



(51) International Patent Classification:

A47F 1/12 (2006.01) A47F 5/00 (2006.01)  
A47F 3/14 (2006.01)

(21) International Application Number:

PCT/US2015/012637

(22) International Filing Date:

23 January 2015 (23.01.2015)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

61/931,404 24 January 2014 (24.01.2014) US  
14/262,420 25 April 2014 (25.04.2014) US

(71) Applicant: **RTC INDUSTRIES, INC.** [US/US]; 2800  
Golf Road, Rolling Meadows, Illinois 60008 (US).

(72) Inventor: **HARDY, Stephen N.**; 383 Barbara Circle,  
Wadsworth, Ohio 44281 (US).

(74) Agent: **VAN PELT, Bradley J.**; Banner & Witcoff, Ltd.,  
10 S. Wacker Drive, Suite 3000, Chicago, Illinois 60606-  
7407 (US).

(81) Designated States (unless otherwise indicated, for every  
kind of national protection available): AE, AG, AL, AM,

AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY,  
BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM,  
DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT,  
HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR,  
KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG,  
MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM,  
PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC,  
SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN,  
TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every  
kind of regional protection available): ARIPO (BW, GH,  
GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ,  
TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU,  
TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE,  
DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU,  
LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK,  
SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,  
GW, KM, ML, MR, NE, SN, TD, TG).

Published:

- with international search report (Art. 21(3))
- before the expiration of the time limit for amending the  
claims and to be republished in the event of receipt of  
amendments (Rule 48.2(h))

(54) Title: PRODUCT MANAGEMENT DISPLAY SYSTEM

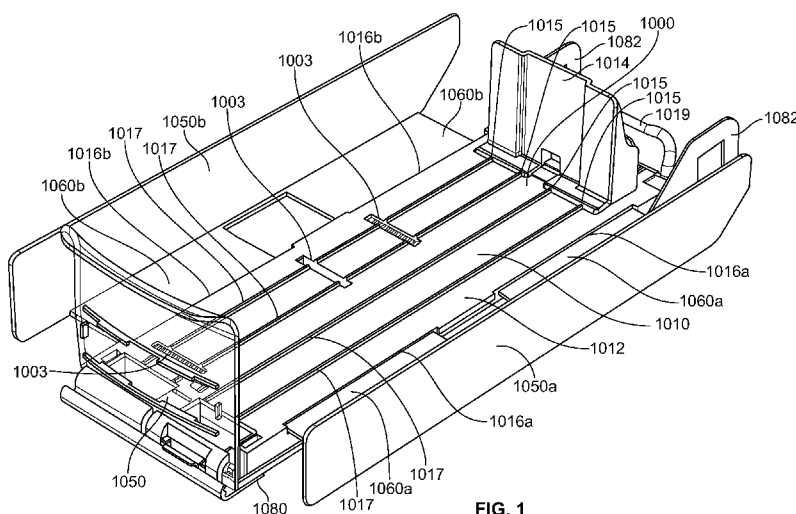


FIG. 1

(57) Abstract: An adjustable tray for a merchandise display system may include a retainer for limiting the movement of products loaded in the adjustable tray, a pusher mechanism configured to bias product toward the retainer, a first divider extending from a first panel and second divider extending from a second panel. The spacing between the first divider and the second divider can be configured to be adjusted. The first panel and the second panel can be configured to move to provide additional surface area for the adjustable tray to accommodate different sized products.



## PRODUCT MANAGEMENT DISPLAY SYSTEM

### CROSS REFERENCE TO RELATED APPLICATION

- [01] This Application claims priority to U.S. Provisional Application No. 61/931,404, filed on January 24, 2014, and U.S. Non-Provisional Application No. 14/262,420, filed on April 25, 2014, which are incorporated fully herein by reference

### FIELD

- [02] The exemplary embodiments herein relate generally to a shelf assembly for use in merchandising product and more particularly to an adjustable shelf assembly for displaying and pushing product on shelves.

### BACKGROUND

- [03] Retail and wholesale stores, such as convenience stores, drug stores, grocery stores, discount stores, and the like, require a large amount of shelving both to store product and to display the product to consumers. In displaying product, it may be desirable for the product on the shelves to be situated toward the front of the shelf so that the product is visible and accessible to consumers. In the case of coolers or refrigerators that are used to store and display such products as soft drinks, energy drinks, bottled water, and other bottled or canned beverages, it may be desirable for these products to also be situated toward the front of the shelf and visible and accessible to the consumers.
- [04] To accomplish this placement of product, systems may include inclined trays or floors that through gravity will cause the product to move toward the front of the shelf. Many of these systems include floors or shelves made of a plastic material such as polypropylene that due its low coefficient of friction permit the product to easily slide along the inclined floor or surface. Other systems may include the use of a pusher system to push the product toward the front of the shelf as the product at the front of the shelf is removed. Pusher systems may be mounted to a track and may include a pusher paddle and a coiled spring to urge the product forward.

## SUMMARY

- [05] In one example a merchandise display system may include one or more of: a retainer for limiting the movement of products loaded in a tray, a pusher mechanism configured to bias product toward the retainer, a first divider extending from a first panel and second divider extending from a second panel. In one example, the spacing between the first divider and the second divider can be configured to be adjusted. In addition or in the alternative, the retainer may include a retainer wall for retaining products in a first position and a retainer projection configured to retain existing products on the shelf in a second position and to serve as a guide for products being loaded into the tray.

## BRIEF DESCRIPTION OF THE DRAWINGS

- [06] Fig. 1 depicts an example of product management display system for merchandising product on an adjustable tray in an extended position.
- [07] Fig. 2 shows a bottom view of the adjustable tray of Fig. 1 in an extended position.
- [08] Fig. 3 shows a front view of the adjustable tray of Fig. 1.
- [09] Fig. 4 shows a front perspective view of the adjustable tray of Fig. 1.
- [10] Figs. 5a and 5b show cross-sectional views of a front portion of the adjustable tray of Fig. 1 in a first configuration and in a second configuration.
- [11] Fig. 6a shows a front view of the adjustable tray of Fig. 1 and an exemplary cam for securing the adjustable tray of Fig. 1 into place.
- [12] Fig. 6b is a magnified view of the portion identified in Fig. 6a.
- [13] Fig. 7 shows the adjustable tray of Fig. 1 engaged with a front rail that can be located on a shelf.

- [14] Fig. 8 shows the adjustable tray of Fig. 1 mounted to a hanger tray for engaging a hang bar in the rear of the shelf.
- [15] Figs. 9 and 10 show the adjustable tray of Fig. 1 and the hanger tray mounted to a hang bar.
- [16] Fig. 11 shows a front view of the adjustable tray of Fig. 1 and the hanger tray mounted to a hang bar at the rear of a display.
- [17] Before the examples are explained in detail, it is to be understood that the disclosure is not limited in its application to the details of construction and the arrangement of the components set forth in the following description or illustrated in the drawings. The disclosure is capable of other embodiments and of being practiced or being carried out in various ways. Also, it is to be understood that the phraseology and terminology used herein are for the purpose of description and should not be regarded as limiting. The use of “including” and “comprising” and variations thereof is meant to encompass the items listed thereafter and equivalents thereof as well as additional items and equivalents thereof. Further, the use of the term “mount,” “mounted” or “mounting” is meant to broadly include any technique or method of mounting, attaching, joining or coupling one part to another, whether directly or indirectly.

#### DETAILED DESCRIPTION

- [18] Fig. 1 depicts an example of product management display system 1000 for merchandising product on a shelf or hang bar having an adjustable tray 1012. Fig. 1 shows a top isometric view of the adjustable tray 1012 secured to a hang-bar tray 1080 with the adjustable tray 1012 in an extended position. Fig. 2 shows a bottom view of the adjustable tray 1012 in an extended position without the hang-bar tray 1080. Fig. 3 shows a front view of the retainer 1050 and the adjustable tray 1012. Fig. 4 shows a front perspective view of the adjustable tray 1012 and the retainer 1050. Figs. 5a and 5b show cross-sectional views of a front portion of the adjustable tray 1012 and the retainer 1050 in both an extended position and in a downward position. Fig. 6a shows a front view of the adjustable tray 1012 and an exemplary

cam for securing the adjustable tray 1012 into place onto a shelf or a hanger tray. Fig. 6b is a magnified view of the portion identified in Fig. 6a. Fig. 7 shows the adjustable tray engaged with a front rail 1090 that can be located on a shelf, and Fig. 8 shows the adjustable tray 1012 mounted to a hanger tray for engaging a hang bar in the rear of the shelf. Figs. 9 and 10 show the adjustable tray 1012 and the hanger tray 1080 mounted to a hang bar at the rear of a display. Fig. 11 shows a front view of the adjustable tray 1012 and the hanger tray mounted to a hang bar at the rear of a display.

- [19] The adjustable tray 1012 is configured to adjust the width of the adjustable tray 1012 to accommodate different sized products therein. In particular, a first divider 1050a and a second divider 1050b can both be moved laterally or horizontally with respect to a pusher mechanism 1014 such that the spacing between the first divider 1050a and the second divider 1050b is configured to be adjusted to accommodate various dimensioned products. As shown in Fig. 1, the adjustable tray 1012 can be formed as an integral assembly and can generally include a pair of dividers (first divider 1050a, second divider 1050b), a pusher mechanism 1014, a track 1016 for guiding the pusher mechanism, a tray surface 1010 first and second panels 1060a 1060b, and a retainer 1050.
- [20] The product can rest on the first panels 1060a, the second panels 1060b, and the tray surface 1010 and can be biased toward the retainer 1050 by the pusher mechanism 1014 using a coiled spring (not shown) in a similar manner to the examples shown and described in U.S. Application No. 14/245,779, filed on April 4, 2014, which is incorporated fully herein by reference. The retainer 1050 can be provided for limiting the movement of products loaded in the adjustable tray 1012 or the forward progression of the products loaded in the adjustable tray 1012 by the pusher mechanism 1014. The first panels 1060a and second panels 1060b can be configured to move to provide for additional tray surface area effectively extending the area of the tray surface 1010 for larger products when the dividers 1050a, 1050b are in the extended position. Also, the first divider 1050a can extend perpendicularly from the first panels 1060a and the second divider 1050b can extend perpendicularly from the

second panels 1060b. Thus, the first divider 1050a can be formed together with the first panels 1060a and the second divider 1050b can be formed together with the second panels 1060b in a suitable forming operation. It is also contemplated that the first panels 1060a and/or the second panels 1060b can be formed as a singular panel or multiple panels.

[21] Both the first panels 1060a and the second panels 1060b form first and second openings 1061a, 1061b. The adjustable tray 1012 can include first slot recesses 1016a for receiving first panels 1060a and second slot recesses 1016b for receiving second panels 1060b. The first and second openings 1061a, 1061b provide for additional rigidity or support on the adjustable tray 1012 in the areas 1008 located adjacent to the first and second slot recesses 1016a, 1016b receiving the first panels 1060a and the second panels 1060b. For example, as shown in Fig. 8, because of the first opening 1061a, the area 1008a on the adjustable tray 1012 adjacent to the first slot recesses 1016a can be provided with additional material which provides for additional rigidity or support. In particular, the adjustable tray 1012 in areas 1008a, 1008b adjacent to the first and second openings 1061a, 1061b of the first and second panels 1060a, 1060b are provided with a greater height than areas adjacent the first and second slot recesses 1016a, 1016b receiving the panels 1060a, 1060b. In this way, the tray can support the desired amount of weight and products. However, it is also contemplated that the first panels 1060a could be formed together as a unitary structure, and the second panels 1060b could be formed together as a unitary structure.

[22] Additionally, the adjustable tray 1012 can be provided with one or more guide members 1021 for guiding and supporting the first panels 1060a and the second panels 1060b during adjustment of the dividers 1050a, 1050b on the adjustable tray 1012. The guide members 1021 can be formed with one or more ribs 1005 to provide for additional support of the first panels 1060a and the second panels 1060b. The guide members 1021 can be formed together with the adjustable tray 1012 or secured to the adjustable tray 1012 using any known securing method. Additionally, as shown in Fig. 1, the track can be provided with shut offs 1003 in the form of openings such

that when forming the guide members 1021 undercuts are avoided during a molding operation.

- [23] As shown in Fig. 2, which is a bottom view of the exemplary adjustable tray 1012, an elongated guide shaft 1020 can extend from a rear portion of the adjustable tray 1002 to a front portion of the adjustable tray 1002. As shown in Fig. 3, the guide shaft 1020 can be provided with a plurality of guide shaft teeth 1025 that are configured to engage or mesh with a first set of teeth 1062a on the first panels 1060a and a second set of teeth 1062b on the second panels 1060b. The guide shaft 1020 can be configured to rotate on first and second pivots 1022a, 1022b. The guide shaft 1020 can be engaged with the first set of teeth 1062a and the second set of teeth 1062b such that when the dividers 1050a, 1050b, the first panels 1060a, and the second panels 1060b move to provide additional surface area for the products loaded therein, the adjustable tray 1012 maintains its symmetry by providing equalized spacing and movement of the dividers 1050a, 1050b.
- [24] Also, as shown in Fig. 3, in one example, the first set of teeth 1062a extend upward to engage the guide shaft teeth 1025, and the second set of teeth extend downward to engage the guide shaft teeth 1025. However, this arrangement can be reversed such that the first set of teeth extend downward toward the drive shaft teeth, and the second set of teeth extend upward toward the guide shaft teeth. As further shown in Fig. 3, the first panels 1060a can be provided with a first limiting member 1064a to limit the distance that the first panels 1060a and first divider 1050a can be extended from the adjustable tray 1012, and the second panels 1060b can be provided with a second limiting member 1064b for limiting the distance that the second panels 1060b can be extended from the adjustable tray 1012. In an alternative example, the guide shaft can be provided with wheels, textured surfaces, or other high friction surface instead of teeth. Also the corresponding panel surfaces can be provided with textured surfaces or high friction surfaces to engage the drive shaft.
- [25] To adjust the size of the adjustable tray, the user can simply push or pull on the dividers 1050a, 1050b to cause the first panels 1060a and the second panels 1060b to

either extend from the adjustable tray 1012 or retract into the first and second slot recesses 1016a, 1016b respectively in the adjustable tray 1012. In this way, the adjustable tray can be adjusted to the appropriate size depending on the width of the product desired to be dispensed. The adjustable tray 1012 can also be provided with a handle 1019 such that the user can easily grasp the adjustable tray 1012 and place the adjustable tray 1012 into the desired location in a merchandising display system.

- [26] The track 1016 of the adjustable tray 1012 can include multiple guides 1017 for guiding the pusher mechanism 1014. The guides 1017 can restrict the pusher mechanism 1014 to horizontal movement and restricts vertical movement of the pusher mechanism 1014 along the track 1016. The pusher mechanism 1014 can be provided with corresponding grooves 1015 for receiving the guides 1017. The guides also serve to reduce the amount of frictional contact between the adjustable tray 1012 and the product therein to facilitate the product movement in the adjustable tray. The guides 1017 can also be formed as guide slots and the pusher mechanism can be formed with corresponding projections that extend into the guide slots. It is contemplated, however, that the pusher mechanism can also be a trackless pusher mechanism such as shown and described in the examples of U.S. Application No. 14/245,779, for example.
- [27] Additionally, as shown in Figs. 5a and 5b, the retainer 1050 can be configured to rotate from an upward position downwardly or to drop down with respect to the adjustable tray 1012. The retainer 1050 can include one or more teeth 1052 positioned at a lower front portion that can be configured to engage a pocket or void 1015 in the front portion of the adjustable tray 1012 to lock the retainer in place when product is biased toward the front of the adjustable tray 1012 by the pusher mechanism. A lip 1054 can also be formed adjacent to the void to assist in maintaining the retainer 1050 in the upward or first position. The retainer 1050 can include a top or front curved portion 1065 that provides the user with a greater capability to grasp the retainer 1050 so as to move the retainer from the upward position to the downward position.



- [28] The retainer 1050 can also be provided with one or more projections or feet 1056 that in an example can be formed as ramps that extend from the base of the retainer 1050. The projections 1056 can provide various functions. For example, the projections 1056 can provide the retainer 1050 with additional stability when the retainer 1050 is located in the extended or upward position as shown in Fig. 5b. In particular, the projections 1056 can fit into a recess 1058 located in the adjustable tray 1012, which the retainer is in the first or upright position. Additionally, the projections 1056 can be provided with a first angled portion 1055a that connects to a second flat portion 1055b. The second flat portion 1055b is configured to rest onto a corresponding flat surface 1013 on the adjustable tray 1012 when the retainer is in the upright position.
- [29] Additionally, when the retainer is in the second or downward position, as shown in Fig. 5a, the projections 1056 are configured to hold the retainer 1050 in the downward or horizontal position and to hold the product itself when the retainer 1050 is in the downward position. In particular, the second flat portion 1055b can be configured to hold the product on the shelf when the retainer 1050 is in the downward position. Also while the retainer 1050 is in the downward or second position as shown in Fig. 5a, the first angled portion 1055a provides a ramp for guiding products into the adjustable tray 1012. In one example, the retainer 1050 can be formed robust enough to withstand placement of a box or carton of product thereon while the product is loaded into the adjustable tray and over the first angled portion 1055a. Additionally, once the products are loaded into the adjustable tray, and the retainer is moved back into the upright or vertical position, the products slide down the first angled portion 1055a into the proper position on the adjustable shelf. The projections 1056 can, therefore, be configured to both hold products into the adjustable tray 1012 as products are loaded and also help guide products into the adjustable tray 1012 as products are loaded into the adjustable tray 1012.
- [30] The first angled portion 1055a and the second flat portion 1055b can together form a recess or groove 1057 in the base of the retainer 1050. The groove 1057 can receive a front curved portion 1059 of the adjustable tray 1012 therein to maintain the retainer 1050 in the horizontal position shown in Fig. 5b. As the retainer 1050 is held in the

downward or second position shown in Fig. 5a, the second flat portion 1055b of the projections 1056 also acts as a stop or a retaining wall for limiting the movement of product that is loaded onto the adjustable tray 1012. The ability to convert from a tall retainer to a short retainer opens up access to make the loading process easier

- [31] In order for the retainer 1050 to be moved into the down or second position, the user simply grasps the front curved portion 1065 of the retainer and pushes back on the retainer toward the rear of the adjustable tray 1012 such that the teeth 1052 can become disengaged with the void 1015. The user then lifts the retainer 1050 up to move the teeth 1052 out of contact with the void 1015 and the lip 1054 to drop the retainer 1050 down. The ability of the retainer 1050 to fold or drop down provides the user with the ability to reload the tray with a large amount of products at once with a carton or otherwise. Also the retainer 1050 can be designed to be robust such that a large carton or amount of products can be placed onto the retainer for loading the products. While the existing products remain onto the shelf due to the second flat portion 1055b, the user can slide the products over the retainer 1050 ramp formed by the first angled portion 1055a and the second flat portion 1055b to load the products onto the shelf.
- [32] In addition, in product settings where there is a lower ceiling or smaller head space between product rows, the ability of the retainer 1050 to move into the horizontal position eases the reloading of the product and unloading of the old product. This may also provide for easier product rotation, for example, the user can pull out all of the old product and the load new product onto the shelf and then reload the old product in front of the old product with ease.
- [33] As shown in Figs. 6a and 6b, the adjustable tray 1012 can be provided with a cam 1070, which operates in a similar fashion as the examples described in U.S. Application No. 14/245,779 to lock the adjustable tray 1012 to either a front rail as shown in Fig. 7 or the hanger tray 1080 as shown in Fig. 8. The tray 1012 can, thus, be used in conjunction with the examples disclosed in U.S. Application No. 14/245,779 and can be mounted to the same front rail described therein along with

any one of the pusher mechanisms and dividers described therein. Additionally, one or more ribs 1006 can be provided adjacent the cam 1070 on the underside of the adjustable tray 1012 to provide for additional rigidity and support of the adjustable tray 1012.

- [34] In one example, as shown in Figs. 8 and 10, the hanger tray 1080 can be provided with one or more hangers 1082, which are configured to engage a hang bar 1084. The hanger tray 1080 can be provided with a void (not shown) in which a corresponding insert 1023 (shown in Fig. 2) on the adjustable tray 1012 can extend into to help lock the adjustable tray 1012 into place onto the hanger tray 1080 in conjunction with the cam 1070. Once secured to the hanger tray 1080, as shown in Figs. 9-11, the adjustable tray 1012 can be suspended from the rear of the back wall of a merchandise display.
- [35] As shown in Figs. 9 and 10, in one example, the hang bar 1084 may be a square tube with a short bracket 1086 attached to either end that fits into the gondola uprights of the shelf system. When installed into the gondola uprights, the hang bar usually can sit an inch or two from the back wall of the gondola. Individual product trays, or sometimes just long hooks or hangers (e.g. hangers 1082), are then attached to the hang bar and cantilever forward. With the use of hangers, the need for a shelf is eliminated. Additionally, the use of hangers allows one to position the product packages closer together vertically and often gives the product a “floating” appearance which may be desirable from a product marketing and management standpoint.
- [36] In one example, an adjustable tray for a merchandise display system can include one or more of: a retainer for limiting the movement of products loaded in the adjustable tray, a pusher mechanism configured to bias product toward the retainer, a first divider extending from a first panel perpendicular to the first divider, and a second divider extending from a second panel perpendicular to the second divider. The spacing between the first divider and the second divider can be configured to be adjusted, and the first panel and the second panel can be configured to move to

provide additional surface area for the adjustable tray when the space between the first divider and the second divider is increased. The adjustable tray can be configured to mount to either a front rail or a hanger tray by a cam.

- [37] In another example a merchandise display system can include one or more of: a tray having a tray surface for receiving products loaded in the tray, a retainer for limiting the movement of products loaded in the tray, a first divider and a second divider for guiding the products in the tray, and a first panel defining a first panel surface and a second panel defining a second panel surface. The first panel surface and the second panel surface can provide for an extension to the tray surface, and the first divider can extend perpendicularly from the first panel and second divider can extend perpendicularly from the second panel. The spacing between the first divider and the second divider can be configured to be adjusted and the first panel and the second panel can be configured to move to provide the extension to the tray surface of the tray when a space between the first divider and the second divider is increased.
- [38] In an example, the adjustable tray may also include a guide shaft which can have a set of guide shaft teeth configured to engage a first set of teeth located on the first panel and a second set of teeth located on the second panel to provide equalized movement and spacing of the first divider and the second divider with respect to one another. The guide shaft can extend underneath the adjustable tray, and one of the first set of teeth or the second set of teeth extend upward to engage the guide shaft.
- [39] In an example, the retainer can be configured to rotate from an upward position to a downward position, and the barrier further comprises a projection configured to provide a ramp for loading product into the adjustable tray. The projection can be configured to limit the movement of product when the retainer is in the downward position. The projection can include an angled portion and a flat portion which together form a groove, and the groove is configured to receive a front portion of the adjustable tray therein to maintain the retainer in the downward position. The retainer may also include a tooth configured to engage a void on the adjustable tray for holding the retainer in the upward position.

- [40] In one example, the first divider can extend from first panels and the second divider can extend from second panels, and the first panels can form a first opening and the second panels can form a second opening. First and second slot recesses can be provided for receiving the first panels and the second panels.
- [41] In one example, an adjustable tray for a merchandise display system can include one or more of: a retainer for limiting the movement of products loaded in the adjustable tray, a pusher mechanism configured to bias product toward the retainer, a first divider, and a second divider. The retainer can include a retainer wall for retaining products in a first position and a retainer projection configured to retain existing products on the shelf in a second position and to serve as a guide for products being loaded into the adjustable tray.
- [42] The projection can include a ramp for guiding the products into the tray when the retainer is in the second position, and the projection can include a flat surface adjacent to the ramp which helps prevent products loaded onto the shelf from advancing off of the tray when the retainer is in the second position. The first divider can be located on a first panel and the second divider can be located on a second panel. The spacing between the first divider and the second divider can be configured to be adjusted and the first panel and the second panel are configured to move to provide additional surface area for the adjustable tray when a distance between the first divider and the second divider is increased. The adjustable tray can be configured to mount to either a front rail or a hanger tray by a cam.
- [43] The retainer can be configured to rotate from the first position to the second position. The projection can be configured to limit the movement of product when the retainer is in the downward position. The projection can include an angled portion and a flat portion which together form groove and wherein the groove is configured to receive a front portion of the adjustable tray therein to maintain the retainer in the second position. The retainer further comprises a tooth configured to engage a void on the adjustable tray for holding the retainer in the first position.

[44] Variations and modifications of the foregoing are within the scope of the present disclosure. For example, one of skill in the art will understand that multiples of the described components may be used in stores and in various configurations. The present disclosure is therefore not to be limited to a single system, nor the upright pusher configuration, depicted in the Figures, as the system is simply illustrative of the features, teachings and principles of the disclosure herein. It should further be understood that the concepts defined herein extends to all alternative combinations of two or more of the individual features mentioned or evident from the text and/or drawings. All of these different combinations constitute various alternative aspects of the present disclosure.

## CLAIMS

What is claimed is:

1. A merchandise display system comprising:
  - a tray having a tray surface for receiving products loaded in the tray;
  - a retainer for limiting movement of products loaded in the tray;
  - a first divider and a second divider for guiding the products in the tray; and
  - a first panel defining a first panel surface and a second panel defining a second panel surface wherein the first panel surface and the second panel surface provide for an extension to the tray surface, wherein the first divider extends perpendicularly from the first panel and second divider extends perpendicularly from the second panel;

wherein spacing between the first divider and the second divider is configured to be adjusted and the first panel and the second panel are configured to move to provide the extension to the tray surface of the tray when a space between the first divider and the second divider is increased.
2. The merchandise display system of claim 1 further comprising a guide shaft comprising a set of guide shaft teeth configured to engage a first set of teeth located on the first panel and a second set of teeth located on the second panel to provide equalized movement and spacing of the first divider and the second divider with respect to one another.
3. The merchandise display system of claim 2 wherein the guide shaft extends underneath the tray wherein one of the first set of teeth or the second set of teeth extend upward to engage the guide shaft.

4. The merchandise display system of claim 1 wherein the retainer is configured to rotate from an upward position to a downward position and wherein the retainer further comprises a projection configured to provide a ramp for loading product into the tray.
5. The merchandise display system of claim 4 wherein the projection is configured to limit movement of product when the retainer is in the downward position.
6. The merchandise display system of claim 5 wherein the projection includes an angled portion and a flat portion which together form groove and wherein the groove is configured to receive a front portion of the adjustable tray therein to maintain the retainer in the downward position.
7. The merchandise display system of claim 6 wherein the retainer further comprises a tooth configured to engage a void on the tray for holding the retainer in the upward position.
8. The merchandise display system of claim 1 wherein the tray is configured to mount to either a front rail or a hanger tray by a cam.
9. The merchandise display system of claim 1 wherein the first divider extends from first panels and second divider extends from second panels and wherein the first panels form a first opening and the second panels form a second opening.
10. The merchandise display system of claim 9 further comprising first and second slot recesses for receiving the first panels and the second panels.
11. The merchandise display system of claim 1 further comprising a pusher mechanism configured to bias product toward the retainer.
12. A merchandise display system comprising:  
a tray having a tray surface for receiving products loaded in the tray; and



a retainer mounted to the tray for limiting movement of products loaded in the tray, the retainer comprising a retainer wall for retaining products in a first position and a retainer projection configured to help retain existing products on the tray in a second position and configured to serve as a guide for products being loaded onto the tray surface.

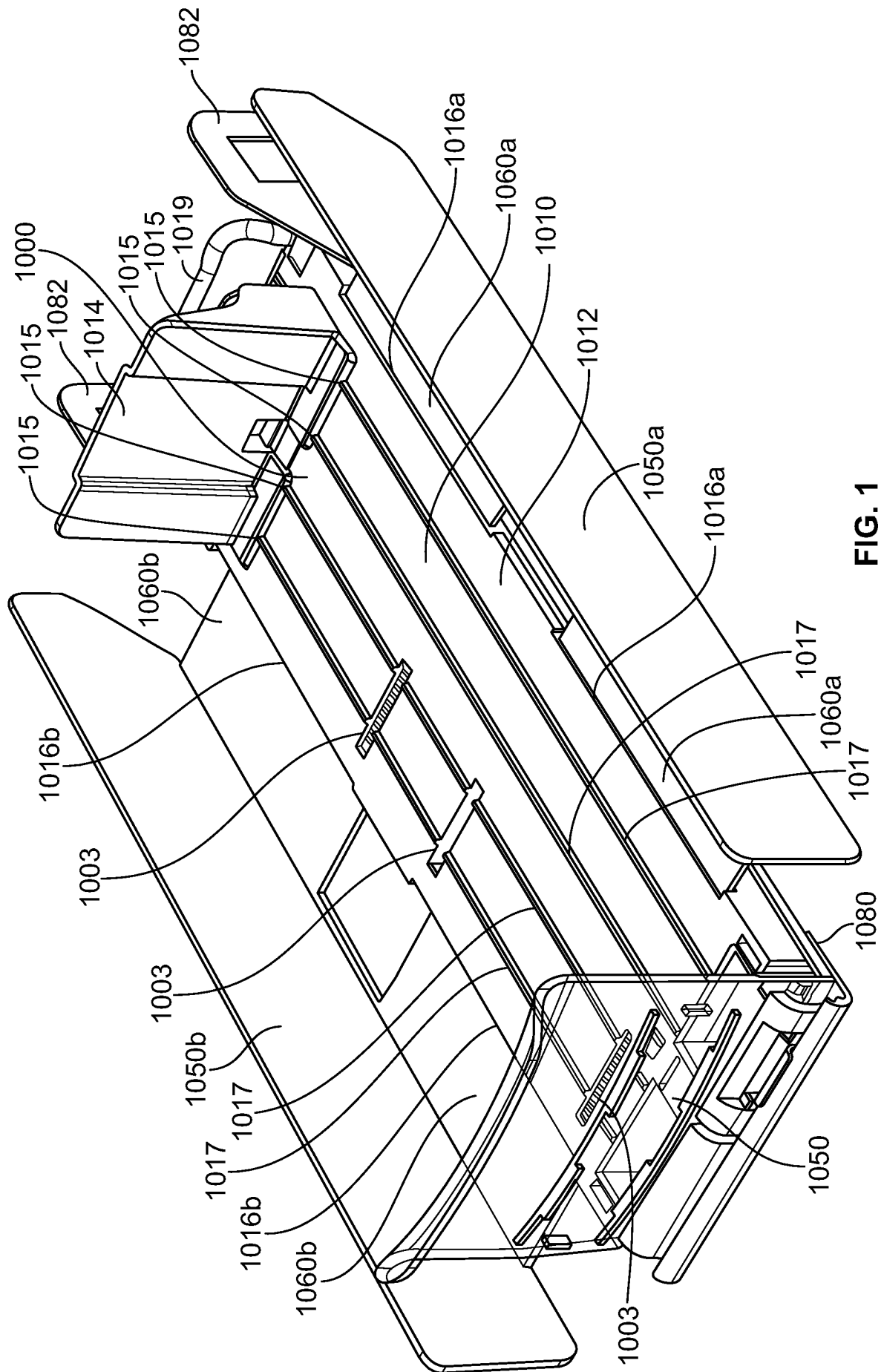
13. The merchandise display system of claim 12 wherein the projection further comprises a ramp for guiding the products into the tray when the retainer is in the second position and the projection further comprises a flat surface adjacent to the ramp which helps prevent products loaded onto the tray from advancing off of the tray when the retainer is in the second position.

14. The merchandise display system of claim 12 further comprising a first divider and a second divider wherein the first divider is located on a first panel and the second divider is located on a second panel wherein spacing between the first divider and the second divider is configured to be adjusted and the first panel and the second panel are configured to move to provide additional surface area to the tray surface when a distance between the first divider and the second divider is increased.

15. The merchandise display system of claim 14 further comprising a guide shaft comprising a set of guide shaft teeth configured to engage a first set of teeth located on the first panel and a second set of teeth located on the second panel to provide equalized movement and spacing of the first divider and the second divider with respect to one another.

16. The merchandise display system of claim 15 wherein the guide shaft extends underneath the tray wherein one of the first set of teeth or the second set of teeth extends upward to engage the guide shaft.

17. The merchandise display system of claim 12 wherein the retainer is configured to rotate from the first position to the second position.
18. The merchandise display system of claim 13 wherein the ramp and the flat surface together form a groove and wherein the groove is configured to receive a front portion of the tray therein to maintain the retainer in the second position.
19. The merchandise display system of claim 18 wherein the retainer further comprises a tooth configured to engage a void on the tray for holding the retainer in the first position.
20. The merchandise display system of claim 12 wherein the tray is configured to mount to either a front rail or a hanger tray by a cam.
21. The merchandise display system of claim 14 wherein the first divider extends from first panels and second divider extends from second panels and wherein the first panels form a first opening and the second panels form a second opening.
22. The merchandise display system of claim 21 further comprising first and second slot recesses for receiving the first panels and the second panels.



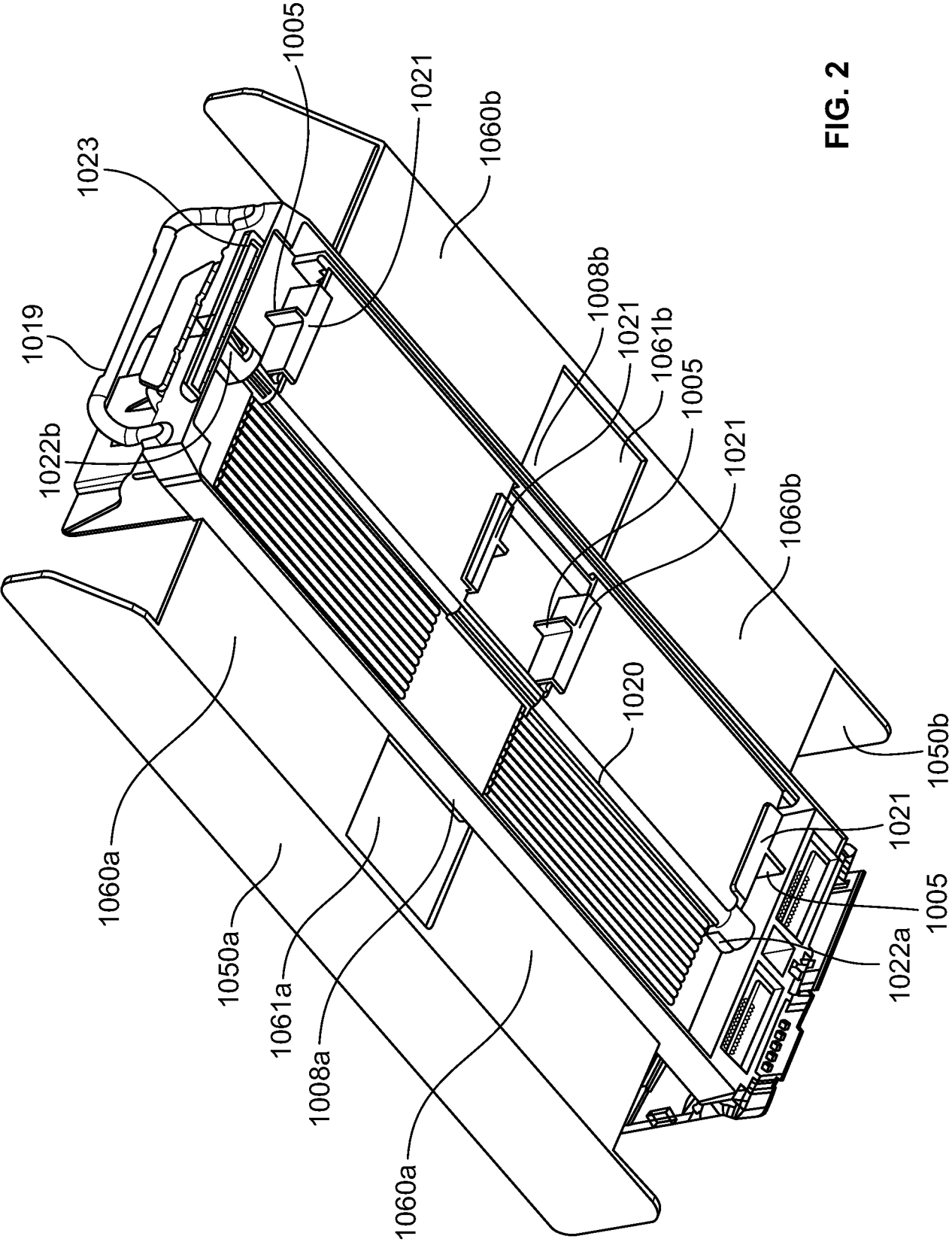


FIG. 2

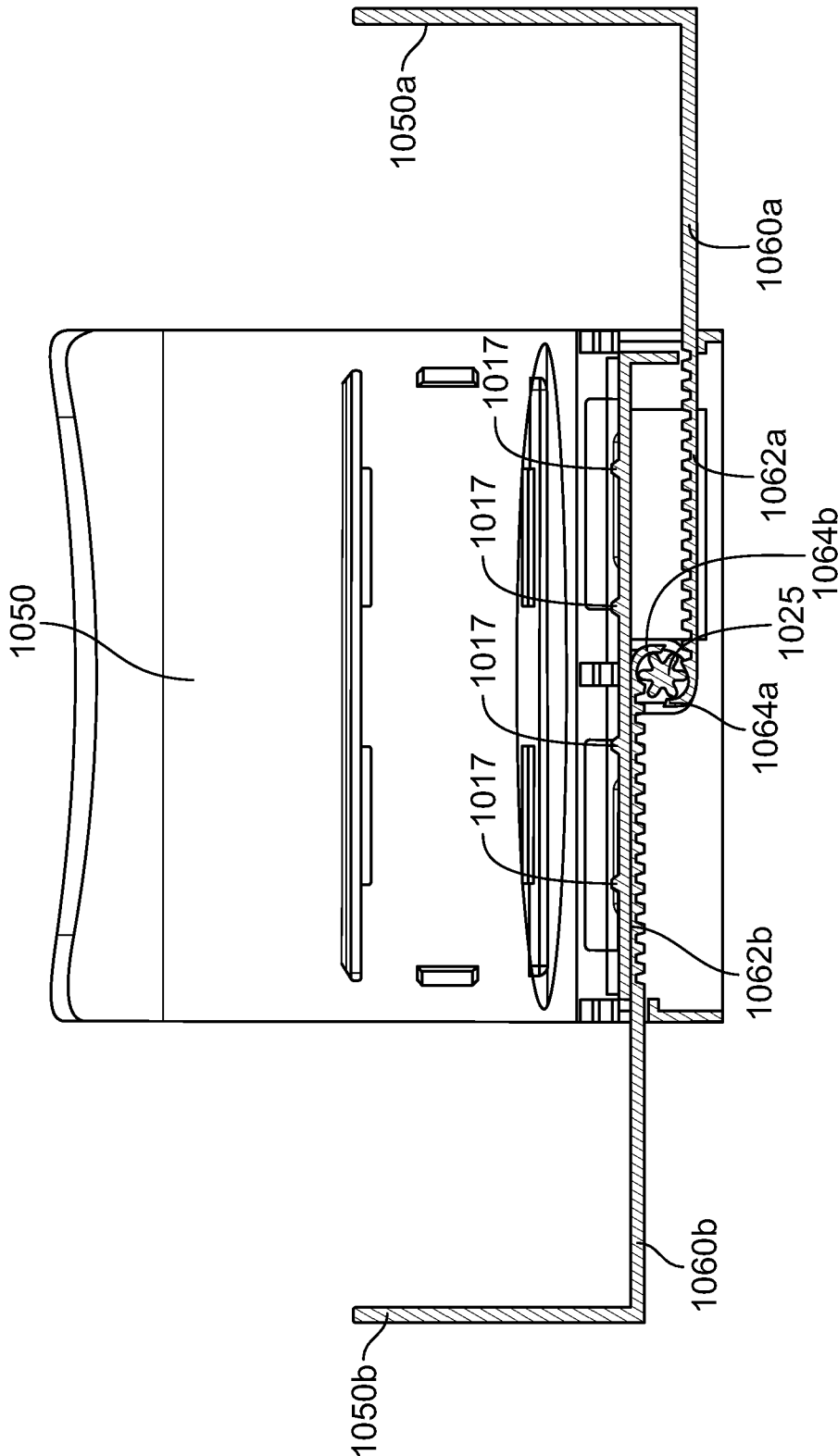
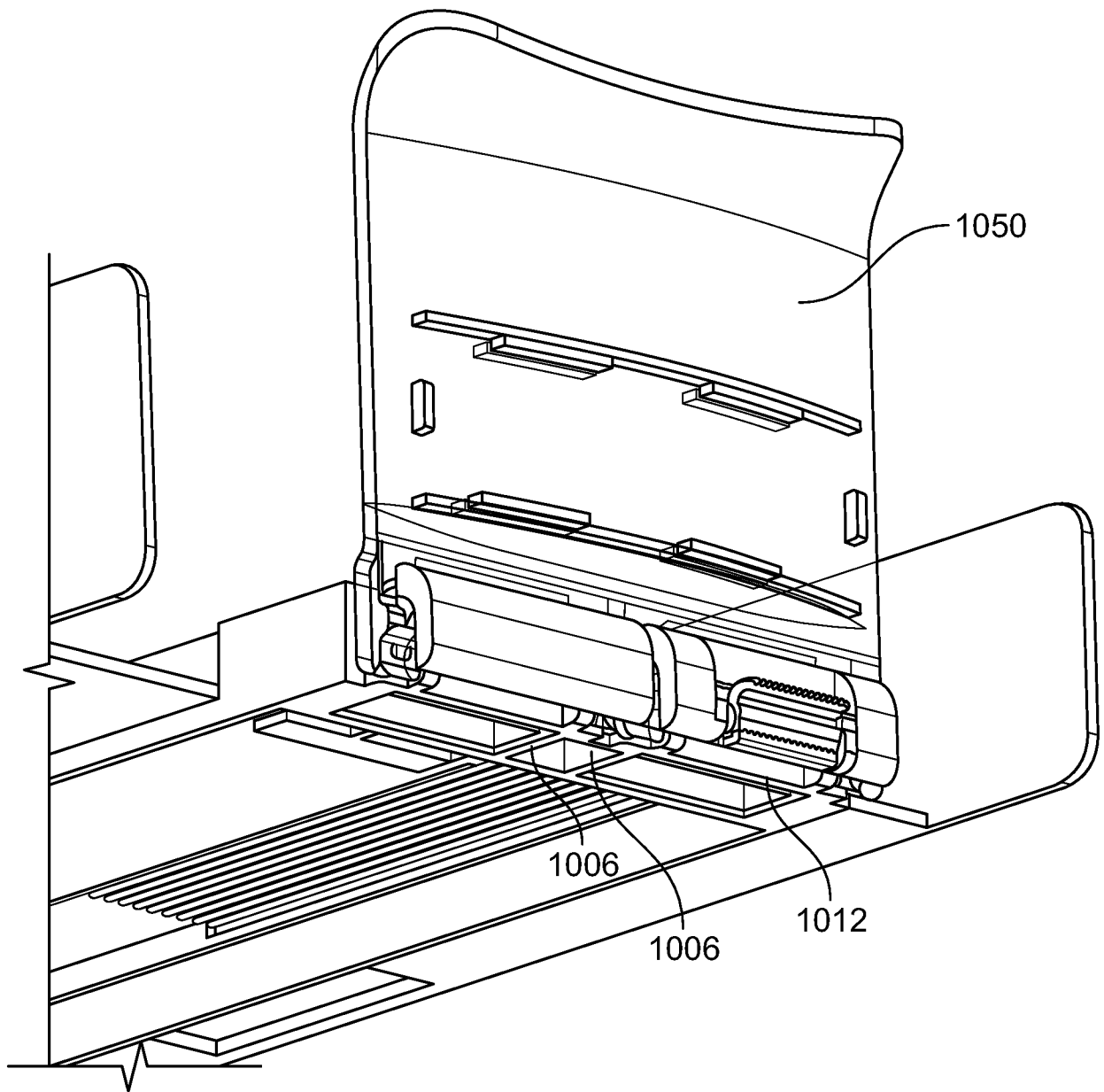


FIG. 3



**FIG. 4**

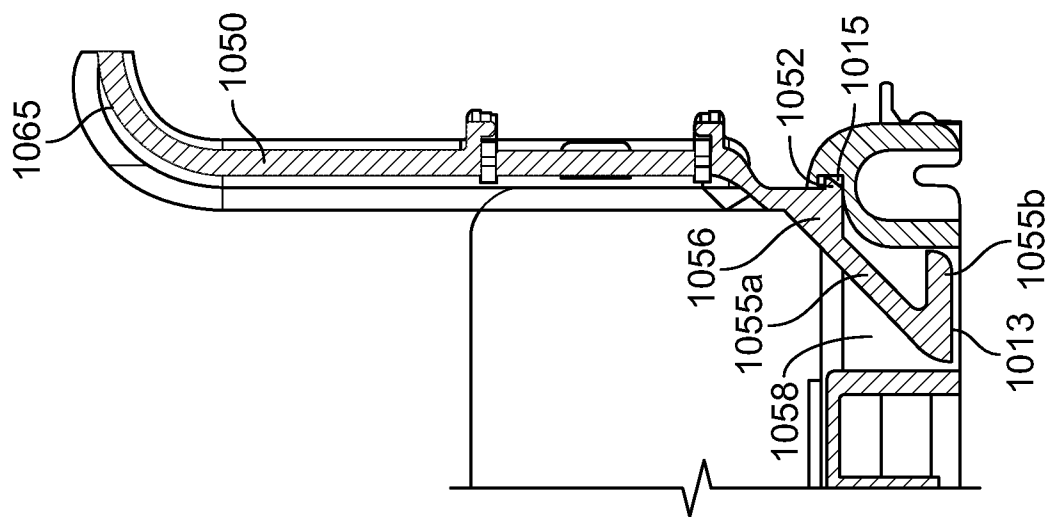


FIG. 5B

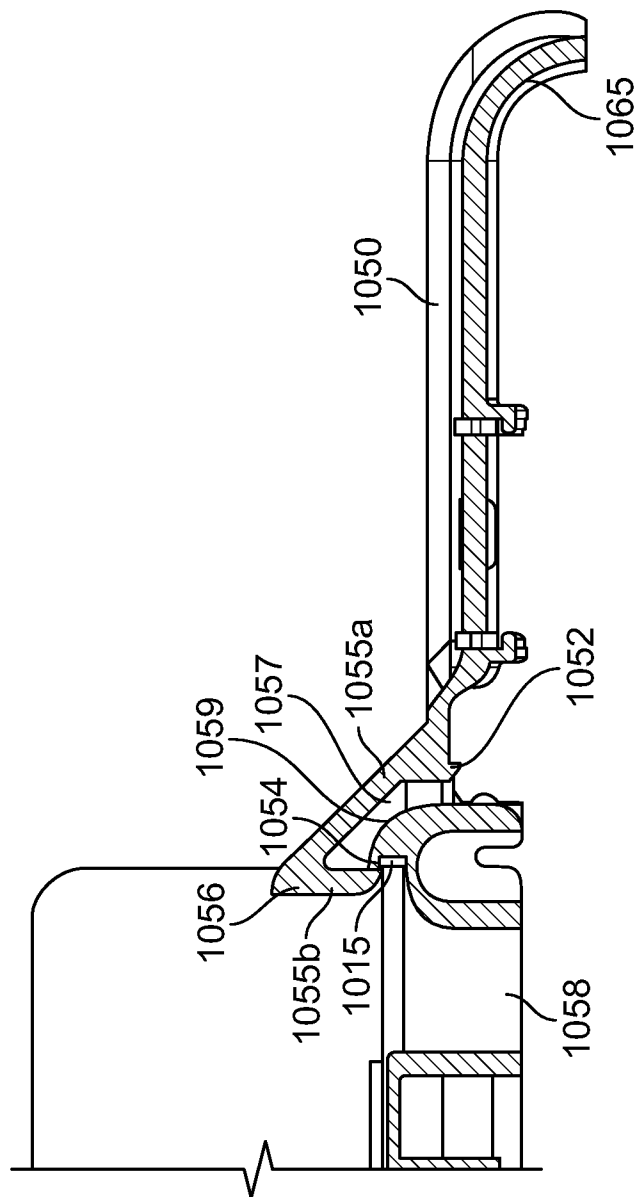


FIG. 5A

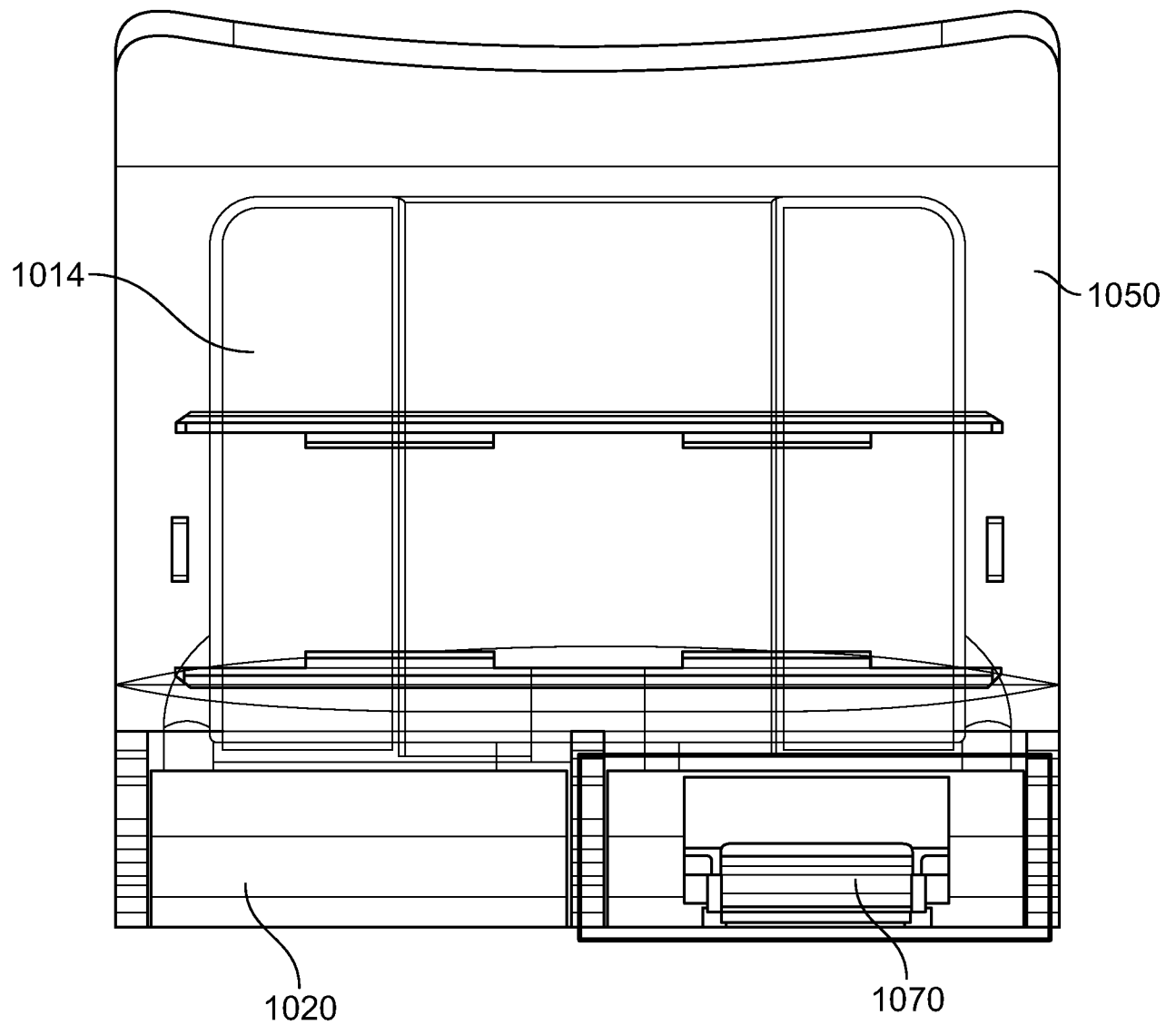


FIG. 6a

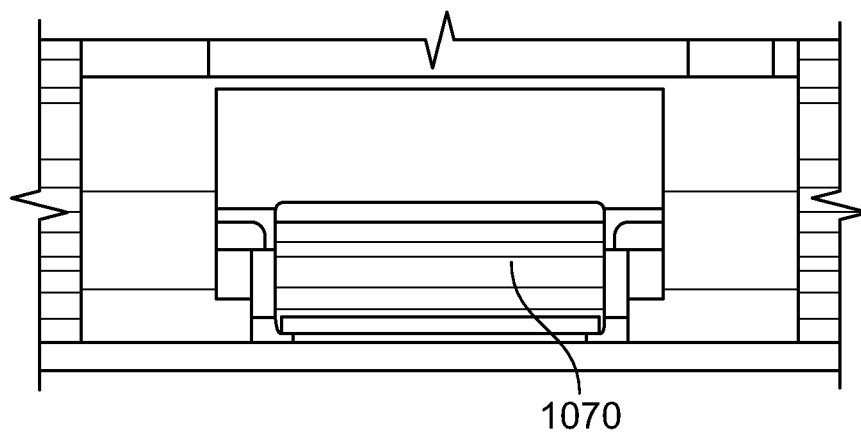


FIG. 6b



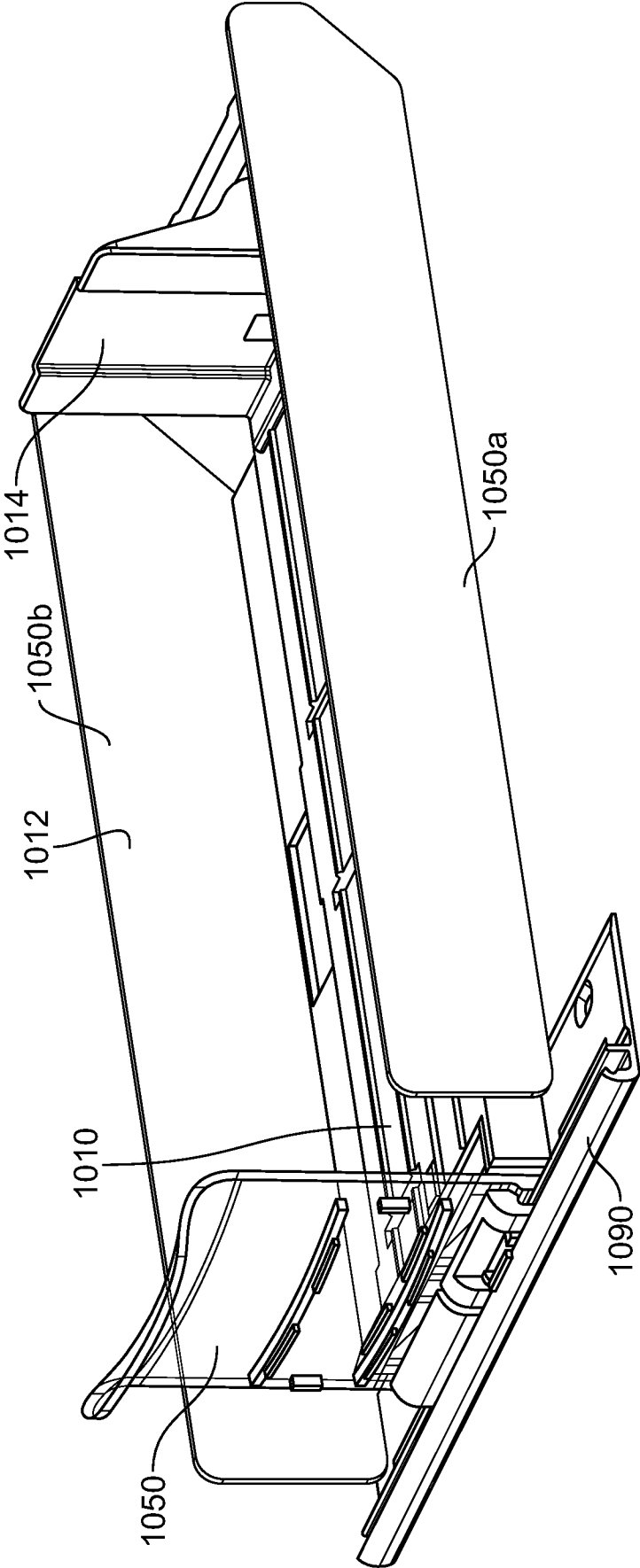
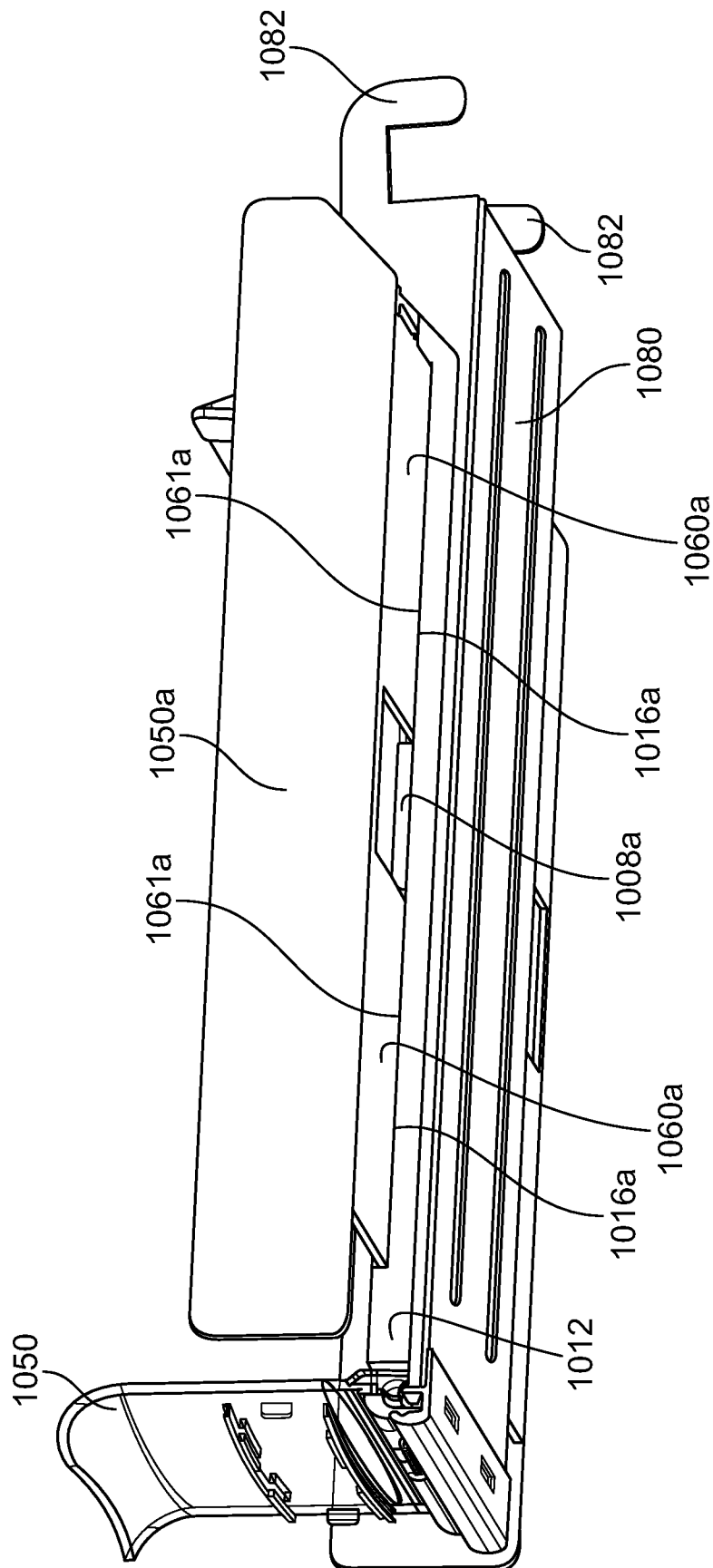
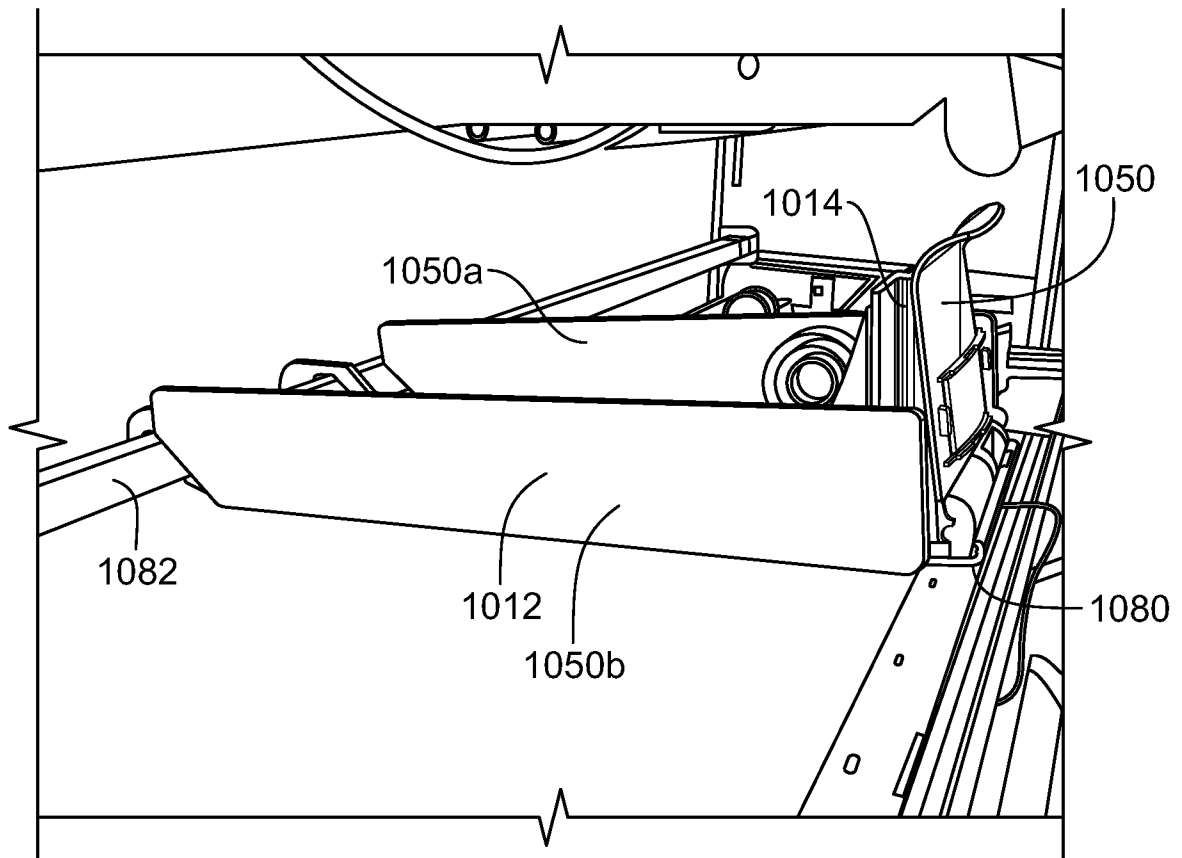


FIG. 7

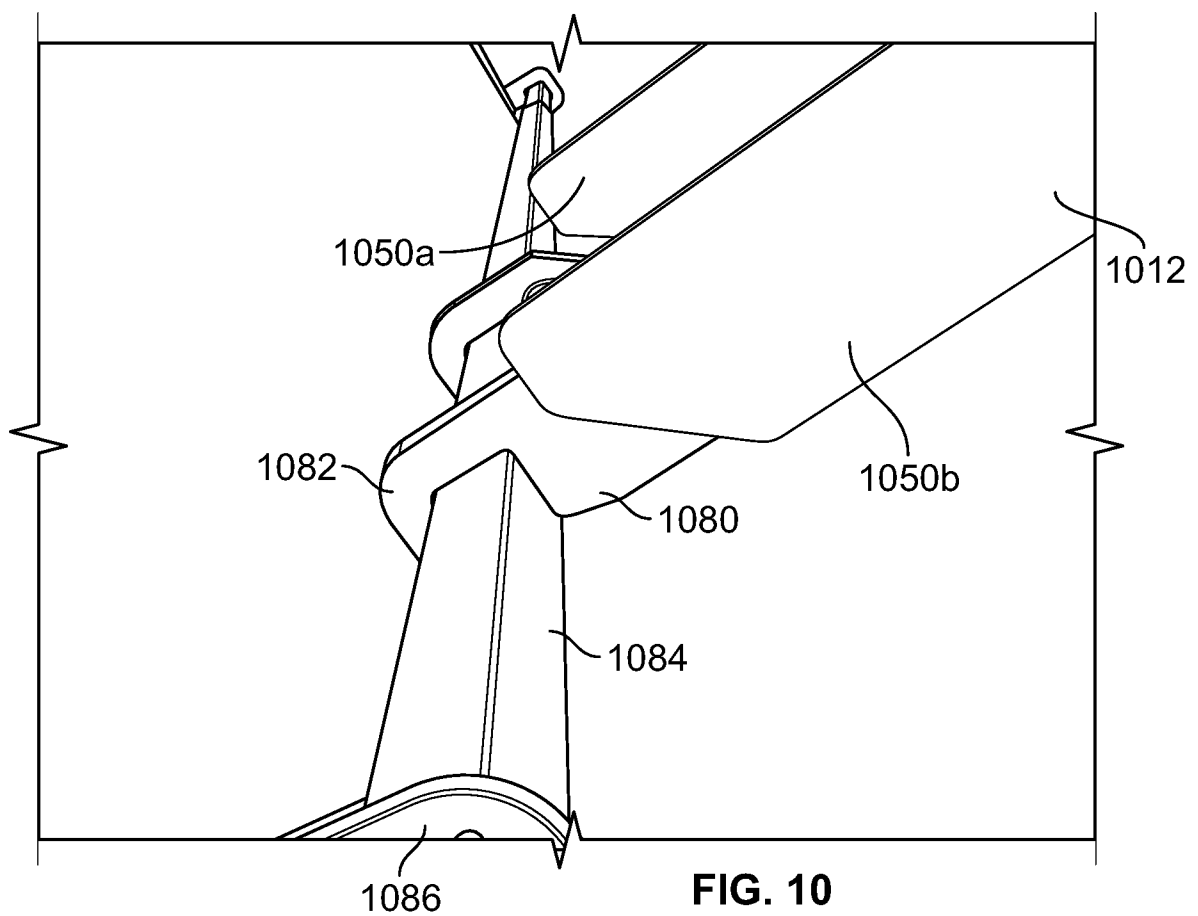


**FIG. 8**

9/10



**FIG. 9**



**FIG. 10**

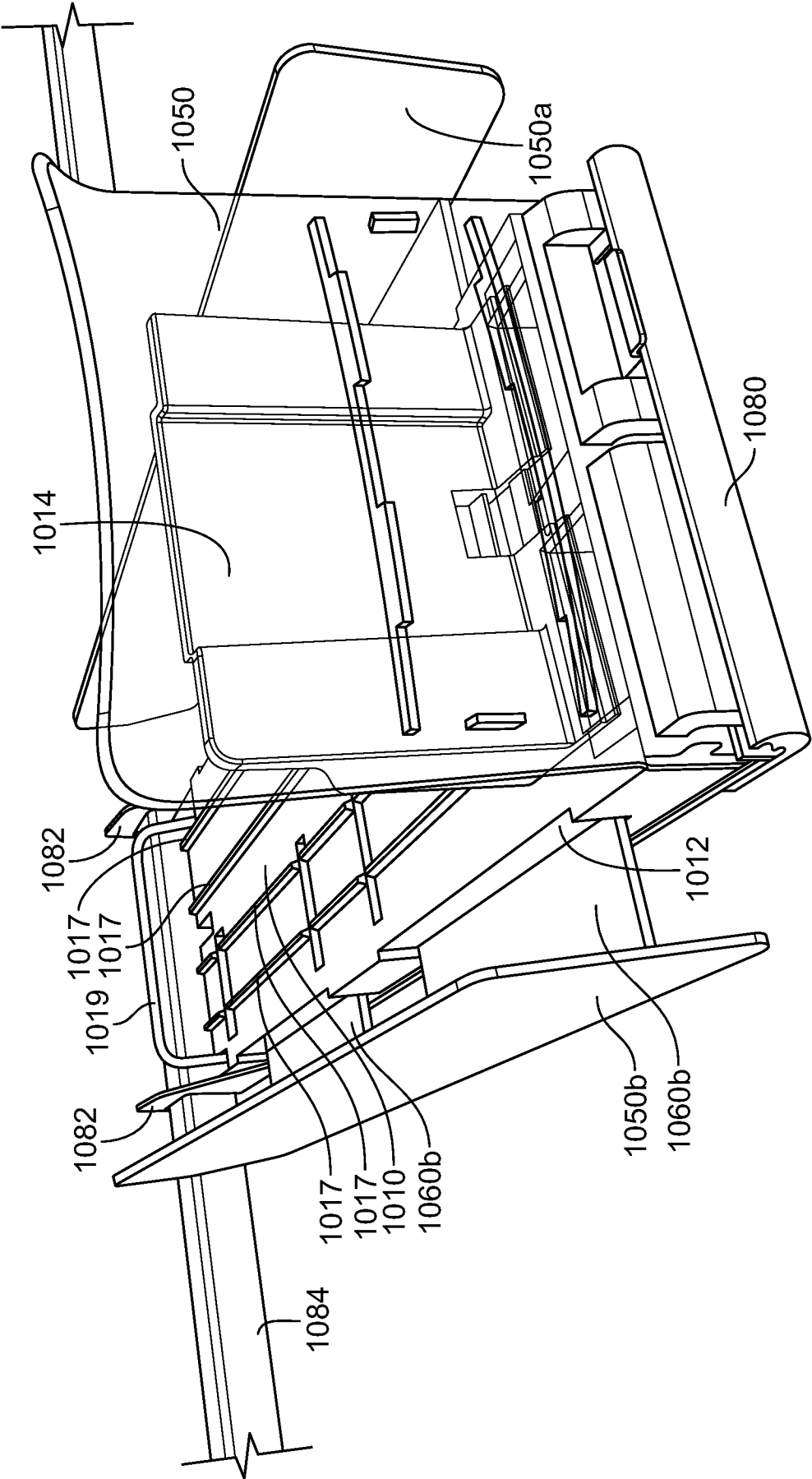


FIG. 11

# INTERNATIONAL SEARCH REPORT

International application No  
PCT/US2015/012637

<b>A. CLASSIFICATION OF SUBJECT MATTER</b> INV. A47F1/12      A47F3/14      A47F5/00 ADD.		
According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b> 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		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X  A	US 5 366 099 A (SCHMID MICHAEL [US]) 22 November 1994 (1994-11-22) column 3, line 53 - column 4, line 4; figures 1,3	1,2  3
X	----- US 2007/175839 A1 (SCHNEIDER RAYMOND M [US] ET AL) 2 August 2007 (2007-08-02) paragraph [0029]; figure 7	1
X	----- US 2003/217980 A1 (JOHNSON ALLEN E [US] ET AL) 27 November 2003 (2003-11-27) paragraph [0040]; figure 2	1
X	----- US 2004/079715 A1 (RICHTER GARY M [US] ET AL) 29 April 2004 (2004-04-29) paragraph [0039]; figures 12,19 ----- <div style="text-align: center;">-/-</div>	1
<div style="display: flex; justify-content: space-between;"> <span><input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C.</span> <span><input checked="" type="checkbox"/> See patent family annex.</span> </div>		
<div style="display: flex;"> <div style="flex: 1;"> <p>* Special categories of cited documents :</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier application or patent but published on or after the international filing date</p> <p>"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)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </div> <div style="flex: 1;"> <p>"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</p> <p>"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</p> <p>"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</p> <p>"&amp;" document member of the same patent family</p> </div> </div>		
Date of the actual completion of the international search  <div style="text-align: center; font-size: 1.2em;">10 April 2015</div>		Date of mailing of the international search report  <div style="text-align: center; font-size: 1.2em;">13/07/2015</div>
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016		Authorized officer  <div style="text-align: center; font-size: 1.2em;">Martinez Valero, J</div>

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US2015/012637

## Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-11

### Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

## INTERNATIONAL SEARCH REPORT

International application No  
PCT/US2015/012637

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 2013/193095 A1 (NAGEL THOMAS O [US]) 1 August 2013 (2013-08-01) figures 1,3 -----	8
A	WO 2013/066686 A1 (SOUTHERN IMPERIAL INC [US]; NAGEL THOMAS O [US]) 10 May 2013 (2013-05-10) figures 1-3 -----	8
A	DE 20 2011 107980 U1 (OECHSLE DISPLAY SYSTEME GMBH [DE]) 27 January 2012 (2012-01-27) figures 1,3 -----	4

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2015/012637

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5366099	A	22-11-1994	NONE
US 2007175839	A1	02-08-2007	US 2007175839 A1 02-08-2007 US 2010140197 A1 10-06-2010 US 2012234779 A1 20-09-2012
US 2003217980	A1	27-11-2003	NONE
US 2004079715	A1	29-04-2004	US 2004079715 A1 29-04-2004 US 2007175840 A1 02-08-2007
US 2013193095	A1	01-08-2013	NONE
WO 2013066686	A1	10-05-2013	AU 2012332933 A1 15-05-2014 CA 2854492 A1 10-05-2013 CN 104023594 A 03-09-2014 EP 2773242 A1 10-09-2014 JP 2014532515 A 08-12-2014 US 2013112634 A1 09-05-2013 US 2014190914 A1 10-07-2014 WO 2013066686 A1 10-05-2013
DE 202011107980	U1	27-01-2012	NONE



**FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210**

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-11

Merchandise display system comprising adjustable side  
dividers

---

2. claims: 12-22

Merchandise display system comprising a rotating front  
retainer with projection to assist refilling

---