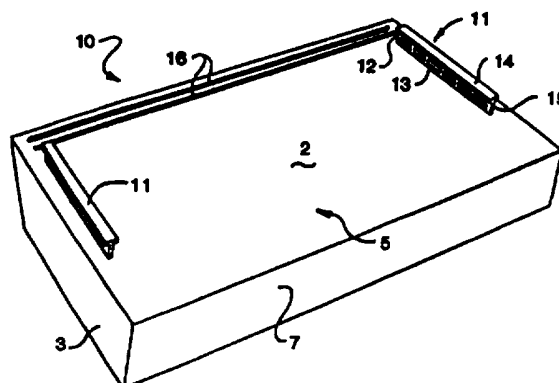
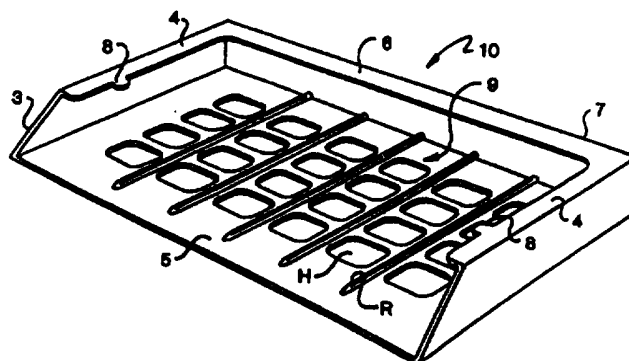
Published

With international search report.

(54) Title: MODULAR STORAGE UNIT

(57) Abstract

A multi-tray storage unit (1) that allows for individual trays (10) to be combined in a number of configurations is disclosed. The storage unit may be stood upright or hung from a vertical panel, using various components, many of which are interchangeable, to make maximum use of available space.



FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AT	Austria	GB	United Kingdom	MR	Mauritania
AU	Australia	GE	Georgia	MW	Malawi
BB	Barbados	GN	Guinea	NE	Niger
BE	Belgium	GR	Greece	NL	Netherlands
BF	Burkina Faso	HU	Hungary	NO	Norway
BG	Bulgaria	IE	Ireland	NZ	New Zealand
BJ	Benin	IT	Italy	PL	Poland
BR	Brazil	JP	Japan	PT	Portugal
BY	Belarus	KE	Kenya	RO	Romania
CA	Canada	KG	Kyrgyzstan	RU	Russian Federation
CF	Central African Republic	KP	Democratic People's Republic of Korea	SD	Sudan
CG	Congo	KR	Republic of Korea	SE	Sweden
CH	Switzerland	KZ	Kazakhstan	SI	Slovenia
CI	Côte d'Ivoire	LI	Liechtenstein	SK	Slovakia
CM	Cameroon	LK	Sri Lanka	SN	Senegal
CN	China	LU	Luxembourg	TD	Chad
CS	Czechoslovakia	LV	Latvia	TG	Togo
CZ	Czech Republic	MC	Monaco	TJ	Tajikistan
DE	Germany	MD	Republic of Moldova	TT	Trinidad and Tobago
DK	Denmark	MG	Madagascar	UA	Ukraine
ES	Spain	ML	Mali	US	United States of America
FI	Finland	MN	Mongolia	UZ	Uzbekistan
FR	France			VN	Viet Nam
GA	Gabon				

MODULAR STORAGE UNIT

Field of the Invention

The present invention relates to document storage and, in particular, to stackable receptacles for storing documents in an efficient manner.

Background of the Invention

Storing documents or the like in such a manner as to allow for maximum flexibility with an efficient use of available space is a laudable goal. Typically, stackable trays have only one way of being stacked. For example, with in/out boxes, the trays will be stacked such that all the tray entrances overlies each other. This makes grasping documents from any tray other than the topmost one difficult. Furthermore, these types of trays lack the ability to be hung from a wall or placed in a drawer or even made to assume a stepped or inclined tray configuration.

Furthermore, various types of hung file trays are known. For example, in US Patent No. 4,588,094, to Evans, a wall mounted file tray is shown. In this patent, a large number of holes must be made in the wall because each tray is supported by a fastener of some type inserted into the wall. When this filing tray system is taken down and moved, substantial wall repair will be required. Furthermore, the file tray of this patent does not allow for more than one configuration, nor use in a horizontal configuration and therefore lacks substantial flexibility of use.

US Patent No. 5,016,760, to Mayo, each tray can be collapsed for storage and shipping purposes. However, the file tray of this patent does not allow for more than one configuration, nor use in a horizontal configuration and therefore lacks substantial flexibility of use. Furthermore it is not easily possible to vary the number of trays.

Finally, there is US Patent No. 5,344,030, to Evenson, in which, due to the nesting configuration of the trays, the available space for file storage is diminished. Furthermore, the file tray of this patent does not allow for more than one configuration, nor use in a horizontal configuration and therefore lacks substantial flexibility of use.

Accordingly, there is room for improvement within the art.

Summary of the Invention

It is thus an object of the invention to provide a modular storage unit made up of trays that may be joined together in various configurations.

It is yet another object of the invention to provide a modular storage unit in which a varying number of identical trays may be connected together.

It is yet another object of the invention to provide a modular storage unit that makes efficient use out of available space.

It is yet another object of the invention to provide a modular storage unit that may be either hung on a vertical surface or stood on a horizontal surface.

These and other objects of the invention are achieved by a modular storage unit having at least one tray comprising: a back wall having front and back surfaces; bottom and side walls extending outwardly from the front surface of the back wall; a bottom lip extending upwardly from the bottom wall; side lips extending inwardly from the side walls; wherein the walls and the lips define a storage area; a first connector on each side of the lips; and two second connectors on the back surface of the back wall.

Brief Description of the Drawings

Figures 1A, 1B, and 1C are top perspective, bottom perspective, and side views, respectively, of an individual tray for use in the modular storage unit according to the invention.

Figures 2A and 2B are two views of alternative configurations of a group of trays according to the invention.

Figure 3 is a perspective view of a group of trays according to the invention placed in a drawer.

Figure 4A is a perspective view depicting a group of trays according to the invention standing a horizontal surface with the aid of a stand.

Figure 4B is a perspective view isolating the stand shown in Figure 4A.

Figure 5A is an elevational view, partially in section, depicting a group of trays according to the invention hung from a vertical panel.

Figure 5B is a perspective view isolating the hook and hanger strip shown in the arrangement illustrated in Figure 5A.

Figure 5C is an elevational back view depicting how the trays may be hung according to Figures 5A and 5B.

Figures 5D-5F are perspective views showing different configurations for the hung group of trays according to the invention.

Figures 6A and 6B are perspective views of clips suitable for hanging a group of trays from a vertical panel in an alternative arrangement.

Figure 7 is a perspective view illustrating an alternative arrangement whereby a group of trays may be hung from a vertical panel.

Detailed Description

It has been found that a modular storage unit constructed according to the invention, achieves a more flexible storage unit that makes effective use of available space.

The heart of the modular storage unit is a tray 10, shown in Figures 1A (top) and 1B (bottom). Tray 10 generally comprises a back wall 5, side walls 3 and bottom (or rear, depending upon upright or supine orientation) wall 7. Side walls 3 and bottom wall 7 extend out of back wall 5, preferably, in a direction perpendicular to back wall 5. Side lips 4 extend inwardly (i.e., towards a center of tray 5) from side walls 3. Bottom lip 6 extends upwardly (i.e., also towards a center of tray 5) from bottom wall 7. Each lip surface should be generally parallel to back wall 5. The various walls and lips define a storage area 9 for documents or the like. While in Figure 1A, back wall 5 is shown as having a series of holes H and raised portions R, the precise structure of back wall 5 is conventional except as will be described below.

The novelty of tray 10 lies in its adaptability to be joined together with other identical trays to form a modular,

multi-tray storage unit which may be hung or stood on a surface. In either arrangement, tray 10 of any multi-tray unit to be described below, will preferably have a face plate 20 (Figure 2A) to prevent any documents or the like from falling out of storage area 9.

To join together a number of trays, a novel connecting structure has been developed. That structure starts with each side lip 4 having a tab 8 molded or mounted thereon. Tabs 8, which are preferably semi-circular, are meant to mate with corresponding mounting structures found on the bottom a subsequent tray.

Two tracks 11 are mounted on back surface 2 of back wall 5. Each track 11 is spaced toward the sides of tray 10 at a position that will be described later. Each track 11 comprises an elongated raised portion 12 topped with an elongated ridge 14. Ridge 14 extends generally perpendicular to raised portion 12, in a direction generally parallel to back wall 5 and towards side wall 3, thus overhanging raised portion 12, forming gap 15. Gap 15 will have a height substantially equal to the thickness of side lips 4 in the area of tab 8 (although it is conceived that entire side lip 4 will have the same thickness). Each track 11 is spaced from side walls 3 so as to cause elongated portions 12, and thus gaps 15, to correspond with tabs 8 and the outermost edges of side lips 4 (Figure 1C). Furthermore, a series of holes 13 extends along the length of each raised portion 12 and extends entirely therethrough. However, it is also conceived that holes 13 may simply be indentations in raised portion 12 on its side facing gap 15. Finally, back surface 2 of back wall 5 has generally parallel protuberances 16 that add structural rigidity to the tray and allow an upright (perpendicular to the bottom of the drawer) drawer divider (not shown) to rest therebetween when the tray is used in a drawer as will be discussed with respect to Figure 3 below.

The structure of an individual tray 10 having been described, it will now be described how two or more trays may be joined together to form a modular, multi-tray storage unit

1. Tabs 8 and side walls 4 of a first tray are slid through gaps 15 of a second or subsequent tray. This sliding continues until tabs 8 of the first tray are friction fitted/locked into the desired holes 13 or indentations of the second tray. By
5 "desired", it is meant that holes 13 allow for adjustment of the longitudinal spacing between trays to attain the specific spacing required for a particular application. For example, in Figure 2A it is shown how the trays 10 can be connected together to form a step-like or inclined storage unit 1. In
10 Figure 2B, it is shown how the trays 10 can be connected together to form a storage unit 1 in which the leading edges of all trays are flush because all back walls 7 are positioned along a plane and not spaced from each other. The particular tray configuration can be easily varied by applying opposing
15 forces to the leading (or the leading and trailing) edges of the two trays until tabs 8 are forced out of holes 13, allowing for relative movement between the trays until tabs 8 enter the next set of holes 13. Typically, to allow for some give in the structure of the tray such that the tabs 8 can be removed from
20 holes 13, yet retaining structural stiffness to prevent undesired relative movement between tabs 8 and holes 13, trays 10 will preferably be made from injection molded polystyrene.

Having now described how a multi-tray storage unit 1 may be formed, description will be made as to how such a unit 1 may
25 be stored at a work surface. First, as shown in Figure 3, unit 1 can be merely lied on its lowermost tray 10 within a desk drawer 25 (unit 1 in configuration shown in Figure 2B). Because of the spacing between entrances to adjacent trays, all trays are equally accessible. As described above, an upright
30 drawer divider (not shown) is placed between protuberances 16 on the back of the uppermost tray. This drawer divider, in combination with the back of the uppermost tray and its protuberances, will cause the modular unit not to tip over.

Figures 4A and 4B illustrate how standing inclined unit 1
35 may be made using stand 30 (which can also be a hanger as will be described below). Stand 30 has upper 32 and lower 33 horizontal bars. Bars 32, 33 are connected by one or more legs

31. When bars 32 and 33 are parallel and there are two legs 31, stand 30 assumes a generally trapezoidal shape. Lower horizontal bar 33 has a base 34 extending perpendicularly from its lower edge. Additionally, tabs 35 (Figure 4B) extend from either end of upper horizontal bar 32. While these tabs are shown as rectangular, they may be semi-circular like tabs 8. To use the stand, as shown in Figure 4A, tabs 35 will be inserted in holes 13 of elongated portion 12 (Figure 1B) and the entire unit 1 stands on base 34 and bottom wall 7 of the lowermost tray in the unit 1. In this configuration, because stand 30 is not placed into gap 15, the thickness of upper horizontal bar 32 is not as important as the fact that tabs 35 fit within holes 13.

Multi-tray unit 1 can also be hung from a wall, door, or panel. It is especially preferable to hang unit 1 from conventional fabric panels V, typically used as room or cubicle dividers. These panels V have slotted tubing T, such as steel tubing, from which accessories can be hung. There are at least three ways of doing this. First, as shown in Figures 5A-C, unit 1 can be hung from a vertical surface V by the use of a hook 80 having a locking portion 87, inserted into conventional hook receiving hardware 100 in tube T. In this arrangement, hanger clips 90 are attached to the back of multi-tray storage unit 1 (Fig. 5C), allowing unit 1 to be hung from hook 80. Figure 5B shows in detail hook 80 and hanger strip 90. Hook 80 is conventional except that it has a clip supporting portion 81 that is offset from the rest of the hook body and may have cut out portions 85. Hanger clip 90 has an inner wall 92 having adhesive backing 93, with a peel-off backing (not shown) thereon. Outer wall 96 has an overhanging portion 91 which defines a downwardly extending channel 95. In use, the backing is peeled off to expose the adhesive, hanger clip 90 is adhesively attached to the back of unit 1, hook 80 is positioned at the appropriate height, and unit 1 is positioned on hook 80 such that downwardly extending channel 95 overlies clip supporting portion 81 (Fig. 5C), thus allowing unit 1 to be hung. Ridge 99 assures the proper positioning of hanger

clip 90. Locking portion 87 may be: centrally mounted (Fig. 5D), left mounted (Fig. 5E), or right mounted (Fig. 5F). For left and right mounts, extra L-shaped support L is adhesively attached to the lower back of the rear tray. Supports L reduce the drooping of the trays which would be caused by the off-centered mounting of locking portion 87.

Figures 6A and 6B show a second way of hanging unit 1 (of which, only a back wall 15 of a last tray 10 is shown in Figure 6A). Here a hanger clip 90', very similar to that described immediately above, is attached to back surface 2 of back wall 15 by adhesive 93'. Ridge 99' assures the proper positioning of hanger clip 90'. Clip 84, similar to that of clip 90', is hung in an inverted orientation with respect to clip 90' on a vertical surface V. The two clips' respective channels are brought into contact with each other, whereby the two clips interlock and the unit 1 is hung from clip 84.

Finally, Figure 7 shows yet a third way of hanging unit 1. In this Figure, stand 30 is inverted and becomes hanger 30'. What was base 34 now becomes overhang 34' which can be fit over the top of a door or panel, etc. Accordingly, unit 1 can be hung using hanger 30'.

It is thus seen how the modular storage unit according to the invention provides a storage unit made up of trays that may be joined together in various configurations. It is also seen how the modular storage unit according to the invention provides a storage unit that makes efficient use out of available space. Further, it is also seen how the modular storage unit according to the invention to provide a storage unit that may be either hung on a vertical surface or stood on a horizontal surface.

The above description is given in reference to a storage unit. However, it is understood that many variations are apparent to one of ordinary skill in the art from a reading of the above specification and such variations are within the spirit and scope of the instant invention as defined by the following appended claims.

THAT WHICH IS CLAIMED:

1. A storage unit having at least one tray comprising:
a back wall having front and back surfaces;
bottom and side walls extending outwardly from said front
5 surface of said back wall;
a bottom lip extending upwardly from said bottom wall;
side lips extending inwardly from said side walls;
wherein said walls and said lips define a storage area;
a first connector on each side of said lips; and
10 two second connectors on said back surface of said back wall.
2. The storage unit according to claim 1, wherein each said first connector of a first tray is connected to one of said second connectors of another tray to form a modular multi-tray
15 unit.
3. The storage unit according to claim 2, wherein said modular multi-tray unit comprises four trays.
4. The storage unit according to claim 2, wherein:
said first connector comprises tabs; and
20 said second connector comprises a track, said track further comprising:
an elongated raised portion, said elongated raised portion having holes along its length; and
an elongated ridge portion, extending sidewardly out
25 from said elongated raised portion to form a gap, said gap being of sufficient magnitude to receive a side lip and tab of said another tray;
wherein when said modular, multi-tray unit is formed, said tab and side lips of a first tray are positioned in the holes and gap, respectively, of said track of said another tray.
30
5. The storage unit according to claim 4, wherein said tabs are semi-circular.
6. The storage unit according to claim 4, wherein each bottom wall of a tray of the modular, multi-tray unit is coincident
35 with a bottom wall of another tray.

7. The storage unit according to claim 4, wherein each bottom wall of a tray of the modular, multi-tray unit is spaced from a bottom wall of another tray.

8. The storage unit according to claim 7, further comprising
5 means for changing the spacing between said bottom walls to effect a change in a configuration of said storage unit.

9. The storage unit according to claim 8, wherein said modular multi-tray unit comprises four trays.

10. The storage unit according to claim 4, wherein said
10 modular multi-tray unit stands.

11. The storage unit according to claim 10, wherein said standing multi-tray unit further comprises:

a stand member having upper and lower horizontal members connected by at least one leg having a base member, said stand
15 member also having tabs thereon;

wherein said tabs of said stand are positioned within said holes of the last tray of said multi-tray unit.

12. The storage unit according to claim 10, wherein said stand of said standing modular multi-tray unit further comprises:

20 a trapezoidally shaped stand member having a base member at a bottom thereof, said stand member also having tabs thereon; and

wherein said tabs of said stand are positioned within said holes of the last tray of said multi-tray unit.

25 13. The storage unit according to claim 7, wherein said multi-tray unit is positioned within a drawer.

14. The storage unit according to claim 7, wherein said multi-tray unit is hung on a vertical surface.

15. The storage unit according to claim 14, further
30 comprising: a hanger arm, said hanger arm extending out from said vertical surface and having a clip supporting portion thereon;

a hanger clip, said hanger clip having an overhanging portion and being fixed to a back surface of said last tray of
35 said multi-tray combination;

whereby said multi-tray unit is hung on said vertical surface by resting said overhanging portion of said hanger clip on said clip supporting portion of said hanger arm.

16. The storage unit according to claim 15, wherein each of
5 said hanger clips further comprises a surface having an adhesive backing thereon, and said hanger clip is fixed to said back surface of said last tray of said multi-tray unit by placing said back surface of said last tray of said multi-tray unit in contact with said adhesive backing.

10 17. The storage unit according to claim 14, further comprising:

a first horizontal member having an upwardly extending channel fixedly attached to said vertical surface;

15 a second horizontal member having a downwardly extending channel fixedly attached to a back surface of said last tray of said multi-tray unit;

wherein by positioning said downwardly extending channel in said upwardly extending channel, said multi-tray unit is hung from said vertical surface.

20 18. The storage unit according to claim 17, wherein said first and second horizontal members are fixedly attached to their respective surfaces by adhesive.

19. The storage unit according to claim 14, further comprising:

25 a top hanger having upper and lower horizontal members connected by at least one leg having a horizontal support at a top thereof, said top hanger having tabs thereon;

30 wherein said tabs of said top hanger are positioned within said holes of the last tray of said multi-tray unit; and said horizontal support is placed over a top of a vertical surface to hang said multi-tray unit.

20. The storage unit according to claim 19, wherein said top hanger can be inverted to be used as a stand for the modular multi-tray unit.

1/7

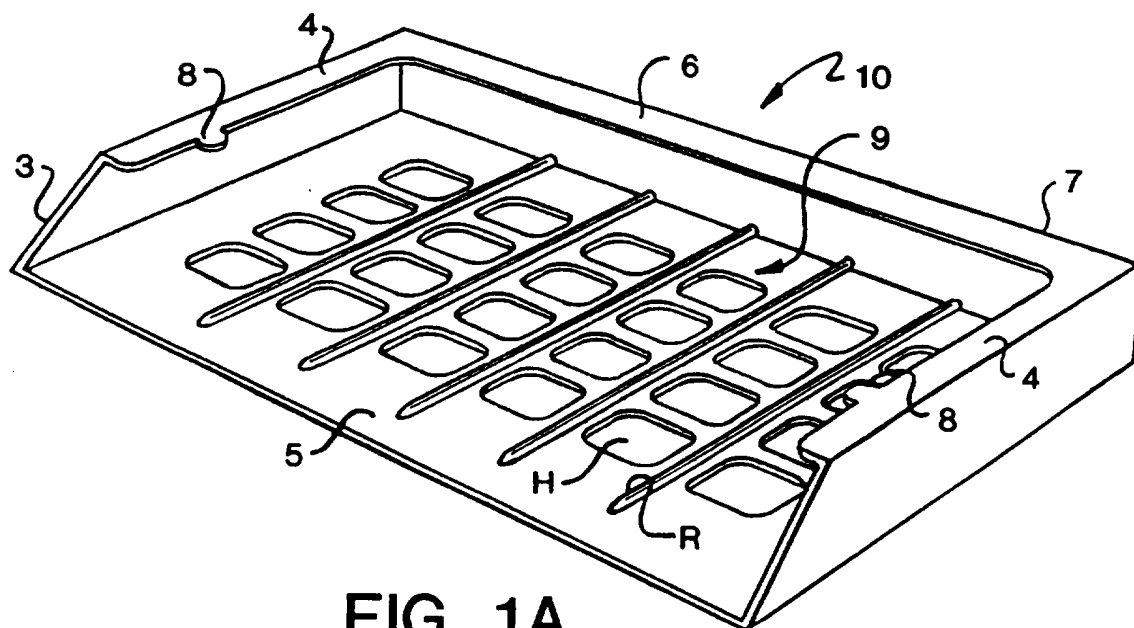


FIG. 1A

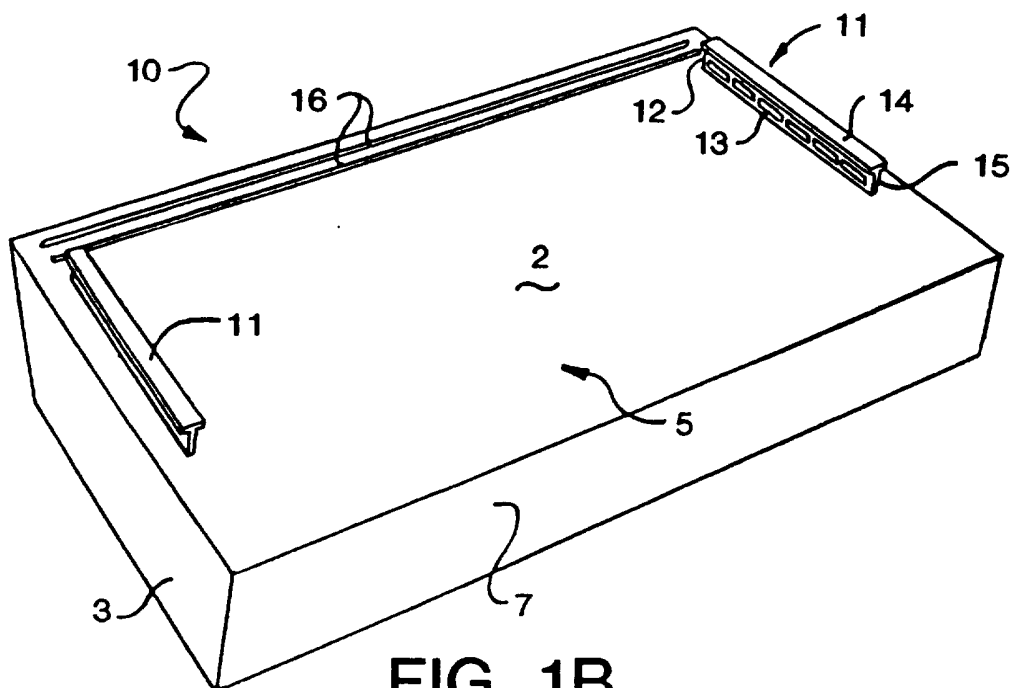


FIG. 1B

2/7

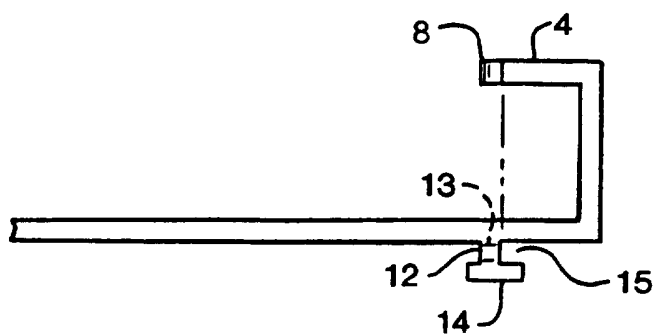


FIG. 1C

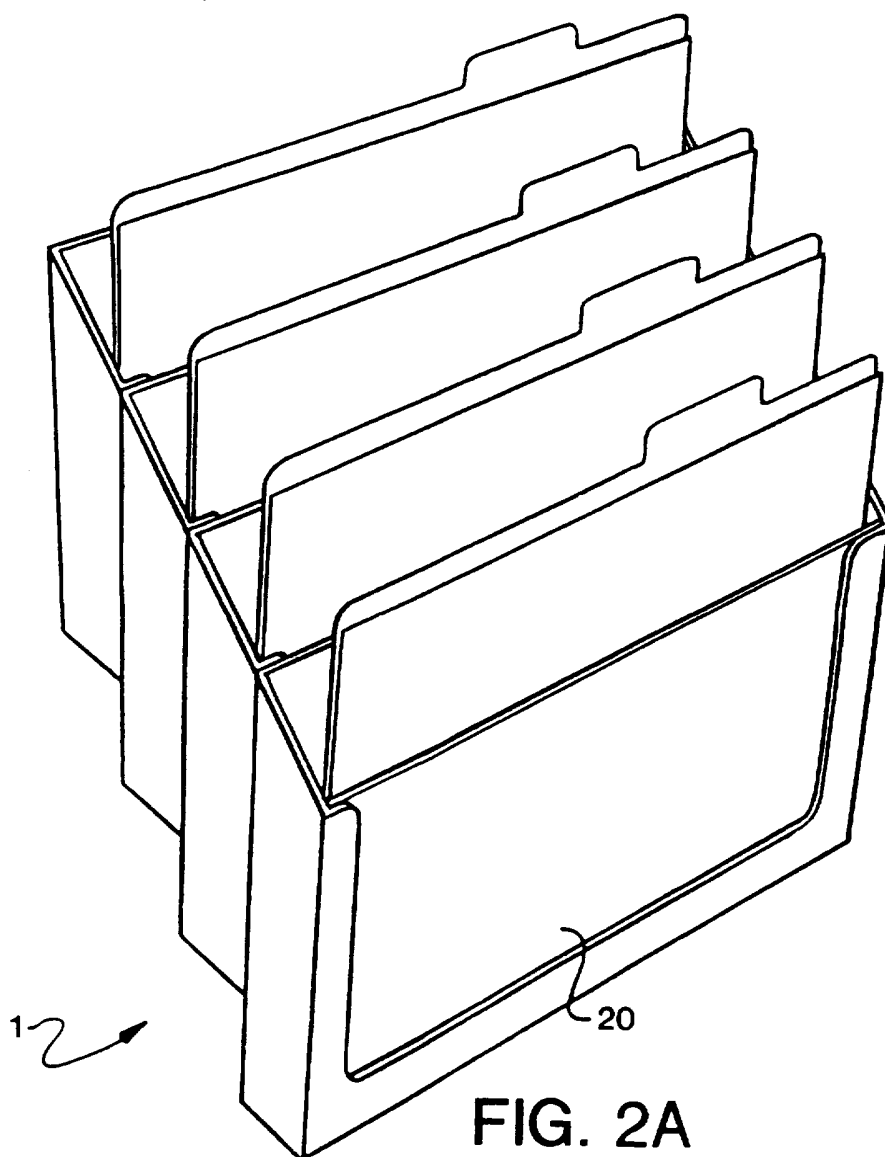


FIG. 2A

3/7

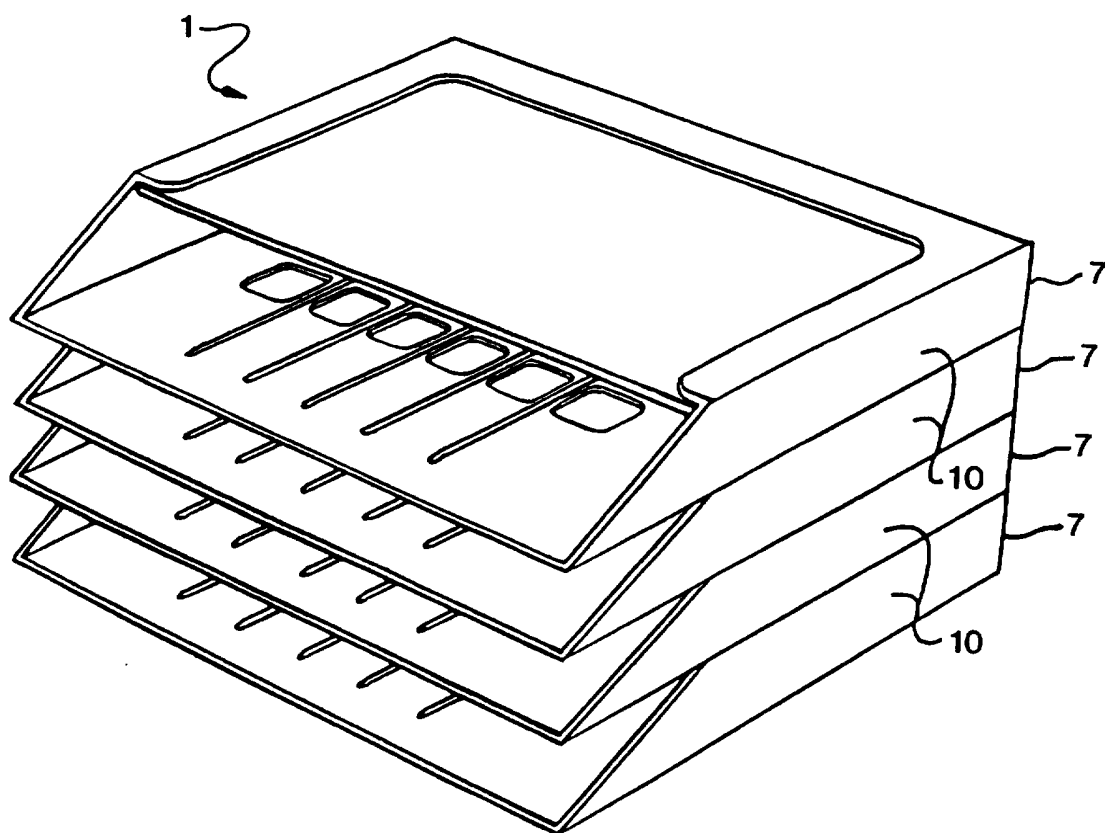


FIG. 2B

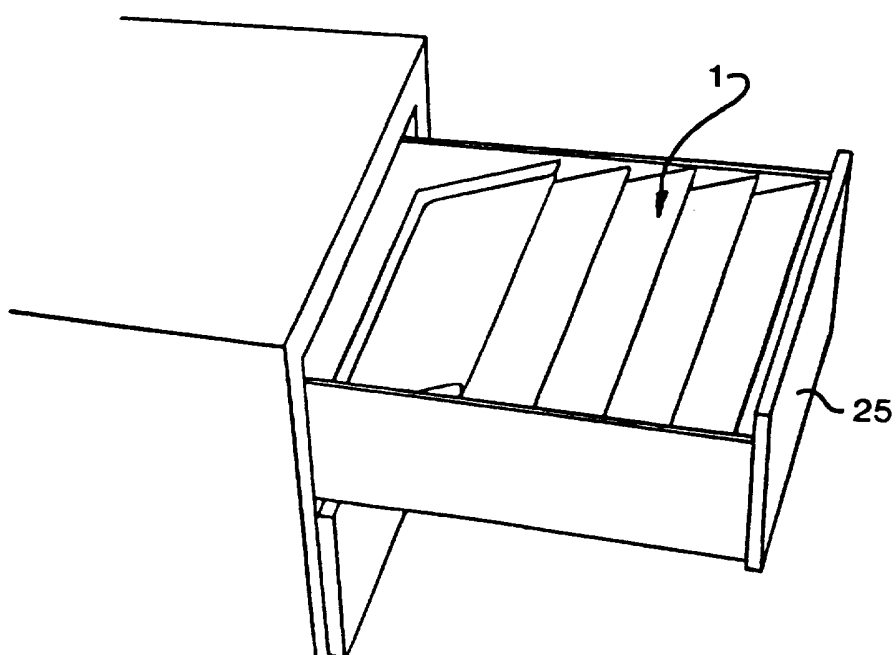


FIG. 3

4/7

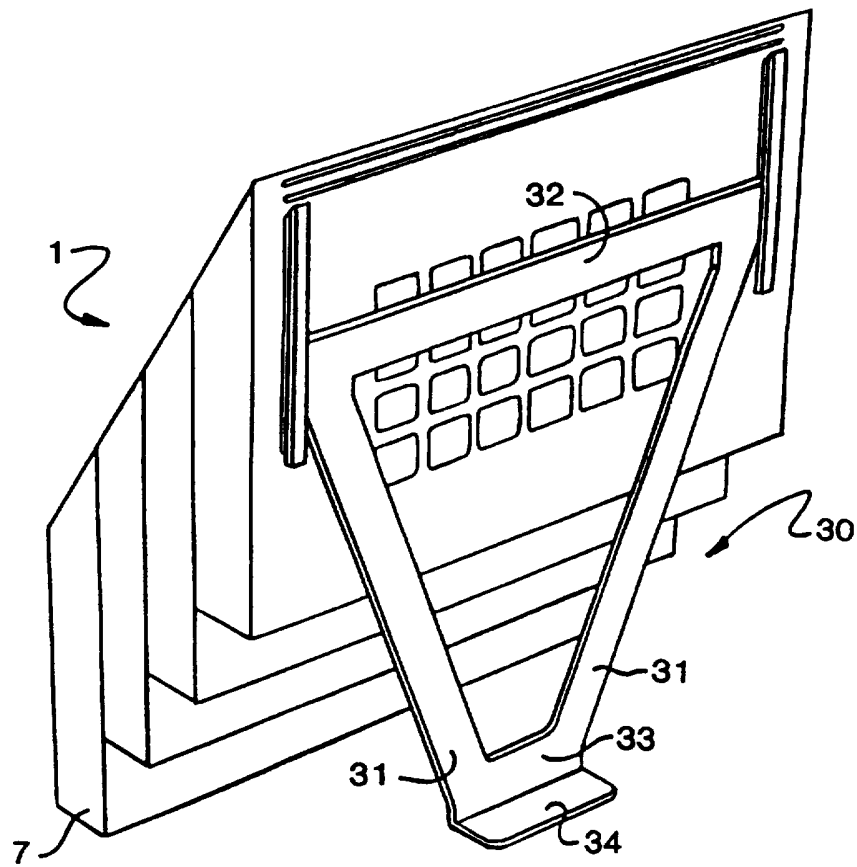


FIG. 4A

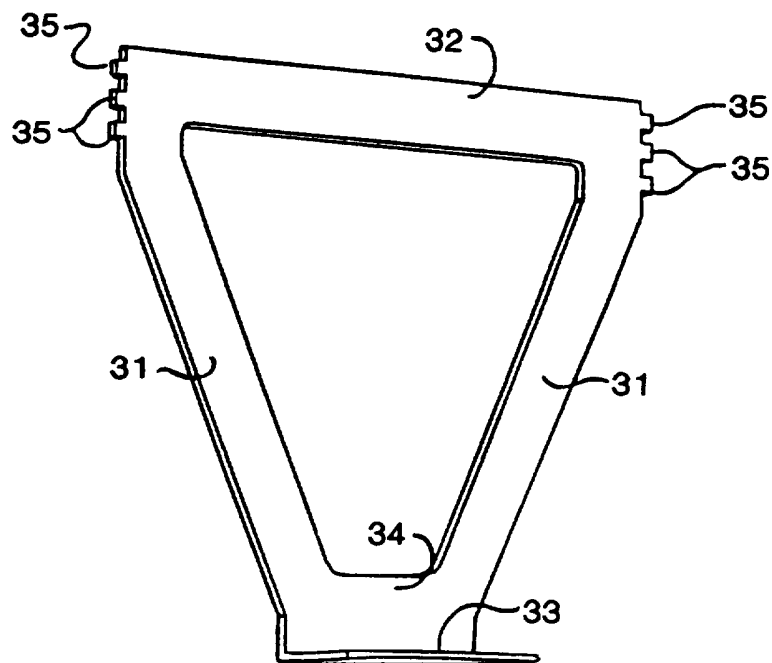


FIG. 4B

5/7

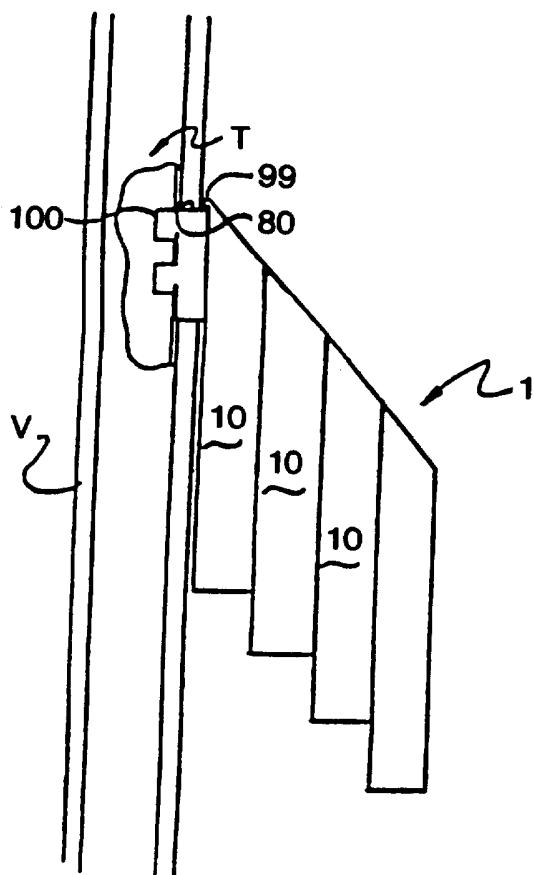


FIG. 5A

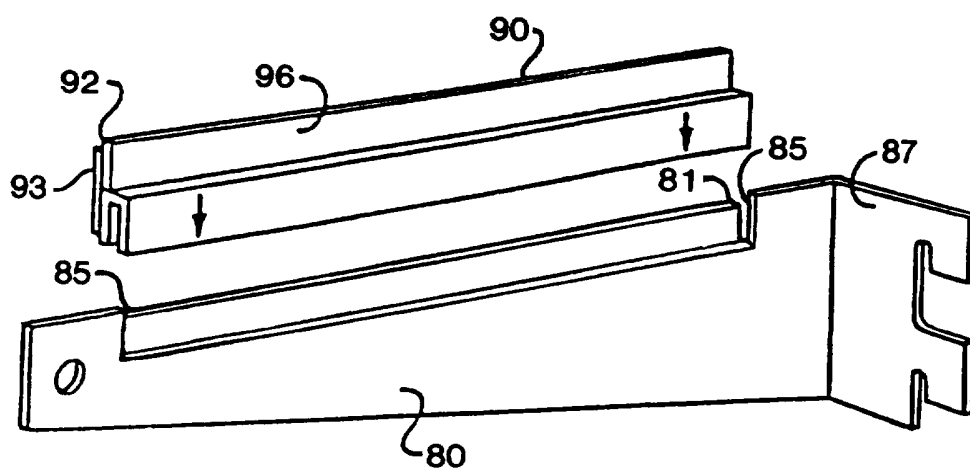


FIG. 5B

6/7

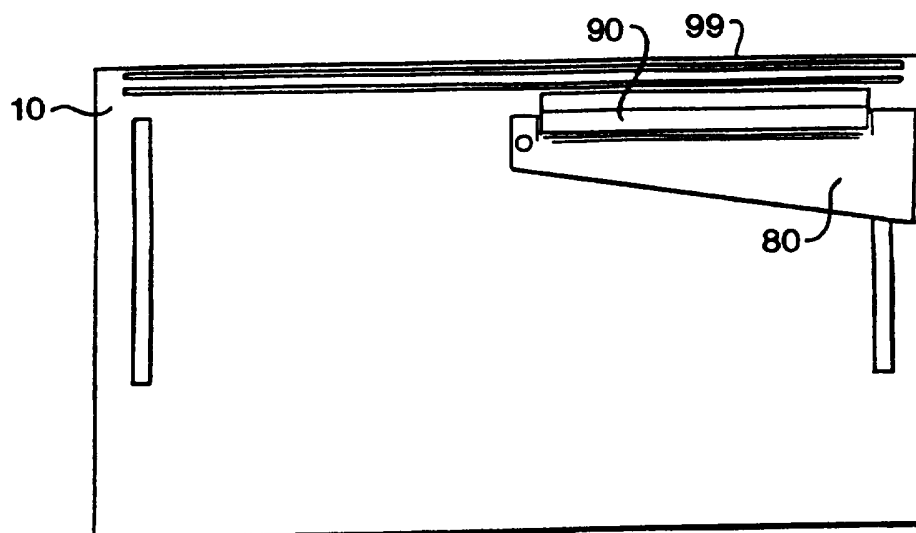


FIG. 5C

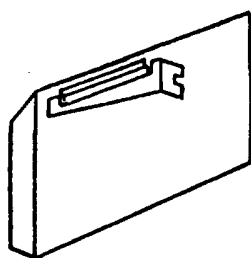


FIG. 5D

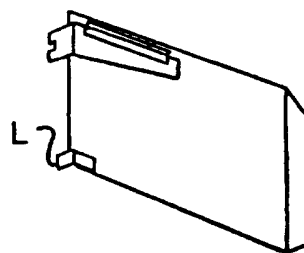


FIG. 5E

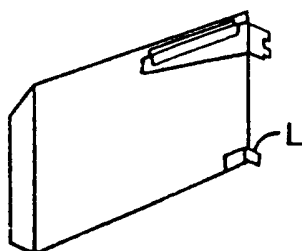


FIG. 5F

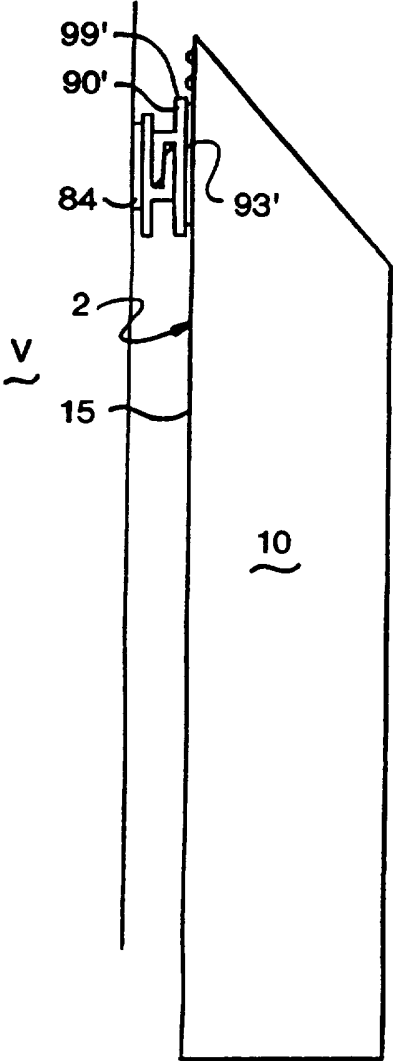


FIG. 6A

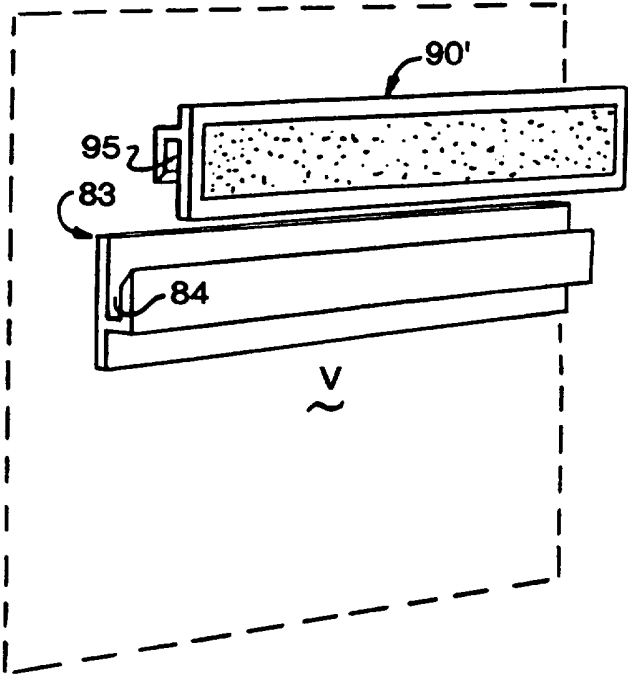


FIG. 6B

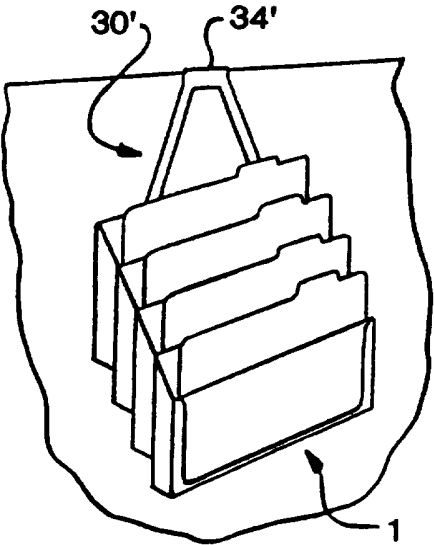


FIG. 7

INTERNATIONAL SEARCH REPORT

International Application No
PC1/CA 95/00692

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 A47F7/14 A47B87/02

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 6 A47F A47B

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)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE,U,91 12 506 (ELDON INDUSTRIES, INC.) 21 November 1991 see figures ---	1,2,4,7, 14,15
A	FR,A,2 638 954 (RACCAH) 18 May 1990 see the whole document ---	1,2,7,14
A	WO,A,89 00509 (BYBE PRODUCTS LIMITED) 26 January 1989 see abstract; figures ---	1-4,6,7
A	DE,U,88 08 344 (BOURBON) 25 August 1988 see claims 1,5 ---	1,16,18
A	US,A,4 871 218 (SWINSON) 3 October 1989 see the whole document -----	1,7,8, 10-12

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

☒ Patent family members are listed in annex.

* Special categories of cited documents :

- * "A" document defining the general state of the art which is not considered to be of particular relevance
- * "E" earlier document but published on or after the international filing date
- * "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- * "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.

* "&" document member of the same patent family

Date of the actual completion of the international search

20 March 1996

Date of mailing of the international search report

04. 04. 96

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+ 31-70) 340-2040, Tx. 31 651 epo nl,
Fax (+ 31-70) 340-3016

Authorized officer

Pineau, A

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/CA 95/00692

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE-U-9112506	21-11-91	US-A- 5085328 AU-B- 636040 AU-B- 7918791 CA-A- 2045163 FR-A- 2667771 GB-A, B 2248765 IT-Z- 221949 JP-A- 4259407	04-02-92 08-04-93 16-04-92 16-04-92 17-04-92 22-04-92 29-12-94 16-09-92
FR-A-2638954	18-05-90	NONE	
WO-A-8900509	26-01-89	NONE	
DE-U-8808344	25-08-88	FR-A- 2617386 FR-A- 2621800 GB-A- 2207274	06-01-89 21-04-89 25-01-89
US-A-4871218	03-10-89	NONE	