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(54) A system for vertically adjusting a shelf

(57) The present invention refers to a system for vertically adjusting a shelf, such as in refrigerating appliances, cabinets, lockers and similar, said shelf comprises horizontal support members (10, 11) arranged perpendicularly to vertical guides (1, 2) where they can be vertically adjusted, and a deposit plate (12), a drawer or similar, being attached to said horizontal support members (10, 11). The invention is based on a fact that said shelf is fixed in a form-locking and friction-type manner in vertical guides (1, 2) by means of horizontal support members (10, 11).

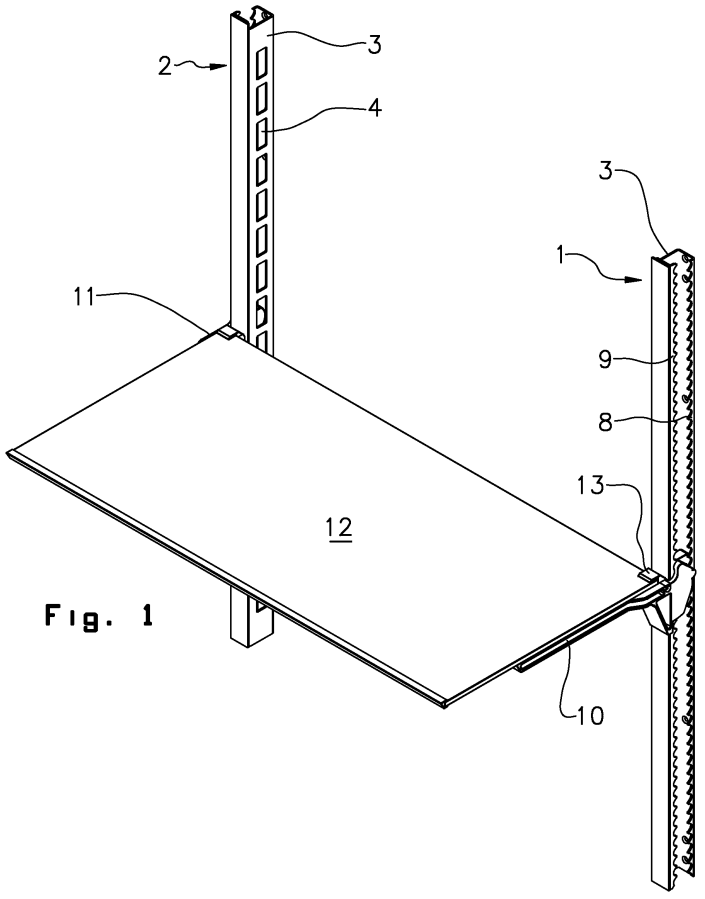

Fig. 1

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Description

[0001] The present invention refers to a system for vertically adjusting a shelf, such as in refrigerating appliances, cabinets, lockers and similar, said shelf comprises horizontal support members arranged perpendicularly to vertical guides where they can be vertically adjusted, and a deposit plate, a drawer or similar, being attached to said horizontal support members.

[0002] The aforementioned system for vertically adjusting a shelf is known from international patent applications No. WO 2008/095775, WO 2008/095545 and WO 2006/120102. All the said known solutions have several drawbacks. The fact that a shelf, when raised and afterwards lowered, can freely fall is particularly outstanding. Furthermore, in order to adjust the shelf vertically it must be moved and rotated in several directions, representing a sever obstacle for a user. In addition to inaccurate vertical adjusting of the shelf, the embodiment of the system itself is rather technologically demanding and time consuming.

[0003] It is the object of the present invention to create a system for vertically adjusting a shelf of the aforesaid kind with which said drawbacks of the known solutions will be remedied.

[0004] According to the invention, said object is solved by a shelf being fixed in a form-locking and friction-type manner in vertical guides by means of horizontal support members. Each said vertical guide, having a C-shaped cross-section, comprises a web formed with a plurality of through holes for passing the air, and a side arranged opposite to said web, said side being formed with folds facing each other. Preferably, the free end of at least one fold is formed with a gearing extending over the entire length of each said guide.

[0005] Furthermore, it is provided for according to the invention that each said horizontal support member is formed on the side cooperating with each of said guides with a flange-like extension, an oblong and relatively narrow tongue-like projection being associated thereto in longitudinal direction. The upper section of said projection is formed with a pair of vertically and horizontally spaced circular projections intended to mesh with said gearing of each guide. Thus, a form-locking connection between the guide and the horizontal support member being provided in this manner. Said friction-type connection between the guide and the horizontal support member is created in a manner that the surface of the flange-like extension facing the guide is pressed against each guide due to dead load of the shelf.

[0006] An embodiment of the invention will now be described with reference to the accompanying drawings without being limited thereto.

Fig. 1 shows a shelf according to the invention in a three-dimensional view,

Fig. 2 shows a detail of a vertical guide of the shelf of Fig. 1,

Fig. 3 shows a horizontal support member of the shelf of Fig. 1 in a three-dimensional view,

Fig. 4 shows a detail of the support member of Fig. 3,

Fig. 5 shows a detail of the support member as in Fig. 4 but from another perspective,

Fig. 6 shows a side view of the shelf according to the invention,

Fig. 7 shows a side view of the shelf according to the invention and ready to be vertically adjusted,

Fig. 8 shows a side view of the shelf according to the invention and fixed in the vertical guides,

Fig. 9 shows a cross-section of the vertical guide and the shelf according to the invention incorporated into a cooling appliance,

Fig. 10 shows a cross-section of another embodiment of the vertical guide and the shelf according to the invention incorporated into a cooling appliance.

[0007] A system for vertically adjusting a shelf being described in details with reference to a cooling appliance comprises at least one, preferably two vertical guides 1, 2 being mutually spaced and formed in the cross-section as the letter C. Since said guides are preferably identical, only the first guide 1 is fully described in the foregoing and with reference to Fig. 2. Said guides 1, 2 are preferably placed against each other in a manner that webs 3 thereof faces each other. However, it is obvious that said guides 1, 2 may be arranged in a manner that said webs 3 are averted from each other. Each web 3 of said guides 1, 2 is formed with a plurality of through holes 4 enabling the air passage. A side 5 of each C-formed guide 1, 2 arranged opposite to said web 3 is formed as a pair of folds 6, 7 facing each other, the free end of at least one fold 6, 7 being preferably formed over the entire length of said guide 1, 2 with a gearing 8, 9.

[0008] To each of said guides 1, 2 there is attached by means of a form-locking connection and on the principle of a cantilever a slender support member 10, 11, said form-locking connection being fully described below, wherein said support member 10, 11 being relocatable in the longitudinal direction of said guides 1, 2 and a deposit plate 12 being superimposed on said support members 10, 11. Since both said support members are identical only the first support member 10 is fully described in the foregoing and with reference to Fig. 3, Fig. 4 and Fig. 5. Said deposit plate 12 is attached to said support members 10, 11 either irremovably, by means of an adhesive means for example, or removably whereby in the latter case said deposit plate 12 being fixed on each said support member 10, 11 by means of a safeguard 13, thus preventing a displacement of said deposit plate 12 relative to said support member 10, 11. Here, said deposit plate 12 being formed of an opaque or partially or entirely translucent material such as glass or plastic, for instance. Said safeguard 13 having preferably the same width as said support member 10, 11 is connected with said support member 10, 11 by means of a form-locking connec-

tion, for example, wherein said safeguard 13 is formed on the side facing said support member 10, 11 with a T-shaped guide 14 cooperating with a suitable T-shaped groove 15 formed in said support member 10, 11. In the present embodiment said groove 15 extends at least over a part of the width of said support member 10, 11, nevertheless it could extend over the entire width thereof. Optionally, said safeguard 13 is additionally secured by means of a fixing means not shown which can be inserted through a hole 16 in the safeguard 13 into a hole 17 in the support member 10, 11. Each said support member 10, 11 is formed on the side cooperating with each vertical guide 1, 2 with a flange-like extension 18 extending in the direction of said vertical guide, an oblong and relatively narrow tongue-like projection being associated with said extension 18 in the longitudinal direction of said vertical guide. The upper section 20 of said projection 19 is formed with a pair of vertically and horizontally spaced circular projections 21, 22 intended to mesh with the gearing 8, 9 of each vertical guide 1, 2. Here, said projections 21, 22 are horizontally spaced to the extent that they just sit into a gap between two neighbouring teeth of each gearing 8, 9 when the shelf according to the invention is in locked horizontal position. Said section 20 is formed on the inner side of the projection 19 with a guide 23 whereto a slider 24 snaps on which cooperates with the vertical guide 1, 2. Each said projection 19 is herewith intended to cooperate with each vertical guide 1, 2 in a manner that it extends through a vertical gap between a wall 26 of a cooling appliance and each vertical guide 1, 2, said guide 23 along with the slider 24 being arranged within each said vertical guide 1, 2. The slider 24 acts as a guidance for each support member 10, 11 inside the vertical guide 1, 2, whereas the circular projections 21, 22 mesh with the gearing 8, 9 of each vertical guide 1, 2, thus each support member 10, 11 as well as the shelf 12 being fixed in the position.

[0009] The shelf consisting of said support members 10, 11 and said deposit plate 12 is vertically adjusted in said vertical guides 1, 2 in a manner that it is lifted up at the end averted from said vertical guides 1, 2 so that it rotates about its centre of rotation which lies approximately in the horizontal axis of said slider 24. It is provided for in this manner that said circular projections 21, 22 unmesh the gearing 8, 9 due to which the shelf can be moved in height for the arbitrary number of teeth of the gearing 8, 9. The precision of the adjusting the shelf according to the invention depends on the size of the teeth of the gearing 8, 9, the pitch of said teeth and the diameter of said circular projections 21, 22. The system as described above provides for a form-locking fixing of the shelf. The shelf according to the invention is additionally fixed in a horizontal position in a manner that a surface 27 of the flange-like extension 18 facing the vertical guide 1, 2 is pressed, due to dead load of the shelf, against the vertical guide 1, 2 and, respectively, against a decorative profile 28 which optionally covers each vertical guide 1, 2. In this manner a friction-type blocking of the shelf is obtained.

Claims

1. A system for vertically adjusting a shelf, such as in refrigerating appliances, cabinets, lockers and similar, said shelf comprises horizontal support members (10, 11) arranged perpendicularly to vertical guides (1, 2) where they can be vertically adjusted, and a deposit plate (12), a drawer or similar, being attached to said horizontal support members (10, 11), ***characterized in that*** said shelf is fixed in a form-locking and friction-type manner in vertical guides (1, 2) by means of horizontal support members (10, 11).

2. A system according to claim 1, ***characterized in that*** said vertical guide (1, 2), having a C-shaped cross-section, comprises a web (3) formed with a plurality of through holes (4) for passing the air, and a side (5) arranged opposite to said web (3), said side (5) being formed with folds (6) facing each other, where the free end of at least one fold (6, 7) is formed with a gearing (8, 9) extending preferably over the entire length of said guide (1, 2).

3. A system according to claim 1 and 2, ***characterized in that*** each said horizontal support member (10, 11) is formed on the side cooperating with each of said guides (1, 2) with a flange-like extension (18), an oblong and relatively narrow tongue-like projection (19) being associated thereto in longitudinal direction, the upper section (20) of said projection (19) is formed with a pair of vertically and horizontally spaced circular projections (21, 22) intended to mesh with said gearing (8, 9) of each said guide (1, 2).

4. A system according to any of the preceding claims, ***characterized in that*** said section (20) is formed in the inner side of the projection (19) with a guide (23) whereto a slider (24) snaps on which cooperates with said vertical guide (1, 2).

5. A system according to any of the preceding claims, ***characterized in that*** said deposit plate (12) is fixed on horizontal support members (10, 11) by means of a safeguard (13) being connected in a form-locking manner with said support member (10, 11).

6. A system according to claim 5, ***characterized in that*** said safeguard (13) is formed on the side facing said support member (10, 11) with a T-shaped guide (14) which cooperates with a suitable T-shaped groove (15) formed in said support member (10, 11).

7. A system according to any of the preceding claims, ***characterized in that*** said shelf is additionally fixed

in a horizontal position by means of a friction-type blocking in a manner that a surface (27) of the flange-like extension (18) facing the vertical guide (1, 2) is pressed, due to dead load of the shelf, against the vertical guide (1, 2) and, respectively, against a decorative profile (28) which optionally covers each vertical guide (1, 2).

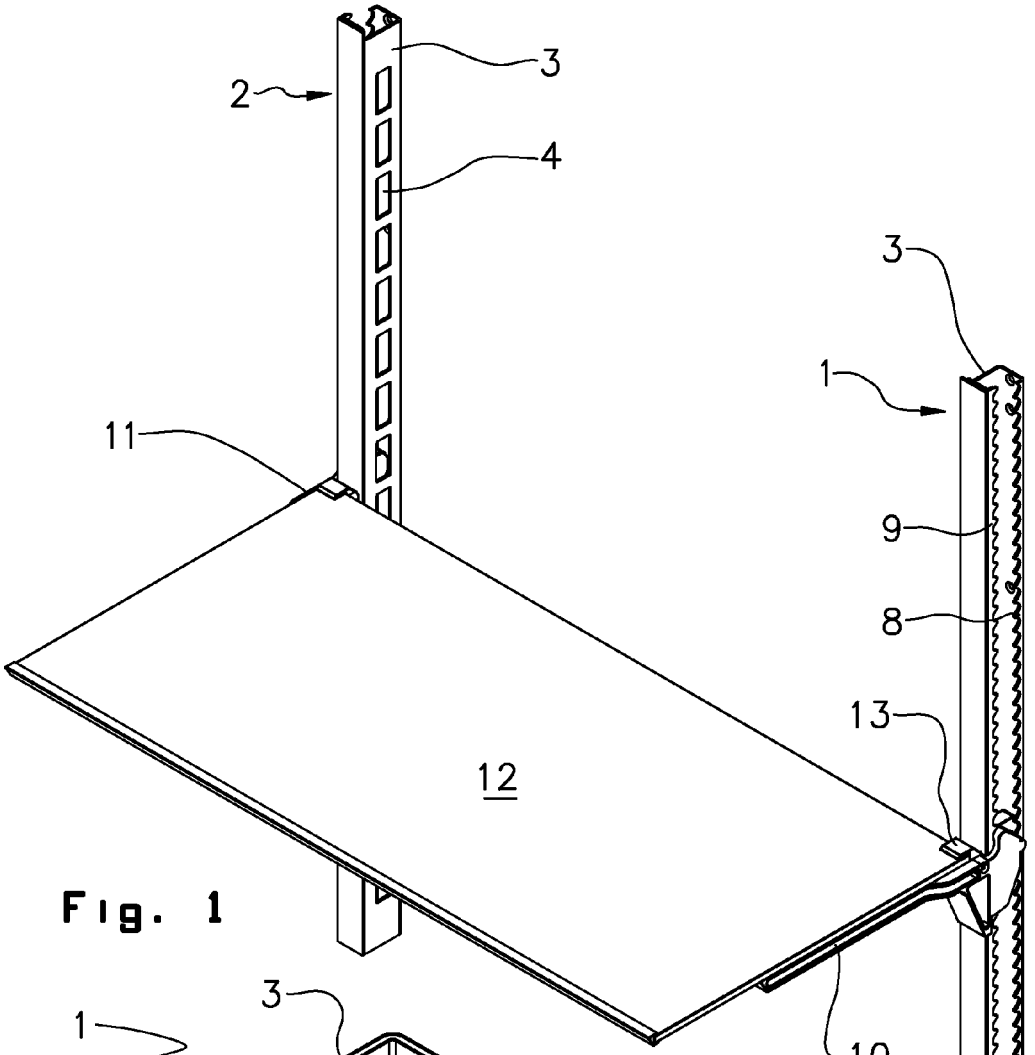

Fig. 1

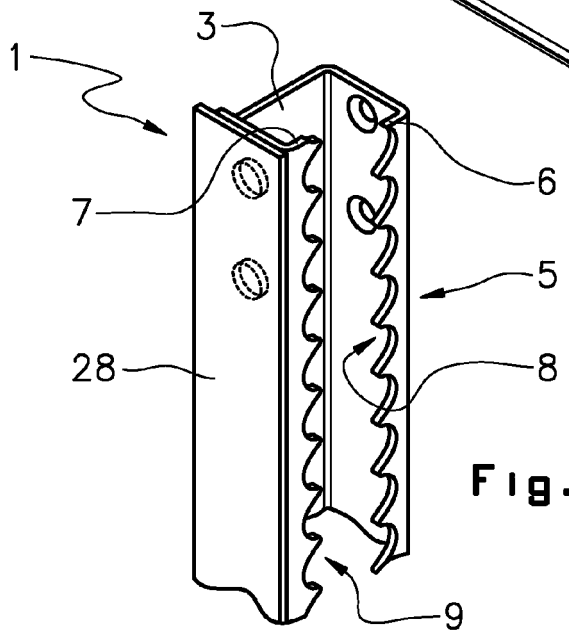

Fig. 2

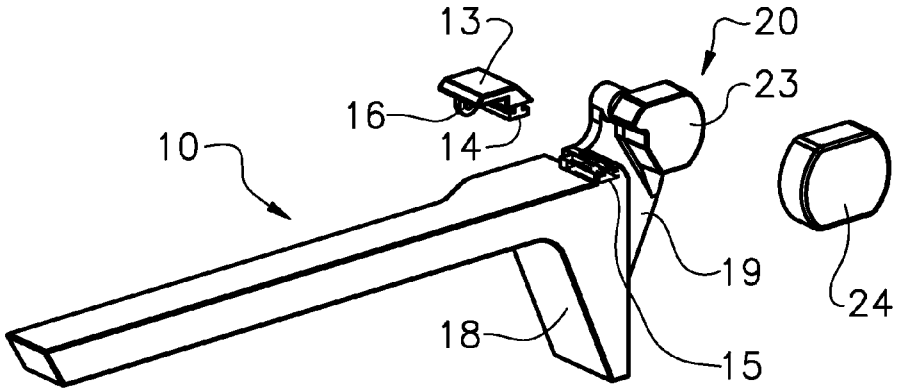

Fig. 3

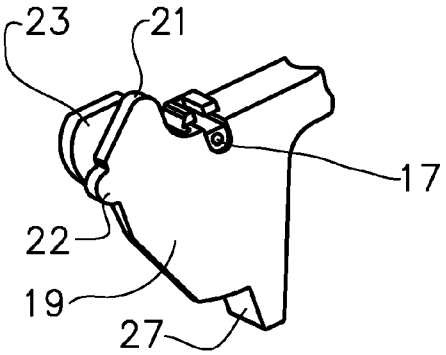

Fig. 4

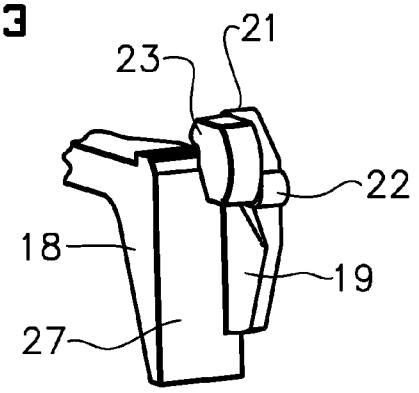

Fig. 5

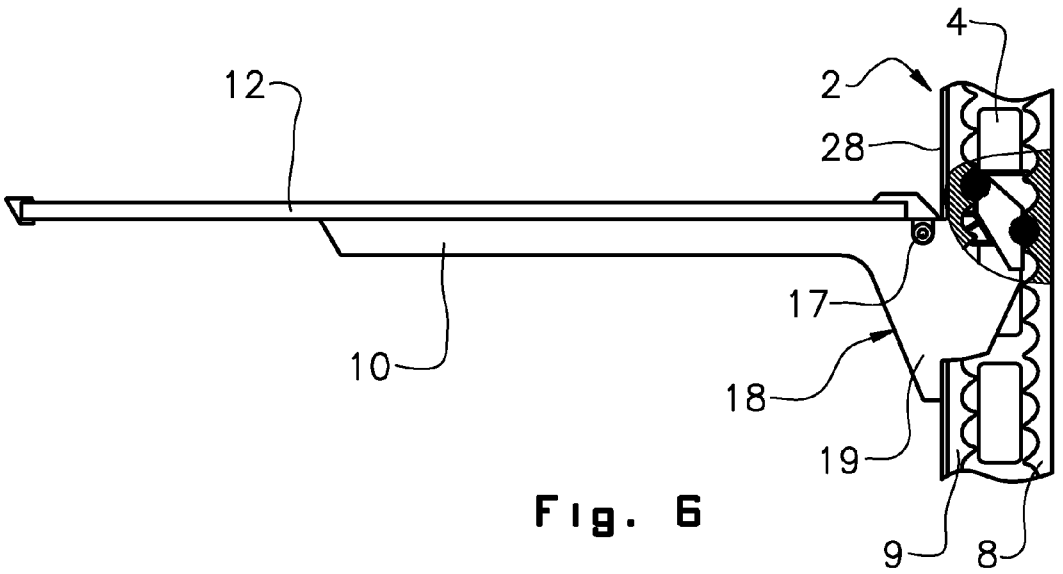

Fig. 6

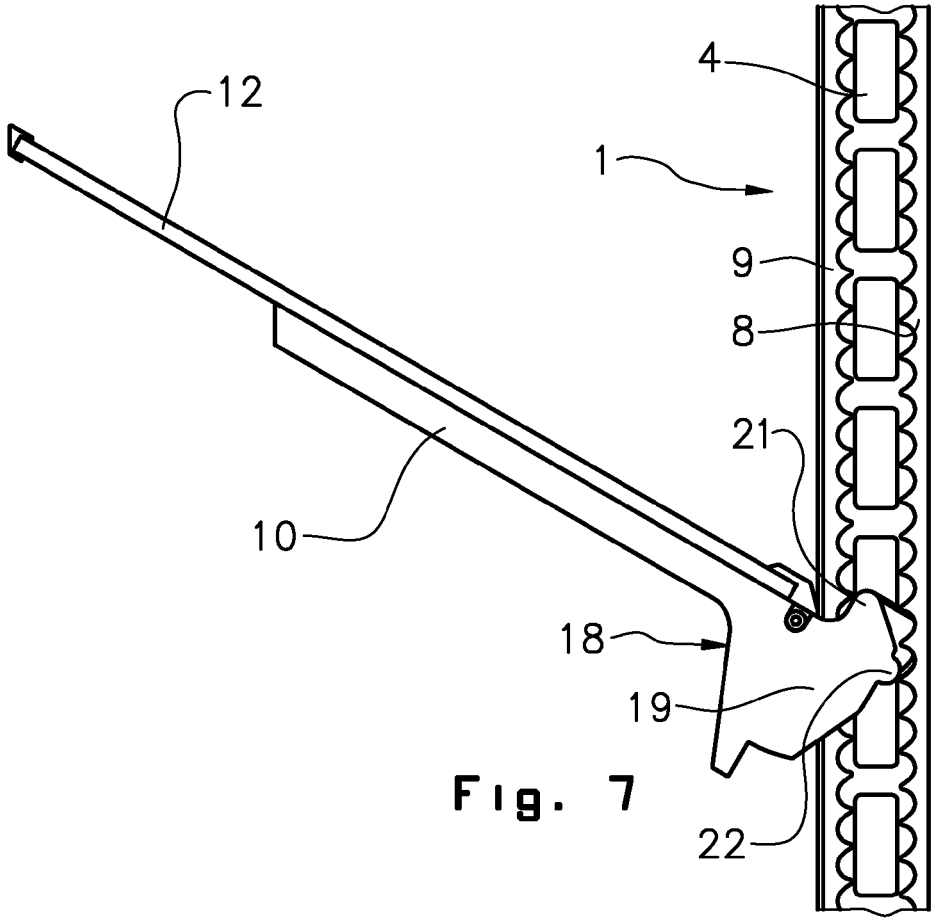

Fig. 7

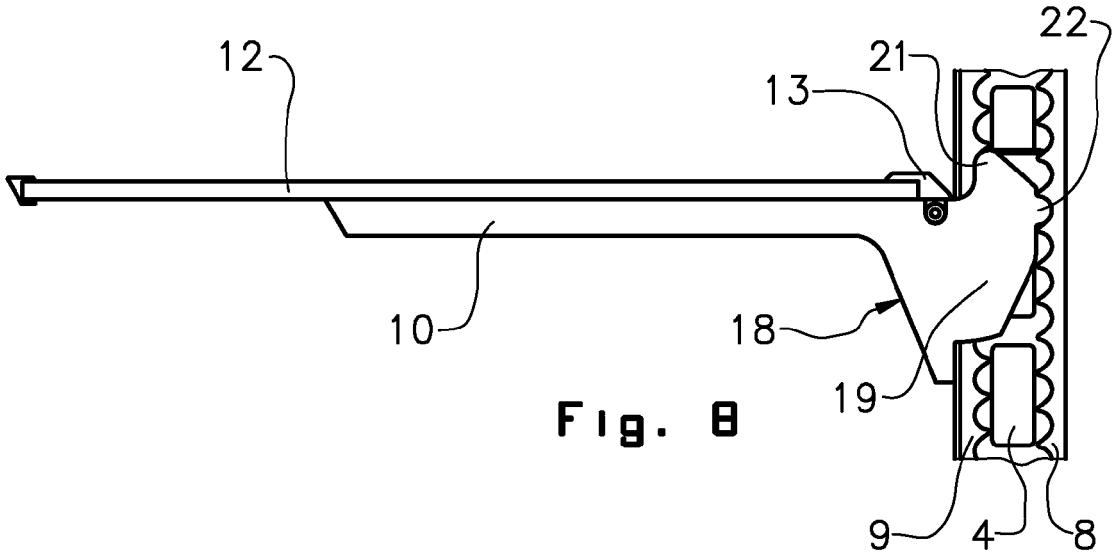

Fig. 8

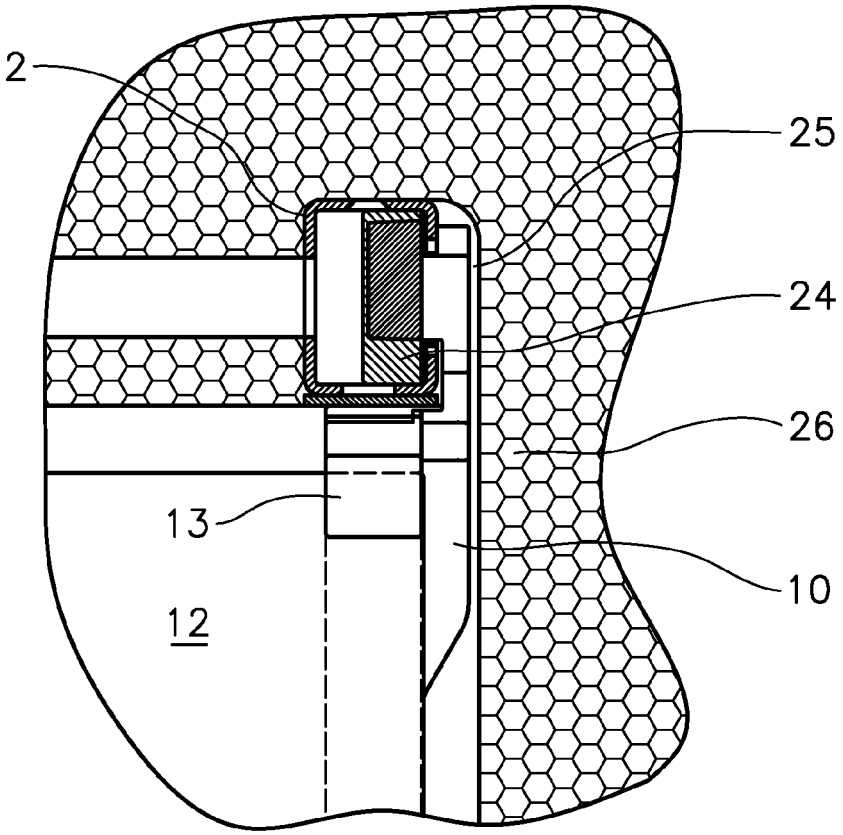

Fig. 9

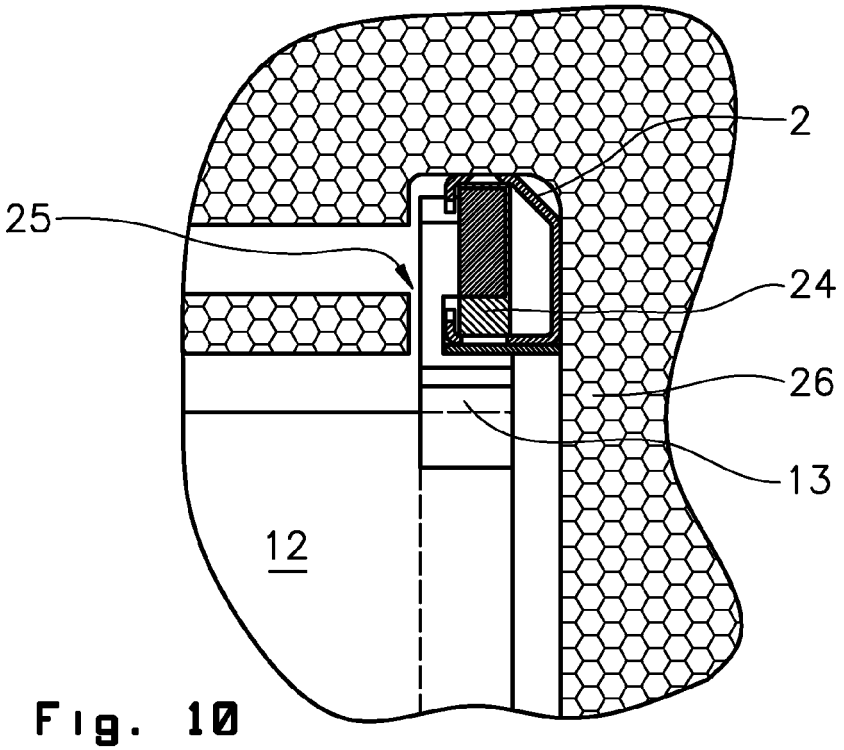

Fig. 10

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EUROPEAN SEARCH REPORT

Application Number
EP 10 15 9087

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	1 September 2010	Klintebäck, Daniel

CATEGORY OF CITED DOCUMENTS

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