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(54) **Closure arrangement**

(57) The present invention relates to a closure arrangement for the openings of furniture (1) or buildings, comprising:

- numerous profile elements (12, 14, 16; 34) extending in a longitudinal direction (z) and arranged side by side in a lateral direction (x), wherein adjacent profile elements

(12, 14, 16; 34) are pivotally connected with regard to a pivot axis (2) extending in longitudinal direction (z), - at least one self-supporting cover member (18) extending over at least two adjacent profile elements (12, 14, 16; 34) and being fixedly attached to a first profile element (12).

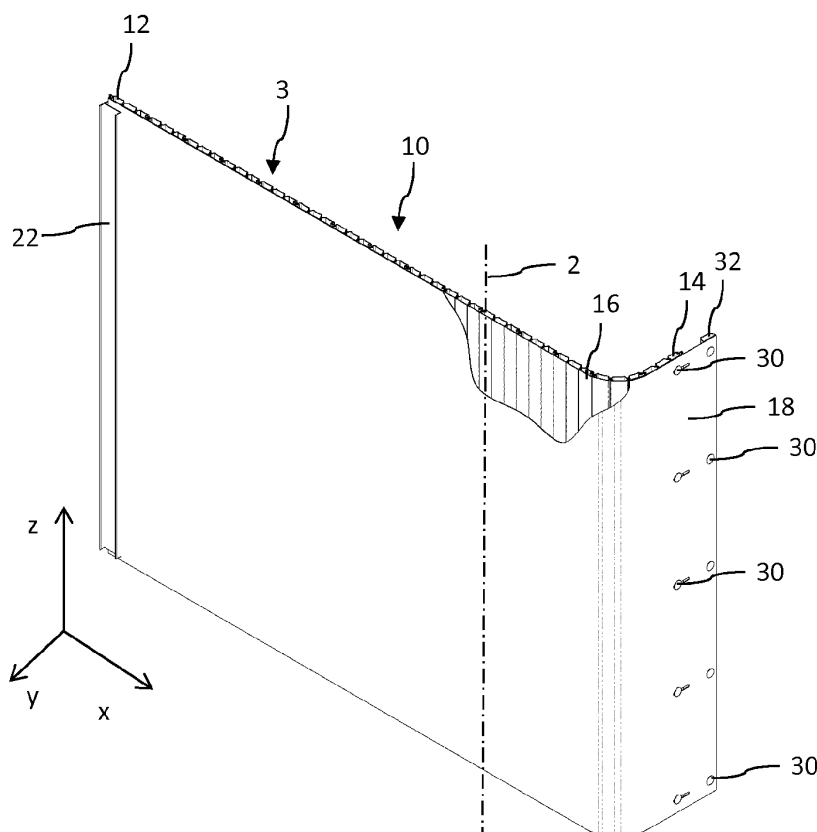


Fig. 2

Description

Field of the invention

[0001] The present invention relates to the field of closure arrangements, in particular for openings of furniture or buildings. Moreover, the invention relates to a roller shutter assembly as well as to a piece of furniture or to a respective building.

[0002] There exist various closure arrangements for the openings of furniture or buildings implementing a roller shutting mechanism. Such closure arrangements typically comprise numerous profile elements extending in a longitudinal direction (z) and being arranged side-by-side in a lateral direction (x). Adjacently located profile elements are pivotally connected and are mutually attached. Additionally, their longitudinal end sections are guided by way of a guide rail extending along the opening in order to move the closure arrangement between an opened and a closed configuration.

[0003] When implemented as a closure arrangement for furniture, the profile elements of such a roller shutter assembly may be displaced from a closed configuration, in which the opening of the furniture is substantially covered by the roller shutter assembly, into an open configuration, in which access to the interior of the furniture is given through the respective opening. Upon a transfer into the opened configuration, the numerous profile elements typically slide along the guide rail, which may extend along the interior of a side wall and/or along a back wall or rear panel of the piece of furniture.

[0004] It is generally desired, that a sliding displacement of the roller shutter assembly is rather smooth and acoustically damped.

[0005] Document WO 2012/159732 A1 discloses a closure arrangement featuring at least one support element, a stabilizing element and a functional element, which is designed as a foil, by way of which various designs, pictures, photos and the like may be imprinted on the closure arrangement. There, the support element, the stabilizing element and/or the functional element are bonded with each other. However, since a pivot axis between adjacently located profiled support elements is located at a certain distance from the stabilizing element and the at least one functional element, pivoting of consecutively arranged support elements inherently leads to a mechanical stress and hence to a stretching of the stabilizing element and the functional element.

[0006] Especially after long term use the stabilizing element and/or the functional element may exhibit some ageing phenomena and may deteriorate at their surface which is visible from outside. Moreover, the multiple adhesive or bonded attachments limit the choice of materials to be used for the stabilizing element and for the functional element. Typically, the stabilizing element may comprise polyvinyl chloride (PVC), which may come along with a particular environmental burden.

[0007] It is therefore an object of the present invention

to provide an improved closure arrangement for the openings of furniture or buildings having a rather simple internal structure and providing a durable and long lasting solution for covering an outer front face of its numerous profile elements. Moreover, the closure arrangement should be easy to assemble and should be producible rather cost efficient. Moreover, the closure arrangement should be made of materials being substantially inert to the environment and to end consumers.

Summary of the invention

[0008] In a first aspect the invention relates to a closure arrangement for the openings of furniture or buildings. The closure arrangement comprises numerous profile elements extending in a longitudinal direction (z) and being further arranged side-by-side or in a consecutive manner in a lateral direction (x). Adjacently located profile elements are pivotally connected with regard to a pivot axis that substantially extends in longitudinal direction.

[0009] Additionally, at least one self-supporting cover member is provided which extends over at least two adjacent profile elements. The self-supporting cover member is further fixedly attached to a first profile element. Hence, the cover member is permanently and/or robustly attached to the first profile element. By means of a self-supporting cover member an outer skin can be provided which may even extend over all profile elements of the closure arrangement. Typically, the cover member extends along the outside facing surface portion of the profile elements, which faces away from the interior of the opening of the respective furniture or building.

[0010] By means of the cover member, grooves extending between the pivotable and consecutively arranged profile elements can be effectively covered. Moreover, the cover member may comprise an arbitrary outer appearance and design. By means of the cover member the outer appearance of the closure arrangement may therefore be arbitrarily modified according to the preferences of end consumers.

[0011] Since the cover member is of self-supporting type an additional stabilizing element as described in WO 2012/159732 A1 is no longer required. Moreover, by means of the self-supporting cover member it may be sufficient to fix the cover member only to a single, namely to the first profile element. The self-supporting cover member typically comprises a sheet-like structure and covers the outside facing surface portion of consecutive profile elements.

[0012] A user induced displacement of the first profile element may then inherently transfer to the cover member, which may then experience a displacement corresponding to the displacement of the first profile element. Since the cover member is of self-supporting type, tensile forces or thrust acting on the cover member in lateral direction or in the direction of guide rails transfer and propagate through the cover member in a substantially unaltered way. Hence, the cover member does not tend

to billow or to exhibit corrugations or undulations when it becomes subject to a mechanical load in the plane of the cover member.

[0013] The cover member itself may be further subject to a surface modification in order to adapted the outer appearance, the color and the design of the closure arrangement. Additionally, it is the cover member itself, which may be directly interconnected and fastened to at least a first profile element. In a particular embodiment, the closure arrangement may even consist of a series of profile elements covered with only one self-supporting cover member.

[0014] In particular, it is the self-supporting cover member that forms the outer surface of the closure arrangement visible to the end user or end consumer.

[0015] According to a further embodiment, the cover member is displaceably attached to a second profile element adapted to support a lateral displacement of at least a portion of the cover member relative to the second profile element. First and second profile elements do not need to be directly interconnected, e.g. by a pivot hinge. Moreover, first and second profile elements may be interconnected by numerous intermediate profile elements.

[0016] Since the cover member is fixedly attached to the first profile element and since the cover member is displaceably attached to the second profile element, the cover member may exhibit a displacement relative to the second profile element, in particular in the event that the closure arrangement with its numerous profile elements is at least partially transferred into a bent or curved configuration, in which the outer radius of the cover member exceeds a radius of curvature of the series of consecutively arranged profile elements.

[0017] Since the cover member is displaceably attached to the second profile element it may experience a compensating motion in lateral direction (x) when the numerous profile elements of the closure arrangement slide along a curved portion of a guide rail in the course of an opening or closing procedure of the closure arrangement.

[0018] Especially by rigidly attaching the cover element to only one profile element, namely to the first profile element and by attaching the cover member to at least one further profile element, hence to a second profile element, in a motion compensating way, mechanical stress acting on the cover member can be effectively reduced or can even be entirely prevented. Hence, the cover member does no longer have to be stretched in lateral direction during opening and closing procedures of the closure arrangement, especially when sliding along a curved guide rail.

[0019] Displacement of the cover member relative to the second profile element and/or relative to other, e.g. intermediate profile elements may occur against the action of a restoring force, which may be provided by some kind of spring element coupled with both, the second profile element and the cover member.

[0020] In a further embodiment, the numerous profile elements form a roller shutter assembly. Here, longitudinal end sections of at least some profile elements are guided in a guide rail. Typically, there are provided two parallel oriented guide rails on opposite sides of the opening. The roller shutter assembly with its numerous profile elements is guided in the guide rails and may therefore slide along the guide rails for closing and opening of the opening of the furniture or of a respective building.

[0021] Speaking in terms of a cabinet type of furniture guide rails may be provided along an upper and a lower margin of the opening. In such a configuration, the roller shutter assembly will be displaceable in horizontal direction for opening and closing the same. In other embodiments, the guide rails may be located at opposite side wall sections of the cabinet. Then opening and closing of the roller shutter assembly may be conducted by displacing the numerous profile elements in vertical direction.

[0022] Since the cover member may extend over the entire roller shutter assembly, its longitudinal end sections may also engage with the guide rail and may also be guided therein. Typically, the guide rail extends along a side wall portion and/or along a back side of the piece of furniture. Depending on the geometrical size of the piece of furniture, the guide rail comprises at least one or even two curved sections in order to stow away the roller shutter assembly out of sight.

[0023] According to another embodiment, the first profile element forms a first lateral end section of the roller shutter assembly. Accordingly, the second profile element forms a second, oppositely located lateral end section of the roller shutter assembly. In this embodiment, first and second profile elements denote the first and last profile element of the roller shutter assembly in terms of an opening or closing motion of the roller shutter assembly.

[0024] Typically, the first profile element coincides with a trailing profile element when opening the closure arrangement and further coincides with the leading profile element when closing the closure arrangement. Correspondingly, the second profile element may be the leading profile element when opening the closure arrangement and may further represent the last or the trailing profile element when closing the roller shutter assembly.

[0025] Further, numerous profile elements extending between first and second profile elements are generally denoted as intermediate profile elements in the present context. By affixing the cover member only to the first and to the second profile elements in the way as already described above, the cover member is fixedly attached to the first profile element while it remains displaceable in lateral direction with regard to the second profile element and with regard to the intermediate profile elements.

[0026] Since the cover member is of self-supporting type and since the cover member may also be guided in the guide rail, a further and additional fixing of the cover

member to any of the intermediate profile elements is not required in general. In this way, mutual assembly of the roller shutter assembly and the cover member is rather straight forward and easy.

[0027] However, in another embodiment, the cover member may also be fixed in a motion compensating way to at least one or several of the intermediate profile elements. For instance a stripes of a magnetic tape attached to the respective intermediate profile may interact with a respective magnetic or ferromagnetic portion of the cover member in a motion compensating way.

[0028] According to another embodiment, the cover member stretches across the entire roller shutter assembly. Typically, the cover member at least slightly exceeds the lateral dimensions of the roller shutter assembly. In this way, the cover member may virtually extend and may at least slightly displace in lateral direction relative to the roller shutter assembly when sliding along a curved portion of the guide rail.

[0029] According to a further embodiment, the cover member comprises a sheet-like structure. Moreover, the cover member is elastically deformable to a certain extent. The elastic properties of the sheet-like cover member are particularly adapted to the radius of curvature of the guide rail, along which the cover member has to be bent or curved. Typically, the cover member is elastically deformable so as to follow a radius of curvature of at least 80mm, 70mm, 60mm, 50mm or even 40mm.

[0030] Here, the rigidity, stiffness or elasticity of the sheet-like cover member is designed in such a way so that the cover member is bendable along said radii of curvature without exceeding the elastic limit of the material the cover member is made of. Depending on the material used for the cover member and its elastic properties, geometric dimensions of the cover member, in particular its thickness may vary and may be selected or designed accordingly.

[0031] The cover member may comprise a plastic material, in particular a duroplastic or thermoplastic material, such like polyethylene (PE), polypropylene (PP) or other polymeric materials, such like polyolefine, polystyrol, polyvinyl chloride, polycarbonate or polyamide and mixtures thereof. When implemented as a sheet of polypropylene, thickness of the cover member may typically vary between 0.2mm and 1.4mm, or between 0.4mm and 1.2mm, or between 0.6mm and 1.0mm. In particular, thickness of the cover member may be about 0.8mm when implemented as a sheet of polypropylene.

[0032] The sheet-like cover member only requires to be elastically deformable in a direction perpendicular to its planar surface. In the plane of the sheet-like structure, the material the cover member is made of does not require to be stretchable or compressible. Hence, in the direction defined by the lateral and longitudinal direction (x, z) the cover member may be substantially pressure stable and tension stable. Since the present invention is particularly based on a relative displacement of the roller shutter assembly and the cover member, even fiber re-

inforced materials may be used for the cover member, wherein the fibers typically extend in the lateral plane (x, z) defined by the lateral direction (x) and the longitudinal direction (z).

[0033] According to another embodiment, the cover member comprises at least one metal layer and/or at least one plastic layer. In particular, the cover member may also consist of one or several metal layers or alternatively it may consist of one or several plastic layers. Especially for implementations as a closure arrangement for openings of buildings it is conceivable, that the cover member comprises a sheet metal, such like stainless steel or a comparable metallic sheet structure.

[0034] According to a further embodiment, the first profile element and a first lateral end section of the cover member are fixedly mounted in a receptacle of a handle member. The handle member typically comprises a handle profile which is actuatable and grippable by the hand of a customer in order to induce a tensile force or trust to the roller shutter assembly for closing and opening the same in lateral direction. Typically, the handle member extends to the outside of the first profile element in order to allow a well-defined and ergonomic gripping and handling thereof.

[0035] The receptacle of the handle member and/or a grippable portion of the handle member typically extends along the entire longitudinal dimension of the first profile element. In order words, a free end of the first profile element can be framed by the receptacle of the handle member. Typically, the receptacle of the handle member comprises two substantially parallel extending branches forming a U-shaped profile by way of which the free end of the first profile element can be framed or surrounded.

[0036] It is of particular benefit, when the first profile element is mounted in the receptacle of the handle member together with the cover member. The cover member substantially overlapping with the outer surface of the first profile element may be urged and/or squeezed in the receptacle together with the first profile element. Hence, the first profile element and the cover member may frictionally engage with the receptacle of the handle member. Additionally it is conceivable, that mutual fixing of first profile element, cover member and/or receptacle of the handle member is achieved by a positive engagement, e.g. provided by screws or bolts extending through the branches of the receptacle, the first profile element as well as through the first lateral end section of the cover member. Additionally or alternatively it is also conceivable, that the cover member is bonded to the first profile element by making use of an adhesive or by means of application of thermal energy, e.g. applied during a welding procedure.

[0037] Typically, the cover member, in particular its first lateral end section is fixedly attached to the first profile element and/or to the receptacle of the handle member, preferably along the entire longitudinal extension of the handle member.

[0038] According to a further embodiment, the cover

member is attached to the second profile element by means of at least one fastening element extending through a laterally extending slit of the cover member. Alternatively, it is also conceivable, that it is the second profile element that comprises a laterally extending slit, through which the at least one fastening element rigidly attached to the cover member may extend.

[0039] In these both alternative embodiments a compensating motion between the cover member and the second profile element of the roller shutter assembly can be provided in lateral direction (x). The fastening element only serves to fix the cover member to the second profile element in a direction perpendicular to the lateral plane (x, z) as defined by the longitudinal direction and lateral direction of the profile elements.

[0040] It may be of particular benefit, when the at least one laterally extending slit of the cover member is located at a minimum distance from the free or second lateral end section of the cover member. In this way, fraying of the laterally extending slit can be substantially avoided in the event that the fastening element should exert respective mechanical load to the cover member in lateral direction.

[0041] According to another embodiment, the cover member is attached to the second profile element and/or to the first profile element multiple times in longitudinal direction. Fixing of the cover member to first and/or second profile elements several times along first and/or second profile elements may help to prevent formation of undulations or corrugations in longitudinal direction, in particular in a region, in which the guide rail and hence the shutter assembly is subject to a curvature.

[0042] According to another embodiment, a second lateral end section of the cover member is folded. Additionally or alternatively the second lateral end section is attached to a stabilizing profile. By folding a free end of the second lateral end section of the cover member, the cover member itself may become less susceptible to longitudinally extending corrugations, billows or undulations. Additional or alternative to a single or multiple folding of the free end of the cover member it is also conceivable to attach the second lateral end section of the cover member to a stabilizing profile. The stabilizing profile may also be guided in the guide rail but is typically located at a predefined distance from the second profile element of the roller shutter assembly.

[0043] In still another embodiment, a second lateral end section of the cover member is laterally displaceable relative to the second profile element. Here, the cover member may displaceably intersect a longitudinal slit of the second profile element. Hence, a free end of the second lateral end section of the cover member may be located inside the hollow profile of the second profile element. By inserting the free end of the second lateral end section of the cover member into a longitudinal slit of the second profile element, additional fixing elements for slidably attaching the cover member to the second profile element are no longer required. By inserting the cover

member into the slit of the second profile element, a laterally displaceable attachment of the cover member to the second profile element in a direction perpendicular to the lateral plane (x, z) can be inherently obtained. Here it is of particular benefit, when the maximum displacement between the cover member and the roller shutter assembly is smaller than the lateral extension of the second profile element.

[0044] Due to its self-supporting structure, the cover member will substantially remain inside the hollow profile of the second profile element. In a final assembly configuration, the free end of the cover member may abut against the inside wall portion of the hollow second profile element.

[0045] According to another embodiment, a support arrangement located outside the guide rail is provided having at least one arm extending towards the cover member. Said arm further supports a guiding element to mechanically engage with an outer surface of the cover member. The support arrangement is typically positioned in a curved region of the guide rail. It serves to provide an inward-directed pressure or force towards the cover member in order to counteract a mutual detachment of cover member and roller shutter assembly. Moreover, by means of the support arrangement, a rather smooth and acoustically damped motion of the entire closure arrangement may be attained.

[0046] The guiding element may comprise a rotatable drum or cylinder by way of which an inward-directed force can be applied to the cover member without introducing friction of substantive magnitude. Alternatively and instead of a rotatable cylinder it is even conceivable to implement a brush element as the guiding element. Moreover, as a further alternative also an elastomeric sealing lip could be provided as the guiding element in order to effectively seal the interior of the guide rail in which the roller shutter assembly may be at least partially stowed away when transferred into the open configuration.

[0047] Typically, the guiding element and/or the arm of the support arrangement extends along the complete longitudinal extension of the profile elements. In this way a rather homogeneous guiding function as well as an effective seal to protect the inner volume of the closure arrangement against ingress of dirt, humidity and/or dust can be provided.

[0048] According to a further embodiment, the cover member comprises an outwardly extending stop element to engage with the guiding element in a stop configuration. Said stop configuration typically coincides with the closed configuration of the closure arrangement, in which the opening of the furniture or building is substantially closed by the roller shutter assembly and the self-supporting cover member attached thereto.

[0049] In this embodiment, the guiding element typically comprises a sealing lip which is elastically deformable by the stop element to form a seal between the support arrangement and the cover member. When reaching the stop or closed configuration, the stop element serves

to exert a respective pressure onto the deformable guiding element so that the guiding element elastically deforms towards the cover member, thereby tightly sealing the interface between the support arrangement and the cover member and/or the roller shutter assembly carrying the same.

[0050] In still another aspect the invention also relates to a piece of furniture or to a building comprising an opening and a closure arrangement as described above.

Brief description of the drawings

[0051] In the following, various embodiments of the invention will be described in detail by making reference to the drawings in which:

- Fig. 1 schematically shows a perspective view of a cabinet type piece of furniture with a closure arrangement in closed configuration,
- Fig. 2 shows an isolated view of the closure arrangement without guiding rails,
- Fig. 3 shows an enlarged view of an upper second end section of the cover member displaceably attached to a second profile element,
- Fig. 4 shows a horizontal cross-section through the closure arrangement in closed configuration,
- Fig. 5 is an isolated cross-sectional view through the closure arrangement according to a first embodiment, and
- Fig. 6 shows a cross-sectional view through another embodiment of the closure arrangement,
- Fig. 7 shows the interaction of the roller shutter assembly with a support arrangement according to a first embodiment, and
- Fig. 8 shows another embodiment of a support arrangement before the closure arrangement reaches its closed configuration and
- Fig. 9 shows the embodiment according to Fig. 8 with the roller shutter assembly in a closed or stop configuration.

Description

[0052] Fig. 1 shows a cabinet type piece of furniture 1 featuring a closure arrangement 10 having numerous profile elements 12, 14, 16 extending in a longitudinal direction (z) and being consecutively arranged side-by-side in a lateral direction (x). As it becomes apparent from the cross-sectional illustrations of Figs. 4-9, various and adjacently located profile elements 12, 14, 16 are pivot

mounted and may be pivoted along their longitudinally extending lateral sides.

[0053] As it is for instance illustrated in cross-section according to Fig. 5, numerous profile elements 14, 16 are arranged side-by-side. An outermost second profile element 14 is pivotally interconnected with adjacent profile elements 16, the latter of which being denoted as intermediate profile elements 16. As further illustrated in Fig. 5, adjacently located profile elements 14, 16 are pivotally attached by means of a bendable bar 17. Here, a triplet of three single profile elements 14, 16 is positively engaged with another triplet of profile elements 16 as indicated in detail in cross-section according to Fig. 6.

[0054] There, adjacently located profile element 16 comprise mutually corresponding receptacles 42, 46 adapted to positively engage with either a protrusion 44 or with a laterally extending peg 40. As illustrated in Fig. 6, the peg 40 of one profile element 16 is positively engaged with a receptacle 42 of another adjacently arranged profile element 16.

[0055] As it becomes apparent from the mutual interconnection of consecutively arranged profile elements 14, 16, their pivot axis 2 is either defined by the interconnecting bar 17 integrally formed with adjacent profile elements 14, 16 or is formed by means of the positive engagement of peg 40 and receptacle 42. In both cases, the respective pivot axis 2 is located at a certain distance from a cover member 18 extending along the outer surface of the roller shutter assembly 3, which is formed by the numerous profile elements 12, 14, 16.

[0056] As a consequence, when the roller shutter assembly 3 slides along a curved portion of a guide rail 20 as indicated in Fig. 4, the cover member 18 is curved or bent along a radius of curvature which is larger than a corresponding radius of curvature of the roller shutter assembly 3, which is formed by the mutually interconnected profile elements.

[0057] In order to provide a compensating motion in lateral direction (x), i.e. along the track defined by the guide rail 20 the cover member 18 is displaceably attached to the leading or to a second profile element 14. The cover member 18 provides a kind of an outer skin for the closure arrangement 10 and may typically comprise a sheet of a flexible but self-supporting polypropylene. As indicated in Fig. 4, the self-supporting cover member 18 is fixedly attached to a first profile element 12 located at the left end of the roller shutter assembly 3 as illustrated in Fig. 2.

[0058] There, a handle member 22 in form of another profile element is provided featuring a receptacle 24 which is adapted to receive both, the first profile element 12 together with a first lateral end section 18a of the cover member 18. As indicated in Fig. 4, the handle member 22 comprises two parallel oriented and laterally extending branches 25, 26 forming a U-shaped profile to receive the free end of the first profile element 12. The first profile element further comprises a laterally extending peg 40 to positively engage with the handle member 22.

[0059] Inside the receptacle 24, the first profile element 12 as well as the cover member 18, in particular its first lateral end section 18a may also be mutually bonded, adhesively attached or welded. In this way, the cover member 18 is immobilized relative to the first profile element 12. Since the cover member 18 is of self-supporting type, application of a tensile force in direction of an opening movement to the handle member 22 does not only displace the roller shutter assembly 3 movement but also induces a corresponding displacement of the cover member 18 to the right hand side according to the illustration of Fig. 4.

[0060] Via the handle member 22, a displacement force, of either tensile or thrust exerting type will be equally transferred to the first profile element 12 as well as to the cover member 18.

[0061] With an opposite end, the cover member 18 is displaceably attached or displaceably connected to the second profile element 14. For this purpose the cover member 18 may comprise a laterally extending slit 28 intersected by a screw- or bolt-like fastening element 30 that engages with the second profile element 14. By means of the slit 28, the cover member 18 is free to move in lateral direction (x) relative to the second profile element 14.

[0062] In this way, different radii of curvature of the roller shutter assembly 3 and of the cover member 18 can be effectively compensated by allowing at least a portion of the cover member 18 to laterally displace relative to the second profile element 14.

[0063] In this context it is to be noted, that the lateral direction (x) generally refers to the course of the guiding rail 20. Hence, the lateral direction specifies the direction along which adjacently located profile element 12, 14, 16 are interconnected. Moreover, the lateral direction (x) denotes the direction of displacement of the various profile elements 12, 14, 16 and the roller shutter assembly 3 formed thereof during an opening and closing procedure.

[0064] As further illustrated in Fig. 3, the laterally extending slit 28 is located at a certain distance from a free end, hence from a second lateral end section 18b of the cover member 18. There, the cover member 18 is either attached to a stabilizing profile 32 or the cover member 18 may be folded onto itself. By means of a folded configuration or by attachment to a rather stiff or rigid stabilizing profile or stabilizing element 32 formation of longitudinally extending undulations or corrugations of the cover member 18 can be effectively prevented or counteracted.

[0065] In an alternative embodiment as illustrated in Fig. 6, the second cover member 34 comprises a longitudinal slit 36 adapted to receive the second end section 18b of the cover member 18. In this way, the free end of the cover member 18 can be displaceably attached to the second profile element 34 without using any further fixing or fastening elements. It is due to the inherent rigidity or stiffness of the self-supporting cover member 18, that its second end section 18b does not release or

separate from the second profile element in a self-acting way.

[0066] In Fig. 7 a support arrangement 50 is illustrated which is assembled in a corner portion of the piece of furniture 1. The support arrangement 50 comprises an inward extending arm 52 supporting a guiding element 54 at its free end. The guiding element 54 may comprise a rotatable drum or cylinder as illustrated in Fig. 7. In this way, the support arrangement 50 serves to induce an inward-directed force towards the cover member 18, thereby preventing a self-acting loosening thereof from the roller shutter assembly 3.

[0067] In another embodiment as illustrated by Figs. 8 and 9 the guiding element 62 comprises an elastically deformable sealing lip which is adapted to engage with an outwardly extending stop element 60 provided and arranged at the outer surface of the cover member 18. The stop element is positioned on the cover member 18 in such a way, that it engages with the guiding element 62 when the roller shutter assembly 3 reaches a closed configuration as for instance illustrated in Fig. 1.

[0068] Since the guiding element 62 is elastically deformable, the stop element 60 will induce an elastic deformation of the guiding element 62' when reaching the stop configuration as indicated in Fig. 9. Due to such a squeezing, the guiding element 62' extends in a direction substantially perpendicular to the lateral plane (x, z) of the roller shutter assembly 3. In this way, a potential gap between the guiding element 62 and the outer surface of the cover member 18 can be substantially closed and sealed. Consequently, the closure arrangement and in particular those portions of the closure arrangement adapted to receive and to stow the roller shutter assembly 3 when in open configuration can be effectively sealed from ingress of dirt or vermin.

[0069] Additionally, the guiding element 54, 62 as illustrated in Figs. 7-9 serves to hold the cover member 18 tightly to the outer surface of the roller shutter assembly 3 and its profile elements 12, 14, 16, 34.

[0070] It is further to be mentioned here, that various modifications and variations may be made to the illustrated embodiments according to the scope of the appended claims. Moreover, it is to be noted, that any reference signs as used in the claims are not to be construed to limit the scope and interpretation of the claims.

List of Reference Numerals

[0071]

- | | |
|----|-------------------------|
| 1 | piece of furniture |
| 2 | pivot axis |
| 3 | roller shutter assembly |
| 10 | closure arrangement |
| 12 | profile element |
| 14 | profile element |
| 16 | profile element |
| 17 | bar |

18 cover member
 20 guide rail
 22 handle member
 24 receptacle
 25 branch
 26 branch
 28 slit
 30 fastening element
 32 stabilizing profile
 34 profile element
 36 slit
 40 peg
 42 receptacle
 44 protrusion
 46 receptacle
 50 support arrangement
 52 arm
 54 guiding element
 60 stop element
 62 guiding element

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Claims

1. A closure arrangement for the openings of furniture (1) or buildings, comprising:

- numerous profile elements (12, 14, 16; 34) extending in a longitudinal direction (z) and arranged side by side in a lateral direction (x), wherein adjacent profile elements (12, 14, 16; 34) are pivotally connected with regard to a pivot axis (2) extending in longitudinal direction (z),
 - at least one self-supporting cover member (18) extending over at least two adjacent profile elements (12, 14, 16; 34) and being fixedly attached to a first profile element (12).

2. The closure arrangement according to claim 1, wherein the cover member (18) is displaceably attached to a second profile element (14; 34) to support a lateral displacement of at least a portion of the cover member (18) relative to the second profile element (14; 34).

3. The closure arrangement according to any one of the preceding claims, wherein the numerous profile elements (12, 14, 16; 34) form a roller shutter assembly (3), wherein longitudinal end sections of the profile elements (12, 14, 16; 34) are guided in a guide rail (20).

4. The closure arrangement according claim 3, wherein the first profile element (12) forms a first lateral end section of the roller shutter assembly and wherein the second profile element (14; 34) forms a second, oppositely located lateral end section of the roller shutter assembly (3).

5. The closure arrangement according to any one of the preceding claims 3 or 4, wherein the cover member (18) stretches across the entire roller shutter assembly (3).

6. The closure arrangement according to any one of the preceding claims, wherein the cover member (18) comprising a sheet-like structure is elastically deformable.

7. The closure arrangement according to any one of the preceding claims, wherein the cover member (18) comprises at least one metal layer and/or a plastic layer.

8. The closure arrangement according to any one of the preceding claims, wherein the first profile element (12) and a first lateral end section (18a) of the cover member (18) are fixedly mounted in a receptacle (24) of a handle member (22).

9. The closure arrangement according to any one of the preceding claims 2 to 8, wherein the cover member (18) is attached to the second profile element (14) by means of at least one fastening element (30) extending through a laterally extending slit (28) of the cover member (18).

10. The closure arrangement according to claim 9, wherein the cover member (18) is attached to the second profile element (14; 34) and/or to the first profile element (12) several times in longitudinal direction (z).

11. The closure arrangement according to any one of the preceding claims, wherein a second lateral end section (18b) of the cover member (18) is folded and/or attached to a stabilizing profile (32).

12. The closure arrangement according to any one of the preceding claims, wherein a second lateral end section (18b) of the cover member (18) laterally displaceably intersects a longitudinal slit (36) of the second profile element (34).

13. The closure arrangement according to any one of the preceding claims 3 to 12, further comprising a support arrangement (50) located outside the guide rail (20), having an arm (52) extending towards the cover member (18) and supporting a guiding element (54; 62) to mechanically engage with an outer surface of the cover member (18).

14. The closure arrangement according to claim 13, wherein the cover member (18) comprises an outwardly extending stop element (60) to engage with the guiding element (62) in a stop configuration to elastically deform the guiding element (62) to form

a seal between the support arrangement (50) and the cover member (18).

15. A piece of furniture or a building comprising an opening and a closure arrangement according to any one of the preceding claims. 5

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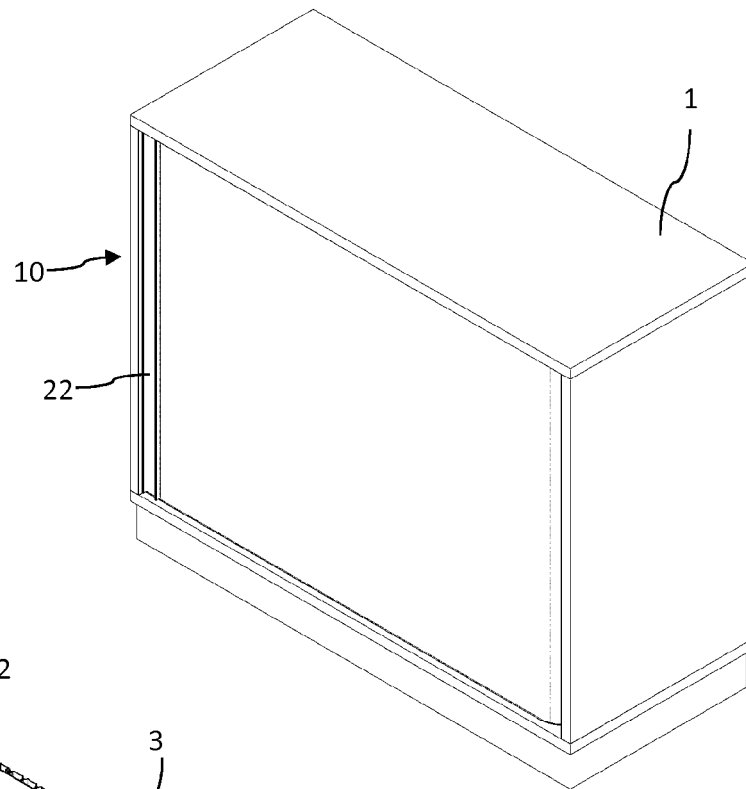


Fig. 1

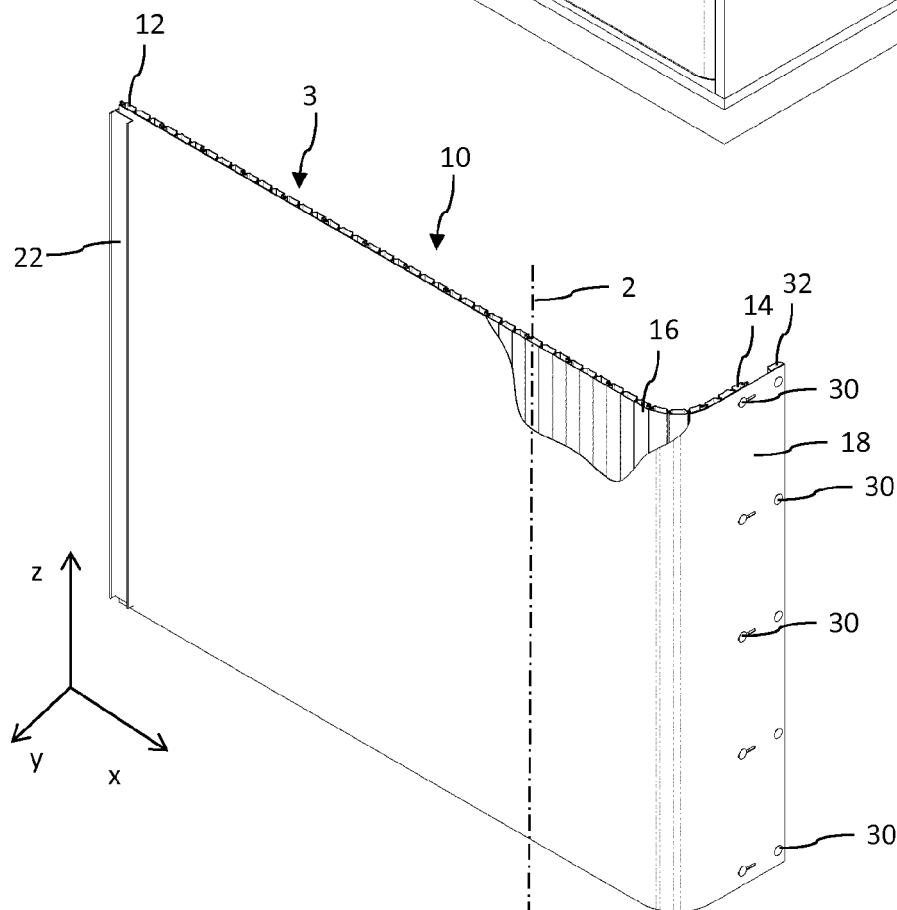


Fig. 2

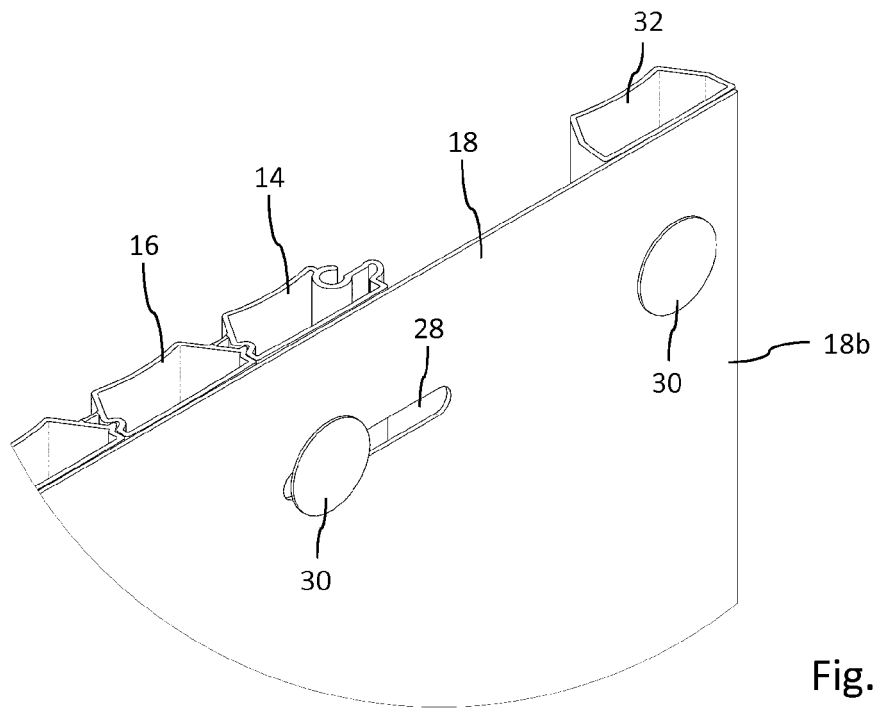


Fig. 3

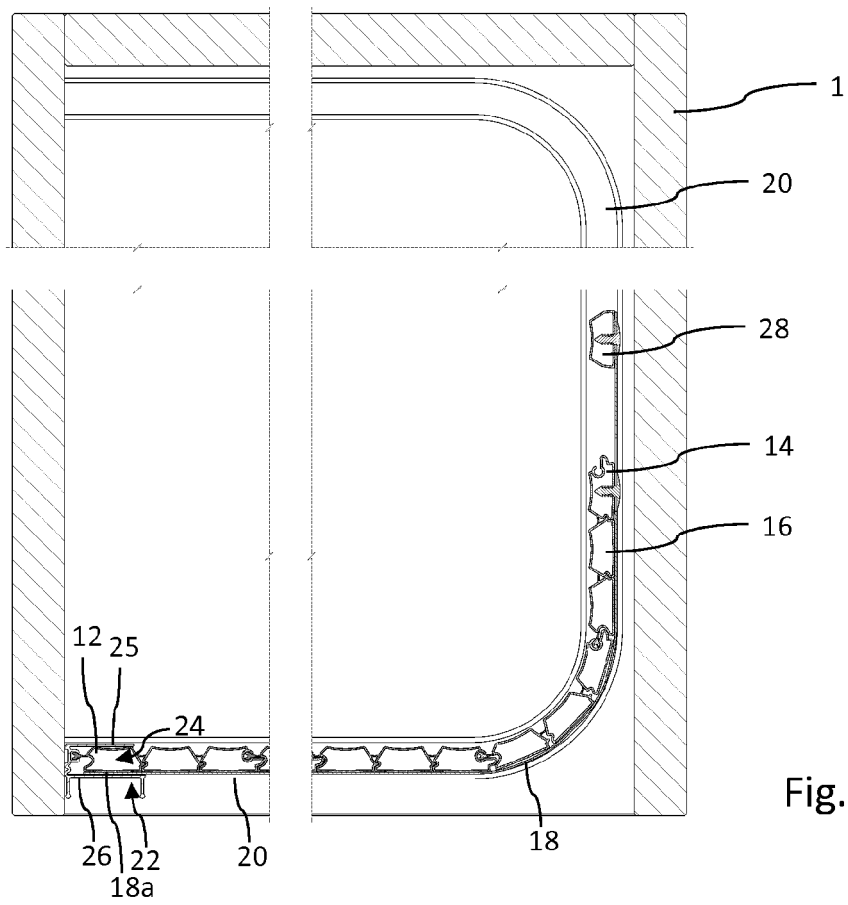


Fig. 4

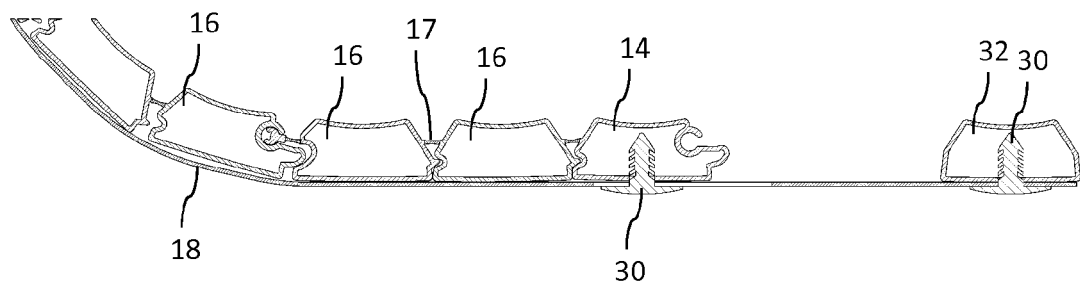


Fig. 5

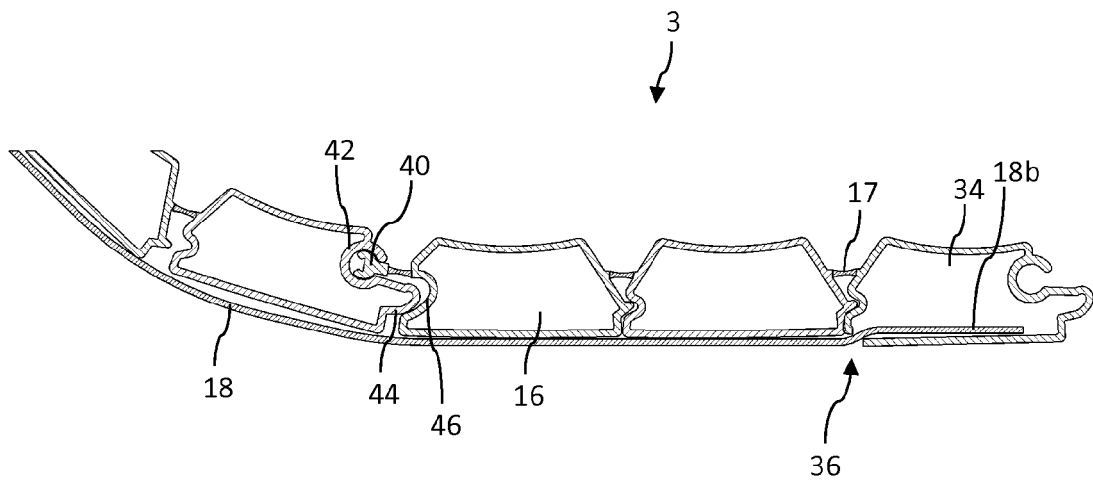


Fig. 6

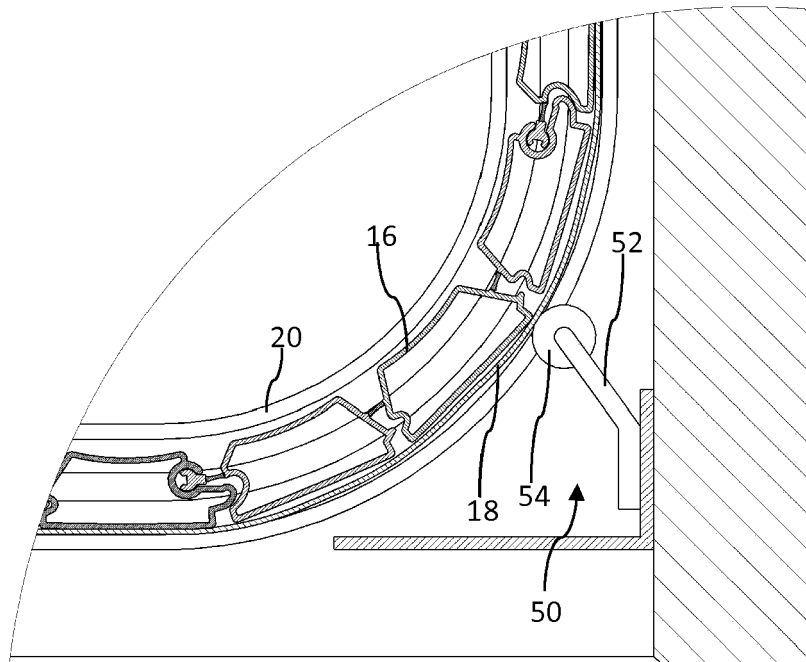


Fig. 7

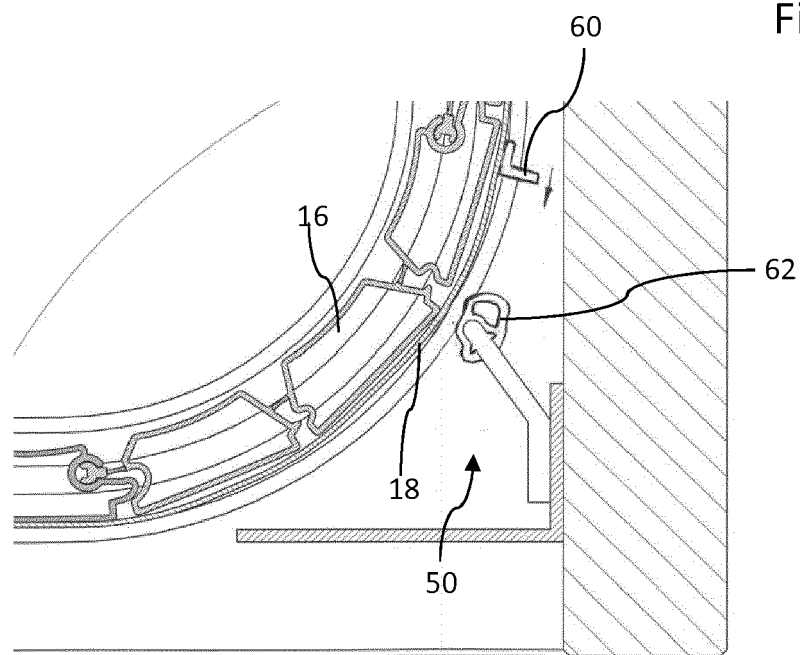


Fig. 8

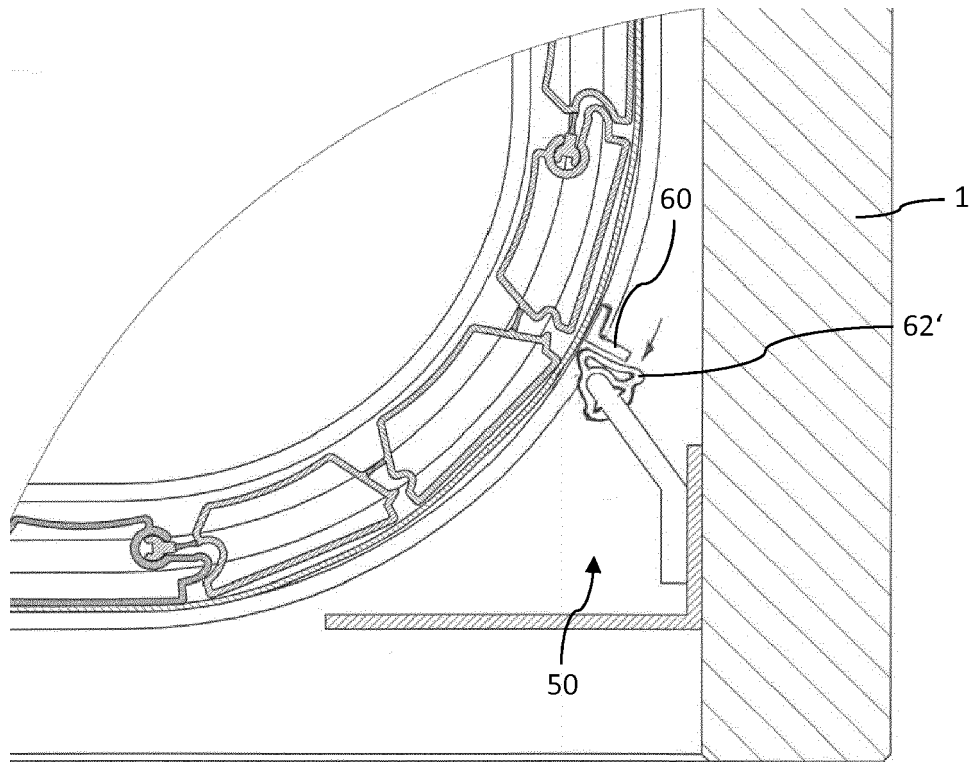


Fig. 9



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Application Number
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