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(54) FEEDER DEVICE AND SLED FOR SUCH DEVICE

(57) A feeder device configured for mounting on a shelf for feeding successive products (P) to a front of the shelf. The device comprises an elongated guide member (10) which is configured for extending longitudinally backwards from the front of the shelf when the device is mounted. A first sled (20) is arranged longitudinally displaceable along the guide member (10) and comprises a back support (23) configured for engaging a rearmost product of the successive products (P) for pushing the products towards the front of the shelf. Means (25) is arranged for urging the first sled (20) along the guide member (10) towards a front end of said guide member. Indication means is arranged to indicate that the first sled (20) has reached or passed a certain predetermined position along the guide member (10), at which position only a predetermined number of the successive products (p) remain at the feeder device. The indication means comprises a second sled (30) which is arranged longitudinally displaceable together with the first sled (20) relative to the guide member and limitedly longitudinally displaceable relative to the first sled (20). The second sled comprises a front support (33) which is arranged to engage a front-most product (P) of the predetermined number of remaining products when the second sled (30) is in a front-most position relative to the first sled (20).

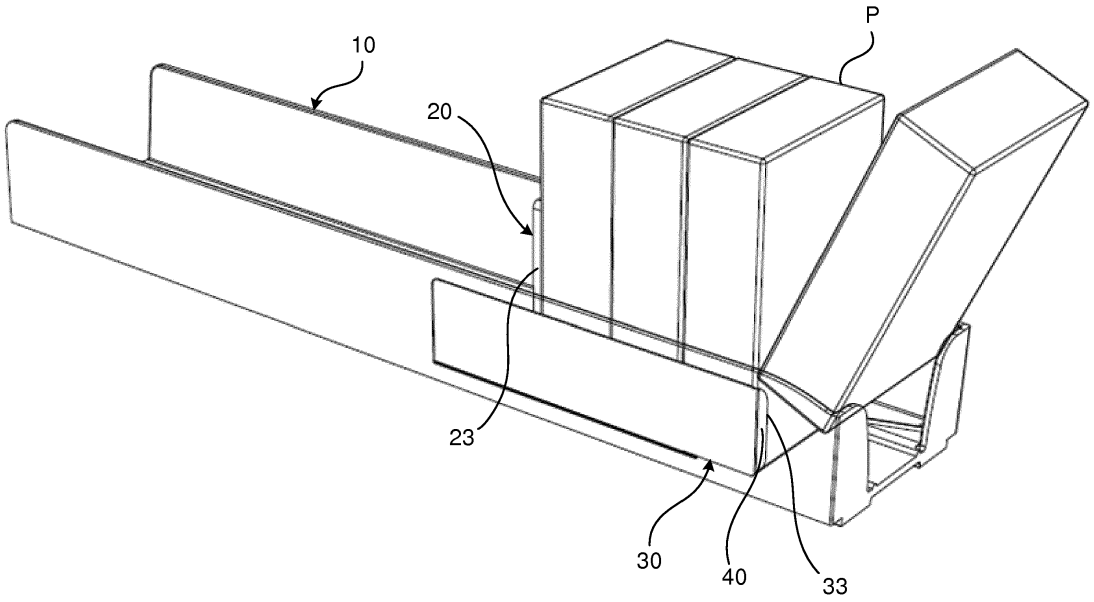

Fig. 1

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Description

TECHNICAL FIELD

[0001] The present invention relates a feeder device for mounting on a shelf for feeding successive products to a front of the shelf. Particularly, it relates to such a feeder device comprising means for indicating that the feeder device is running out of products. The invention also relates to a sled for such a feeder device.

BACKGROUND

[0002] Stores that retail convenience goods or commodities on a daily basis often present their goods on shelves. In order to create an ordered display of these displayed goods and to enhance their presentation there is used shelf management systems comprising a number of different accessories, such as shelf dividers, different types of feeder devices for pushing the goods and different types of trays, etc. Such accessories are often mounted on the upper surface of the shelf.

[0003] Known technology allows these accessories to be affixed to the shelf in a number of different ways, for instance mechanically with the aid of screws or corresponding devices, by frictional engagement or by adhesion with the aid of double-sided adhesive tape or by corresponding means.

[0004] The devices used to fasten the accessories to the shelves will preferably have some fundamental properties. One important property resides in the ability to fasten the accessories at selected positions along the length of the shelving, so as to position the accessories in a selected space relationship that is adapted to suit different packages and different quantities of goods.

[0005] It is also particularly important that the accessories are securely held to the shelving. The fixing device should, of course, prevent the accessories from being loosened inadvertently from the shelving. It is also important that the accessories will not be displaced inadvertently along the shelving.

[0006] For reasons of space and also for aesthetical reasons it is preferable that the accessory fixing arrangement projects as slightly as possible from the upper surface of the shelving and its front side.

[0007] Feeder devices for merchandising in general are used for example in grocery stores where goods are exposed on the shelves. Feeder devices are used to push forward placed goods or stored items, one behind the other in rows, to the front edge of the shelf, in order to facilitate the picking of the goods, improve visibility of the goods and make the shelf aesthetic appearance more appealing.

[0008] The feeder device may include a base or web which is placed on the shelf so that it extends from the shelf front edge in a rearward direction. A feed sled is slidably disposed on the base along its length. When the shelf is to be refilled, the sled is pushed rearwards and a row or stack of products is placed in front of the sled, which then engages the back side of the rearmost product. At automatic feeder devices the sled is forwardly biased, for example by a coil spring which is arranged on the backside of the sled and which at one end is attached to the front end of the base. At manually operated feeder devices, a tool having a handle or grip which is accessible by a person standing in front of the shelf maybe connected to the sled. When the foremost positions at the shelf are empty, personnel may grip the handle and pull the sled forwardly, thereby moving the remaining products forwardly and filling the foremost positions.

[0009] Feeder devices are often used in combination with shelf dividers or trays for forming well defined compartments in which the row or stack of successive products are placed and guided during forward movement. Especially for products and packages having well defined dimensions, such as cigarette packages, trays with fixed dimensions are often used for forming the guiding compartments. Since most cigarette manufactures use standardized dimensions for the packages, one and the same standardized tray may be used for storing and displaying cigarette packages of vastly differing brands. The same also applies also to other types of products such as beverages contained in standardized cans, bottles or cartons, snuff tobacco contained in cylindrical plastic boxes, pharmaceuticals packaged in carton boxes or plastic bottles and CD, DVD and Blueray discs contained in plastic cases.

[0010] Especially at shelf management systems comprising automatic feeders, it may be difficult for personnel working in the store to know how many products are remaining in each compartment and when the compartment should be refilled. Each compartment should preferably be refilled before the compartment is completely empty, since this increases the sales and customer satisfaction. Typically, the compartments should ideally be refilled when approximately three to four products remain in the compartment.

[0011] WO 2002/042721 A1, JP 2003210286 A and JP H 07241227 A all disclose feeder devices with means for continuously displaying the number of remaining products. Such continuous display of the number of remaining products is however often superfluous since it is sufficient for the personnel to know only whether or not the number of products has decreased below a certain value. The continuous display also requires a relatively complex design involving a comparatively high number of moving components or electronics. Further more, these devices require that the person wanting to know the number of remaining products approaches each feeder device individually and studies the displayed number at a comparatively short distance.

[0012] WO 20 13/153579 A1 discloses a feeder device which comprises means for detecting and alerting that the remaining number of fed items has fallen below a predetermined number. At this known device the alert is given at the rear end of the device. The device is com-

paratively complex in construction and the rear end alert requires that the forward movement of the feeder sled is translated into a rearward movement of the alert member.

[0013] EP 3141159 A1 discloses a feeder device comprising an elongate guide member and a forwardly urged sled configured for pushing a row of successive products forwardly. The device further comprises an indication means arranged to indicate that the sled has reached a certain position along the guide member, which position corresponds to that only a predetermined number of products are remaining. The indication means comprises a limitedly displaceable transmission rod with a flag at the front end and a magnet by which the rod may be connected to and disconnected from the sled. As the sled approaches a position where only a predetermined number of products remain, the transmission rod is magnetically connected to the sled and moves along from an inactive to an active position where the flag protrudes in front of the guide member, thereby indicating a low stock situation. At further forward movement of the sled, the magnetic connection is broken such that the transmission rod and flag remain in the active position. When the sled is pushed backward during re-filling of products the transmission rod is again magnetically connected with the sled, such that it follows the sled to the inactive position.

SUMMARY

[0014] It is an object of the present invention to provide an enhanced feeder device which gives a low stock indication, indicating that the number of remaining products has decreased below a certain value.

[0015] Another object is to provide such a feeder device which is simple in construction and which involves only a limited number of moving parts.

[0016] Yet another object is to provide such a feeder device which maybe accomplished by fitting only one additional component to already existing feeder devices.

[0017] Still another object is to provide such a feeder device which gives a binary and criteria triggered low stock indication.

[0018] A further object is to provide such a feeder device at which the low stock indication is readily observable at a distance.

[0019] Yet another object is to provide such a feeder device which visually gives a clear low stock indication that maybe observed at a glance.

[0020] A still further object is to provide such a feeder device at which the low stock indication is automatically reset when the feeder device is refilled with products.

[0021] A further object is to provide such a feeder device which allows to give a low stock indication at a distance, remotely from the shelf.

[0022] These and other objects are achieved by a feeder device as set out in the preamble of claim 1, which feeder device exhibits the special technical features specified in the characterizing portion of said claim. The feeder device configured for mounting on a shelf for feeding successive products to a front of the shelf. The device comprises an elongated guide member which is configured for extending longitudinally backwards from the front of the shelf when the device is mounted. A first sled is arranged longitudinally displaceable along the guide member and comprises a back support configured for engaging a rearmost product of the successive products for pushing the products towards the front of the shelf. The device also comprises means for urging the first sled along the guide member towards a front end of said guide member. Indication means is arranged to indicate that the first sled has reached or passed a certain predetermined position along the guide member, at which position only a predetermined number of the successive products remain at the feeder device. The indication means comprises a second sled which is arranged longitudinally displaceable together with the first sled relative to the guide member and limitedly longitudinally displaceable relative to the first sled. The second sled comprises a front support which is arranged to engage a front-most product of the predetermined number of remaining products when the second sled is in a front-most position relative to the first sled

[0023] The feeder device according to the invention thus gives a clear and reliable low stock indication only when the number of products remaining at the feeder device has fallen below a certain value. The invention is based on the idea that the products them selves may be utilized for bringing the indication means along with the first sled to the position where it indicates that only the predetermined number of products remain at the feeder device. By this means the low stock indication maybe accomplished in a very simple and reliable manner. No additional components, such as magnets or other means for connecting and disconnecting the indication means from the pusher sled is needed, which is the case at the device according to e.g. EP 3141159 A1. The only component in addition to the components of a conventional feeder device, without any low stock indication, that is required is the second sled. This second sled may further be very simple in construction as long as it is limitedly displaceable relative to the first sled and comprises a front support arranged to engage a front most of the remaining products.

[0024] A further advantage is that such a second sled may easily be constructed such that it may be retro-fitted to already existing feeder devices without low stock indication means, thereby upgrading such existing feeder devices to comprise the low stock indication feature. The invention even allows for that the second sled is constructed such that it may easily be retro-fitted to existing feeder device on cite in the shops by store clerks, without any further training.

[0025] The second sled may exhibit a longitudinal slit and the first sled may comprise a drive member which is received in the longitudinal slit.

[0026] The second sled may comprise a bottom portion which is arranged to be guidedly supported by the guide

member.

[0027] The second sled may comprise a second sled side wall.

[0028] The product support maybe arranged at a front end of the second sled side wall.

[0029] The guide member may exhibit a longitudinal guide slit which receives the drive member for guiding the first sled along the guide member.

[0030] The guide member may comprise a bottom wall arranged to support the successive products.

[0031] The guide member may further comprise a guide member side wall arranged at each longitudinal lateral side of the bottom wall, thereby forming a tray for receiving the successive products.

[0032] The guide member may comprise at least one front wall.

[0033] The second sled may comprise a visual indication means arranged to be become visible at the front of the guide member when the second sled has reached its front-most position along the guide member.

[0034] The visual indication means may be arranged at the front support.

[0035] The front support maybe arranged at a predetermined distance from the back support when the second sled is in its front-most position relative to the first sled, which predetermined distance corresponds to the accumulated longitudinal dimension of a stack comprising the predetermined number of remaining products.

[0036] The distance between the front support and the back support maybe between 60 and 80 mm, preferably approx. 70 mm, when the second sled is in its front-most position relative to the first sled.

[0037] The means for urging the first sled towards the front end of the guide member may comprise a spring comprising a coil arranged at the first sled and a free end fixed at the front end of the guide member.

[0038] The spring may extend through a spring opening in the second sled.

[0039] The second sled may comprise a flexible, longitudinal tab extending backwards behind the spring opening, which tab exhibits the longitudinal slit.

[0040] The guide member may comprises a transparent front wall.

[0041] Alternatively or in combination, the indication means may comprise an electronic circuit arranged to give an electronic indication when the second sled has reached the position corresponding where only the predetermined numbers of products remain at the feeder device.

[0042] The electronic circuit may be arranged to give the electronic indication at a distance from the shelf.

[0043] It is e.g. possible that the second sled is connected to a switch or a sensor which gives an electronic signal when the second sled has reached the predetermined front-most position relative to the guide member. The signal may be conducted or transmitted to a control panel or a computer arranged remotely from the shelf, e.g. in an office or a storage of the store. It is then possible for personnel to be notified that the feeder device needs to be refilled without the need of walking through the store.

[0044] The invention also relates to a sled for being used at such a feeder device.

[0045] Further objects and advantages of the invention will appear from the following detailed description of embodiments and from the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0046] Embodiments will now be described, by way of example, with reference to the accompanying drawings, in which:

Fig. 1 is a perspective view of a feeder device according to an embodiment of the invention which holds a number of product packages.

Fig. 2 is a perspective view of the feeder device shown in fig. 1 without product packages.

Fig. 3 is a longitudinal section of the feeder device shown in fig. 2.

Fig. 4a-c are perspective views corresponding to fig 2, where one part has been cut away for increased visibility and illustrating the first and second sleds in different operating positions.

Fig. 5 is a perspective view of the second sled comprised in the feeder device shown in figs. 1-4c.

DETAILED DESCRIPTION

[0047] Embodiments will now be described more fully hereinafter and with reference to the accompanying drawings, in which a certain embodiment is shown. However, other embodiments in many different forms are possible within the scope of the present disclosure. Rather, the following embodiments are provided by way of example so that this disclosure will be thorough and complete, and will fully convey the scope of the disclosure to those skilled in the art. Like numbers refer to like elements throughout the description.

[0048] Any directions and orientations, such as rearward, forward, sideways, up and down refer to the longitudinal direction of the feeder device when positioned on a horizontal shelf and extending rearwards from the front edge of the shelf.

[0049] At the embodiment shown in figs. 1-4c, the feeder device is configured for storing, displaying and feeding products P in the form of cigarette packages. Such packages is an example of products which have standardized dimensions that are used by many manufacturers for their different brands. For such products, known feeder devices often comprise an elongate tray comprising a bottom wall, two lateral side walls and a front wall. The

bottom wall is arranged to support a stack or row of successive products arranged one behind the other. The side walls are arranged at a lateral distance corresponding to the width of the products and extend upwards to a sufficient height of the products such tat the products are guided along the tray and supported sideways.

[0050] In the shown example the feeder device comprises an elongate guide member 10, and a first sled 20. The exemplifying feeder device is configured for storing, displaying and feeding successive products P in the form of cigarette packages which are arranged in a horizontal stack or row one after the other. The feeder device is further arranged to be positioned on and attached to a shelf (not shown) such that the elongate guide member 10 extends backwards from a front edge of the shelf.

[0051] The guide member 10 is formed as a tray and comprises an elongate bottom wall 11 defining a longitudinal direction, a first side wall 12a, a second side wall 12b and a front wall 13, divided in two portions 13a, 13b. The side walls 12a, 12b extend vertically upwards from respective lateral edges of the bottom wall 11 to a height which corresponds approximately to 1/3 of the height of the products P. The lateral distance between the side walls 12a, 12b corresponds to the widths of the products P with some play added. By this means the products are securely guided along the tray, while keeping the longitudinal alignment of row and preventing the products from tilting sideways. The bottom wall 11 is provided with a number of upwardly projecting ribs 14 which extend in parallel, longitudinally along essentially the entire length of the bottom wall 11. In the shown example 4 such ribs are provided. The number may however be varied. The ribs 14 are arranged to support the bottom surface of the products and contribute, together with the play between the side surfaces of the products and the side walls 12a, 12b to reduce the friction between the products and the guide member 10 as the products are feed forwardly.

[0052] The guide member further exhibits a longitudinal guide slit 15 which penetrates through the bottom wall 11 and extends centrally from a rear portion of bottom wall to a short distance behind its front end.

[0053] The guide member 10 maybe manufactured in different ways . A preferred example is by injection moulding of a plastic material. At the shown example the entire guide member 10 has been injection moulded using a transparent plastic material. Making the guide member transparent affords for the advantage that the visibility of products is enhanced. As explained below an other advantage is that the indication of a low stock situation may easily be accomplished if visual indication means are readily observable through the front wall portions 13a, 13b of the feeder device. In cases where it is desirable that only the front wall of the guide member is transparent but the side walls and/or the bottom wall are non-transparent, it is possible to manufacture the guide member by co-moulding of one transparent and at least one non-transparent plastic materials.

[0054] The first sled 20 comprises a base 21 which is slidingly supported by the ribs for longitudinal displacement relative to the guide member 10. A drive member 22 protrudes downwardly from a bottom surface of the base 21. The drive member 22 comprises a downwardly projecting peg 21 having a rectangular cross section and a horizontal bottom plate 22b at its free end. The peg 22a extends through the guide slit 15 such that it is guidedly received therein and the bottom plate 22b extends laterally past the longitudinal edges of the guide slit 15 such that the first sled 20 is prevented from being lifted out of engagement with the guide slit 15. The second sled 20 further comprises a back support 23 in the form of a plate which extends upwardly from the front edge of the base 21. The back support 23 has a height which corresponds to at least half the height of the products for preventing that the products P fall backwards when pushed forwardly by the second sled 20. The width of the back support 23 is chosen sufficiently large in relation to the width of the products P such that the products are prevented from rotating about a vertical axis.

[0055] In the shown example the feeder is of the automatic type where the second sled is constantly urged forwardly by means of spring. The feeder device thus comprises a spring 25 of the clock spring type, which comprises a wound coil 25a and a free end 25b. The second sled comprises a rearwardly open space 24 which is formed between two vertical 24a and one upper horizontal 24b spring wall. The spring walls 24a, 24b extend backwards from the rear side of the back support 23 and the vertical spring walls 24a are joined with the base 21. The spring coil 25a is received in the spring space 24 and the free end 25b is fixed to the front end of the bottom wall 11 of the guide member 10. When the second sled is displaced backwardly from the front end of the guide member 10, the coil is un-winded, such that an intermediate portion 25c, between the coil 25a and the free end 25b extends through a spring aperture 26 in the lower edge of the back support 23 forwardly above the bottom wall 11 to the free end 25b. The free end 25b is fixed to the bottom wall 11 by means of being bent into engagement with a transverse fixation slit 16 arranged in the bottom wall 11, closely behind its front end.

[0056] At manually manoeuvred feeder devices the spring may be exchanged by a feeding rod (not shown) which releasably engages the first sled and extends forwardly to the front end of the guide member.

[0057] Both automatic and manual feeder devices of the above described type, comprising a tray formed guide member, a sled with a back support and forward urging means are known and widely used e.g. in grocery stores and at tobacconist's for storing, displaying and dispensing packages with standardized dimensions.

[0058] The feeder device further comprises a second sled 30 which is arranged displaceable relative to the guide member 10 and limitedly displaceable relative to the first sled 20. As best seen in fig. 5, the second sled 30 comprises a bottom portion 31. The lower side of the bottom portion 31 is supported by the ribs 14 on the bot-

tom wall 11 of the guide member 10. The lateral width of the bottom portion 31 corresponds to the distance between the side walls 12a, 12b such that the second sled is received in the tray, between the side walls 12a, 12b with a slight play. The second sled 30 is thereby guidedly displaceable along the guide member 10. A second sled side wall 32 extends upwardly from one longitudinal side edge of the bottom portion 31. The second sled side wall 32 extends from the rear edge of the bottom portion 31 along the entire bottom portion and protrudes forwardly a certain distance in front of the front edge of the bottom portion 31. A front support 33 is arranged at the front edge of the second sled side wall 32. The front support 33 is arranged as an laterally inwardly bent tab or wall portion which extends vertically an perpendicularly to the longitudinal direction of the guide member, when the second sled 30 is mounted in the tray. The forwardly facing surface of the front support carries a visual indication means 40. In the exemplifying embodiment this visual indication means 40 consists in that the front surface is coloured in a bright clearly visible colour, such as red. However, the visual indication means could be formed and achieved in many other ways, e.g. by printing a message on the front surface of the front support.

[0059] The bottom portion 31 exhibits a centrally extending longitudinal slit 34 which is arranged to receive the drive member 22 of the first sled 20. A spring opening 35 is arranged in the bottom portion 31, centrally in front of the slit 34.

[0060] The spring opening 35 is arranged to receive the intermediate portion 25 of the spring when the second sled 30 is mounted. The bottom portion 31 is further provided wit a cut out 37 which forms a flap 38 having a free end. The flap 38 extends centrally rearwards behind the spring opening 35 and the longitudinal slit 34 is arranged in the flap 38. The width of the flap 38 is somewhat smaller than the lateral distance between the two centre-most ribs 14 such that the flap 38 may be flexed downwardly between the centre-most ribs 14. The cut out 37 is further positioned and formed such that the base 21 of the first sled 20 may extend there through and be supported by the ribs 14. The arrangement of the cut-out 37 and the flexible flap 38 provides for that the contact area between the bottom portion 31 and the bottom wall 11 is small. Thereby the friction between the second sled 30 and the bottom wall 11 of the guide member 10 is low such that the second sled 30 may easily be longitudinally displaced relative to the guide member 10.

[0061] When the second sled 30 has been mounted to the feeder device 10, the intermediate portion 25c of the spring 25 extends rearwardly, from below up through the spring opening 35. The spring opening 35 is preferably give a certain minimum dimension in the longitudinal direction such that the intermediate portion 25c of the spring may pass through the spring opening 35 without exerting any important frictional forces to the bottom portion 31 of the second sled 30. By this means it is provided that the second sled may move freely at low friction in relation to both the first sled 20 and the guide member 10.

[0062] The drive member 22 extends through the longitudinal slit 34 of the second sled 30 and through the guide slit 15 in the bottom wall 11 of the guide member 10. When so mounted, the second sled is displaceable together with the first sled 20 relative to the guide member 10. Additionally the second sled 30 is limitedly displaceable relative to the first sled 20. This relative displacement is limited by the length of the longitudinal slit 34 in the bottom portion 31 of the second sled 30. When the second sled is in its front-most portion relative to the first sled 20, the drive member 22 makes contact with the rear end of the slit 34 and when the second sled 30 is in its rear-most position relative to the first sled 20, the drive member 22 is in contact with the front end of the slit 34.

[0063] The second sled 30 maybe manufactured in many different ways. However injection moulding of plastic material or punching and bending a sheet formed plastic material is preferred. It is also preferred that the material thickness of the bottom portion 31 and the second sled side wall 32 is made comparatively small. By this means an important advantage is achieved in that the second sled may easily be fitted to already existing feeder devices thereby upgrading them to feeder devices having the low stock indicating functionality.

[0064] Further, the front support 33 is positioned in relation to the rear end of the slit 34 such that the distance between to front support 33 and the back support 23, when the second sled is in its front-most position is essentially equal to the accumulated length in the longitudinal direction of a row of products arranged one after the other and containing the predetermined number of products which should remain at the feeder device when the feeder device should indicate a low stock situation. As best seen in fig. 1, at the shown example the distance between the back support 23 and the front support 33, when the second sled 30 is in the front-most position relative to the first sled 20 is chosen to correspond to the accumulated length of three cigarette packages arranged in a row. Since most cigarette packages have standardized dimensions, setting this distance to approximately approx. 70 mm will allow the exemplifying feeder device to be used for feeding and low stock indication when three cigarette packages from most manufacturers remain at the feeder device.

[0065] With reference mainly to figs. 4a-c the operation of the feeder device will now be explained. Fig. 4a illustrates a position of the first 20 and second sled 30 relative to the guide member 10, where seven successive products (not shown) are arranged one after the other in front of the back support 23 of the first sled 10. The front most product is supported by the front wall portions 13a, 13b and the first sled is thus maintained in position against the forwardly urging spring force by the row of products received between the back support 23 and the front wall portion 13a, 13b. The three rearmost products are received between the back support 23 and the front support 33 of the second sled 30. Thereby the second sled 30 is

maintained in its front most position relative to the first sled.

[0066] When the front-most product in the entire row is picket out, the spring urges the first sled forwardly a distance which corresponds to the longitudinal dimension of the picked-out product. Since the three rearmost products are still arranged between the back 23 and front 33 supports, the second 30 sled will follow the first sled 20 and maintain its front-most position relative to the first sled 20. When four products of the initial seven products have been picked out, the first 20 and second 30 sled reaches the position shown in fig. 4b. At this position, the three products received between the back 23 and front 33 supports maintain the second sled 30 in its front-most position relative to the first sled 20. However, at this position the front surface of the front support, which surface is coloured red, has made contact with the rear surface of the left hand (as seen in fig. 4b) front wall portion 13a. Hereby two main effects are achieved. Firstly, even though not illustrated in fig. 4b, as the front wall portion 13a is transparent, the visual indication means 40, i.e. the red front surface of the front support 33 is clearly visible through the front wall portion. Thereby, any person such as shop personnel glancing at the feeder device from a position in front of the shelf will immediately realize that the products in the feeder device in question are running low and that a low stock situation has occurred, with only three or less products remain at the feeder device.

[0067] Secondly, contact between the front surface of the front support 33 and the rear surface of the front wall portion 13a, will prevent the second sled 30 from being displaced further forwardly. As the next product, i.e. the third last product, is picked out, the second sled 30 will remain its position relative to the guide member 10, thus still indicating the low stock situation. The first sled 20 on the other hand, will be urged forwardly by the spring 25 to thereby feed the two remaining products forwardly, relative to the guide member 11 och the second sled 30. The same relative movement will occur also when the second last product is picked out. At least at this stage the feeder device should be refilled for avoiding that the feeder device is left without any products. However, if also the last remaining product is picked out the second sled 30 will remain its position and the first sled 20, will move further forward to its front-most position relative to the guide member 10 and the second sled 30.

[0068] When the low stock situation has been indicated, the feeder device may easily be re-filled with new products. Simply by manually pushing the remaining front-most product or, in cases where no product remain, the back support 23 of the first sled rearwardly, the first sled 20 will be displaced rearwards relative to the guide member 10 and to the second sled 30. The second sled will then again assume its front-most position relative to the first sled 20. By further rearward pushing of the front-most remaining product or the back support 23, both the first 20 and the second sled 30 will be positioned at their rear-most positions relative to the guide member 10. In this position a row or stack of new products containing the total number of products for which there is sufficient space at the feeder device may easily be fitted into the tray, in front of any remaining product. Since the front support 33 is made thin in the longitudinal direction, the front support 23 will easily slide in between adjacent products at the rear end of the row or stack. By this means, the predetermined number of products that should remain when a low stock indication is given (i.e. three products in this example) will be positioned between the back 23 and front 33 supports. When the entire row or stack of new products have been so positioned in the tray the feeder device is again ready to store, display and feed the products.

[0069] The invention thus provides a feeder device which is easy to operate and which reliably gives a low stock indication when only the predetermined number and any lower number of products remain at the feeder device. The feeder device comprises only a low number of components and is very reliable in use. An particular advantage is that the inventive feeder device may be accomplished simply by retro-fitting only one single and simple component, i.e. the second sled to already existing feeder devices.

[0070] The present disclosure has mainly been described above with reference to a few embodiments. However, as is readily appreciated by a person skilled in the art, other embodiments than the ones disclosed above are equally possible within the scope of the present disclosure, as defined by the appended patent claims. For example, the visual indication means may be formed in many other ways than described above. It is e.g. possible to form the visual indication means as a forwardly extending peg or the like which is fixed to the front support or any other portion of the second sled and which protrudes forwardly through an aperture in the front wall of the guide member when the second sled has reached its front-most position relative to the guide member. Alternatively or in combination the feeder device could be provided with low stock indication means other than visual. Such indication means could e.g. be electronic as described in the summary of the invention.

[0071] The guide member and the first and second sled may take many different forms and the sled may be urged forwardly by other means than a coil spring. The first sled may be urged forwardly by a compression spring arranged between the rear portion of the guide member and the sled or by a tension spring arranged between the front of the guide member and the sled. Alternatively, the feeder device may be a manually operated feeder wherein the sled is moved forwardly manually by gripping and pulling a handle being connected to the sled.

[0072] Instead of forming the guide member of the feeder device as a tray, it is possible that the guide member comprises merely a longitudinal guide track, without side walls and arranged to be fixed to a shelf such that it extends rearwards from the front edge of the shelf. The

shelf management system may then comprises further accessories, such as dividing walls and front walls which may be arranged at the shelf for forming compartments with suitable widths for the products that are to be placed therein. One or several separate guide tracks may then be fixed between two adjacent compartment defining divider walls. The first sled with back support may be guided by the guide track and urged forwardly. The second sled may comprise a bottom portion with a slit receiving a guide member as in the above described embodiment. However, at this embodiment the second sled side wall may be exchanged by a second sled front wall which extends upwardly from a front edge of the bottom portion. The front surface of the second sled front wall may carry visual indication means corresponding to the visual indication means described above. At such an embodiment the firs sled is longitudinally guided by the guide track and the second sled is arranged to be guided by the guide track and or the first sled. The products on the other hand are at this embodiment guided by the separate divider walls. By this means, one and the same feeder device maybe used in combination with sideways movable dividers for allowing products with varying widths to be stored, displayed and forwardly fed and for allowing low stock indication.

Claims

1. A feeder device configured for mounting on a shelf for feeding successive products (P) to a front of the shelf, the device comprising:

an elongated guide member (10) which is configured for extending longitudinally backwards from the front of the shelf when the device is mounted;
a first sled (20) which is arranged longitudinally displaceable along the guide member (10) and which comprises a back support (23) configured for engaging a rearmost product of the successive products (P) for pushing the products towards the front of the shelf;
means (25) for urging the first sled (20) along the guide member (10) towards a front end of said guide member; and
indication means arranged to indicate that the first sled (20) has reached or passed a certain predetermined position along the guide member (10), at which position only a predetermined number of the successive products (p) remain at the feeder device;
characterised in that
the indication means comprises a second sled (30) which is arranged longitudinally displaceable together with the first sled (20) relative to the guide member and limitedly longitudinally displaceable relative to the first sled (20) and which comprises a front support (33) which is arranged to engage a front-most product of the predetermined number of remaining products (p) when the second sled (30) is in a front-most position relative to the first sled (20).

2. A feeder device according to claim 1, wherein the second sled (30) exhibits a longitudinal slit (34) and the first sled (20) comprises a drive member (22) which is received in the longitudinal slit (34).

3. A feeder device according to claim 1 or 2, wherein the second sled (30) comprises a bottom portion (31) which is arranged to be guidedly supported by the guide member (10).

4. A feeder device according to any of claims 1-3, wherein the second sled (30) comprises a second sled side wall (32).

5. A feeder device according to claim 4, wherein the front support (33) is arranged at a front end of the second sled side wall (23).

6. A feeder device according to any of claims 1-5, wherein the guide member (10) exhibits a longitudinal guide slit (15) which receives the drive member (22) for guiding the first sled (20) along the guide member (10).

7. A feeder device according any of claims 1-6, wherein the guide member (10) comprises a bottom wall (11) arranged to support the successive products (P).

8. A feeder device according to claim 7, wherein the guide member (10) further comprises a guide member side wall (12a, 12b) arranged at each longitudinal lateral side of the bottom wall (11), thereby forming a tray for receiving the successive products (P).

9. A feeder device according to any of claims 1-8, wherein the guide member (10) comprises at least one front wall (13a, 13b).

10. A feeder device according to any of claims 1-9, wherein the second sled (30) comprises a visual indication means (40) arranged to be become visible at the front of the guide member (10) when the second sled (30) has reached its front-most position along the guide member (10).

11. A feeder device according to claim 10, wherein the visual indication means (40) is arranged at the front support (33).

12. A feeder device according to any of claims 1-11 wherein the front support (33) is arranged at a predetermined distance from the back support (23)

when the second sled (30) is in its front-most position relative to the first sled (20), which predetermined distance corresponds to the accumulated longitudinal dimension of a stack comprising the predetermined number of remaining products (P).

13. A feeder device according to any of claims 1-13, wherein the distance between the front support (33) and the back support (23) is between 60 and 80 mm and preferably approx.. 70 mm when the second sled (30) is in its front-most position relative to the first sled (20).

14. A feeder device according to any of claims 1-13, wherein the means for urging the first sled (20) towards the front end of the guide member (10) comprises a spring (25) comprising a coil (25a) arranged at the first sled (20) and a free end (25b) fixed at the front end of the guide member (10).

15. A feeder device according to claim 14, wherein the spring (25) extends through a spring opening (35) in the second sled (30).

16. A feeder device according to claim 15, wherein the second sled (30) comprises a flexible, longitudinal flap (38) extending backwards behind the spring opening (34), which flap (38) exhibits the longitudinal slit (34).

17. A feeder device according to any of claims 1-16, wherein the guide member (10) comprises a transparent front wall (13a, 13b).

18. A sled (30) for a feeder device according to any of claim 1-17, comprising;

- a bottom portion (31) which is arranged to be guidedly displaced relative to a guide member of the feeder device and limitedly displaceable relative to a first sled of the feeder device,
- a longitudinal slit (34) which is arranged to receive a drive member of the first sled,
- indication means (40) arranged to indicate that the first sled has reached a certain predetermined position along the guide member, at which position only a predetermined number of the successive products remain at the feeder device, and
- a front support (33) arranged to engage a front-most of a predetermined number of products, wherein
- the front support (33) is arranged at a specific distance from a rear end of the longitudinal slit (34), thereby allowing the predetermined number of products to be received between the front support and a back support of the first sled, when the sled (30) is in its front-most position relative to the first sled.

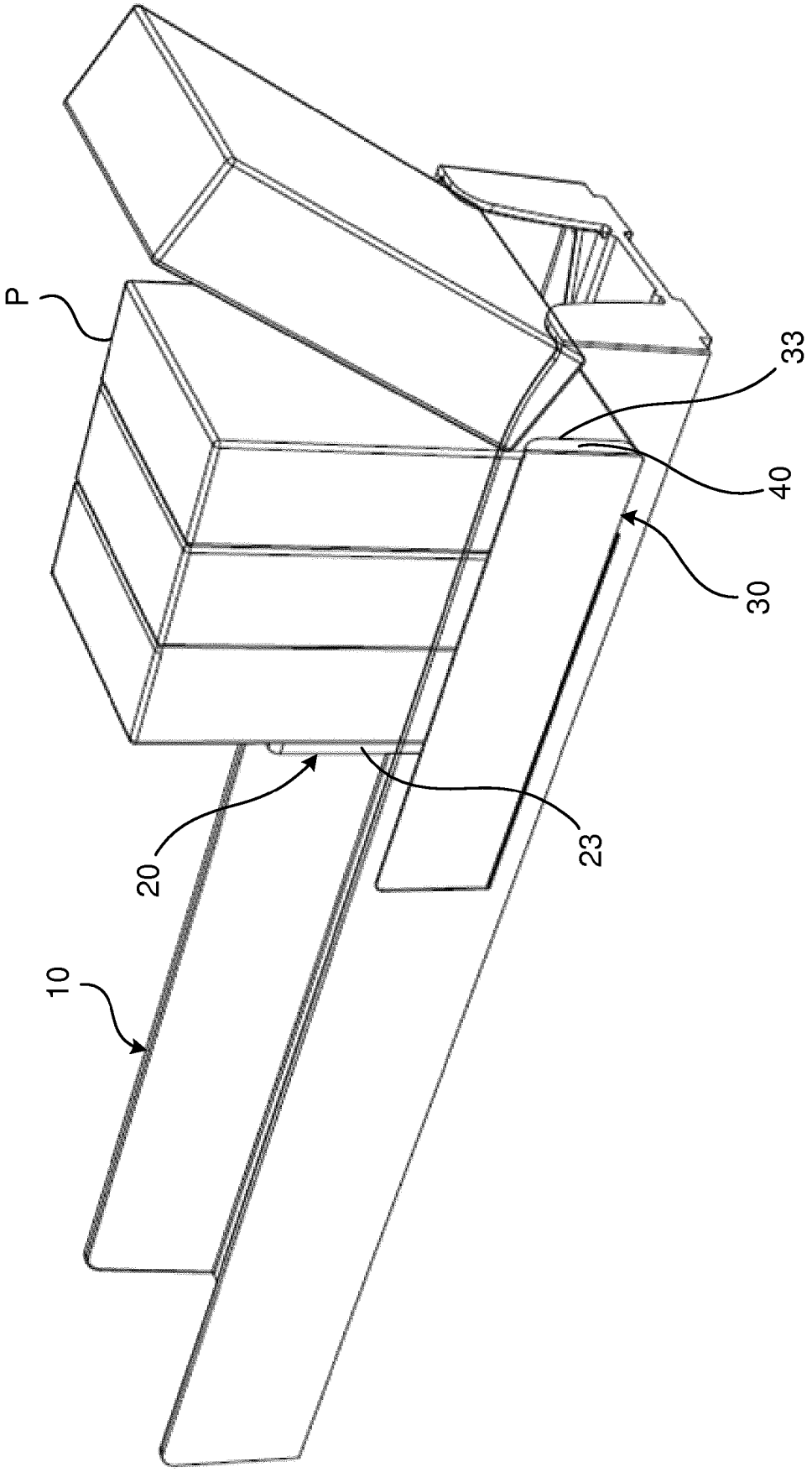

Fig. 1

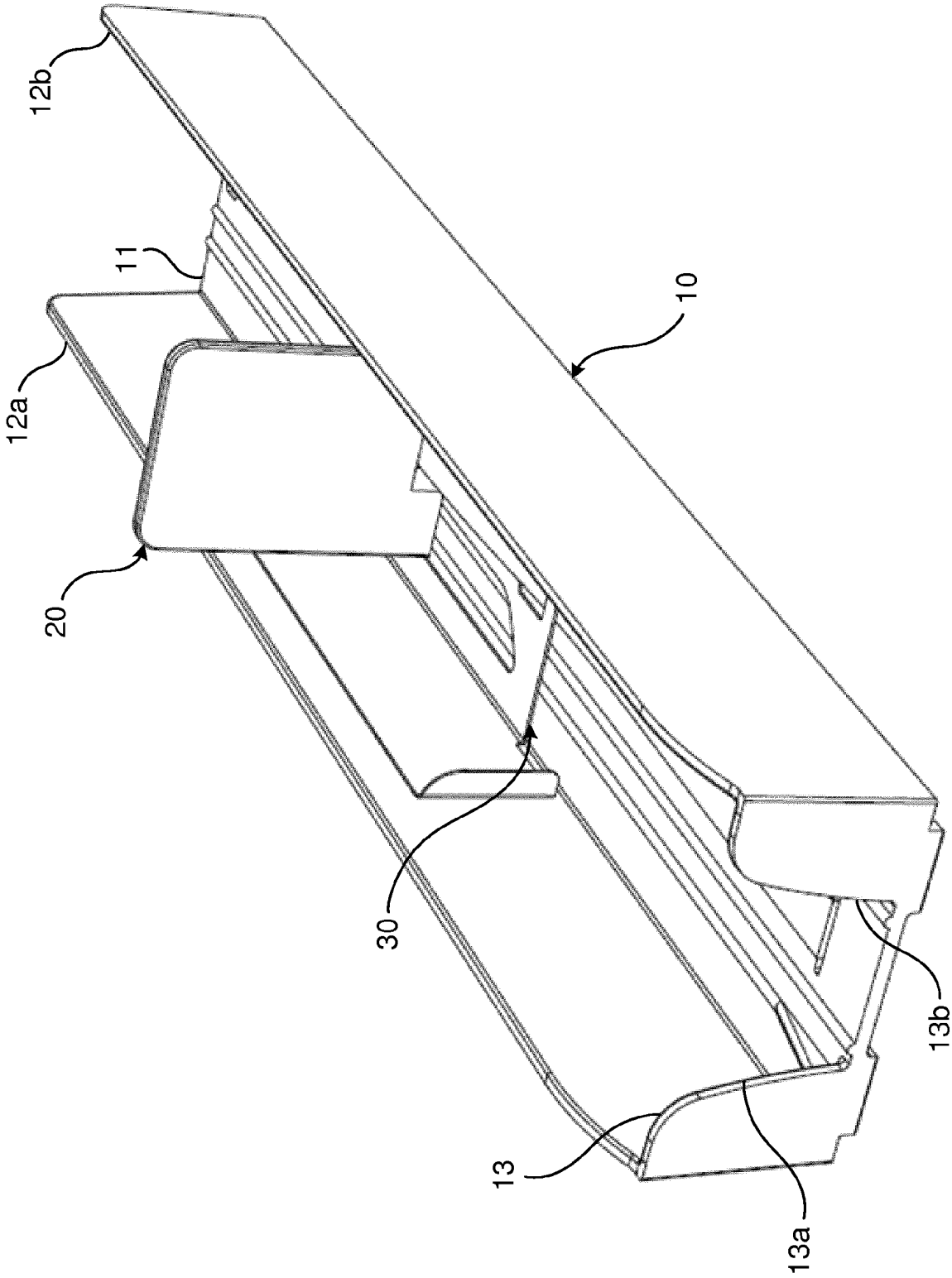

Fig. 2

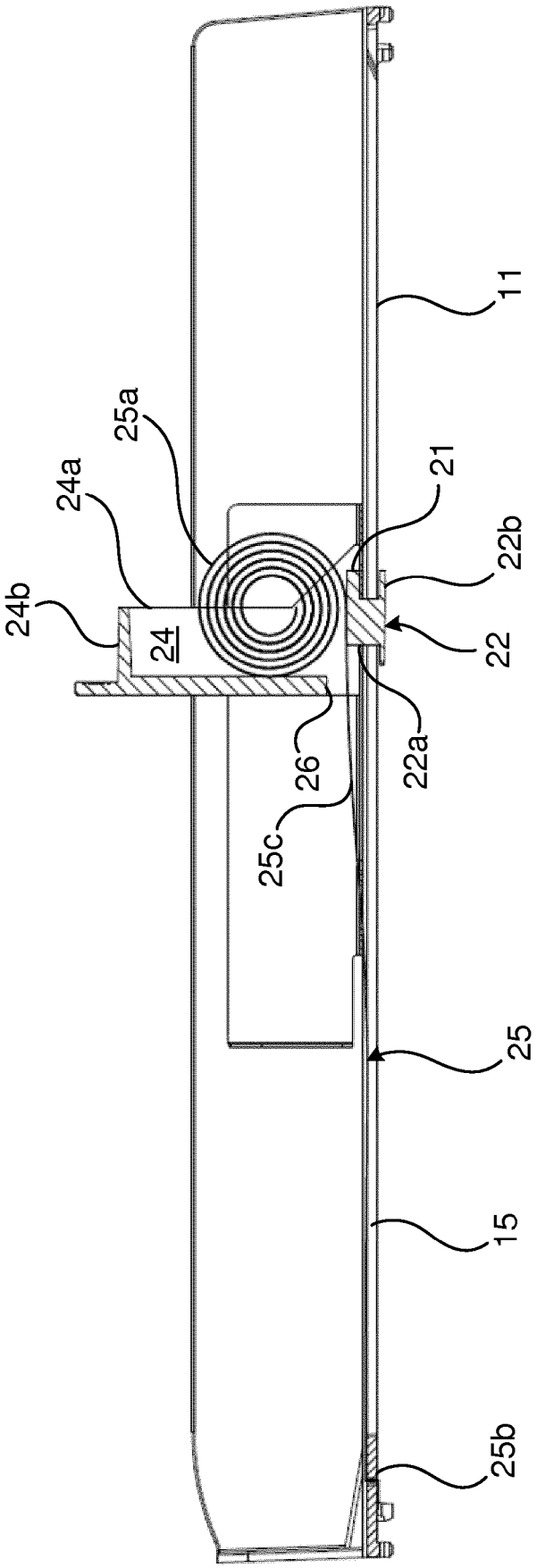

Fig. 3

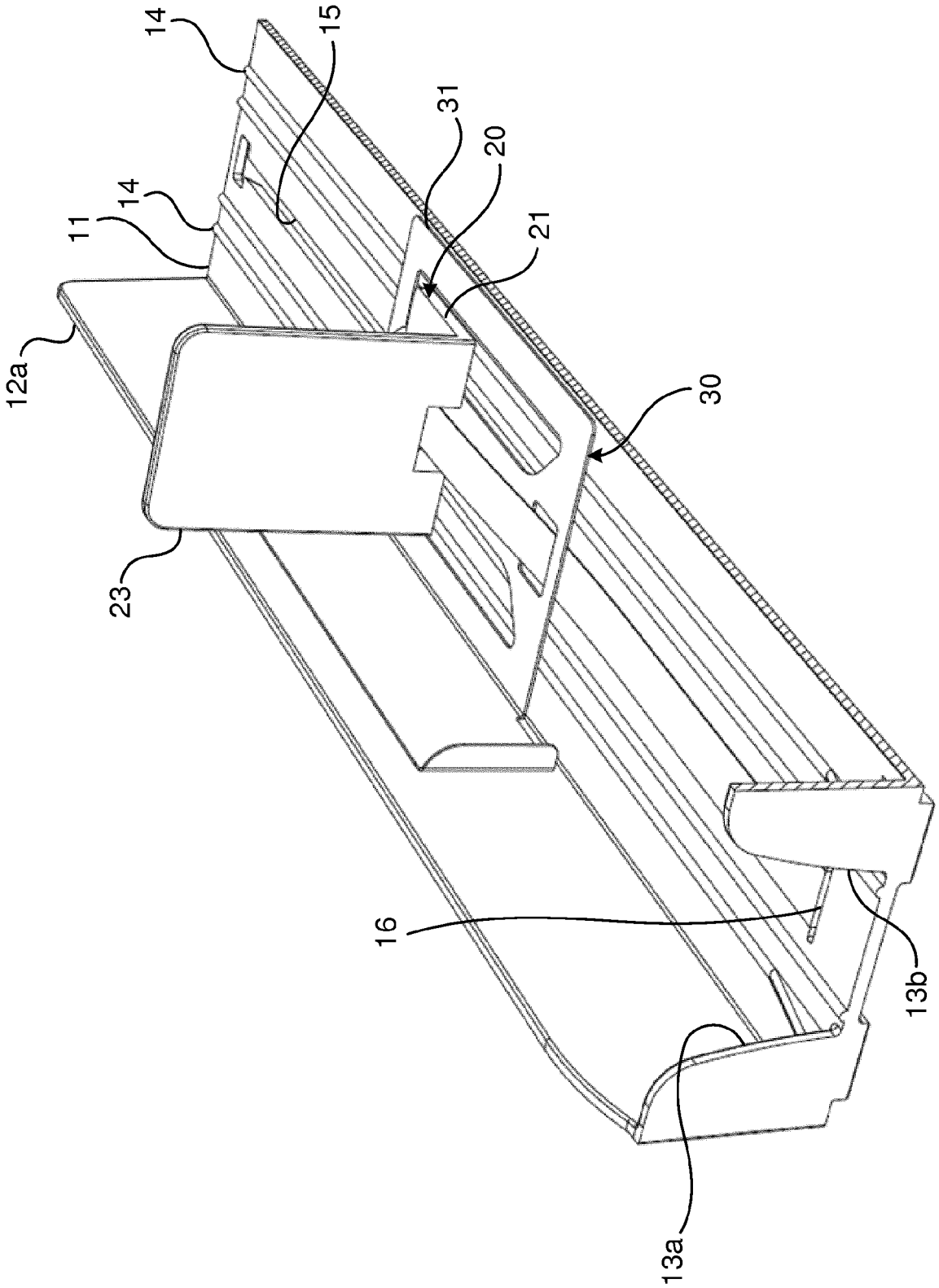

Fig. 4a

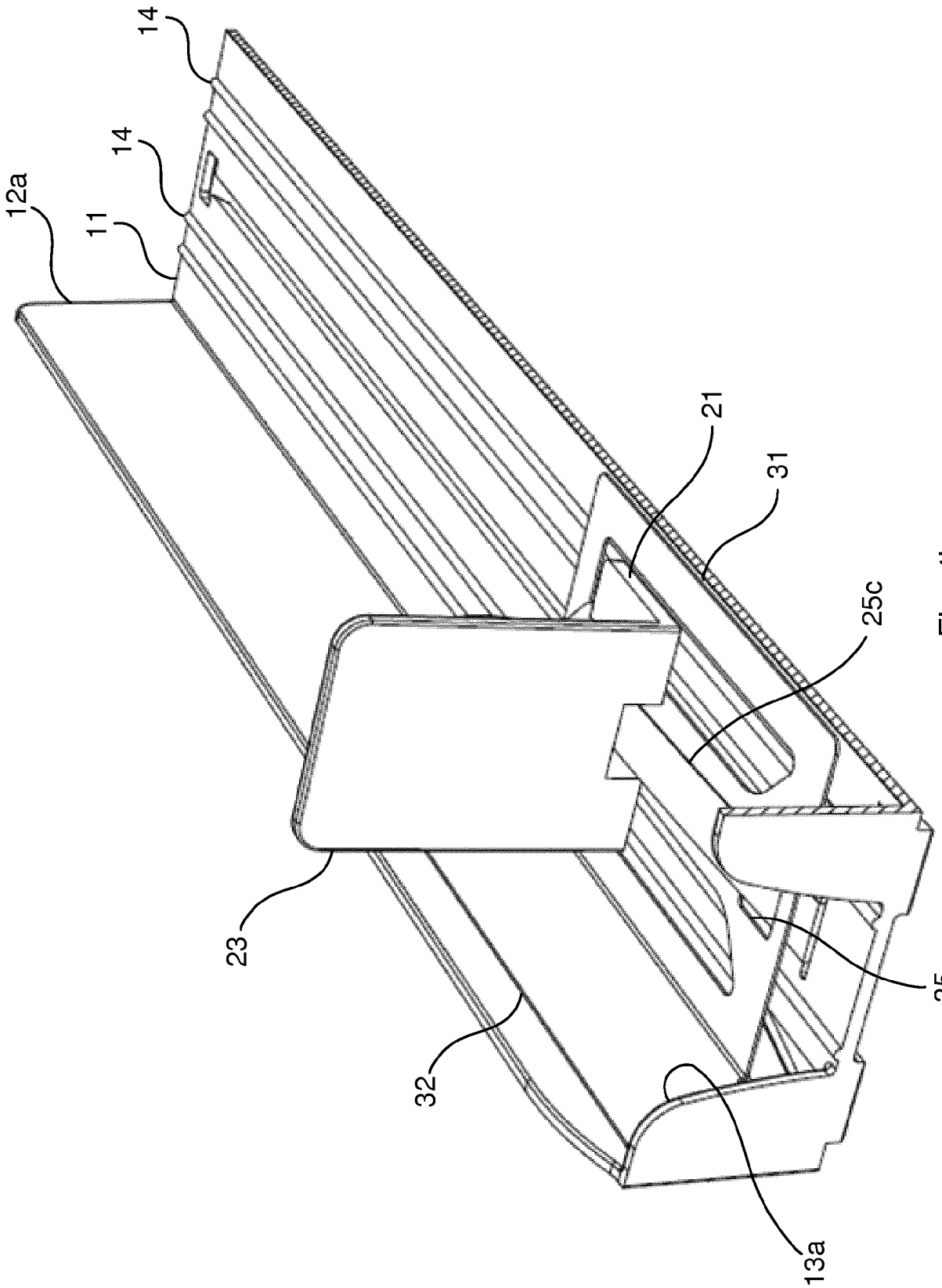

Fig. 4b

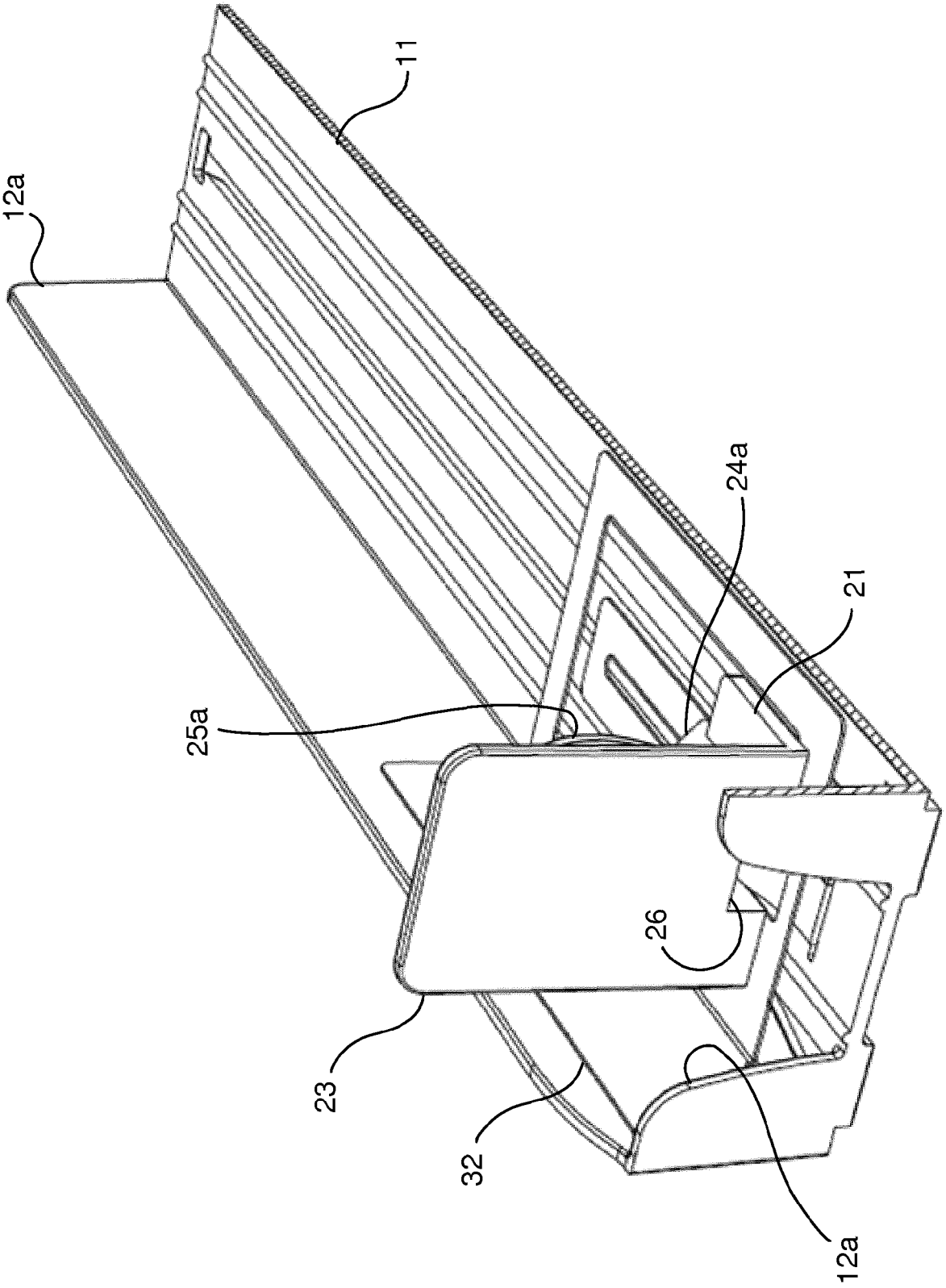

Fig. 4c

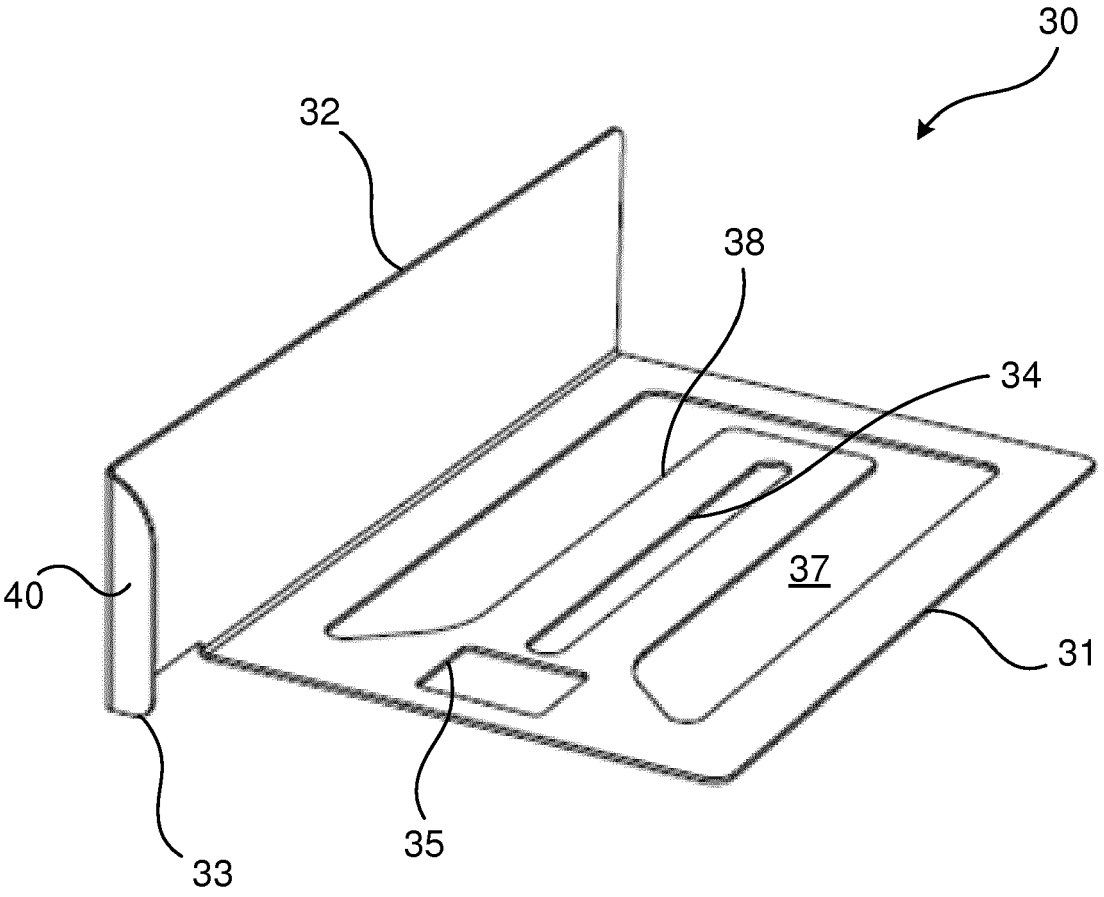

Fig. 5

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PARTIAL EUROPEAN SEARCH REPORT

under Rule 62a and/or 63 of the European Patent Convention. This report shall be considered, for the purposes of subsequent proceedings, as the European search report

Application Number
EP 17 20 4123

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	WO 2017/015142 A1 (RTC IND INC [US]) 26 January 2017 (2017-01-26) * figures 110A-O * * paragraph [0390] - paragraph [0395] *	1-14,17	INV. A47F1/12
X	US 2015/320237 A1 (HARDY STEPHEN N [US] ET AL) 12 November 2015 (2015-11-12) * figures 107-110 *	1-14,17	
A	EP 0 038 032 A1 (KIMNACH ALLIT PLASTIK [DE]) 21 October 1981 (1981-10-21) * the whole document *	1	

TECHNICAL FIELDS SEARCHED (IPC)

A47F

INCOMPLETE SEARCH

The Search Division considers that the present application, or one or more of its claims, does/do not comply with the EPC so that only a partial search (R.62a, 63) has been carried out.

Claims searched completely :

Claims searched incompletely :

Claims not searched :

Reason for the limitation of the search:

see sheet C

Place of search	Date of completion of the search	Examiner
The Hague	7 May 2018	Linden, Stefan

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

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INCOMPLETE SEARCH
SHEET C

Application Number
EP 17 20 4123

Claim(s) completely searchable:
1-17

Claim(s) not searched:
18

Reason for the limitation of the search:

It is noted that claims 1 and 18 do not meet the requirements of Rule 43(2) EPC.
The search was limited to claims 1-17 as indicated by the Applicant in his reply to the invitation pursuant to Rule 62a(1) EPC.
The Applicant is reminded that, in order to meet the requirements of Rule 137(5) EPC, future amendments may not relate to subject-matter that was excluded from the search following the invitation under Rule 62a(1) EPC.

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 17 20 4123

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
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07-05-2018

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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- JP 2003210286 A **[0011]**
- JP H07241227 A **[0011]**
- WO 2013153579 A1 **[0012]**
- EP 3141159 A1 **[0013] [0023]**