



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
17.07.2013 Bulletin 2013/29

(51) Int Cl.:
A47F 9/04 (2006.01)

(21) Application number: **13388001.3**

(22) Date of filing: **08.01.2013**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME

(72) Inventor: **Crysell, Mark Simon**
9400 Norresundby (DK)

(74) Representative: **Larsen, Hans Ole et al**
Larsen & Birkeholm A/S
Skandinavisk Patentbureau
Banegaardspladsen 1
1570 Copenhagen V (DK)

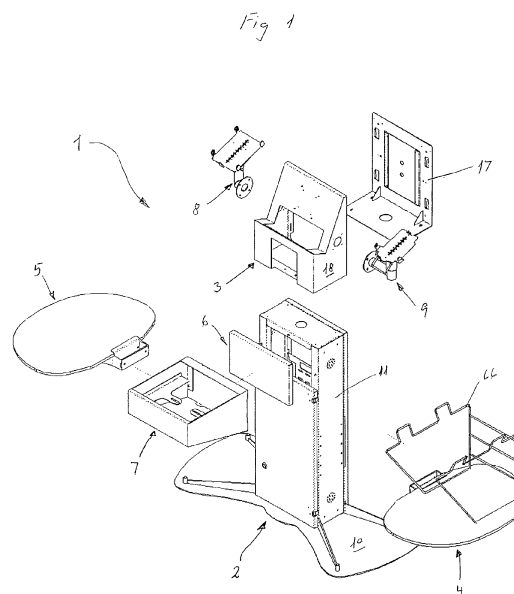
(30) Priority: **12.01.2012 DK 201200032**

(71) Applicant: **Ergonomic Solutions Manufacturing A/S**
9400 Nørresundby (DK)

(54) **A system comprising a tower module, a top module as well as a plurality of additional modules**

(57) The invention relates to a system for the building of a free-standing tower structure (1) for the support of electronic equipment, comprising a tower module (2) and a top module (3) as well as a plurality of supplementary modules to be mounted on the tower module or the top module, said tower structure, in cooperation with selected electronic equipment, constituting a functional unit, such as a self-service checkout station, a storage control desk, an info stand or the like, characterized in that the tower module (2) comprises a foot plate (10) and a cabinet (11) secured to the foot plate, said cabinet being equipped with a mounting position (12) for the top module (3) and a mounting position (13, 14) for supplementary modules, and that the top module comprises a mounting plate (17) and a housing (18) coupled to the mounting plate, said housing being equipped with a mounting position (15) for supplementary modules and a mounting position (16) for electronic equipment, and that the supplementary modules comprise packaging shelves (4, 5) with and without a bag holder (66), a blind plate (6), a frame-shaped shelf (7) as well as arms (8, 9) for the support of electronic equipment.

This provides a relatively inexpensive and flexible mechanical structure which requires a minimum of floor space, which makes it movable, and which allows layout, expansion and change, as needed, in a simple manner.



Description

The prior art

[0001] The invention relates to a system which comprises a tower module, a top module as well as a plurality of supplementary modules, and which may be combined to create various configurations.

[0002] Systems of this type are used in particular for the building of self-service checkout stations in supermarkets and similar establishments,

[0003] The specification of US 2009/0188757 A1 discloses an example of a system comprising a tower structure with a cabinet (94), electrical equipment and a bag holder.

[0004] This known system, however, is vitiated by the drawback that it cannot be built with various modules and thus cannot be built to the full extent to achieve the desired structures and thereby the desired applications, since the system does not have the necessary mounting positions.

The object of the invention

[0005] It is the object of the invention to remedy or remove the drawbacks and inexpedient circumstances with respect to the erection and equipment of self-service checkout stations, which are described above.

[0006] Moreover, it is an object to provide a relatively inexpensive and flexible mechanical structure of the invention, which requires a minimum of floor space, which makes it movable, and which allows layout, extension and change in a simple manner according to the desires of the supermarket/user.

Disclosure of the invention

[0007] The object stated above is achieved by modules for the building of a free-standing tower structure for the support and mounting of electronic equipment, as stated in the introductory portion of claim 1, wherein the tower module comprises a foot plate and a cabinet secured to the foot plate, said cabinet being equipped with mounting positions for the top module and one or more supplementary modules, and wherein the top module comprises a mounting plate and a housing coupled to the mounting plate, said housing being equipped with mounting positions for electronic equipment and for one or more supplementary modules, and wherein the supplementary modules comprise packaging shelves with and without a bag holder, a blind plate, a frame-shaped shelf as well as arms for supporting electronic equipment.

[0008] Hereby, it is possible to build a tower structure consisting of a tower module and a top module as well as one or more supplementary modules, and to equip the top module and the supplementary modules with electronic equipment according to the customer's wishes for functions and make.

[0009] In this manner, the tower structure may form the basis for the creation of self-service checkout stations, stock control modules, info stands and the like.

[0010] With the cabinet secured to the foot plate and with the top plate secured to the cabinet, it is moreover ensured that a free-standing tower structure is achieved, which only takes up floor space corresponding to the area of the floor plate. The tower structure is movable and may freely be arranged on both sides of a gangway.

[0011] As stated in claim 2, the cabinet comprises two side plates with front edges perpendicular to the side plate, a top plate with a front edge perpendicular to the front plate, a bottom plate, a rear plate and a front door, and wherein each of the side plates is equipped with mounting positions for the shelves, said mounting positions being formed by attachment holes arranged in pairs after each other in a row, and wherein the mounting position for the blind plate or the frame-shaped shelf is formed by attachment holes disposed centrally on the front edge of the top plate and on the uppermost part of the front edge of the side plates, and wherein the mounting position for the top module is formed by attachment holes disposed at their respective corners of the top plate.

[0012] It is ensured hereby that the cabinet constitutes a stable supporting element for the packaging shelves and for the top module, and that the positions of the attachment holes provide the possibility of selecting a mounting height for the packaging shelves. Moreover, it makes it possible either to mount a blind plate or a frame-shaped shelf on the front edge of the cabinet immediately above the front door depending on the customer's desires.

[0013] As stated in claim 3, the mounting plate of the top module is bent at a right angle, so that it is formed by a horizontal plate part, which is equipped with attachment holes disposed so as to match the positions of the attachment holes in the top plate of the cabinet, and a vertical plate part, which is equipped with a service opening as well as at least two hooks for securing the housing of the top module.

[0014] With the mounting plate secured to the top plate, an engagement face with hooks is established, which facilitates mounting and attachment of the housing of the top module, and the service opening provides for the ability to service equipment in the interior of the housing.

[0015] As stated in claim 4, the housing of the top module has a ground plan with attachment holes, which match both the attachment holes in the horizontal part of the mounting plate of the top module and the top plate of the cabinet, a front side with a cut-out for electronic equipment, such as a commodity scanner, two sides with mounting positions formed by attachment holes for arms for the support of electronic equipment, such as a printer and/or a card terminal, a partly open rear side with at least two slots configured to engage the hooks on the mounting plate, as well as an inclined plane facing toward the front side and having mounting positions formed by attachment holes according to the VESA standard for

electrical equipment, such as a flat-screen.

[0016] This ensures that it is possible to pass the hooks of the mounting plate and the slots of the housing into each other by a simple downward movement, thereby securing the housing and thus the top module to the top plate of the cabinet.

[0017] Further, with the top module arranged on top of the tower module, it is ensured that the electrical equipment is arranged at an operation-friendly and ergonomically correct height and within normal reach and reading distance for an attendant, so that the attendant does not have to move in connection with the registration and payment for the commodity.

[0018] As stated in claim 5, the packaging shelf comprises a laminated plate with rounded edges and corners secured to a shelf bracket, said shelf bracket being configured to engage the side plates of the cabinet at a selected height opposite a pair of the attachment holes of the mounting position, said plate being equipped with predrilled holes below the laminate for the attachment of a bag holder.

[0019] Hereby, it is possible to mount a packaging shelf on the side plates of the cabinet at a desired height e.g. for a shopping basket, and to use the same laminated plate irrespective of the use of a bag holder.

[0020] As stated in claim 6, the packaging shelf comprises a laminated plate with rounded edges and corners secured to a shelf bracket and a bag holder, said shelf bracket being configured to engage the side plates of the cabinet at a selected height opposite a pair of the attachment holes of the mounting position, said bag holder being made of wire and secured to the laminated plate through the predrilled holes.

[0021] Hereby, it is ensured that a packaging shelf with a bag holder may be mounted on the side plates of the cabinet, so that one side is equipped with a shelf for a shopping basket and the other with a shelf with a bag holder.

[0022] Finally, as stated in claim 7, it is expedient that the blind plate is configured with bent edges equipped with attachment holes which match the attachment holes of the cabinet, and which allow attachment of the blind plate from the inner side of the cabinet. Hereby, the blind plate appears without any signs of assembly.

[0023] As stated in claim 8, the frame-shaped shelf is equipped with attachment holes which match the attachment holes of the cabinet, as well as a bracket and an open top plan for receiving an electronic instrument, such as a scale and/or a commodity scanner.

[0024] It is ensured hereby that the frame-shaped shelf may be mounted on the upper part of the front edges of the cabinet, and that the tower structure may be expanded with an instrument shelf, as needed.

[0025] As stated in claim 9, the arms for the support of electronic equipment comprises a fixed pipe member and a pipe member rotatable about a vertical axis, and wherein the fixed pipe member is equipped with a flange with attachment holes which match the attachment holes on

the side of the top module, and wherein the rotatable pipe member is equipped with a mounting plate for an electronic instrument, such as a printer and/or a card terminal, said mounting plate being connected with the pipe member at a bearing with a horizontal axis.

[0026] It is ensured hereby that the electronic instruments may be mounted and adjusted about a vertical axis and a horizontal axis, so that the instruments are arranged in an operation-friendly and ergonomically optimal position relative to the attendant.

[0027] As stated in claim 10, it is expedient that the cabinet is equipped with a mounting plate for electrical units, such as computers, power supplies and the like, which are arranged inside the cabinet behind a lockable front door.

The drawing

[0028] Exemplary embodiments of the invention will be explained more fully below with reference to the drawing, in which:

- | | |
|------------|---|
| Fig. 1 | shows an exploded view of all the modules of the tower structure, in perspective, |
| fig. 2 | shows an exploded view of the tower modules with blind plate and door, in perspective, |
| fig. 3 | shows the cabinet of the tower module without blind plate and door, in perspective, |
| figs. 4-4a | show an exploded view of the top module with arms seen obliquely from the front, in perspective, |
| figs. 5-5a | show an exploded view of the top module with arms seen obliquely from behind, in perspective, |
| fig. 6 | shows an exploded view of a packaging module with a bag holder, in perspective, |
| fig. 7 | shows the tower structure in an embodiment with modules for a self-service check-out station, in perspective. |

Detailed description of the invention

[0029] A tower structure 1 according to the invention is shown in figures 1-7. Fig. 1 shows a perspective view in an exploded form of the tower structure with all the associated modules.

[0030] The tower module 2 comprises the foot plate 10 and the cabinet 11. The cabinet is secured to the foot plate by screw attachment.

[0031] The top module 3 comprises a mounting plate 17 and a housing 18.

[0032] The supplementary modules comprise a packaging shelf 4 with a bag holder 66, a packaging shelf 5 without a bag holder, a blind plate 6, a frame-shaped shelf 7, an arm 8 with a bend for supporting electronics as well as an arm 9 without a bend for supporting electronics.

[0033] It is shown in fig. 2 that the foot plate 10 of the tower module is equipped with five adjustment feet 34, four of said adjustment feet being arranged at the corners of the plate and one in the centre of the plate. The adjustment feet may be adjusted from the upper side of the foot plate with a tool after the removal of a plastics strap 35 (not shown). The foot plate is made of steel.

[0034] It is shown in figs. 2 and 3 that the cabinet 11 of the tower module comprises two side plates 19, which are configured with bent front edges 20 and rear edges 36, a top plate 21 with a front edge 22 and a rear edge 37, a bottom plate 23 configured like the top plate 21, a rear plate 24 with bent edges as well as a lockable front door 25 (figs. 1, 2).

[0035] In addition, the side plates 19 are provided with a mounting position 13 for the packaging shelves 4, 5. The mounting position 13 is formed by attachment holes 26 arranged in pairs after each other, so that the packaging shelves 4, 5 may be arranged in five different levels, as desired. Further, the side plates are provided with vent holes 38 at the top and at the bottom.

[0036] The top plate 21 and the bottom plate 23 are constructed identically. The front edge 22 and the rear edge 37 are bent at a right angle to the plane of the top plate. The side edges 39 are likewise bent at a right angle to the plane of the top plate, and the side edges are reinforced by a bracket 40, which is disposed internally between the side edges 39 and the top plate. Moreover, the top plate is provided with a hole 41 in the centre of the top plate for the running of cables.

[0037] In addition, the top plate is equipped with a mounting position 12 for the top module 3. The mounting position is formed by attachment holes 28 which are arranged at their respective corners of the top plate.

[0038] The rear plate 24 is rectangular in shape and covers the rear side of the cabinet. The rear plate is provided with bent edges and is secured to side plates and top and bottom plates by means of a special screw attachment, which is formed by a captive screw or a push-on fastener. The bent edges are cut away on the stretches which are opposite the mounting position 13 in order to make room for the mounting of the shelf bracket 62 (see fig. 6) and along the bottom of the rear plate to make room for the foot plate 10.

[0039] The front door 25 is rectangular in shape and covers about 75% of the front side of the cabinet. The front door is provided with bent edges and is mounted on the front edge 20 of a side plate 19 by means of two hinges 42. The hinges are mounted such that they cannot be removed from the outer side. Further, the front door is equipped with a lock 43, which requires a special key (see fig. 1 or 7).

[0040] The cabinet is additionally equipped with a mounting position 14 for a blind plate 6 or a frame-shaped shelf 7. The mounting position is formed by attachment holes 27 arranged centrally on the front edge 22 of the top plate 21 and on the uppermost part of the front edges 20 of the side plates 19.

[0041] A mounting plate 54 for electrical units of various types, such as a computer, power supplies and the like, is arranged in the inner space of the cabinet.

[0042] The cabinet is made of steel.

[0043] The mounting plate 17 of the top module is shown in figs. 4a and 5a and is formed by a plate bent at an angle so as to produce a horizontal plate part 29 and a vertical plate part 31. The horizontal plate part 29 is provided with attachment holes 30 and a hole 44 for the running of cables, so that it matches the top plate 21 of the cabinet. The vertical plate part 31 is provided with a service opening 32, hooks 33 for the attachment of the housing 18 of the top module as well as at least four holes 45 at each corner for optional wall mounting.

[0044] The housing 18 of the top module is shown in figs. 4 and 5 and is configured with a ground plan which matches the horizontal part 29 of the mounting plate and the top plate 21 of the cabinet. The front side 46 of the housing is provided with a cut-out 47 for electronic equipment, such as a commodity scanner. The sides 48 of the housing are equipped with a mounting position 15. The mounting position is formed by attachment holes 49 for arms 8, 9 for the support of electronic equipment. The rear side 50 of the housing, which is partly open, is provided with two to four slot-shaped cut-outs 51. The slots 51 are configured to engage the hooks 33 on the mounting plate. Moreover, the housing is provided with an inclined plane 52 facing toward the front side and having a mounting position 16 which is formed by attachment holes 53 according to the Vesa standard for electronic equipment, such as a monitor of the flat-screen type. The inclined position of the plane is selected to favour an advantageous position for the reading of the screen text.

[0045] The top module 3 is mounted on the tower module 2 by first securing the mounting plate 17 to the top plate 21 with at least two bolts, which are passed through the rearmost ones of the attachment holes 30 and 28, and then securing the housing 18 to the mounting plate 17 by a downward movement, so that the hooks 33 and the slot 51 engage each other. Then, two additional bolts may be passed through the front attachment holes in the housing, the top plate and the mounting plate. The top module is made of steel.

[0046] The arm 8, 9 for the support of electronic equipment is shown in figs. 4 and 5 and comprises a fixed pipe member 55 and a pipe member 56 rotatable about a vertical axis, said fixed pipe member 55 being equipped with a flange 57 with attachment holes 58 which match the attachment holes 49 on the side of the housing 18. The rotatable pipe member is equipped with a mounting plate 59 for electrical equipment, such as e.g. printers or card terminals. The mounting plate 59 is anchored to the pipe

member 56 at a horizontally disposed bearing 60. In an embodiment, the arm 8 may be provided with a bend on the fixed pipe member 55. The arms are made of steel. The mounting plate 59 may be adjusted about a vertical axis and about a horizontal axis. Hereby, it may be set at an angle which is operation-friendly and ergonomically correct relative to a user.

[0047] The operation height of the electronic equipment is determined on the basis of ergonomic recommendations and anthropometric data.

[0048] The packaging shelf 4, 5 is shown in fig. 6 and comprises a wooden plate 61 secured to a shelf bracket 62 of steel. The wooden plate is provided with rounded edges and corners and is equipped with a laminated surface. The shelf bracket is provided with two supporting arms and arranged to engage the side plates 19 of the cabinet at a selected height opposite a pair of the attachment holes 26 of the mounting position 13. On the lower side, the wooden plate is equipped with predrilled holes 63, which, however, do not penetrate the laminated surface.

[0049] In an embodiment, the packaging shelf 4 moreover comprises a bag holder 66, which is made of steel wire. The bag holder is screwed on to the wooden plate via the predrilled holes 63.

[0050] When the packaging shelves 4, 5 are mounted on their respective sides of the cabinet, it is ensured that a user may place his/her shopping basket on the one shelf, from which the commodity is taken, registered and put down into a bag on the other shelf. The height of the shelves is selected on the basis of the desire for having an ergonomically correct working position, so that all functions may be performed in a coherent sequence.

[0051] The frame-shaped shelf 7, which is shown in figs. 1 and 7, is equipped with attachment holes which match the attachment holes 27 of the cabinet, as well as suspension brackets 65. Further, the shelf is configured with an open top plan 67 for receiving an electronic instrument, such as a scale and/or a commodity scanner.

[0052] The size of the opening of the top plan and the configuration of the suspension bracket are determined by the type of scale and/or commodity scanner which is selected.

[0053] If the shelf 7 is not to be used, the blind plate 6 is mounted instead, which is provided with bent edges, and which likewise has attachment holes matching the attachment holes 27 of the cabinet.

[0054] In an embodiment, a free-standing info stand may be established by coupling the tower module 2 and the top module 3 together and by mounting a flat-screen with a finger-touch function. Such an info stand is movable and may be used in numerous situations at many places.

[0055] In another embodiment, a free-standing stock control desk may be established by coupling the tower module and the top module together and by equipping the top module with a flat-screen with a finger-touch function and a commodity scanner. Such a desk may be set

up as an independent unit in a storage room, but it may also be set up as a unit in cooperation with other similar units.

[0056] In a third embodiment, the top module may be equipped with a flat-screen and a commodity scanner and be suspended from a wall. When a customer moves a commodity past the scanner, information on the commodity, its contents and its price will appear.

[0057] In a special embodiment, the tower module 2 may be replaced by a coin and banknote machine. In that case, the machine is equipped with a mounting position 13 for packaging shelves 4, 5 on each side and a mounting position 12 for the top module 3 on the upper side of the machine. The machine may additionally be provided with a cut-out in the upper side e.g. for an electronic scale and/or a commodity scanner. Such a solution will be interesting in particular in those markets where credit cards or payment cards have not been adopted to the full extent.

[0058] The stated embodiments should not be considered to be exhaustive for the use of the invention. A constant development within registration and payment of commodities is taking place, including the development of checkout lanes and electronic devices for checkout lanes, which, in many case, will involve adaptations or extension of the modules of the invention. Such changes are also within the idea and scope of the invention.

Claims

1. A system, which comprises a tower module (2), a top module (3) as well as a plurality of supplementary modules, and which may be combined to create various configurations, **characterized in that** the tower module (2) comprises a foot plate (10) and a cabinet (11) secured to the foot plate, said cabinet being equipped with a mounting position (12) for the top module (3) and a mounting position (13, 14) for supplementary modules, and that the top module comprises a mounting plate (17) and a housing (18) coupled to the mounting plate, said housing being equipped with a mounting position (15) for supplementary modules and a mounting position (16) for electronic equipment, and that the supplementary modules comprise packaging shelves (4, 5) with and without a bag holder (66), a blind plate (6), a frame-shaped shelf (7) as well as arms (8, 9) for the support of electronic equipment.

2. A system according to claim 1, **characterized in that** the cabinet (11) comprises two side plates (19) with front edges (20) perpendicular to the side plate, a top plate (21) with a front edge (22) perpendicular to the top plate, a bottom plate (23) corresponding to the top plate, a rear plate (24) and a front door (25), and that each of the side plates is equipped with the mounting position (13) for the packaging shelves (4,

- 5), said mounting position being formed by attachment holes (26) arranged in pairs after each other in a row, and that the mounting position (14) of the blind plate (6) or the frame-shaped shelf (7) is formed by attachment holes (27) disposed centrally on the front edge (22) of the top plate and on the uppermost part of the front edge (20) of the side plates, and that the mounting position (12) for the top module (3) is formed by attachment holes (28) disposed at their respective corners of the top plate.
3. A system according to claims 1-2, **characterized in that** the mounting plate (17) of the top module is bent at a right angle, so that it is formed by a horizontal plate part (29), which is equipped with attachment holes (30) disposed so as to match the attachment holes (28) in the top plate (21), and a vertical plate part (31), which is equipped with a service opening (32) as well as at least two hooks (33) for the attachment of the housing (18) of the top module.
4. A system according to claims 1-3, **characterized in that** the housing (18) of the top module has a ground plan which matches both the horizontal plate part (29) of the mounting plate of the top module and the top plate (21) of the cabinet, a front side (46) with a cut-out (47) for electronic equipment, such as a commodity scanner, two sides (48) with mounting positions (15) formed by attachment holes (49) for arms (8, 9) for the support of electronic equipment, such as a printer and/or a card terminal, a rear side (50) with at least two slots (51) configured to engage the hooks (33) of the mounting plate (17), as well as an inclined plane facing toward the front side and having a mounting position (16) which is formed by attachment holes according to the Vesa standard for electronic equipment, such as a flat-screen.
5. A system according to claims 1-2, **characterized in that** the packaging shelf (5) comprises a laminated wooden plate (61) with rounded edges and corners and a shelf bracket (62), and that the shelf bracket is configured to engage the side plates (19) of the cabinet at a selected height opposite a pair of the attachment holes (26) of the mounting position, and that the lower side of the wooden plate is equipped with predrilled holes (63) for a bag holder (66).
6. A system according to claims 1-2 and 5, **characterized in that** the packaging shelf (4) comprises a laminated wooden plate (61) with rounded edges and corners and a shelf bracket (62), and that the shelf bracket is configured to engage the side plates (19) of the cabinet at a selected height opposite a pair of the attachment holes (26) of the mounting position, and that the bag holder (66) is screwed on to the wooden plate (61) via the holes (63).
7. A system according to claims 1-2, **characterized in that** the blind plate (6) is provided with bent edges equipped with attachment holes which match the attachment holes (27) of the cabinet.
8. A system according to claims 1-2, **characterized in that** the frame-shaped shelf (7) is equipped with attachment holes which match the attachment holes (27) of the cabinet, as well as a bracket (65) and an open top plan (67) for receiving electronic equipment, such as a scale and/or a commodity scanner.
9. A system according to claims 1-4, **characterized in that** the arms (8, 9) for support comprise a fixed pipe member (55) and a pipe member (56) rotatable about a vertical axis, and that the fixed pipe member is equipped with a flange (57) with attachment holes (58) matching the attachment holes (49) on the side of the housing (18), and that the rotatable pipe member is equipped with a mounting plate (59) for electronic equipment, such as a printer and/or a card terminal, said mounting plate being connected with the pipe member at a bearing (60) with a horizontal axis.
10. A system according to claims 1-2, **characterized in that** the cabinet additionally comprises a mounting plate (54) for electronic units to be arranged internally in the cabinet behind the front door (25), said front door being lockable.

Fig 1

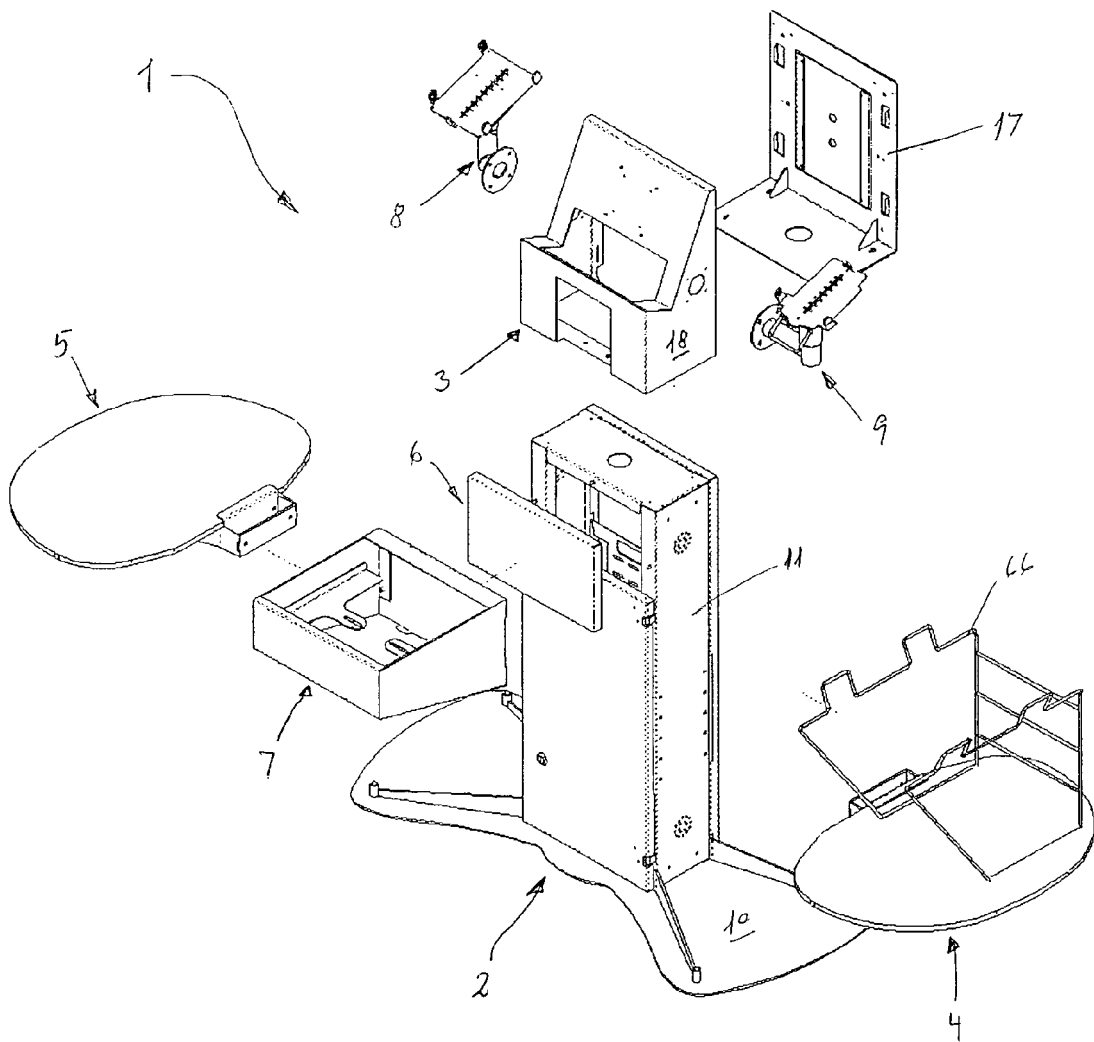


Fig. 2

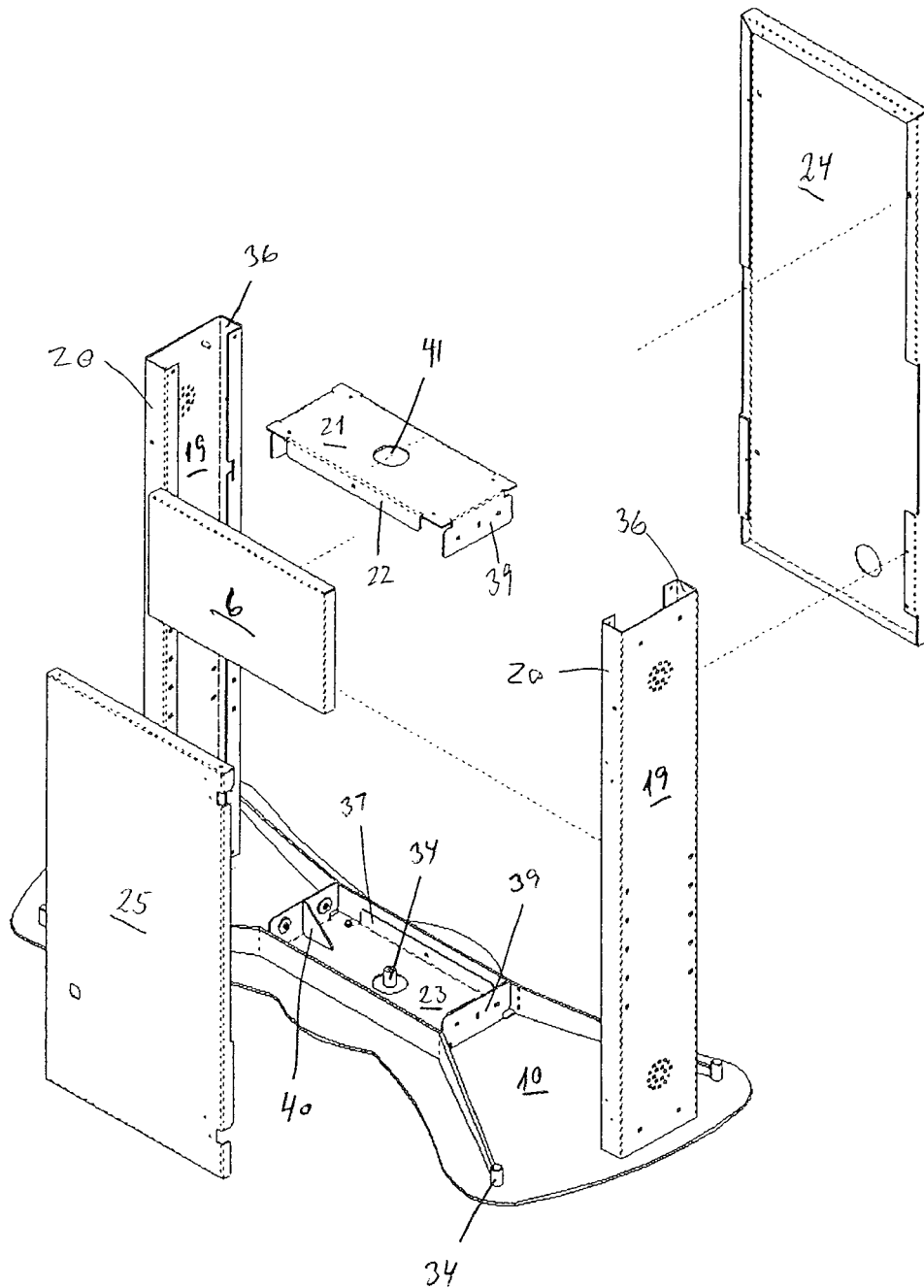


Fig. 3

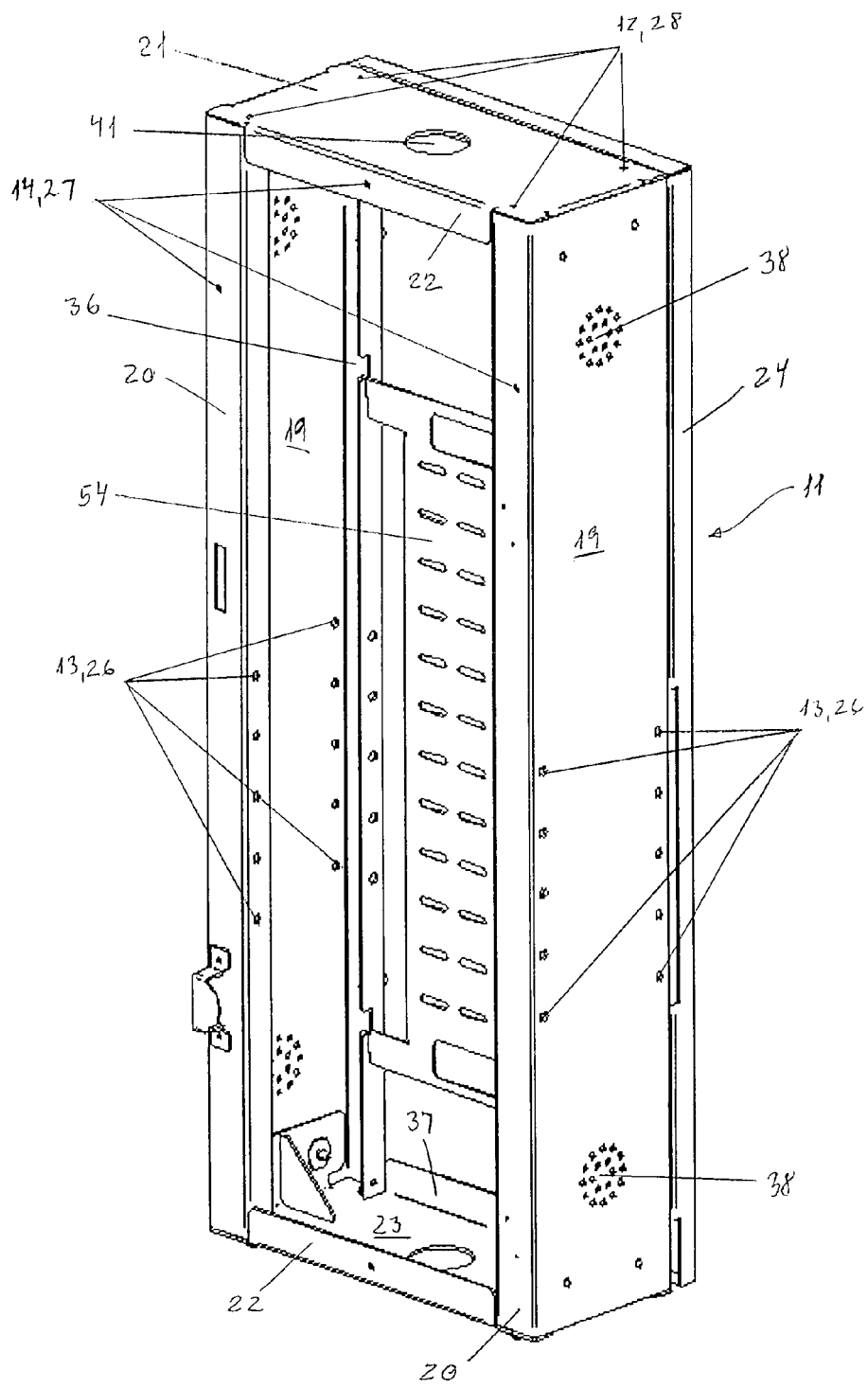


Fig. 4

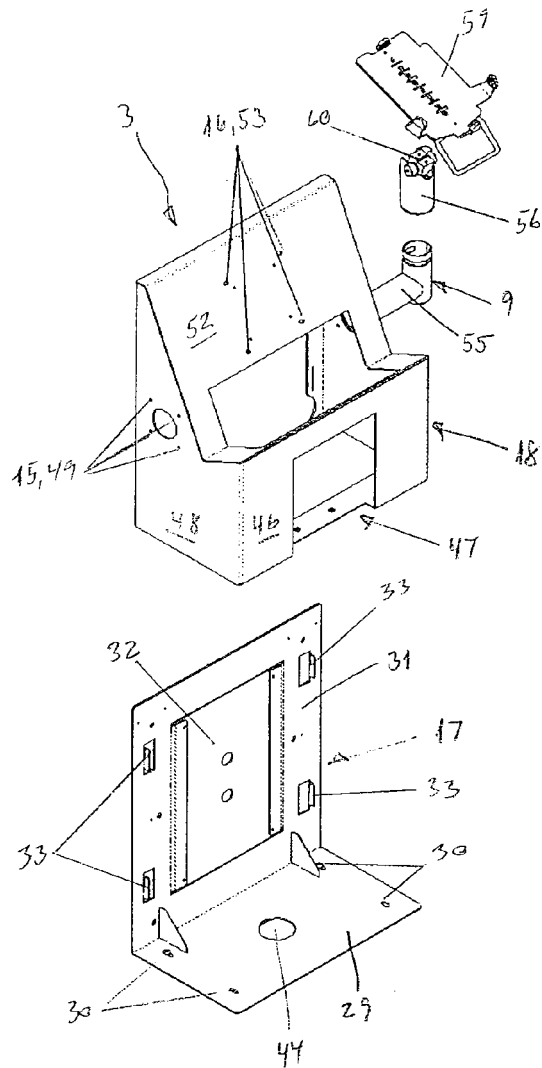


Fig. 4a

Fig. 5

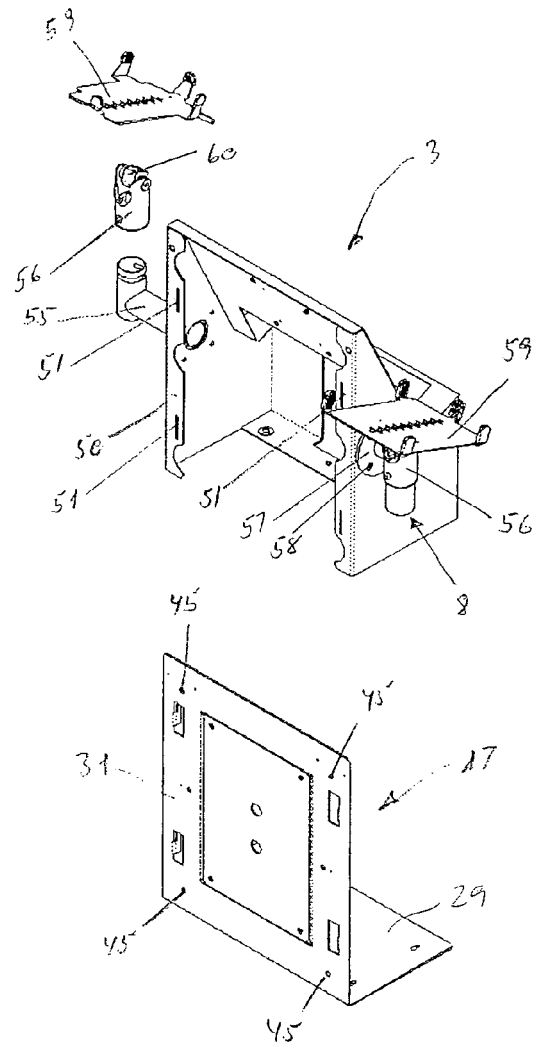


Fig. 5a

Fig. 6

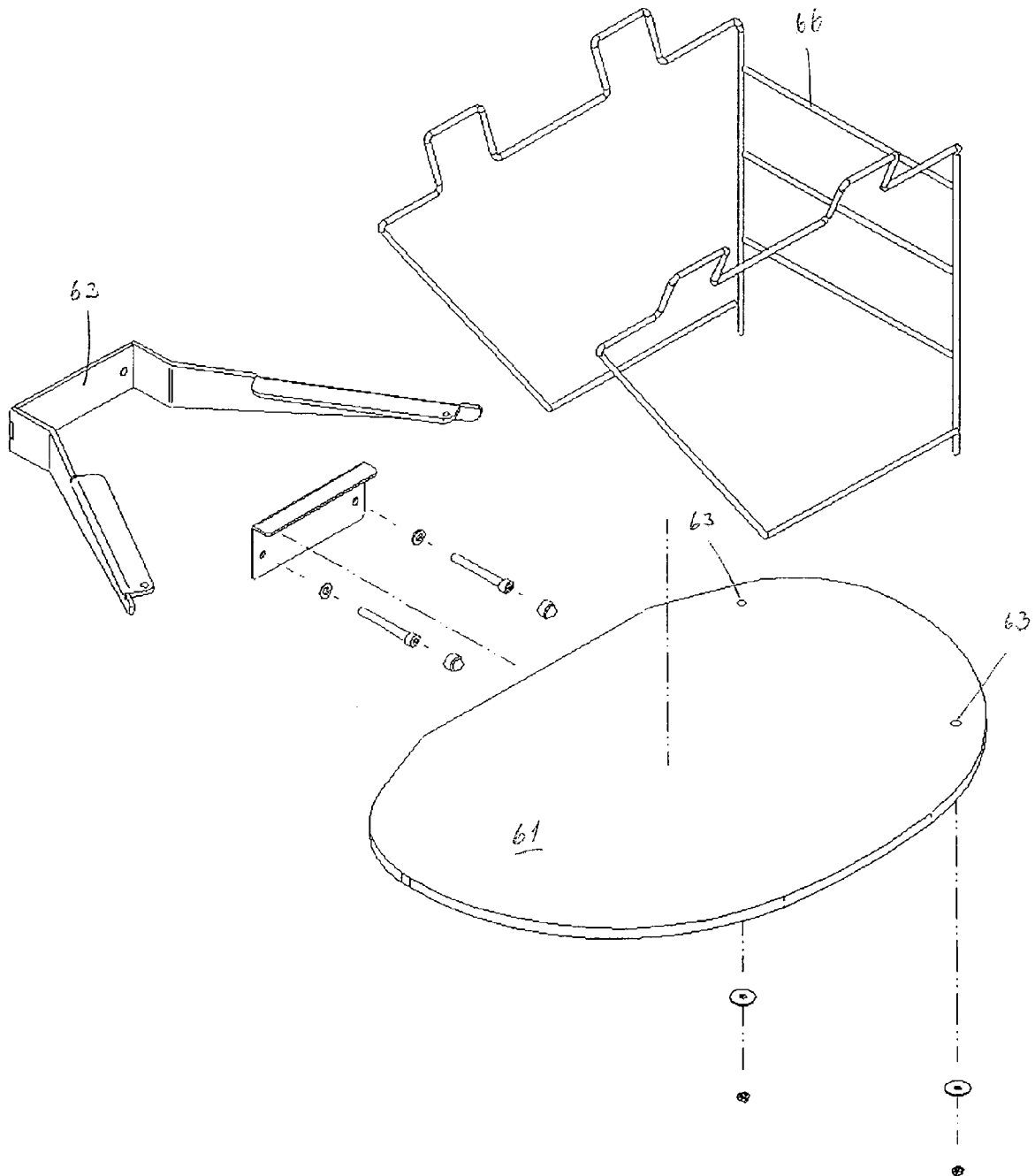
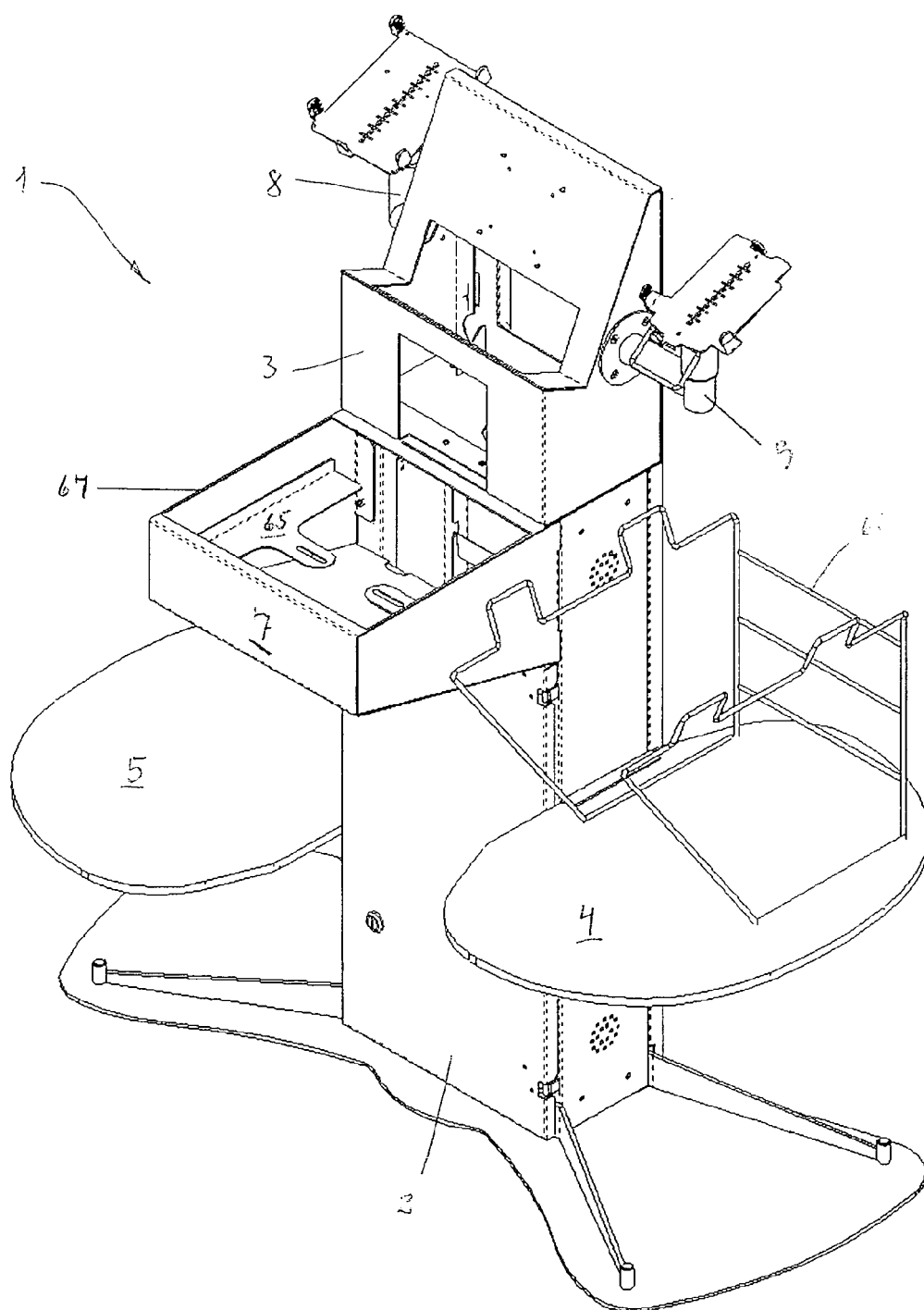


Fig 7





EUROPEAN SEARCH REPORT

Application Number
EP 13 38 8001

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	US 2003/226891 A1 (SATO SHIGERU [JP]) 11 December 2003 (2003-12-11) * paragraph [0018] * * figure 1 *	1,5,10	INV. A47F9/04
X	EP 0 445 422 A1 (SIEMENS NIXDORF INF SYST [DE]) 11 September 1991 (1991-09-11) * figures 1,2 *	1,5,10	
A	US 4 113 331 A (DERDZINSKI TERRENCE EDMUND ET AL) 12 September 1978 (1978-09-12) * column 2, line 30 - line 38 * * figure 2 *	1	
A,D	US 2009/188757 A1 (COX AARON R [US] ET AL) 30 July 2009 (2009-07-30) * the whole document *	1	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			A47F
Place of search		Date of completion of the search	Examiner
The Hague		11 March 2013	Bitton, Alexandre
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

 2
EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 13 38 8001

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

11-03-2013

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2003226891 A1	11-12-2003	JP 3626738 B2	09-03-2005
		JP 2003281624 A	03-10-2003
		US 2003226891 A1	11-12-2003

EP 0445422 A1	11-09-1991	DE 4007219 A1	12-09-1991
		EP 0445422 A1	11-09-1991
		ES 2067639 T3	01-04-1995
		JP 4219892 A	10-08-1992
		JP 8021129 B	04-03-1996
		US 5177345 A	05-01-1993

US 4113331 A	12-09-1978	NONE	

US 2009188757 A1	30-07-2009	US 2009188757 A1	30-07-2009
		US 2009192902 A1	30-07-2009

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- US 20090188757 A1 [0003]