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(54) **A COOLING DEVICE**

KÜHLVORRICHTUNG

DISPOSITIF DE REFROIDISSEMENT

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Description

[0001] The present invention relates to a cooling device that comprises drawers.

[0002] The cooling devices comprising drawers are devices wherein a cooling or freezing volume is separated by drawers placed on top of one another without a wall therebetween. The cooling device does not have a separate door wherein the cover of each drawer forms the cooling device door. Access to inside of the cooling device is maintained by pulling the drawer outward, loading and unloading therein can be performed when the drawer is pulled out.

[0003] Gaskets that surround the cover are provided behind each drawer cover. A beam or beams are provided between the drawers, where to these gaskets bear against, insulating the cooling volume from the outside. When the drawer is closed, the gasket bears against the frame and the beam and leak-proofing is maintained.

[0004] This beam connects the two side walls at the front of the body. The said beam does not separate the cooling volume into two, only forming a surface where to the gaskets bear against when the drawers are closed for providing insulation of the cooling volume. Thus, in a cooling volume, for example two drawers can exist in the same cooling conditions.

[0005] In the embodiments known in the technique, the said beam (K) is stationary. The drawers (A) are produced with less depth so that the drawers (A) can be pulled outward from above and under the beam (K) without colliding since the beam (K) is stationary and a dead zone (D) is formed between the two drawers (A) in the portion corresponding to the beam (K). This zone cannot be utilized by the user and causes the energy consumption values of the cooling device to increase (Figure 1).

[0006] In the Japanese Patent Application no JP9113115, another embodiment known in the technique, a drawer-type refrigerator is explained. In this embodiment, the beam is secured to the drawer cover and the beam does not pose an obstacle for the user in loading and unloading by moving together with the drawer. When the drawer is closed, the beam is seated on the locking mechanisms formed on the side walls.

[0007] In the state of the art Japanese Patent Application no JP8271132, a beam is explained that is secured on the drawer and moves together with the drawer. JP 8 271 132 discloses a cooling device according the preamble of claim 1.

[0008] In both embodiments known in the technique, the beam is secured on the upper drawer and the weight of the drawer is increased. Moreover, when the upper drawer is opened, the leak-proofing of the lower drawer fails since there isn't any surface whereon the gasket of the closed lower drawer can contact with since the beam moves together with the drawer.

[0009] The aim of the present invention is the realization of a cooling device wherein the usage volume of the drawers is increased.

[0010] The cooling device realized in order to attain the aim of the present invention, explicated in the first claim and the respective claims thereof, comprises more than one drawer, disposed one over the other in the cooling or freezing volume, moving in the horizontal direction and a beam that moves away from the path the drawer follows by the actuation of the opened drawer, rotating about its axis and being shifted.

[0011] By means of the beam that leaves the path the drawer follows by rotating and shifting, the need for decreasing the depth of the drawer is not required for passing over the beam. Consequently, the depth of the drawer is increased. Moreover, this motion of the beam is made without leaving the body. Thus, the leak-proofing of the closed drawer is affected minimally by the opening of the other drawer since the beam forms a surface whereon the gasket of the closed drawer can press on.

[0012] The cooling device furthermore comprises a housing, above or below the drawer, just behind the cover, extending along the front side of the drawer and wide enough for the rotating inside and shifting beam to be seated therein.

[0013] In the beginning, the beam stands upright between the drawers. In this position, when the drawers are closed, both of the gaskets of the two drawers simultaneously press on a bearing surface on the beam and leak-proofing is maintained between the drawers and the outside environment. When one of the drawers is opened, the beam changes to the horizontal position by rotating and shifting and settles in the housing of the closed drawer. At the same time, only the gasket of the closed drawer presses on the other narrower bearing surface, situated oppositely on both sides of the rotational axis and extending vertically to the bearing surface. Thus, even if one of the drawers is opened, the other closed drawer presses on thereby minimizing the effect on the leak-proofing.

[0014] The cooling device furthermore comprises two guides, that direct the motion of the beam, the arms thereof preferably facing inside the body, configured as a cantilevered "U" shape and two pins situated at both ends of the beam, forming the rotational axis, moving inside the guides and between the arms depending on the motion of the drawers.

[0015] The cooling device comprises springs inside the guide that maintain the beam to return to the former position wherein the gaskets of both drawers can press on when the drawers are closed, with one ends secured to both arms of the guide such that the pin remains therebetween and the other ends secured on both sides of the pin.

[0016] By means of the present invention, the distance between the drawers can be reduced such that both drawers are allowed to move without brushing against each other. This permits the use of deeper drawers. Moreover, when one of the drawers is opened, the other closed drawer is affected from the outside environment minimally. This lowers the energy consumption of the

cooling device to a minimum.

[0017] A cooling device realized in order to attain the aim of the present invention is illustrated in the attached figures, where:

[0018] Figure 1 - is the schematic view of a cooling device in the prior art.

[0019] Figure 2 - is the schematic view of a cooling device when the drawers are inside the body.

[0020] Figure 3 - is the schematic view of the cooling device while the upper drawer is pulled out of the body.

[0021] Figure 4 - is the schematic view of the cooling device while the lower drawer is pulled out of the body.

[0022] Figure 5 - is the schematic view of the path followed by the beam while the lower drawer is pulled out of the body.

[0023] Figure 6 - is the schematic view of the beam, housing, pin and the springs when the drawers are closed, when the upper drawer is open and when the lower drawer is open.

[0024] The elements illustrated in the figures are numbered as follows:

1. Cooling device
2. Body
3. Drawer
4. Cover
5. Beam
6. Pin
7. Guide
8. Spring
9. Gasket
10. Housing

[0025] The cooling device (1) comprises a body (2), at least two drawers (3) disposed one over the other inside the body (2), moving in the horizontal direction, a cover (4) allowing the drawer (3) to be pulled out of the body (2) for accessing inside, and one or more gaskets (9) mounted on the rear surface of the cover (4) and surrounding the cover (4).

[0026] The cooling device (1) comprises a beam (5)

- disposed between the drawers (3), fastened from both ends to the side walls of the body (2),
- whereon the gaskets (9) bear against when the drawers (3) are in the closed position in the body (2),
- moves away from the path the drawer (3) will follow
- by rotating around the axis of fastening to the body (2) almost 90 degrees and shifts toward inside the body (2) when either one of the drawers (3) is opened (Figure 2).

[0027] The cooling device (1) furthermore comprises a housing (10) above or under the drawer (3), just behind the cover (4), extending along the portion corresponding to the front side of the drawer (3), wherein the beam (5) can be seated. Thus, while a drawer (3) is opened, the beam (5), seated in the housing (10) on the other drawer

(3), does not hinder the movement of the other drawer (3) and provides the said drawer (3) to move in the horizontal direction outwards from the cooling device (1).

[0028] When either one of the drawers (3) is opened, the beam (5) both rotates and shifts without leaving the body (2) by the pushing of the opened drawer (3). As a result of this motion, the beam (5) moves away from the path the drawer (3) will follow and is seated in the housing (10) on the drawer (3) that remains inside the cooling device (1). In this position, the beam (5), not leaving the body (2), does not create a barrier against the motion of the opening drawer (3). Moreover, leak-proofing is not impaired during this process. Thus, drawers (3) with greater volumes can be disposed inside the body (2) without affecting leak-proofing. In Figure 2, the shaded areas show the additional volumes of the drawers (3).

[0029] The beam (5) comprises at least a first bearing surface (S1) whereon the gaskets (9) on both covers (4) bear against when the drawers (3) are in the closed position inside the body (2) and at least two second bearing surfaces (S2), vertical to the said first bearing surface (S1), situated oppositely on both sides of the fastening axis to the body (2), and narrower than the first bearing surface (S1), whereon only the gasket (9) on the cover (4) of the drawer (3) in the closed position presses on when one of the drawers (3) is opened. By means of the beam (5) rotated around the fastening axis to the body (2) side walls, the bearing surface (S1) whereto the gaskets (9) contact can be changed when both of the drawers (3) are inside the body (2) and when either one is opened. When the drawers (3) are closed the first bearing surface (S1) is used, that is wide enough for the gaskets (9) on both drawers (3) to bear against, and when one of the drawers (3) is brought to the open position, the narrower second bearing surface (S2) is used whereon only the gasket (9) on the drawer (3) in the closed position can contact.

[0030] The cooling device (1) furthermore comprises two guides (7), disposed oppositely on both side walls of the body (2), with one arm placed to be corresponding under the upper drawer (3), and the other arm above the lower drawer (3), having a curvilinear orbit between these two arms, the arms configured as a canted "U" shape facing inside the body (2) and two pins (6) situated at both ends of the beam (5), forming the rotational axis of the beam (5), by being seated inside the guides (7) and moving between the arms of the guide (7) depending on the motion of the drawers (3).

[0031] While the guide (7) directs the shifting motion of the beam (5) in both the horizontal and vertical planes, the pin (6) maintains the beam (5) to rotate around its axis in the guide (7) on the body (2) side wall. While the lower drawer (3) is pulled, the beam (5) moves upward in the vertical plane and toward inside the body (2) in the horizontal plane, and is seated in the housing (10) on the upper drawer (3), without hindering the motion of the lower drawer (3). While the upper drawer (3) is pulled, the beam (5) moves downward in the vertical plane and

pulled inside the body (2) in the horizontal plane, being seated in the housing (10) on the lower drawer (3), without hindering the motion of the upper drawer (3).

[0032] The cooling device (1) furthermore comprises two springs (8) in each guide (7), with one ends secured on both sides of the pin (6) such that the pin (6) remains therebetween and the other ends secured to both arms of the guide (7) thereby maintaining the beam (5) to return to the former position when the drawer (3) is placed in the body (2) (Figure 6). Figure 6 shows the details of the guide (7), the pin (6) and the beam (5) wherein I: is when the drawers (3) are closed, II: when the upper drawer (3) is open and III: is when the lower drawer (3) is open.

[0033] When both of the drawers (3) are closed inside the body (2), the beam (5) stands in the upright position between the drawers (3) superimposed on one another. In this position, the gaskets (9) on both covers (4) press on the first bearing surface (S1) having a wide surface. In this position, the pin (6) is stayed between both arms of the guide (7).

[0034] When a drawer (3), for example the upper drawer (3) is opened and pulled out of the body (2), the base of the drawer (3) contacts with the side of the beam (5) remaining above the rotational axis. As a result of the contact, a force is applied on the beam (5) and as the beam (5) rotates clockwise around the pin (6) by overcoming the force of the spring (8) depending on the pulling motion of the drawer (3), at the same time is shifted inside the guide (7) by means of the pin (6) and passes to the horizontal position at the lower end of the guide (7). In this position, the pin (6) is at the lower end of the guide (7). When the beam (5) changes to the horizontal position, the base of the upper drawer (3) exerts pressure on the beam (5) even though the spring (8) forces the beam (5) to return to the former position and maintains the beam (5) to remain in the housing (10). The beam (5) is entirely seated in the housing (10) on the lower drawer (3), moves away from the path to be followed by the upper drawer (3) when pulled. At the same time, the gasket (9) on the cover (4) of the lower drawer (3) in the closed position presses on the narrower second bearing surface (S2) of the beam (5), almost wide enough for a gasket (9) to exert pressure. In this position, only the gasket (9) on the lower drawer (3) in the closed position presses on the beam (5) (Figure 3).

[0035] When the upper drawer (3) is closed and the lower drawer (3) is wanted to be changed to the open position by pulling out of the body (2), the ceiling of the drawer (3) contacts with the side of the beam (5) remaining below the rotational axis. As a result of the contact, a force is applied on the beam (5) and as the beam (5) rotates this time counterclockwise around the pin (6) by overcoming the force of the spring (8) depending on the pulling motion of the drawer (3), at the same time is shifted inside the guide (7) by means of the pin (6) and passes to the horizontal position at the upper end of the guide (7). In this position, the pin (6) is at the upper end of the guide (7). When the beam (5) changes to the horizontal

position, the ceiling of the lower drawer (3) exerts pressure on the beam (5) even though the spring (8) forces the beam (5) to return to the former position and maintains the beam (5) to remain in the housing (10). The beam (5) is entirely seated in the housing (10) on the upper drawer (3), moves away from the path to be followed by the lower drawer (3) when pulled. At the same time, the gasket (9) on the cover (4) of the upper drawer (3) in the closed position presses on the narrower second bearing surface (S2) of the beam (5), almost wide enough for a gasket (9) to exert pressure. In this position, only the gasket (9) on the upper drawer (3) in the closed position presses on the beam (5) (Figure 4 and Figure 5).

[0036] By means of the present invention, the depths of the drawers (3) are increased and the dead zone between the drawers (3) is minimized.

Claims

1. A cooling device (1) that comprises a body (2), at least two drawers (3) disposed one over the other in the body (2) moving in the horizontal direction, a cover (4) allowing the drawer (3) to be pulled out of the body (2) for accessing inside, and one or more gaskets (9) mounted on the rear surface of the cover (4) and surrounding the cover (4) and **characterized by a beam (5)**

- disposed between the drawers (3), fastened from both ends to the side walls of the body (2),
- whereon the gaskets (9) bear against when the drawers (3) are in the closed position in the body (2),
- that moves away from the path the drawer (3) will follow
- by rotating around the axis of fastening to the body (2) almost 90 degrees and shifts toward inside the body (2) when either one of the drawers (3) is opened.

2. A cooling device (1) as in Claim 1, **characterized by a housing (10) above or under the drawer (3), just behind the cover (4), extending along the portion corresponding to the front side of the drawer (3), wherein the beam (5) can be seated.**

3. A cooling device (1) as in Claim 1 or 2, **characterized by the beam (5) that comprises a first bearing surface (S1) whereon the gaskets (9) on both covers (4) bear against when the drawers (3) are in the closed position inside the body (2) and at least two second bearing surfaces (S2), vertical to the said first bearing surface (S1) situated oppositely on both sides of the fastening axis to the body (2), and narrower than the first bearing surface (S1), whereon only the gasket (9) on the cover (4) of the drawer (3) in the closed position presses on when one of the drawers (3) is**

opened.

4. A cooling device (1) as in any one of the above Claims, **characterized by** two guides (7) disposed oppositely on both side walls of the body (2), with one arm placed to correspond under the upper drawer (3), and the other arm above the lower drawer (3), having a curvilinear orbit between these two arms. 5
5. A cooling device (1) as in Claim 4, **characterized by** guides (7) with the arms configured as a canted "U" shape facing inside the body (2). 10
6. A cooling device (1) as in Claims 4 or 5, **characterized by** two pins (6) situated at both ends of the beam (5), forming the rotational axis of the beam (5), seated inside the guides (7) and moving between the arms of the guide (7) depending on the motion of the drawers (3). 15
7. A cooling device (1) as in Claim 6, **characterized by** two springs (8) disposed in the guide (7) such that the pin (6) remains therebetween, with one ends secured on the pin (6) and the other ends secured to both arms of the guide (7) and thereby maintaining the beam (5) to return to the former position when the drawer (3) is placed in the body (2). 20 25

Patentansprüche

1. Kühlvorrichtung (1), umfassend einen Gehäusekörper (2), mindestens zwei Schubladen (3), die in dem Gehäusekörper (2) horizontal beweglich übereinander angeordnet sind, eine Abdeckung (4), mittels der die Schublade (3) aus dem Gehäusekörper (2) gezogen werden kann, um Zugang zum Inneren zu erhalten, und eine oder mehrere Dichtungen (9), die an der Rückfläche der Abdeckung (4) angebracht sind und die Abdeckung umgeben, und **gekennzeichnet durch** eine Strebe (5),
 ■ die zwischen den Schubladen (3) angeordnet ist und an beiden Enden an den Seitenwänden des Gehäusekörpers (2) befestigt ist,
 ■ gegen die die Dichtungen (9) drücken, wenn sich die Schubladen (3) in geschlossener Position im Gehäusekörper (2) befinden,
 ■ die sich von dem Weg fortbewegt, dem die Schublade (3) folgt,
 ■ indem sie sich um nahezu 90 Grad um die Befestigungsachse am Gehäusekörper (2) dreht und sich zum Inneren des Gehäusekörpers (2) hin verschiebt, wenn eine der beiden Schubladen (3) geöffnet wird. 30 35 40 45 50
2. Kühlvorrichtung (1) nach Anspruch 1, **gekennzeichnet durch** ein Gehäuse (10) über oder unter der Schublade (3) unmittelbar hinter der Abdeckung (4), das sich an dem Abschnitt entlang erstreckt, der der 55

Vorderseite der Schublade (3) entspricht, und in dem die Strebe (5) angeordnet werden kann.

3. Kühlvorrichtung (1) nach Anspruch 1 oder 2, **gekennzeichnet durch** eine Strebe (5), die eine erste Lagerfläche (S1) umfasst, gegen die die Dichtungen (9) an den beiden Abdeckungen (4) drücken, wenn sich die Schubladen (3) in geschlossener Position im Gehäusekörper (2) befinden, und wenigstens zwei zweite Lagerflächen (S2) vertikal zu der ersten Lagerfläche (S1), die gegenüber an beiden Seiten der Befestigungsachse am Körper (2) angeordnet sind, und die schmaler sind als die erste Lagerfläche (S1), und gegen die nur die Dichtung (9) der Abdeckung (4) der Schublade (3) in geschlossener Position drückt, wenn eine der Schubladen (3) geöffnet ist.
4. Kühlvorrichtung (1) nach einem der vorangehenden Ansprüche, **gekennzeichnet durch** zwei Führungselemente (7), die gegenüber an beiden Seitenwänden des Gehäusekörpers (2) angeordnet sind, wobei ein Arm derart angeordnet ist, dass er mit der oberen Schublade (3) übereinstimmt, und der andere Arm über der unteren Schublade (3), wobei zwischen diesen zwei Armen eine kurvenförmige Umkreisungsbahn vorliegt.
5. Kühlvorrichtung (1) nach Anspruch 4, **gekennzeichnet durch** Führungselemente (7), deren Arme als abgeschrägte "U"-Form konfiguriert sind, die zum Inneren des Gehäusekörpers (2) hin gewandt sind.
6. Kühlvorrichtung (1) nach Anspruch 4 oder 5, **gekennzeichnet durch** zwei Stifte (6), die an beiden Enden der Strebe (5) angeordnet sind, und die die Drehachse der Strebe (5) bilden, und die in den Führungselementen (7) angeordnet sind und sich je nach der Bewegung der Schubladen (3) zwischen den Armen des Führungselements (7) bewegen.
7. Kühlvorrichtung (1) nach Anspruch 6, **gekennzeichnet durch** zwei Federn (8), die derart im Führungselement (7) angeordnet sind, dass der Stift (6) dazwischen bleibt, wobei ein Ende am Stift (6) gesichert ist und das andere Ende an den beiden Armen des Führungselements (7) gesichert ist und auf diese Weise die Strebe (5) derart hält, dass sie in die vorherige Position zurückkehrt, wenn die Schublade (3) in den Gehäusekörper (2) geschoben wird.

Revendications

1. Un dispositif de refroidissement (1) comprenant un corps (2), au moins deux tiroirs (3) disposées l'un sur l'autre dans le corps (2) se déplaçant dans sens horizontal, un couvercle (4) permettant au tiroir (3) d'être retiré du corps (2) pour accéder à l'intérieur,

et un ou plusieurs joints (9) montées sur la surface arrière du couvercle (4) et entourant le couvercle (4) et **caractérisé par** un faisceau (5)

■ disposé entre les tiroirs (3), fixé aux deux extrémités sur les parois latérales du corps (2),

■ sur lequel les joints (9) s'appuient lorsque les tiroirs (3) sont en position fermée dans le corps (2),

■ qui s'éloigne de la voie que le tiroir (3) suivra,

■ en tournant autour de l'axe de fixation sur le corps (2) près de 90 degrés et déplace vers l'intérieur du corps (2) lorsque l'un des tiroirs (3) est ouvert.

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autres extrémités fixées à deux bras du guide (7) et donc permettant au faisceau (5) de revenir à l'ancien position lorsque le tiroir (3) est placé dans le corps (2).

2. Un dispositif de refroidissement (1) selon la Revendication 1, **caractérisé par** un boîtier (10) au-dessus de ou sous le tiroir (3), juste derrière le couvercle (4), s'étendant le long de la partie correspondant à la côté avant du tiroir (3), dans lequel le faisceau (5) peut être placé. 15
3. Un dispositif de refroidissement (1) selon la Revendication 1 ou 2, **caractérisé par** le faisceau (5) qui comprend une première surface d'appui (S1) sur laquelle les joints (9) sur les deux couvercles (4) s'appuient lorsque les tiroirs (3) sont en position fermée dans le corps (2) et au moins deux secondes surfaces d'appui (S2), verticales audit première surface d'appui (S1) située d'une manière opposée sur les deux côtés de l'axe de fixation dur corps (2), et plus étroite que la première surface d'appui (S1), sur laquelle seul le joint (9) sur le couvercle (4) du tiroir (3) en position fermée presse lorsque l'un des tiroirs (3) est ouvert. 20 25 30
4. Un dispositif de refroidissement (1) selon l'une quelconque des revendications précédentes, **caractérisé par** deux guides (7) disposés d'une manière opposée sur les deux parois latérales du corps (2), avec un bras placé pour correspondre sous le tiroir supérieur (3), et l'autre bras au-dessus du tiroir inférieur (3), ayant une orbite curviligne entre ces deux bras. 35 40
5. Un dispositif de refroidissement (1) selon la Revendication 4, **caractérisé par** les guides (7) avec les bras configurés en forme d'un U incliné face à l'intérieur du corps (2). 45
6. Un dispositif de refroidissement (1) selon la Revendication 4 ou 5, **caractérisé par** deux goupilles (6) situées aux deux extrémités du faisceau (5), formant l'axe de rotation du faisceau (5), placées à l'intérieur des guides (7) et se déplaçant entre les bras du guide (7) selon le mouvement des tiroirs (3). 50
7. Un dispositif de refroidissement (1) selon la Revendication 6, **caractérisé par** deux ressorts (8) disposés dans le guide (7) de telle sorte que la goupille (6) reste entre ceux-ci, avec une extrémité de chaque une de ceux-ci fixée sur la goupille (6) et les 55

Figure 1

PRIOR ART

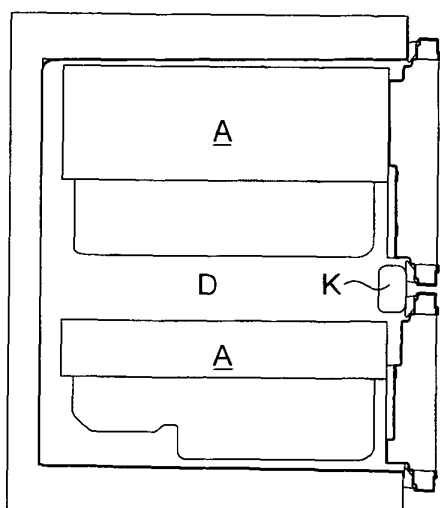


Figure 2

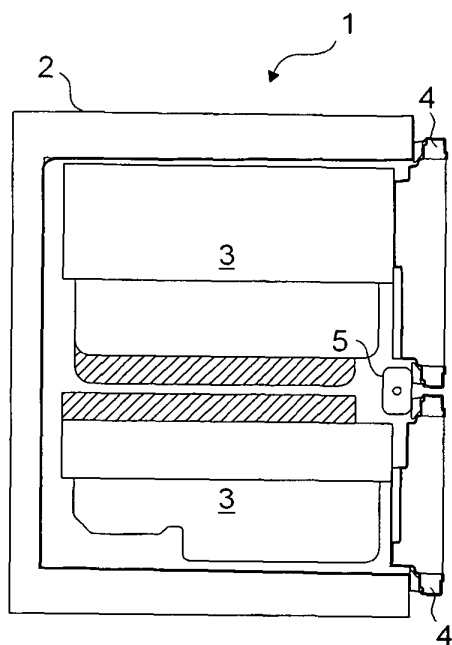


Figure 3

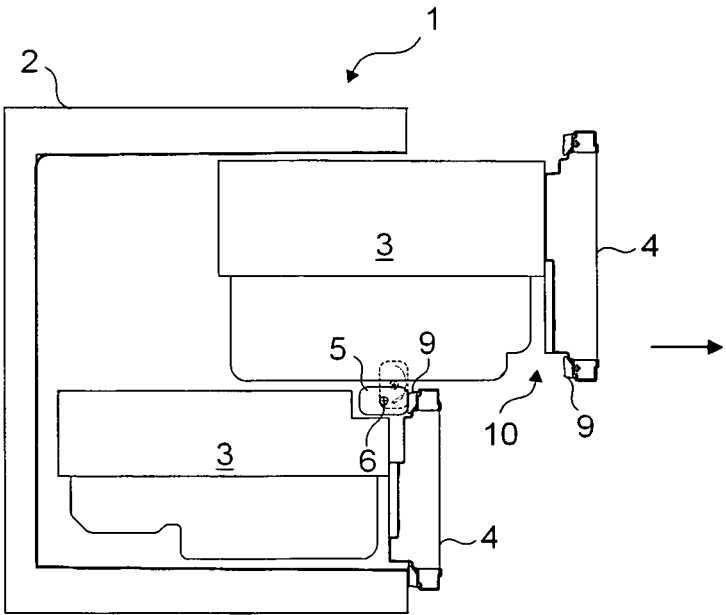


Figure 4

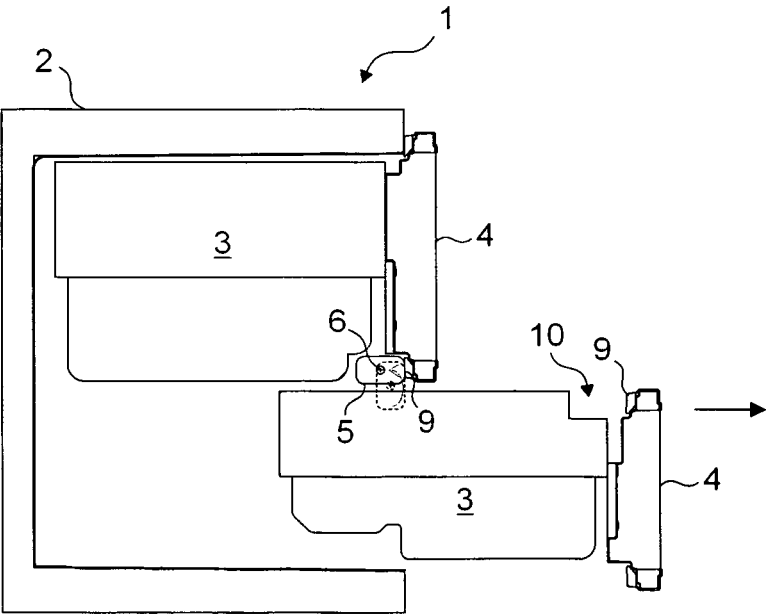


Figure 5

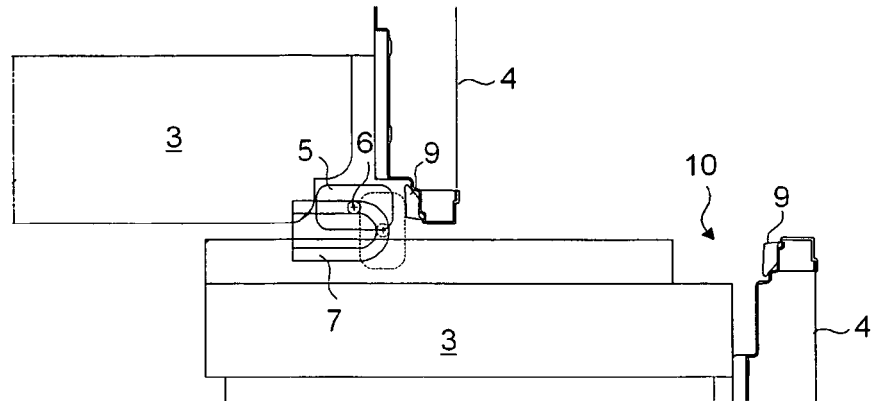
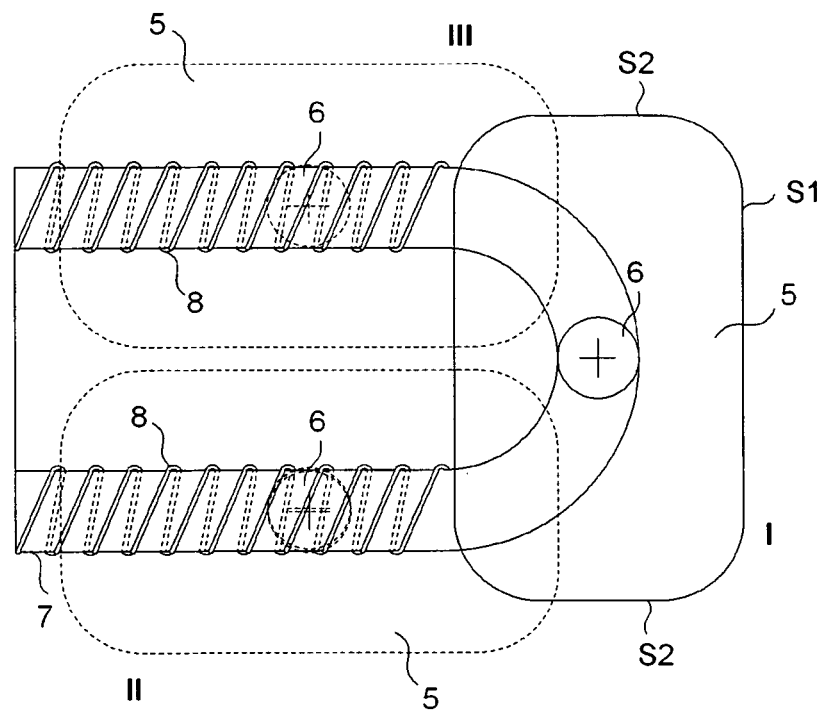


Figure 6



REFERENCES CITED IN THE DESCRIPTION

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