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- (71) Applicant: WEGMANN AUTOMOTIVE GMBH & CO. KG [DE/DE]; Rudolf-Diesel-Straße 6, 97209 Veitshöchheim (DE).
- (72) Inventor: GRABER, Michael; Leinacherweg 1, 97265 Hettstadt (DE).
- (74) Agent: LOHR, Georg; LOHR JÖSTINGMEIER & PARTNER, Junkersstraße 3, 82178 Puchheim (DE).
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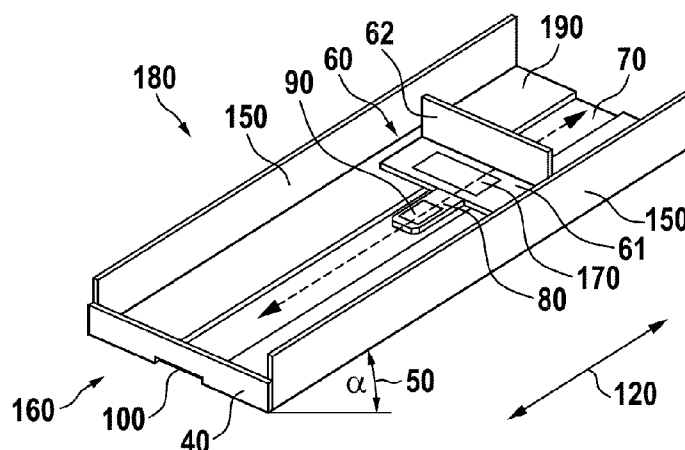
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(54) Title: TRAY WITH LEVEL INDICATION

Fig. 1



(57) Abstract: The invention relates to a shelving rack for storing articles like balancing weights, preferably in boxes. The shelving system or rack is designed to enable an easy extraction of the balancing weights out of their boxes. It comprises of a plurality of trays, each holding multiple boxes. A slider together with an indicator contact the boxes. In case that a box is the last one in the tray, a requirement display indicates that the tray is nearly empty.

Tray with level indication

Field of the invention

The invention relates to a tray, a shelf and a storage rack for storing articles preferably balancing weights. The storage rack holds a plurality of articles, preferably small parts, like balancing weights, tire valves, TPMS parts and accessories or other contained in boxes. It is designed to enable an easy extraction of the balancing weights out of their transport packaging. In case of an empty package the package can be removed and a new package will be supplied automatically. In case that the package is the last one, an indicator appears which hints the user that only one article for example one box of balancing weights is left.

Description of the related art

A shelving system for supplying boxes is disclosed in DE 10 2012 024 994 A1. The shelving system has a loading spring with a marker which may be seen through a small window in the front cover indicating whether the shelf is empty.

US 2014/0124463 A1 discloses a space saving manual shelf management system for storing groceries, having a puller device over the length of the entire shelf which needs to be accessible at all times, even when the shelf is full of products.

WO 2009/156599 A1 discloses a device for displaying products including at least one longitudinal supporting element and at least one longitudinal guide element in parallel mounted on a common frame comprising a securing element.

US10702987 A discloses a tray for displaying merchandise. The tray is designed as a container and being suitable to be placed on the shelves in stores.

Summary of the invention

The problem to be solved by the invention is to provide a simple and robust tray, shelf or storage rack with an indicator which indicates that only one or another predetermined number of articles is left. An article may be a box for small parts for example balancing weights. The box is designed to present and make for example balancing weights available to an operator.

The solution of the problem is described in the independent claims. The dependent claims relate to further improvements of the invention.

In a preferred embodiment a tray for storing articles comprises a base preferably having an elongate rectangular shape with a left and a right broadside, a front side and a rear side. The front side may serve for presentation of articles. The base preferably has one or two lateral guides at one or both of the broadsides. It is preferred, if the tray has a stop at the front side for limiting the movement of the slider. The rear side may be open for refilling of articles. The tray comprises a slider which is supported by the base of the tray. The slider may be guided moveable in at least one guiding track which may be part of the base and/or by at least one of the lateral guides. The slider may have a slider plate for sliding on the base. The slider plate preferably has a rectangular shape. From the slider plate extends a driving pin or plate for contacting and/or driving at least one of the articles. The slider plate may have a protrusion which may interface with the guiding track.

The slider has at least one indicator fixed thereto which may be a tongue or a rod oriented towards the front side and preferably approximately parallel to the base. The tongue or the rod may be made out of metal or plastic material. The indicator which may be a tongue or rod may have at least one marking area which may have some marking. The marking may have a specific colors and/or may have a bar code or a serial number or another inscription or a color marking.

The base of the tray may have rolls or ball bearings to support, or enable an improved movability of the articles in the tray and/or the slider which may be guided by the rolls or the ball bearings too. The tray has at least one opening at its front side which preferably is a slot, corresponding to the indicator.

The indicator has a length so that it may extend from the opening at the front side, in a way that the indicator is visible from the front side, when the slider is close to the front side. The indicator may have a length according to at least the width of one article which is stored in the tray. Such the indicator may extend only when the slider is in a position close to the front side. In a preferred embodiment the indicator has a length so that it is visible if only one article (one box of balancing weights) is left in the tray. The indicator may also have a length larger than one or more articles to give an indication if one or more articles are remaining in the tray.

In a further embodiment at least one tray may be part of a shelf which may be part of a storage rack. The shelf may have a frame where a plurality of trays may be mounted or hooked and secured. The shelf may also be a plate which may furthermore be subdivided in at least one or a plurality of trays with at least two lateral guides. The material of the shelf may be wood, metal, plastic or a combination thereof. The shelf may be attached perpendicular to the frame or with an inclination angle to the frame. The tray may be inclined at an inclination angle such that gravity generates a force to the slider which is directed to the front side. Preferably the inclination angle has a range from 1° to 45° to enable a movement of the articles to the front side by gravity. There may further be a means for generating force to the slider towards the front side. Such a means may be a spring. The slider may be spring loaded by a spring towards the front side. The trays may be attached to the frame with screws, rivets or welding. The shelf preferably has at least one stop on the front side, which is preferably at the side where the user may pick the boxes or balancing weights.

The storage rack may further comprise at least one shelf. It may have a frame in an upward direction which may be made out of metal, aluminum or steel. The frame may have a rectangular, round or oval shape. The frame may have a round or square or oval pattern contour. The square may be done as a closed frame on a base plate with or with at least one pedestal and a base plate.

Description of Drawings

In the following, the invention will be described by way of example, without limitation of the general inventive concept, on examples of embodiment with reference to the drawings.

Fig. 1 shows a preferred embodiment of the tray.

Fig. 2 shows a shelf with trays.

Fig. 3 shows a rack system with several shelves and trays.

Fig. 4 shows a preferred embodiment of rack system in a side view.

Fig. 5 shows another preferred embodiment of the tray.

Fig. 6 shows another preferred embodiment of the tray.

Fig. 1 discloses a single tray 180. The tray 180 preferably having a preferably planar base 190 with an elongate rectangular shape with two broadsides 120, a front side 160 and a rear side. Preferably, the base 190 comprises a lateral guide 150 on each side in the broadside 120. Furthermore, the tray 180 may comprise a stop 40 at the front side 160 and a slider 60 which may be guided by a track 70. The slider 60 may have a slider plate 61 for sliding on the base 190. The slider plate 61 preferably has a rectangular shape. From the slider plate extends a driving plate 62. The slider plate 61 may have a protrusion which may interface with the guiding track 70. The slider 60 further comprises an indicator 80 which may

be a tongue, and which preferably is attached to the slider 60 most preferably in parallel to the plane of the base 190. The front side 160 has an opening 100 through which the indicator 80 may extend only when the slider 60 is in a position close to the front side. The slider 60 or the indicator 80 preferably has a marking area 90, 170. The marking may have a specific color and/or may have a bar code or a serial number or another inscription or a color marking. Each stop 40 has an opening 100 for the indicator 80 which may be a tongue. There may be a spring. The slider 60 may be spring loaded by the spring towards the front side 160.

Fig. 2 discloses a shelf 30 which is divided into several trays 180. Each tray 180 has a slider 60 which is guided by a track 70 and each slider 60 has an indicator 80 which may be a tongue. The slider 60 may have a slider plate 61 for sliding on the base 190. The slider plate 61 preferably has a rectangular shape. From the slider plate 61 extends a driving plate 62 for contacting and/or driving at least one of the articles 200. The slider plate 61 may have a protrusion which may interface with the guiding track 70. Each tray 180 has a stop 40, preferably at the front side. Each stop 40 has an opening 100 for the indicator 80 which may be a tongue. The indicator 80 may have a length according to at least the width of one article 200 which is stored in the tray so that it is visible if only one article 200 left in the tray 180. The indicator 80 may also have a length larger than one or more articles 200 to give an indication if one or more articles 200 are remaining in the tray.

Fig. 3 shows a preferred embodiment of a storage rack 10 in a front view, comprising a frame 20 with two parallel pedestals 21, 22 which are arranged in an upward direction 110 and mounted to a base plate 31 into the direction of the longitudinal side 130. The frame 20 is preferably made out of metal. The storage rack 10 further comprises several shelves 30 which are attached to the frame 20 and extra shelves 140 for storage space for storing for example tools or docu-

ments or other equipment. Each shelf 30 is divided into several trays 180 by lateral guides 150. Each tray has a stop 40 with an opening 100, preferably on the front side 160.

Fig. 4 discloses a shelving system 10 in a side view with several shelves 30 and extra shelves 140 for storage space for storing for example tools or documents, adhesive balancing weights or other equipment. Each shelf 30 preferably has an inclination angle 50 of approximately 10 degrees.

Fig. 5 discloses a single tray 180 similar to figure 1. The tray 180 has a vertical oriented indicator 81 which is aligned via a tongue 82 to the driving plate 62. The indicator 81 may be guided in a separate guiding track 71. The stop 41 may have a profiled contour.

Fig. 6 discloses the single tray 180 of figure 5. The slider 60 is shown in a position whereby the indicator 81 protrudes through an opening 101 in the stop 41. The opening 101 may have a vertical orientation.

List of reference numerals

10	storage rack
20	frame
21	first pedestal
22	second pedestal
30	shelf
31	base plate
40	stop
41	stop
50	inclination angle
60	slider
61	slider plate
62	driving plate
70	guiding track
71	guiding track
80	indicator
81	indicator
82	tongue
90	marking area
100	opening / slot
101	opening / slot
110	upward direction
120	broadside
130	longitudinal side
140	storage space
150	lateral guide
160	front side

170	marking area
180	tray
190	base
200	box / article

Claims

1. A tray (180) for storing articles (200) having a base (190) and a front side (160) for presentation of articles (200),
the tray (180) comprising:
a slider (60), moveable arranged in a guiding track (70) in said base (190),
a stop (40) at the front side (160) limiting the movement of the slider
characterized in that,
an indicator (80) is fixed to the slider (60) and oriented towards the front side (160), and
the front side (160) has an opening (100) through which the indicator extends only when the slider (60) is in a position close to the front side.
2. A tray (180) according to claim 1,
characterized in, that
the indicator (80) has at least one marking area (90, 170).
3. A tray (180) according to claim 2,
characterized in, that
the marking area (90, 170) has a bar code.
4. A tray (180) according to claim 2,
characterized in, that
the marking area (90, 170) has a color marking.
5. A tray (180) according to any one of the previous claims,
characterized in, that
the base (190) of the tray (180) has rolls or ball bearings to support the transported articles (200) and / or the slider (60).

6. A tray (180) according to any one of the previous claims, characterized in, that the tray (180) comprises means for generating a force to the slider (60) which is directed to the front side (160).
7. A tray (180) according to claim 6, characterized in, that the means for generating a force to the slider (60) is a spring.
8. A tray (180) according to any one of the previous claims, characterized in, that the tray is inclined at an inclination angle (50) such that gravity generates a force to the slider (60) which is directed to the front side (160).
9. A tray (180) according to any one of the previous claims, characterized in, that the opening (100) comprises a slot (100).
10. A tray (180) according to any one of the previous claims, characterized in, that the tray (180) has at least one lateral guide (150).
11. A tray (180) according to any one of the previous claims, characterized in, that the length of the slider (60) and the length of the indicator (80) is larger than one or multiples of the length of an article (200).
12. A Shelf (30) comprising at least one tray (180) according to any one of the previous claims.

13. A Storage rack (10) comprising at least one shelf according to claim 11.
14. A Storage rack (10), according to claim 12,
characterized in, that
the shelf has an inclination angle (50).
15. A storage rack (10) according to claim 12 or 13,
characterized in, that
the storage rack (10) comprises a frame (20) with a rectangular shape.

Fig. 1

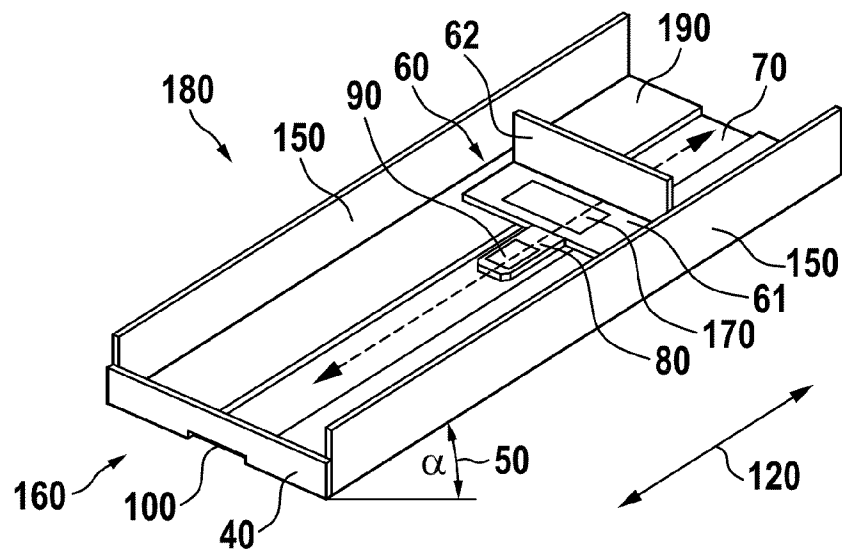


Fig. 2

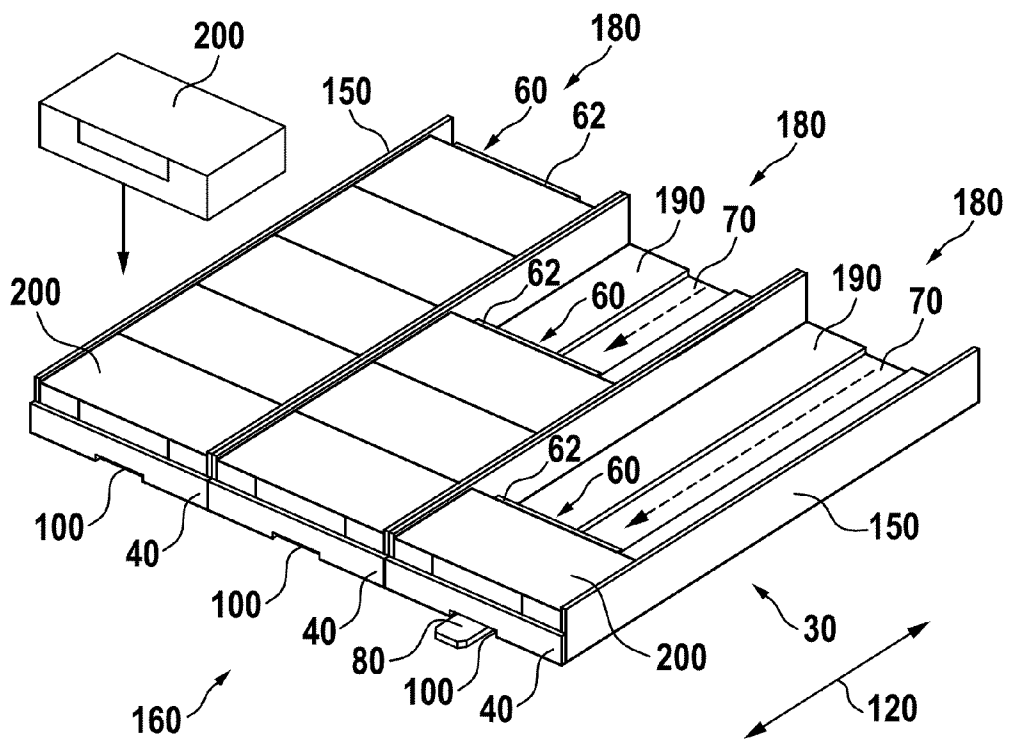


Fig. 3

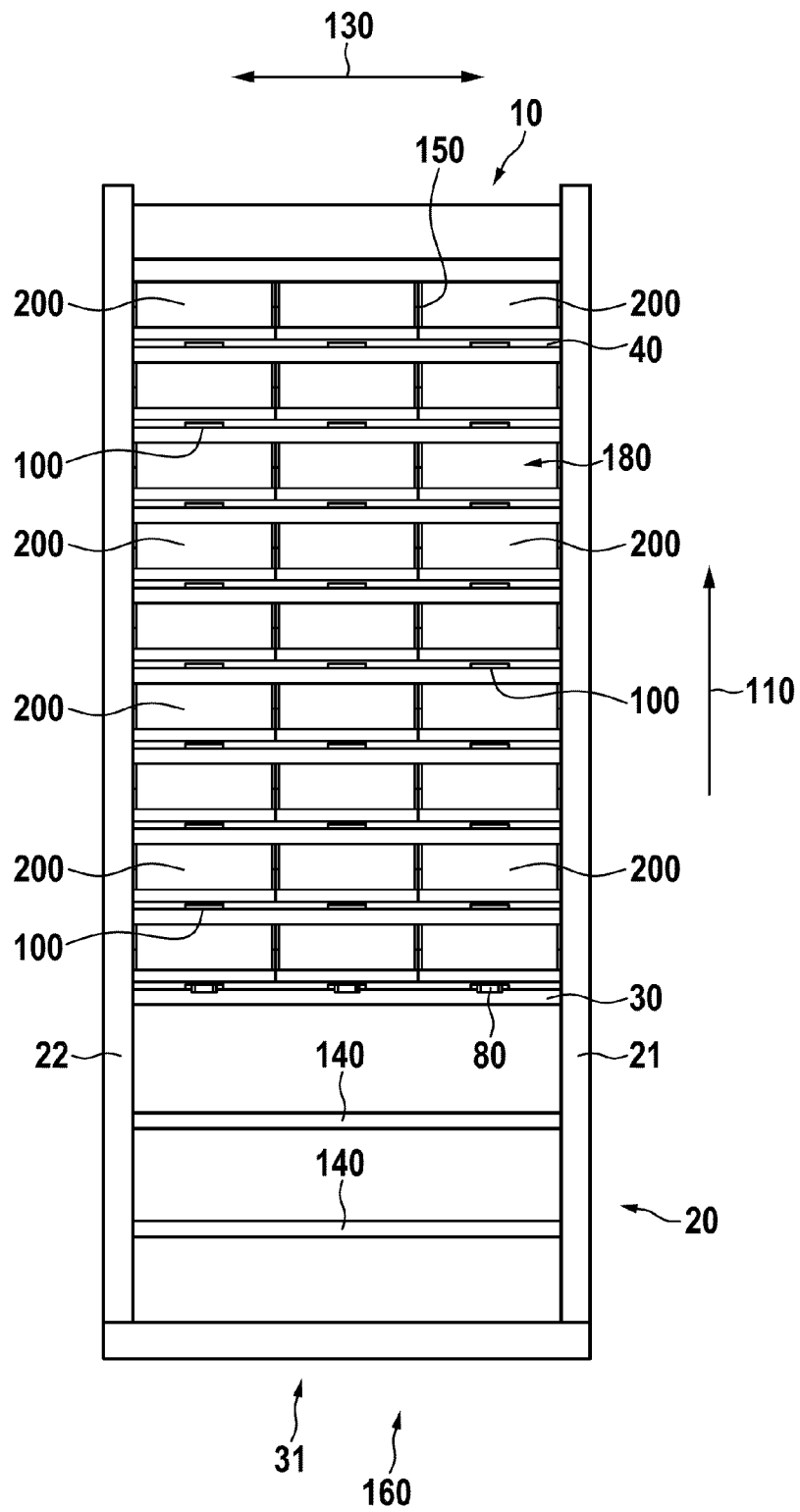


Fig. 4

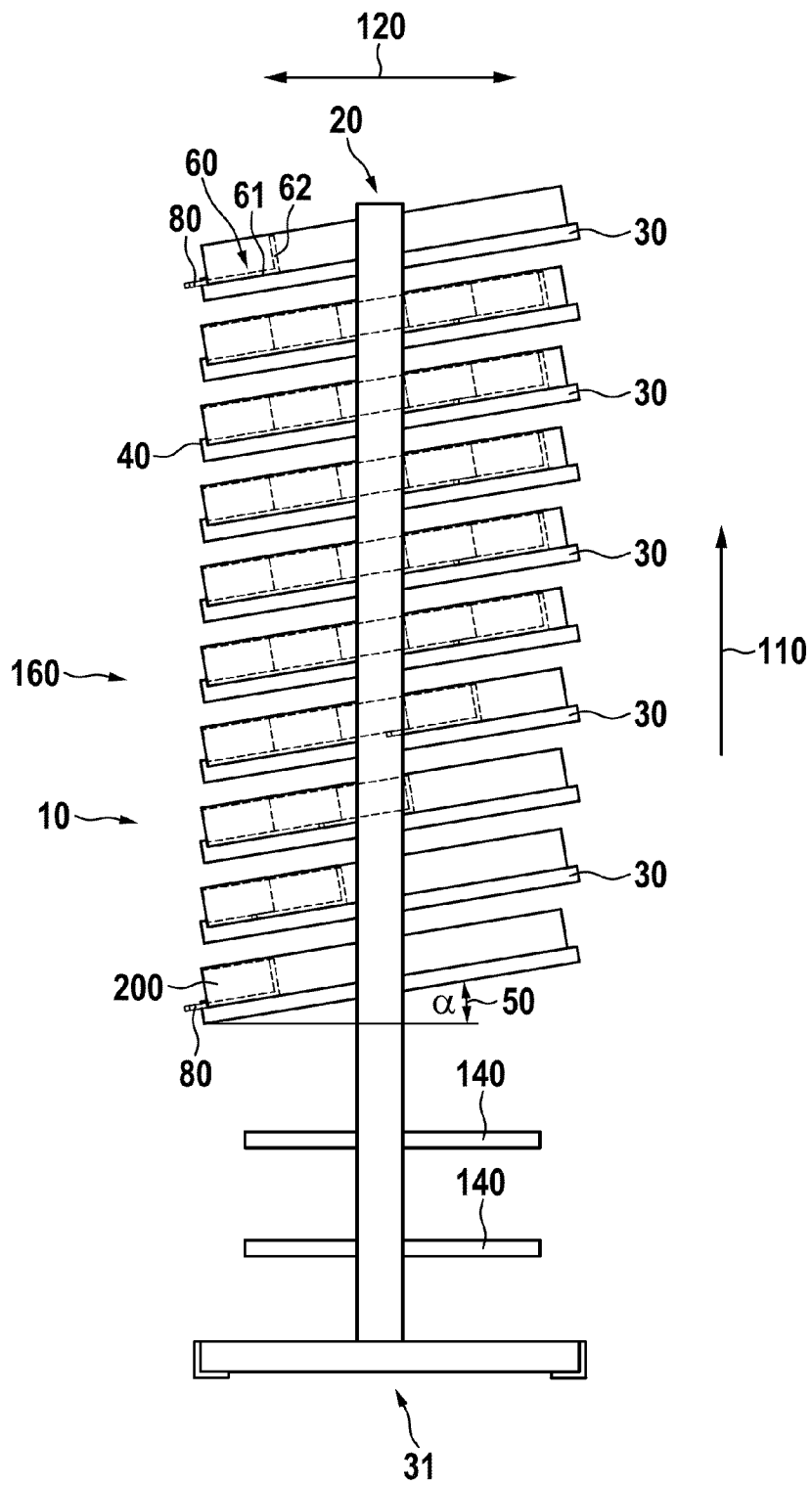


Fig. 5

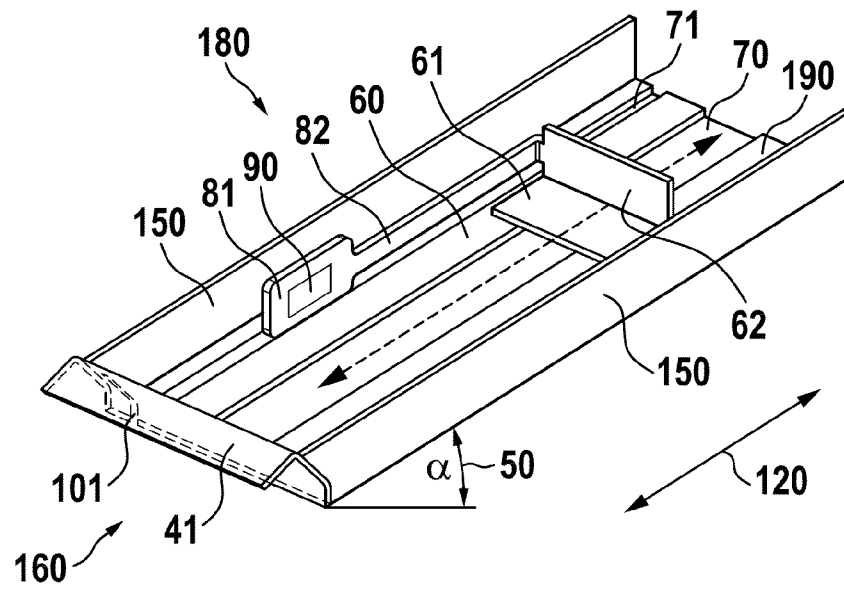
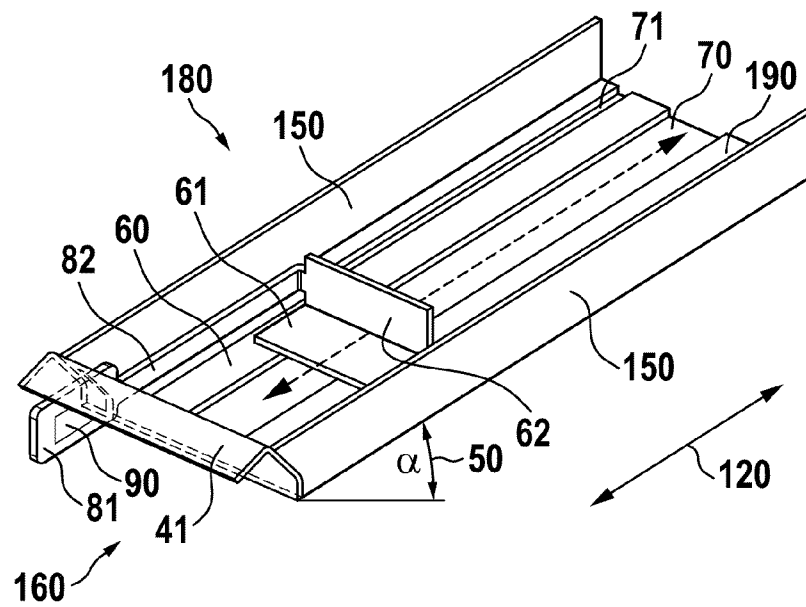


Fig. 6



INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2016/069040

A. CLASSIFICATION OF SUBJECT MATTER
INV. A47F1/12
ADD.

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)
A47F

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 practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2014/124463 A1 (GOEHRING WILLIAM R [US]) 8 May 2014 (2014-05-08) paragraph [0030] - paragraph [0032]; figures 7A,7B	1-15
A	WO 2009/156599 A1 (SHOP NOVATION [FR]; ECRAN PHILIPPE [FR]) 30 December 2009 (2009-12-30) page 10, line 9 - page 12, line 2; figures 3-5,9,7,10	1-15
A	US 1 702 987 A (WILSON GORDON C) 19 February 1929 (1929-02-19) figures 1-3	1-15
A	US 4 742 936 A (REIN GARY [US]) 10 May 1988 (1988-05-10) the whole document	1-15
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Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents :

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

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

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

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

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Date of the actual completion of the international search

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

Authorized officer

Kohler, Pierre

INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2016/069040

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 743 428 A (RANKIN VI ALEXANDER [US]) 28 April 1998 (1998-04-28) the whole document -----	1-15

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2016/069040

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2014124463	A1	08-05-2014	NONE
WO 2009156599	A1	30-12-2009	NONE
US 1702987	A	19-02-1929	NONE
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