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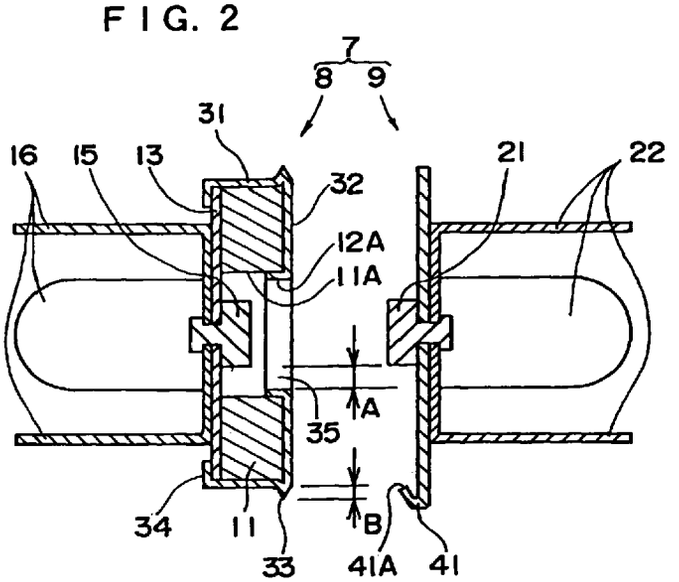
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(54) MAGNET FIXING MEMBER

(57) A magnet fixing member (7) is produced by disposing a magnet portion (8) having a permanent magnet (11) at the main body portion (3) of a bag, or the like, and a sheet-like attracted portion (9) made of iron, which is attracted by the magnet portion (8), and provided to a cover portion (5). A hook portion (41) the distal end of which faces inward is disposed round the outer periphery of the attracted portion (9) and a flange portion (33) for hooking the hook portion (41) is provided to the outer peripheral portion of the magnet portion (8). Even when various articles are put into the bag and the bag swells, the tensile strength for pulling the distal end side of the cover portion (5) to the proximal end side keeps hooking between the hook portion (41) of the attracted portion (9) and the flange portion (33) of the magnet portion (8), and accidental fall-off can be prevented without deteriorating operability.

F I G. 2



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Description

Technical Field

This invention relates to a magnetic fastener for coupling a bag cover onto a bag body of a bag or the like with the use of an attractive force of a permanent magnet.

Background Art

Conventionally, a magnetic fastener for coupling a bag cover onto a bag body is used for a bag, such as a hand bag.

As an example of the magnetic fastener, Fig. 13 shows a disc-shaped fastener 2 used in a hand bag 1. The fastener 2 is composed of a magnet portion 4, which is attached on a side face of a bag-body 3 of the hand bag 1, and an attracted portion 6 which is attached adjacent to the end of a bag-cover 5 of the hand bag 1.

As shown in Fig. 14, the magnet portion 4 of the fastener 2 protrudes from the surface of the bag-body 3 of the hand bag 1. The magnet portion 4 is composed of: a disc-shaped permanent magnet 11 having a through-hole 11A at the center; a brass case 12 which covers the side faces and upper face of the permanent magnet 11 and has an opening 12A corresponding to the through-hole 11A of the permanent magnet 11; and an iron base plate 13 for closing the case 12 on the back face of the permanent magnet 11.

The case 12 is provided with plural tabs 14 on the circumferential edge of the surface of the case 12, confronting the bag-body 3 of the hand bag 1. The tab 14 is bent in the state that the permanent magnet 11 and the base plate 13 are accommodated in the case 12. The bent tabs 14 cause the permanent magnet 11 and the base plate 13 to be secured inside the case 12.

The base plate 13 are provided with an iron projection 15 which is loosely inserted in the through-hole 11A of the permanent magnet 11, and plural legs 16 for securing the magnet portion 4 to the bag-body 3 of the hand bag 1.

A facing ring 17, which has through-holes 17A for passing the legs 16, is placed between an outer-face member 3A, forming the outside of the bag-body 3 of the hand bag 1, and an inner-face member 3B forming the inside of the bag-body 3. Each end of the legs 16 of the magnet portion 4 passes through the outer-face member 3A and is bent after being inserted through the through-hole 17A of the facing ring 17. Thereby, the magnet portion 4 is secured to the bag-body 3 of the hand bag 1.

The attracted portion 6 of the fastener 2 is provided on the back face of the bag-cover 5 of the hand bag 1. The attracted portion 6 has a disk shape made of iron and has an iron projection 21 which is loosely inserted into the through-hole 11A of the permanent magnet 11, and plural legs 22 for securing the attracted portion 6 to the bag-cover 5 of the hand bag 1.

Similar to the bag-body 3, a facing ring 23 having through-holes 23A for passing the legs 22 is placed between an outer-face member 5A forming the outside of the bag-cover 5 of the hand bag 1 and an inner-face member 5B forming the inside of the bag-body 5. In a manner similar to the leg 16 of the magnet portion 4, each end of the legs 22 of the attracted portion 6 passes through the outer-face member 5A and is bent after being inserted through the through-hole 23A of the facing ring 23. Thereby, the attracted portion 6 is secured to the bag-cover 5 of the hand bag 1.

In the fastener 2 described above, when magnet poles are respectively provided on the front and back faces of the permanent magnet 11, magnetic flux emitted from the permanent magnet 11 is concentrated in the through-hole 11A by the projection 15 which is loosely inserted in the through-hole 11A.

Therefore, among attractive forces of the permanent magnet 11, especially, the attractive force for attracting the projection 21 of the attracted portion 6 into the through-hole 11A is larger. The projection 21 of the attracted portion 6 can be surely inserted in the through-hole 11A of the permanent magnet 11 without wathing directly, so that the attracted portion 6 is smoothly attracted to the magnet portion 4, resulting in an easy coupling operation of the fastener 2 between the bag-body 3 and the bag-cover 5.

On the other hand, the attraction of the attracted portion 6 to the magnet portion 4 is caused by the attractive force of the permanent magnet 11, so that the attracted portion 6 can be easily uncoupled from the magnet portion 4 against the attractive force of the permanent magnet 11, resulting in an easy uncoupling operation of the fastener 2 for the coupling state between the bag-cover 5 and the bag-body 3.

According to the aforementioned fastener 2, when the bag-cover 5 is opened from and closed to the bag-body 3, the coupling and uncoupling operation of the fastener 2 can be smoothly carried out, making the use of the hand bag convenient.

The attracted portion 6, however, is attracted to the magnet portion 4 only by the attractive force of the permanent magnet 11. When the external force with respect to the attractive force of the permanent magnet 11 is applied, the attracted portion 6 is sometimes uncoupled from the magnet portion 4 unexpectedly, and to make matters worse, small articles held in the hand bag may spill out of the hand bag.

Especially, when the side faces of the hand bag 1 are bulged with bulky contents in the hand bag 1, the edge of the bag-cover 5 is pulled toward the base end of the bag-cover 5, and the rotational moment is always applied to the attracted portion 6 at the contacting point of the inner circumferential face of the opening 12A of the case 12 and the side face of the projection 21 as a fulcrum, so that the attracted portion 6 is easily uncoupled from the magnet portion 4 unexpectedly by a small

external force.

There is an idea as shown in Fig. 15: a rise 24, which reaches on the periphery of the back face of the magnet portion 4, is formed on a part of the edge of the attracted portion 6. Magnetic flux emitted out of the permanent magnet 11 is concentrated by the rise 24, so that the attractive force of the magnet portion 4 for the attracted portion 6 is increased, or the attractive force of the attracted portion 6 is increased by simply increasing magnetic force by which the attracted portion 6 is attracted to the permanent magnet 11. Thereby the attracted portion 6 is not uncoupled from the magnet portion 4 unexpectedly.

As a result of simply increasing magnetic attraction, however, the attracted portion 6 is not easily separated from the magnet portion 4. That is to say the bag-cover 5 coupled to the bag-body 3 is not easily opened.

And additionally, a fastener 2A as shown in Fig.16 is known, which is provided with a magnet portion 4A and an attracted portion 6A, the magnet portion 4A having an elongated hole 12C formed along and on the periphery of one of the opposed edge sides of a box-shaped case 12B and a quadrate plate shaped permanent magnet 11B which has no hole placed against the other edge side of the case 12C, and the attracted portion 6A having a bent portion 25 inserted through the aforementioned elongated hole 12C along the side thereof.

According to the above fastener 2A, when the side faces of the hand bag 1 are bulged, the edge of the bag-cover 5 is pulled toward the base end. In addition, the bent portion 25 is attracted by the magnetic force of the permanent magnet 11B, so that the bent portion 25 of the attracted portion 6A is tightly engaged with the inside of the elongated hole 12C of the magnet portion 4A, therefore the attracted portion 6A is not unexpectedly and easily uncoupled from the magnet portion 4A by a small external force.

However, in order to separate the attracted portion 6A attracted onto the magnet portion 4A from the magnet portion 4A while the side faces of the hand bag 1 are bulged, a large force is required for pulling against both tension applied to the bag-cover 5 and the magnetic force of the permanent magnet 11B.

Moreover, once the large pulling force is weakened, the engagement between the bent portion 25 and the inside of the elongated hole 12C is easily reengaged, so that the pulling force must be continuously applied until the bent portion 25 is completely pulled out from the elongated hole 12C.

Therefore, the aforementioned fastener 2A has a laborious uncoupling operation.

When the attractive force of the permanent magnet 11B, which attracts the bent portion 25 inserted through the elongated hole 12C of the magnet portion 4A, is smaller, the attracted portion 6A is easily slid in a direction to release the engagement between the elongated hole 12C and the bent portion 25, so that the attracted portion 6A is unexpectedly uncoupled from the magnet portion 4A with facility. Alternatively, when the attractive force of the permanent magnet 11B is larger, a large force is required for engaging the bent portion 25 with the elongated hole 12C, so that the coupling operation is laborious.

Moreover, the operation for inserting the bent portion 25 of the attracted portion 6A into the elongated hole 12C of the magnet portion 4A cannot be carried out without watching directly, so that it should be done by keeping an eye upon the bent portion 25 and the elongated hole 12C. Especially, when the bag-cover 5 is pulled, with side faces of the hand bag 1 being bulged, the bent portion 25 of the attracted portion 6A should be being inserted into the elongated hole 12C of the magnet portion 4A with the bent portion 25 keeping approximately perpendicular to the magnet portion 4A while the bag-cover 5 is being pulled toward the edge side thereof, resulting in the arduous coupling operation.

Note that it is difficult to reduce the size of the aforementioned fastener 2A from the viewpoints of the strength of the bent portion and the facility of the coupling operation.

It is an object of the present invention to provide a magnetic fastener which prevents an attracted portion from separating from a magnet portion unexpectedly without impairing the facility of a coupling and uncoupling operation.

Disclosure of the Invention

A magnet fastener according to he present invention, has a magnet portion provided on any one of a bag-body and a bag-cover of a bag and having a permanent magnet, and a plate-shaped attracted portion provided on any one of the bag-body and the bag-cover of the bag and made of magnetic materials attracted onto the magnet portion, and is characterized by a hook portion provided on the outer circumferential edge of the attracted portion, the end thereof being oriented inward, and an engagement portion provided on the outer circumference of the magnet portion to engage with the hook portion.

In the above description, it is advisable that: the magnet portion has a contacting face for attracting and coupling the attracted portion, and a through-hole passing through the almost central area of the contacting face; the attracted portion has a first projection which is to be loosely inserted into the through-hole of the magnet portion; and the magnetic fastener has a second projection loosely inserted into the through-hole of the magnet portion, and a magnetic substance base plate closing the through-hole, on the opposite face of the magnet portion to that formed with the contacting face.

It is desirable that the diameter of the through-hole of the magnet portion is sized to have a predetermined margin between the through-hole and the first projection of the attracted portion inserted thereinto, and the pre-

determined space being longer than a shortest moving-distance which is needed in order that the attracted portion is moved from a position, where the hook portion of the attracted portion is completely engaged with the engagement portion of the magnet portion, to a position to release the engagement.

As the aforementioned magnet portion, a magnet portion having a case which covers at least the side face of the aforementioned permanent magnet can be used.

In this point, a collar portion protruding from the side face of the case or a groove formed on the side face of the case can be used as the aforementioned engagement portion.

When the collar portion is used as the engagement portion, it is advisable for the collar portion to have faces formed as tapered faces to be close to each other toward the extremity on both sides thereof extending in a direction from the side face of the case.

In the invention as described thus far, when the hook portion of the attracted portion and the engagement portion of the magnet portion are provided to be located in the vicinity of the end of the bag-cover, the bag-cover is being laid on the side face of the bag-body to bring the magnet portion into contact with the attracted portion while tension is being applied on the opened bag-cover, that is, the end of the bag-cover is being pulled slightly, and then the hook portion of the attracted portion is engaged with the engagement portion of the magnet portion by releasing the tension applied to the bag-cover during the above contacting state, thereby completing the coupling operation.

Accordingly, in coupling the bag-cover with the fastener, complicated operations or operations requiring a large force is unnecessary, so that the coupling operation is carried out smoothly.

On the other hand, tension is applied to the closed bag-cover, that is, the end of the bag-cover is pulled slightly, whereby the engagement of the hook portion of the attracted portion and the engagement portion of the magnet portion is easily released. By opening the bag-cover in the above state, the attracted portion and the magnet portion are separated from each other, thereby completing the uncoupling operation.

Accordingly, in uncoupling the fastener, complicated operations or operations requiring a large force is unnecessary, so that the uncoupling operation is carried out smoothly.

In consequence, when the bag-cover is opened and closed against the bag-body, the coupling and uncoupling operation of the magnetic fastener are smoothly carried out, thereby facilitating the use of the hand bag or the like.

In addition, when the side faces of the bag is bulged with a lot of things put in the bag and the end of the bag-cover is pulled toward the base end of the bag-cover, the tension pulling the end of the bag-cover acts in a direction to maintain the engagement of the hook portion of the attracted portion and the engagement portion of the magnet portion.

Therefore, even when the side faces of the bag is bulged with a lot of things put in the bag, the attracted portion is not unexpectedly and easily released from the magnet portion by external force in some degree.

Here, the magnet portion has the contacting face causing the attracted portion to be attracted and coupled, and the through-hole passing through at the central area of the contacting face. And the attracted portion has the first projection loosely inserted into the through-hole of the magnetic portion. In addition, the magnetic substance base plate having the second projection loosely inserted into the through-hole of the magnetic portion, is provided on the face of the magnetic portion opposite to the contacting face. Thereby, magnetic flux emitted from the permanent magnet is concentrated in the aforementioned through-hole, and then the attractive force for attracting the projection of the attracted portion into the through-hole is increased, resulting in the further improved coupling operation.

The diameter of the through-hole of the magnet portion is sized to have the space having a predetermined dimension, from the first projection of the attracted portion which is loosely inserted into the through-hole. In addition, the predetermined dimension of the space is longer than a shortest moving-distance which is needed in order that the attracted portion is moved from a position where the hook portion of the attracted portion is completely engaged with the engagement portion of the magnet portion, to a position where the engagement is released. Thereby, the engagement of the hook portion of the attracted portion and the engagement portion of the magnet portion can be surely released by applying tension to the bag-cover.

Moreover, the magnet portion has the case covering at least the side face of the permanent magnet, whereby the engagement portion is not formed onto the magnet portion which is unsuitable for processing and can be formed onto the case, resulting in the simplified processes.

When the collar portion, protruding from the side face of the case, or the groove formed on the side face of the case is used as the engagement portion, the configuration of the engagement portion is simplified, thereby the engagement portion itself is processed easily.

When the collar portion, having faces formed as tapered faces to be close to each other toward the extremity on both sides thereof in a direction extending from the side face of the case, is used as the engagement portion, the tapered faces of the collar portion guide the hook portion of the attracted portion in the coupling and uncoupling operation. Therefore, without an action that the bag-cover is pulled toward the end thereof, the coupling and uncoupling operation can be respectively carried out in a single action.

Brief Description of Drawings

Fig. 1 is a perspectively exploded view showing the first embodiment of the present invention;
Fig. 2 is a sectional view of the first embodiment;
Fig. 3 is a perspective view showing the second embodiment of the present invention;
Fig. 4 is a sectional view of the third embodiment of the present invention;
Fig. 5 is a sectional view of the fourth embodiment of the present invention;
Fig. 6 is a sectional view taken along the vi-vi line in Fig. 5;
Fig. 7 is a sectional view of the fifth embodiment of the present invention;
Fig. 8 is a sectional view taken along the vii-vii line in Fig. 7;
Fig. 9 is a view for explaining Experiment 1 according to the present invention;
Fig. 10 is a view for explaining Experiment 2 according to the present invention;
Fig. 11 is a sectional view showing a modification according to the present invention;
Fig. 12 is a perspective view showing another modification according to the present invention;
Fig. 13 is a perspective view showing a hand bag as a bag to which the present invention is applied;
Fig. 14 is a sectional view showing a prior art;
Figs. 15 are a perspective view and a sectional view showing a modification of the prior art; and
Fig. 16 is a sectional view showing another prior art.

Best Mode for Carrying out the Invention

The preferred embodiments according to the present invention will be explained below with reference to the attached drawings. In the description of the following embodiments, the same reference numerals as used in describing the aforementioned components will be used to designate components identical with or similar to the aforementioned components and the description thereof will be omitted or simplified.

First Embodiment

Figs. 1 and 2 show a magnetic fastener 7 according to the first embodiment of the present invention. The magnetic fastener 7 is composed of: a magnet portion 8 which is provided on the bag-body 3 of a bag or the like, and has the permanent magnet 11; and an attracted portion 9 which is provided on the bag-cover 5, and is made of an iron plate or the like to be attracted onto the magnet portion 8.

The magnet portion 8, in turn, has an approximately cylindrical brass case 31 which covers an outer circumferential surface and a face confronting the attracted portion 9 (the bottom face in the drawing), of the permanent magnet 11. The case 31 has a contacting face 32 confronting the attracted portion 9 (the bottom face in the drawing) to attract and couple the attracted portion 9 on the face thereof. On the circumferential edge of the contacting face 32, a collar portion 33 is formed by a bending process with a press machine or the like to be projected from the outer circumferential face of the case 31.

The collar portion 33 has a pair of faces on both sides in a direction extending from the side face of the case 31 and is formed as tapered faces to be close to each other toward the extremity.

In the drawing, the base plate 13 which is made of an iron plate or the like and has four legs 16 is provided above the permanent magnet 11.

The second projection 15 is formed on the base plate 13 to be loosely inserted into the through-hole 11A of the permanent magnet 11, as the through-hole of the magnet portion 8.

The permanent magnet 11 and the base plate 13 are accommodated in the case 31, and secured inside the case 31 by bending a bent holder 34 which is formed along the outer circumferential edge of the case 31.

The attracted portion 9 is entirely made of iron to be a disc shape. , a sectional V-shaped hook portion 41 is provided on a part of the circumferential edge of the attracted portion 9, which has an end 41A oriented inward and is formed to have a larger space between the end 41A and the attracted portion 9.

The attracted portion 9 has a first projection 21, which is to be loosely inserted into the through-hole 11A of the magnet portion 9, on the central area of the face side thereof, confronting the magnet portion 8. In addition, four legs 22 are provided on the inverse face side to that formed with the first projection 21.

The collar portion 33 of the magnet portion 8 is an engagement portion for engaging with the hook portion 41 of the attracted portion 9.

The diameter of the through-hole 11A of the magnet portion 8 is sized to have a space 35 from the projection 21 of the attracted portion 9 which is inserted into the through-hole 11A. The space 35 has a predetermined dimension A from the inner circumferential edge of the opening 12A of the case 31 to the outer circumferential face of the projection 21.

The predetermined dimension A is longer than a shortest movingdistance B which is needed in order that the attracted portion 9 is moved for releasing the engaging state from a position where the hook portion 41 of the attracted portion 9 is completely engaged with the collar portion 33 of the magnet portion 8, in other words, a protrudent length B which the collar portion 33 is projected from the outer circumferential face of the case 31. For example, when the space A is defined as approximately 1 mm, the moving-distance B can be defined as approximately 0.8 mm.

In the embodiment, the bag-cover 5 of the hand bag

1 is closed and the attracted portion 9 approaches the magnet portion 8, thereupon the attracted portion 9 is coupled onto the magnet portion 8 by the attractive force of the permanent magnet 11. At this time, the tapered face of the collar portion 33 guides the hook portion 41 of the attracted portion 9, so that the hook portion 41 is automatically engaged with the collar portion 33, resulting in the smooth coupling operation.

On the other hand, when the closed bag-cover 5 is opened, the attracted portion 9 can be separated from the magnet portion 8 against the attractive force of the permanent magnet 11. The tapered face of the collar portion 33 guides the hook portion 41 of the attracted portion 9 also, so that the engagement of the hook portion 41 and the collar portion 33 is automatically released, resulting in the smooth uncoupling operation.

Therefore, when the bag-cover 5 is coupled by the fastener 7, complicated operations or operations requiring large force are unnecessary, and the coupling operation is carried out smoothly. Moreover, in the uncoupling operation, complicated operations or operations requiring large force are also unnecessary, therefore the uncoupling operation is carried out easily.

According to the embodiment described thus far, the following effects can be obtained.

The hook portion 41 is formed at a position as the top side of the bagcover 5 on the circumferential edge of the attracted portion 9. And, the collar portion 33 is formed along the entire circumferential edge of the magnet portion 8 to be engaged with the hook portion 41 of the attracted portion 9. So that tension, which is generated when a lot of things are put in the bag-body 3 of the bag to bulge the side faces of the bag-body 3, acts in a direction to maintain the engagement of the hook portion 41 with the collar portion 33. Accordingly, even when the side faces of the bag-body 3 are bulged with a lot of contents in the bag-body 3, the engagement of the hook portion 41 with the collar portion 33 is not released by slight external force, thereby avoiding unexpected uncoupling the attracted portion 9 from the magnet portion 8.

The attracted portion 9 is securely coupled with the magnet portion 8 irrespective of the strength of the attractive force of the permanent magnet 11, by the aforementioned engagement of the hook portion 41 with the collar portion 33. Therefore, even when the attractive force of the permanent magnet 11 is unstable, the coupling performance of the fastener 7 can be stable.

The complicated operation or the operation requiring large force is unnecessary for the coupling and uncoupling operation of the bag-cover 5 by using the fastener 7, so that the bag-cover 5 can be easily opened from and closed to the bag-body 5, thereby enabling convenient use of the bag.

In addition, the magnet portion 8 has the contacting face 32 which attracts and couples to the attracted portion 9, and the through-hole 11A which passes through the central portion of the contacting face 32. The iron base plate 13, having the second iron projection 15 which is loosely inserted into the through-hole 11A, is placed on the face inverse to the face where the contacting face 32 is formed. And then, the first iron projection 21 is placed in the attracted portion 9 to be loosely inserted into the through-hole 11A of the magnet portion 8, so that the magnetic flux emitted from the permanent magnet 11 can be concentrated in the through-hole 11A, whereby the attractive force to attract the projection 21 of the attracted portion 9 to the through-hole 11A is increased. Accordingly, in the coupling operation, the projection 21 of the attracted portion 9 is guided into the through-hole 11A by the increased attractive force, and the attracted portion 9 is attracted onto the magnet portion 8 by a larger force, resulting in the smooth coupling operation.

The diameter of the through-hole 11A of the magnet portion 8 is sized to have the space 35 of the predetermined dimension A from the projection 21 of the attracted portion 9, which is to be loosely inserted into the through-hole 11A. Additionally, the predetermined dimension A of the space 35 is longer than the shortest moving-distance B which is needed in order that the attracted portion 9 is moved from a position where the hook portion 41 of the attracted portion 9 is completely engaged with the collar portion 33 of the magnet portion 8, to a position to release the engaging state with the magnet portion 8. Thereby, the engagement of the hook portion 41 with the collar portion 33 can be securely released by only one instantaneous action of pulling the bag-cover 5, resulting in the smooth uncoupling operation.

Moreover, the case 31 is provided for covering the side faces of the permanent magnet 11 of the magnet portion 8. And additionally, the collar portion 33 is formed on the case 31 by a bending process with a press machine or the like, so that the number of processes applied to the permanent magnet 11, which is unsuitable for process, is reduced, thereby easily processing the magnet portion 8.

The collar portion 33 protrudes from the side face of the case 31 and is formed along the entire circumference of the circlular contacting face 32, thereby forming the arched collar portion 33 and securing the sufficient strength in spite of its thinness. In addition, the collar portion 33 has a simple shape for processing, resulting in the simple process.

Second Embodiment

Fig. 3 shows a magnetic fastener 7A according to the second embodiment of the present invention. In the embodiment, a collar portion 33A, which is formed along the approximate half of the circumference of the contacting face 32 of a case 31A, is used instead of the collar portion 33 which is formed along the entire circumference of the contacting face 32 of the case 31 of

the first embodiment.

More specifically, in the case 31A, the collar portion 33A, which protrudes from the outer circumferential face of the case 31A, is formed along the approximate half (the bottom of the drawing) of the entire circumference of the contacting face 32.

The collar portion 33A is formed to be a pair of faces parallel to each other, placed on both sides in respect with a direction that the collar portion 33A protrudes from the side face of the case 31A. A hook portion 41B engaged with the collar portion 33A has a sectional C-shape in which an end 41C is parallel to the body of the attracted portion 9 without being widened.

On the other half (the upper side of the drawing) of the entire circumference of the contacting face 32, a rise 36 is formed to stand up at right angles to the contacting face 32.

The rise 36 is formed in order that a bank card or a credit card is not attracted onto the contacting face 32 of a magnet portion 8A.

In the embodiment, when the bag-cover 3 is laid on the side face of the bag-body 5 while the end of the opened bag-cover 3 is being pulled downward slightly, the magnet portion 8A and the attracted portion 9 are automatically in contact with each other by the magnetic force. In this contact state, tension applied to the bag-cover 3 is released, whereupon the attracted portion 9 is moved while being attracted onto the magnet portion 8A, so that the hook portion 41B of the attracted portion 9 is engaged with the collar portion 33A of the magnet portion 8, and then the coupling operation is completed.

On the other hand, the end of the closed bag-cover 3 is slightly pulled downward, whereupon the engagement of the hook portion 41B with the collar portion 33A is easily released. In this state, when the bag-cover 5 is pulled upward, the attracted portion 9 is separated from the magnet portion 8A, thereby completing the uncoupling operation, and opening the bag-cover 5.

In the embodiment, the functions and effects similar to that of the first embodiment can be also obtained. In addition, the rise 36 does not allow a bank card or a credit cart to be attracted onto the contacting face 32 of the magnet portion 8A, so that the magnetic strip of the bank card or the like does not contact the through-hole 11A having large magnetic flux density. Therefore, even when the bank card or the like accidentally put close to the magnet portion 8A, the data recorded in the magnetic strip is prevented from being deleted.

Moreover, the uncoupling operation is carried out by pulling the bagcover 3 downward once, so that another person virtually cannot open the hand-bag 1 without being noticed, thereby decreasing risks of encountering theft by a pickpocket or the like.

Third Embodiment

Fig. 4 shows a magnetic fastener 7B according to the third embodiment of the present invention. In the embodiment, an annular groove 33B, which is depressed toward the center from the side face of the case 31B, is used instead of the collar portion 33 protruding from the side face of the case 31, used in the first embodiment.

In the embodiment, the functions and effects similar to that of the first embodiment can also be obtained. In addition, from a designing standpoint, a protrusion can be omitted from the outer circumferential face of the case 31B placed in the magnet portion 8B.

Fourth Embodiment

The fourth embodiment according to the present invention is shown in Figs. 5 and 6. In the fourth embodiment, a magnetic fastener 51 with a lock system 50 is used instead of the magnetic fastener 7 used in the first embodiment.

The magnetic fastener 51 has a case 52 for accommodating the lock system 50. The case 52 has a sectional C-shape, in which an alcove 53 is formed on the back face of the case 52 to hold the magnet portion 8 and the attracted portion 9 (see Fig. 5). The front of the alcove 53 is also covered with a covering portion 54 covering the entire front of the case 52. The attracted portion 9 is secured on the covering portion 54, in a position corresponding to the alcove 53.

In the upper side of the case 52 in the drawings, a rotating shaft 56 rotated by a key 55B inserted into a keyhole 55A is provided. On the side face of the rotating shaft 56, a cam 57, having two abutting faces 57A and 57B which differ in distance from the center of the rotation from each other, is provided.

An engagement bar 59 which is forced toward the cam 57 is abutted to the cam 57 by a coil spring 58. The central area of the engagement bar 59 can be protruded and recessed by the rotating operation of the rotating shaft 56 from the inner circumferential face of the alcove 53.

The abutting face 57A of the cam 57 is abutted to the engagement bar 59 by the rotating operation of the rotating shaft 56, whereupon the central area of the engagement bar 59 is projected from the inner circumferential face of the alcove 53, and engaged with the collar portion 33 of the magnet portion 9. Then, the attracted portion 9 is locked so as not to be separated from the magnet portion 8.

On the other hand, the abutting face 57B of the cam 57 is abutted to the engagement bar 59 by the rotating operation for the rotating shaft 56, whereupon the central area of the engagement bar 59 is recessed into the inner circumferential face of the case 52, and then the attracted portion 9 is unlocked to be separated from the magnet portion 8.

In the embodiment, the functions and effects similar to that of the first to third embodiments can be also obtained. In addition, the attracted portion 9 is locked, thereby improving the safeguard against theft.

Fifth Embodiment

The fifth embodiment according to the present invention is shown in Figs. 7 and 8. In the fifth embodiment, a simple lock system 60, called "Hineri (or twist)", is used instead of the lock system 50, used in the fourth embodiment.

The case 52 of a magnet fastener 61 is the same as that in the fourth embodiment. The case 52 has a sectional C-shape, in which an alcove 53 is formed on the back face of the case 52 to hold the magnet portion 8 and the attracted portion 9 (see Fig. 7). The rotating shaft 57, which is provided in the upper side of the case 52 in the drawings, has a locking knob 65 placed at the end thereof, and an approximately oval-shaped cam 67 protruded from the side face thereof in a direction of the diameter.

An edge 67A of the cam 67 is protruded from the inner circumferential face of the alcove 53 by the rotating operation of the locking knob 65, whereupon the edge 67A is engaged with the collar portion 33 of the magnet portion 9, and then the attracted portion 9 is locked so as not to be separated from the magnet portion 8.

On the other hand, when the edge 67A of the cam 67 is sunk into the case 53 by the rotating operation of the locking knob 65, the attracted portion 9 is unlocked to be separated from the magnet portion 8.

In the embodiment, the functions and effects similar to that of the first to fourth embodiments can be also obtained. In addition, crime can be improvingly prevented with the simple system.

The effects of the present invention will be described below with reference to specific experiments.

Experiment 1

In Experiment 1, the hand bag 1 with the magnet fastener 7 shown in the first embodiment is dropped, to see the coupling of the fastener 7 is released or not.

More specifically, a 2 kg weight is put into the hand bag 1 together with newspaper, and then a strap 1A having a predetermined length is joined to the hand bag 1 as shown in Fig. 9.

The strap 1A is joined to the top of a stand 50 having a height whereat the hand bag 1 does not hit against the floor even when the strap 1A is fully stretched. In this state, the hand bag 1 is dropped from the top of the stand 50, to see whether the coupling of the fastener 7 is released by the drop impact or not.

The straps 1A having various lengths are prepared. The aforementioned tests are performed with each of the straps 1A.

Comparison 1

In Comparison 1, the same test as Experiment 1 is conducted to the hand bag 1 with the conventional fastener 2 shown in Fig. 15.

Comparison 2

In Comparison 2, the same test as Experiment 1 is conducted to the hand bag 1 with the conventional fastener 2A shown in Fig. 16.

Experimental Results

In Experiment 1, even when the length of the strap 1A is more than 1 meter (i.e. a difference in elevation is more than 50 cm), the fastener 7 is not uncoupled by the drop impact.

In Comparison 1, the length of the strap 1A is from 24 cm to 30 cm (a difference in length is from 12 cm to 15 cm). The coupling of the fastener 2 is uncoupled by the drop impact.

In Comparison 2, even when the length of the strap 1A is more than 1 meter (a difference in elevation is 50 cm), the fastener 2A is not uncoupled by the drop impact.

In Comparison 2, however, the fastener 2A is easily uncoupled by slightly pushing the hand bag 1 with the fastener 2A from above.

Additionally, when the side faces of the hand bag 1 are bulged and the bag cover 5 is under tension, it is difficult to insert the bent portion 25 of the attracted portion 6A into the elongated hole 12C of the magnet portion 4A in the state the bent portion 25 is perpendicular to the magnet portion 4A while the bag-cover 5 is being pulled toward the end thereof.

Experiment 2

In Experiment 2, the following condition is replicated: the side faces of the hand bag 1 with the fastener 7 of the first embodiment are bulged with a lot of contents therein, so that a pressuring force is being applied to the fastener 7 from the inside of the hand bag 1. In addition, the pressuring force to the fastener 7 is increased. And then, the degree of the pressuring force when the fastener 7 is uncoupled is inspected.

More specifically, in Experiment 2, a device for experiment as shown in Fig. 10 is used. Ends of coil springs 52 are respectively fixed at the middle portion of a pair of rods 51 standing parallel to each other. The other ends of coil springs 52 are respectively fixed to ends of iron plates 53 having length L of 10 cm and thickness t of 1 mm. The other ends of the iron plates 53 are respectively attached with the magnet portion 8 and the attracted portion 9 of the fastener 7.

When the attracted portion 9 attached onto the iron plate 53 is coupled onto the magnet portion 8 attached onto the other iron plate 53, the pair of coil springs 52 are elongated, and then a predetermined tension is applied to the pair of iron plates 53 completely.

Above the magnet portion 8 and the attracted por-

tion 9 which are coupled, an electric balance 54 and a lifting device 55 are secured. The lifting device 55 pushes down the electric balance 54, whereby the pressuring force is applied to the fastener 7. While the lifting device 55 is being controlled to increase the pressuring force which is applied to the fastener 7, the pressuring force is measured with the electric balance 54. And then, the pressuring force when the fastener 7 is uncoupled is measured.

Comparison 3

In Comparison 3, the same test as Experiment 2 is conducted to the hand bag 1 with the conventional fastener 2 shown in Fig. 15.

Experimental Results

In Experiment 2, even when the pressuring force is more than 5 kg, the fastener 7 is not uncoupled.

In Comparison 3, when the pressuring force reaches 600 g, the fastener 2 is uncoupled.

Modifications

It is to be understood that the present invention is not intended to be limited to the above-described embodiments. Modifications, as described below, are included within the scope of the present invention.

More specifically, the case is not limited to the brass case formed by a bending process with a press machine or the like, and may be a casting, such as a die-cast aluminum.

The engagement portion is not limited to be the collar portion and the groove, which are formed on the face of the magnet portion. The circumferential face of the contacting face is sloped to be a tapered face so as to form an acute angle with the contacting face of the magnet portion and the circumferential face. And this tapered face may be the engagement portion.

As a structure for attaching the magnet portion and the attracted portion onto the bag, it is not limited to use the legs which are engaged with the facing ring by bending. As shown in Fig. 11, insert-holes 71 are formed in the magnet portion 8 and the attracted portion 9, and screws 72 penetrating into the insert-holes 71 may be screwed with the facing rings 17 and 23. When the above attaching structure is employed, the fastener can be secured onto the facing ring for attaching a brooch-type adornment or the like onto the bag-cover of the bag, thereby being convenient for the production of a bag with adornment.

The first projection of the attracted portion is not limited to be merely shaped cylindrically. As shown in Fig. 11, a projection 75, having a sloped face 74 which is formed by chamfering the circumferential edge of the cylinder, may be used. Thereby, the projection 75 can be further easily inserted into the opening 12A, and the ease-of-use can be further improved.

The magnet portion and the attracted portion are not limited to have a disc shape which is entirely thin, and may have a thin plate shape, having a polygonal plane, such as a quadrangle. Alternatively, as shown in Fig. 12, a magnet portion 80 and an attracted portion 81, which have a shape that a part of the disc is cut linearly, may be used, that is, the specific shape can be appropriately selected in practice.

Note that, according to the structure of Fig. 12, for example, when the edge of the bag-cover 5 is seamed, straight-shaped portions 82 and 83 of the magnet portion 80 and the attracted portion 81 can be placed along the seam, thereby effecting the convenience for the seaming process.

Industrial Availability

The present invention is proper for improving the ease-of-use of a bag, such as a hand bag and a clutch bag, in that an attracted portion is prevented from unexpectedly separating from a magnet portion, without impairing the facility of a coupling and uncoupling operation.

Claims

1. A magnet fastener attached on any one of a bag-body and a bag-cover of a bag, comprising a magnet portion having a permanent magnet, and a plate-shaped attracted portion provided on any one of the bag-body and the bag-cover of the bag, the attracted portion being made of magnetic materials attracted onto the magnet portion, said magnet fastener further comprising:

   a hook portion provided on the outer circumferential edge of the attracted portion, the end thereof being oriented inward; and

   an engagement portion provided on the outer circumference of the magnet portion, and engaging with said hook portion.

2. The magnetic fastener according to claim 1,

   wherein the magnet portion has a contacting face for attracting and coupling the attracted portion, and a through-hole passing through the central area of said contacting face;

   wherein the attracted portion has a first projection which is to be loosely inserted into said through-hole of the magnet portion; and

   further comprising a second projection loosely inserted into said through-hole of the magnet portion and a magnetic substance base plate closing said through-hole on a face of the magnet portion opposite to said contacting face.

3. The magnetic fastener according to claim 2,

wherein the diameter of said through-hole of the magnet portion is sized to have a predetermined space from said first projection of the attracted portion inserted into said through-hole; and

wherein the predetermined space is longer than a shortest movingdistance which is necessary for the attracted portion to move from a position where said hook portion of the attracted portion is completely engaged with said engagement portion of the magnet portion, to a position to release the engagement.

4. The magnetic fastener according to any one of claim 1 to claim 3,

wherein the magnet portion has a case covering at least the side face of the permanent magnet; and

wherein said engagement portion is a collar portion protruding from the side face of said case.

5. The magnetic fastener according to any one of claim 1 to claim 3,

wherein the magnet portion has a case covering at least the side face of the permanent magnet; and

wherein said engagement portion is a groove formed on the side face of said case.

6. The magnetic fastener according to claim 4, wherein said collar portion has faces formed as tapered faces to be close to each other toward the extremity on both sides thereof in a direction extending from the side face of said case.

FIG. 1

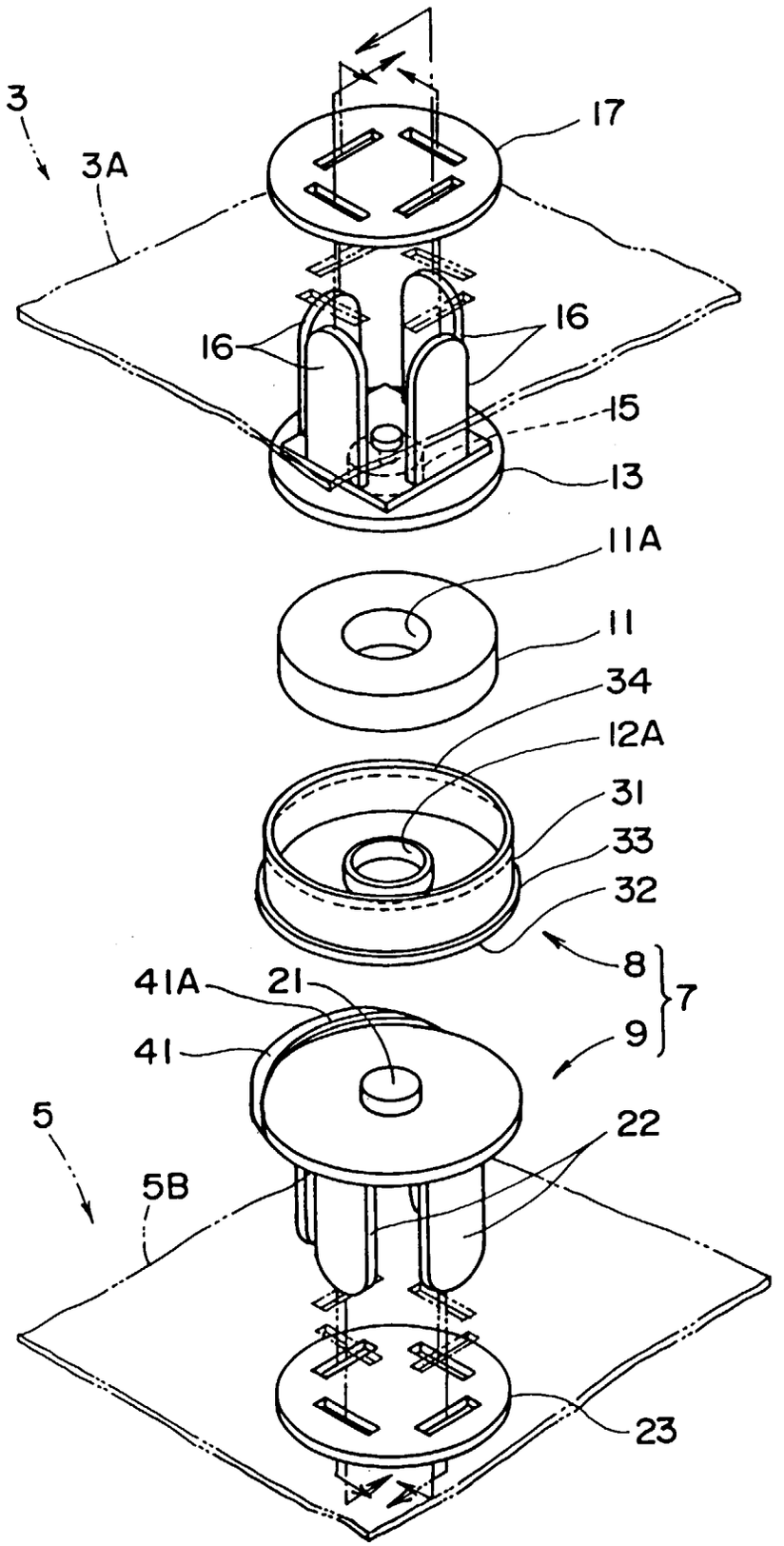


FIG. 2

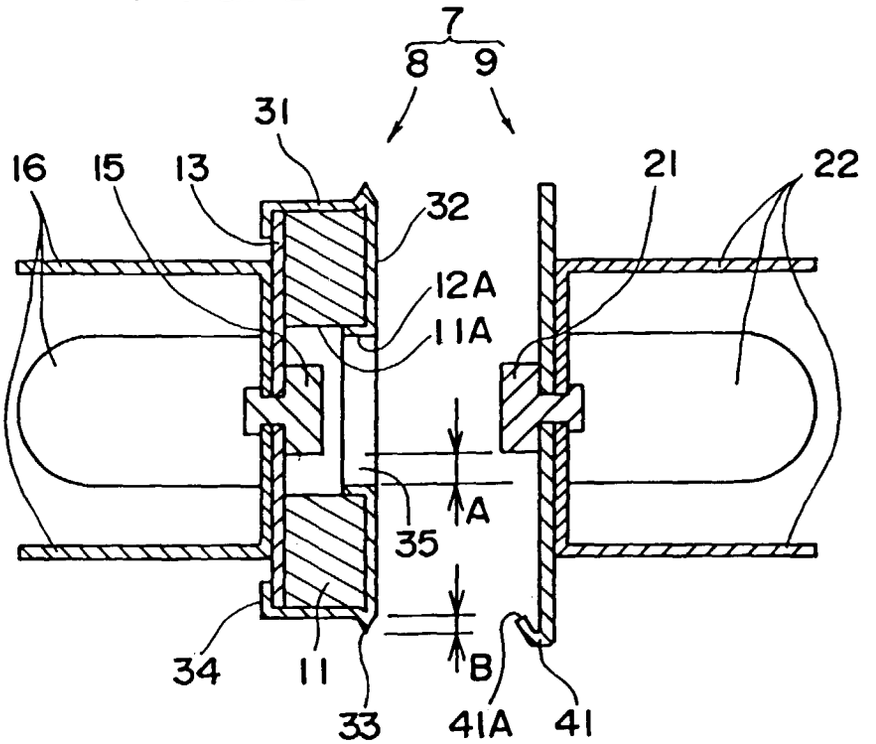

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12A
11A
A
35
34
11
B
33
41A
41

FIG. 3

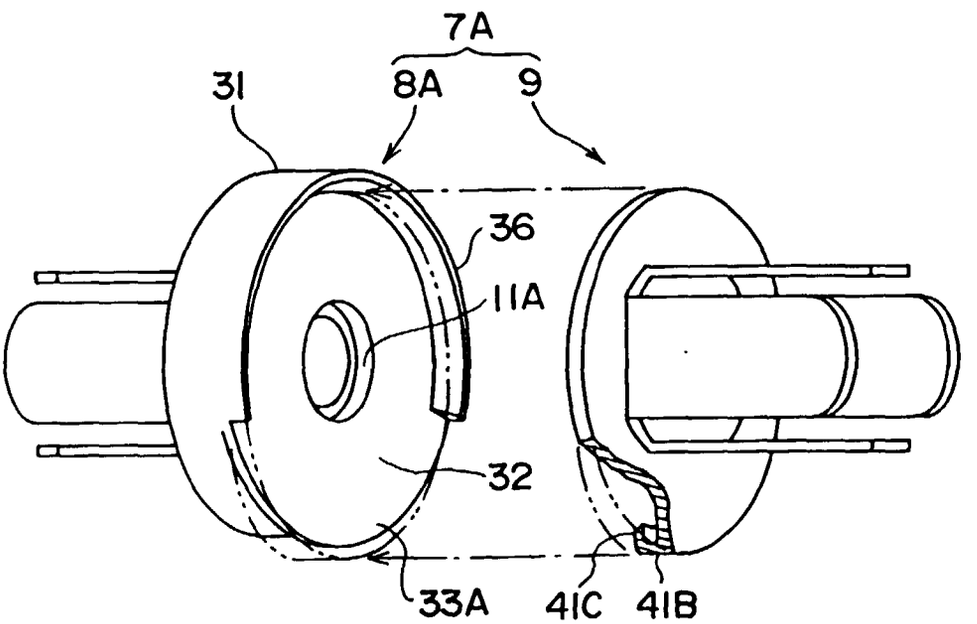

7A
31
8A
9
36
11A
32
33A
41C
41B

FIG. 4

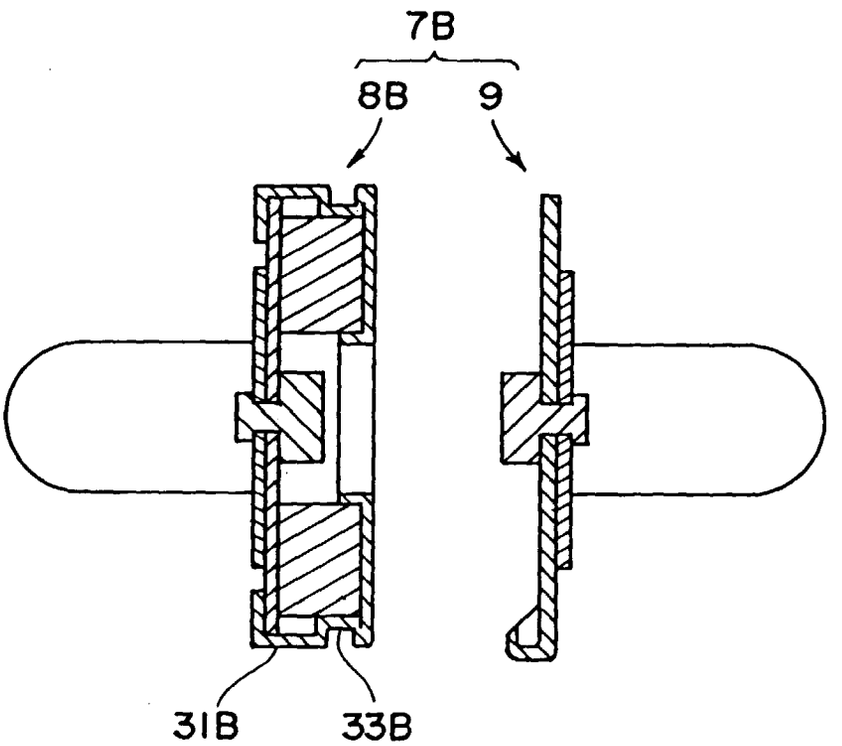


FIG. 5

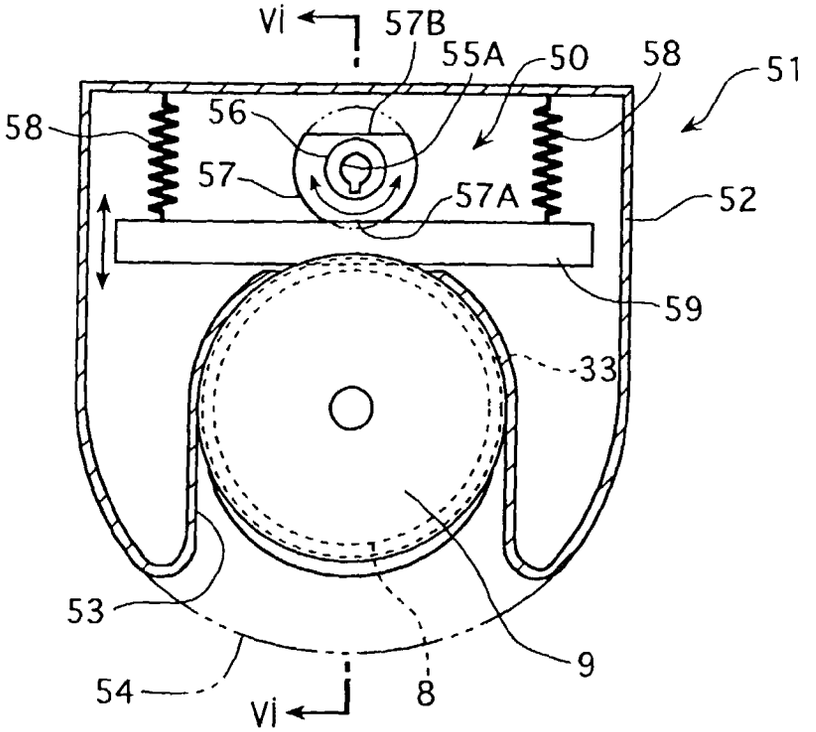

VI
57B
55A
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57A
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VI
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9

FIG. 6

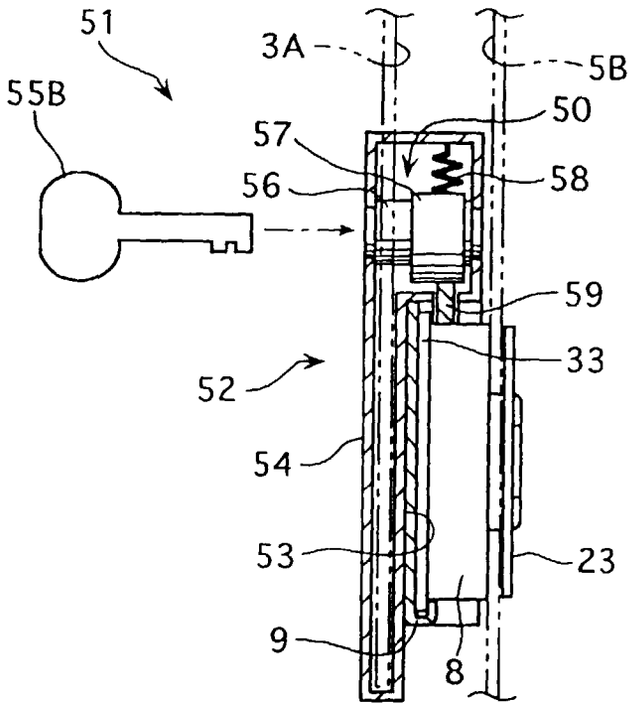

51
3A
5B
55B
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8

FIG. 7

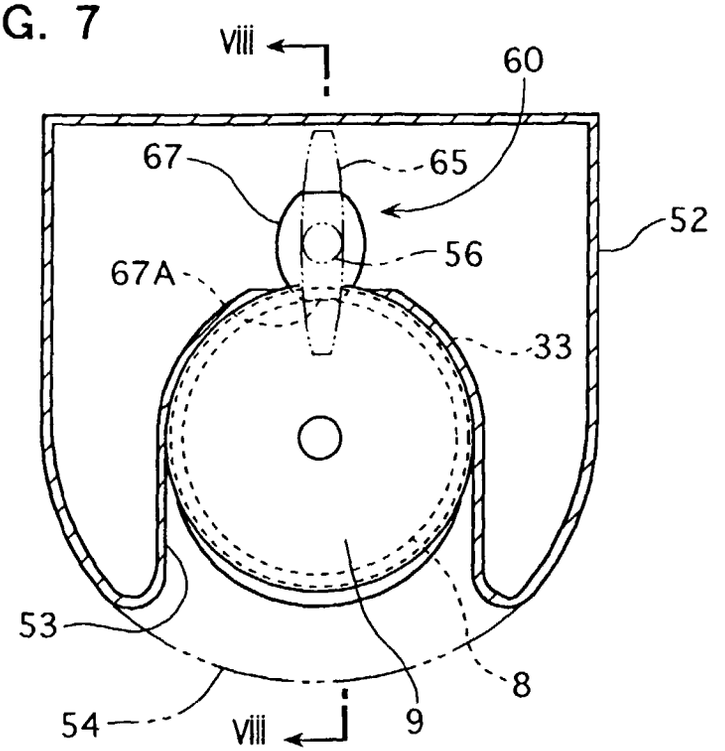

VIII
60
67
65
52
56
67A
33
53
8
54
VIII
9

FIG. 8

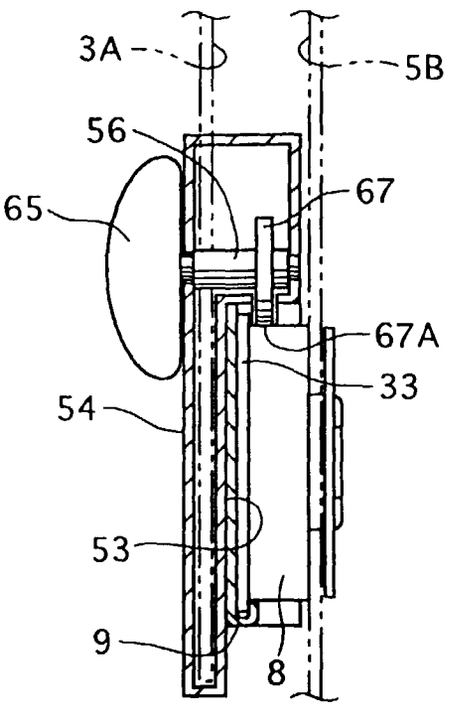

3A
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67A
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8

FIG. 9

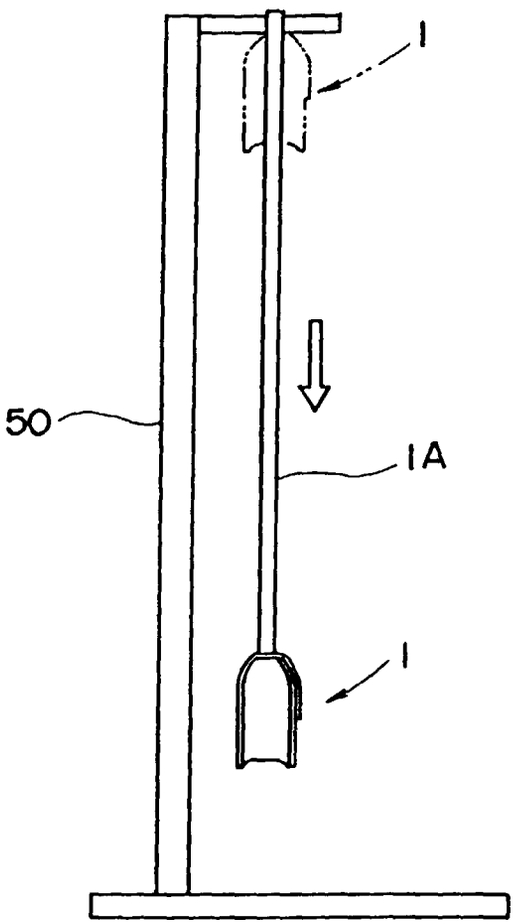


FIG. 10

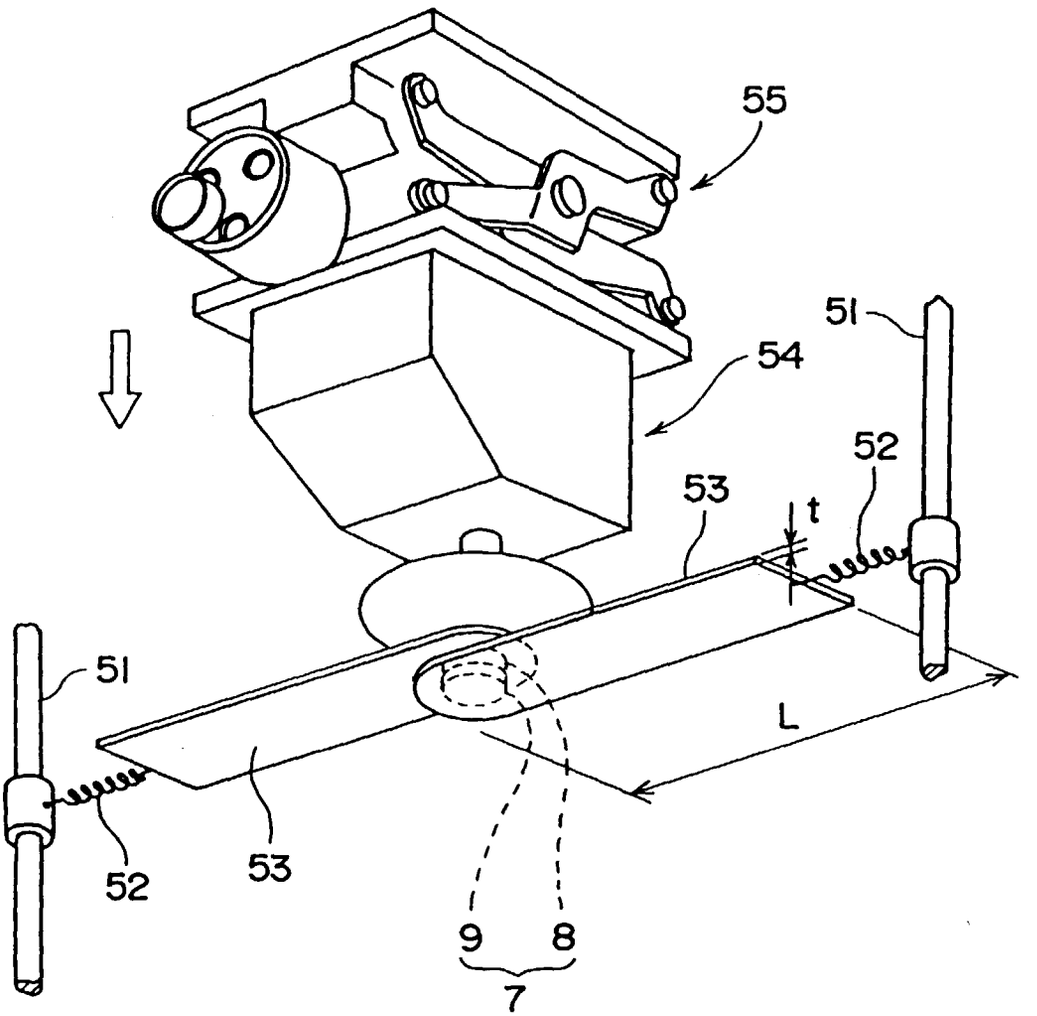


FIG. 11

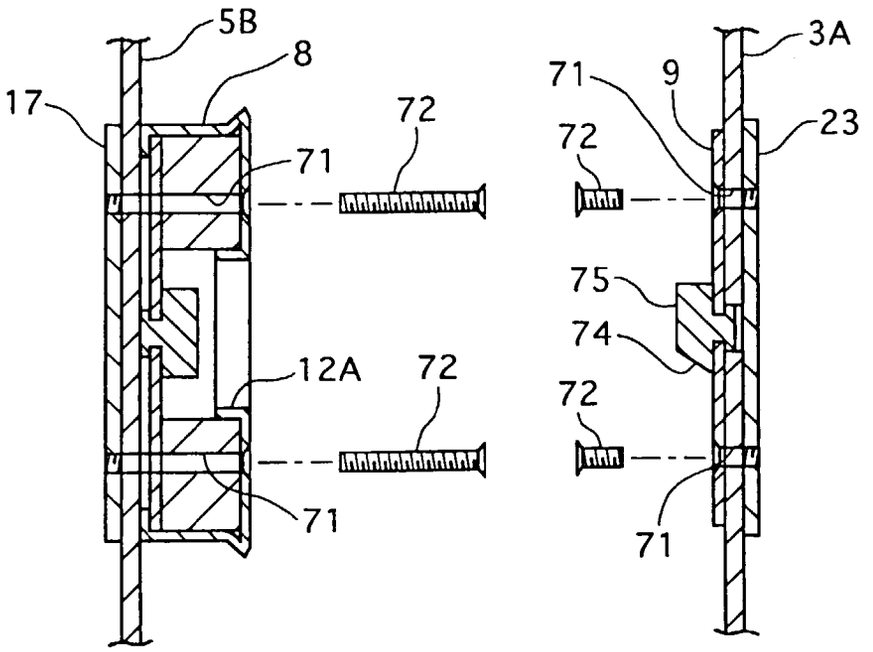


FIG. 12

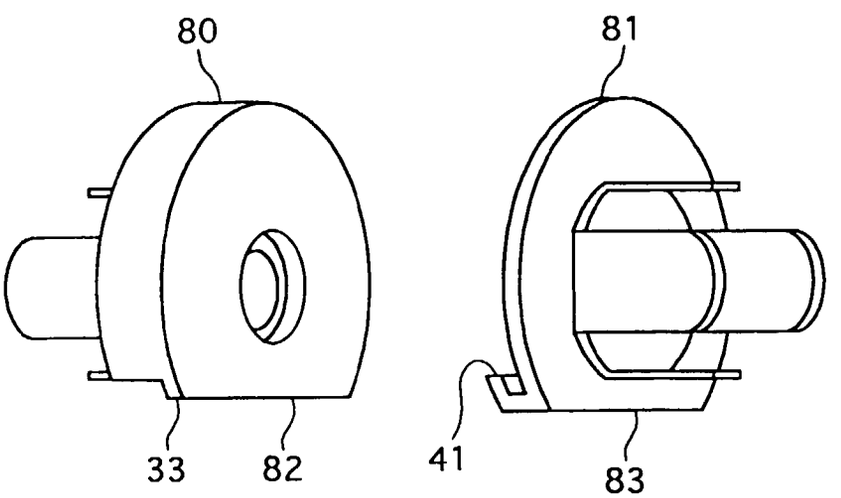


FIG. 13

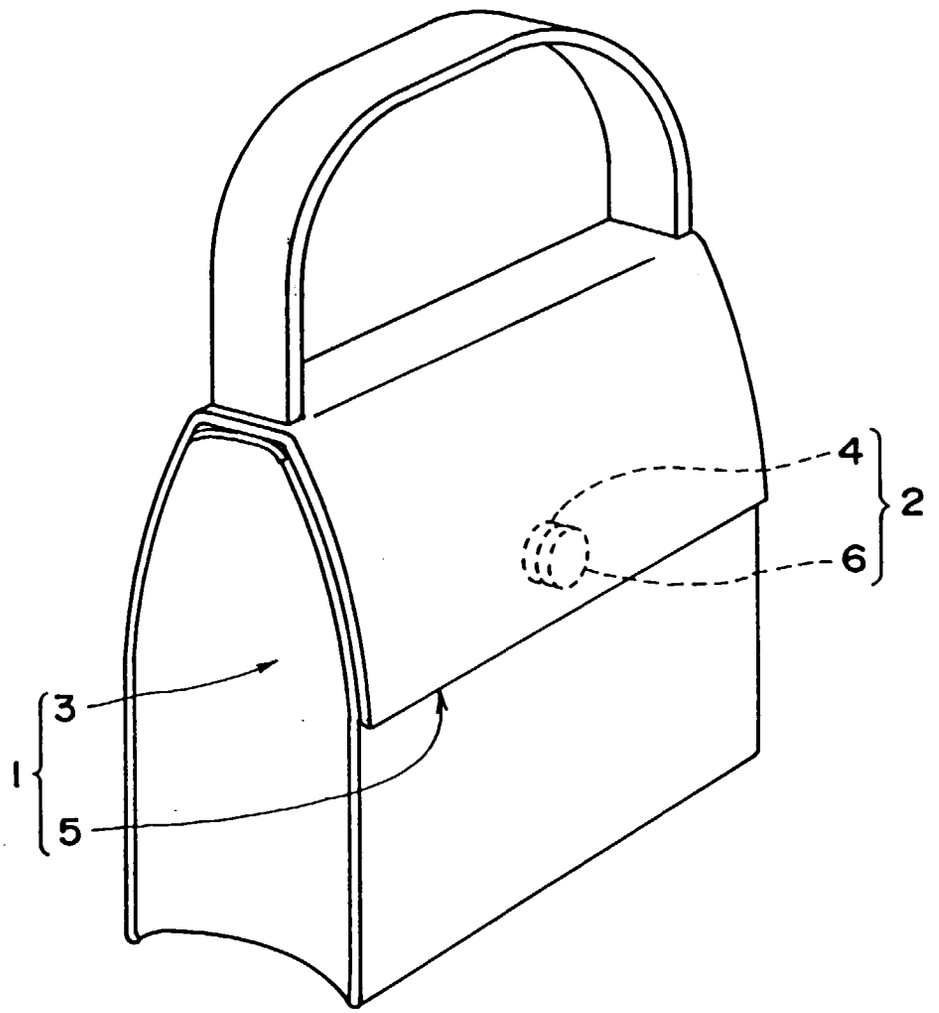


FIG. 14

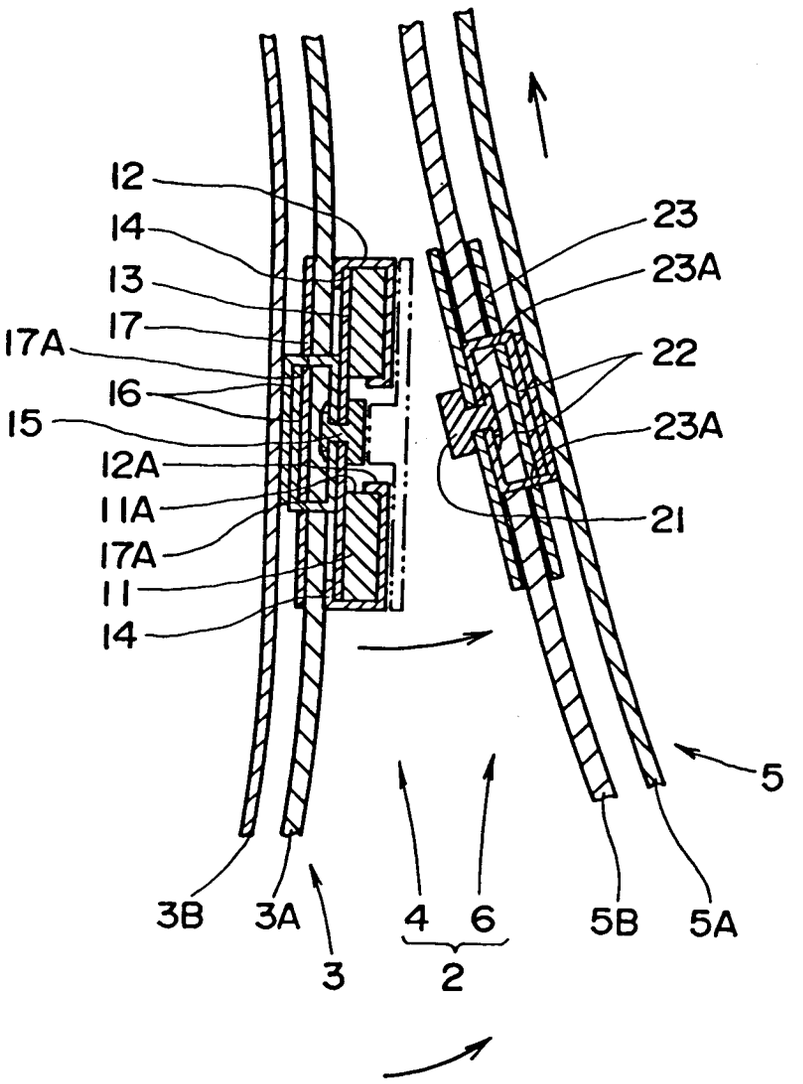

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5B
5A

FIG. 15

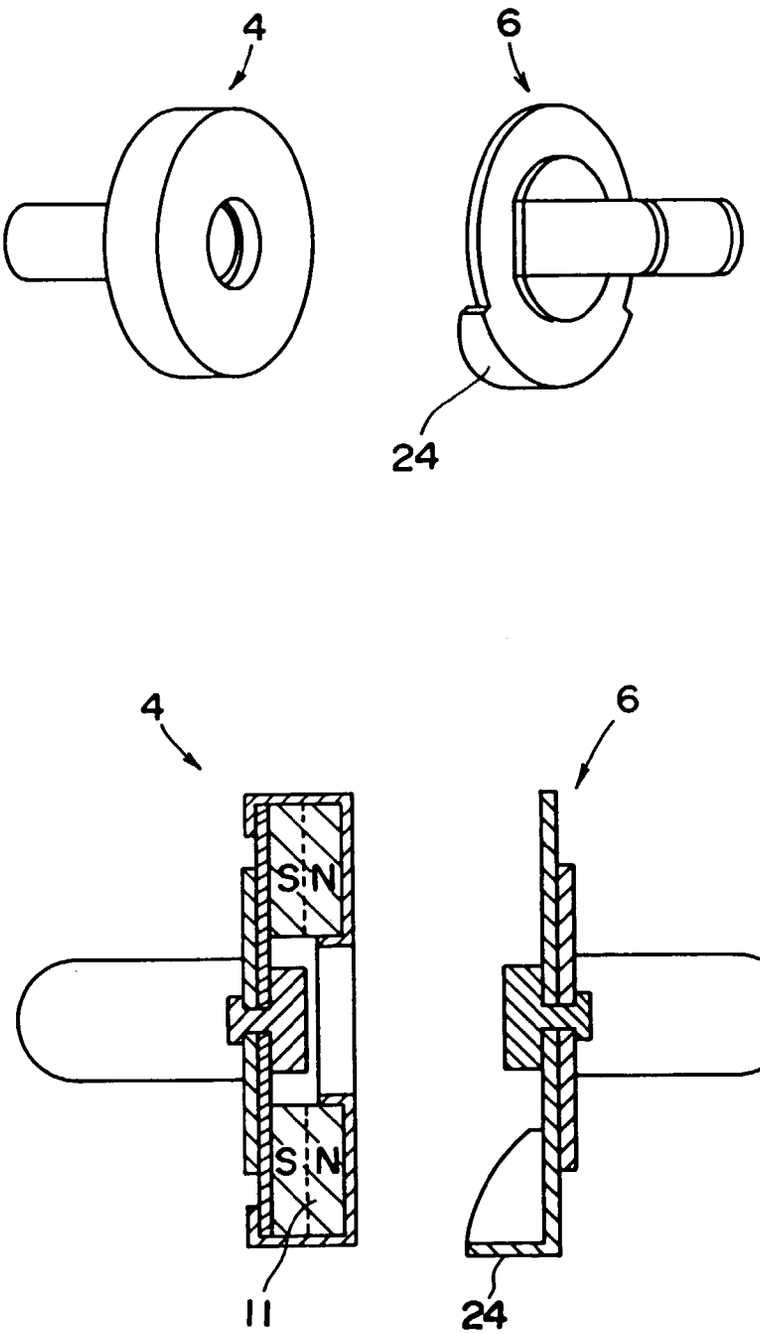
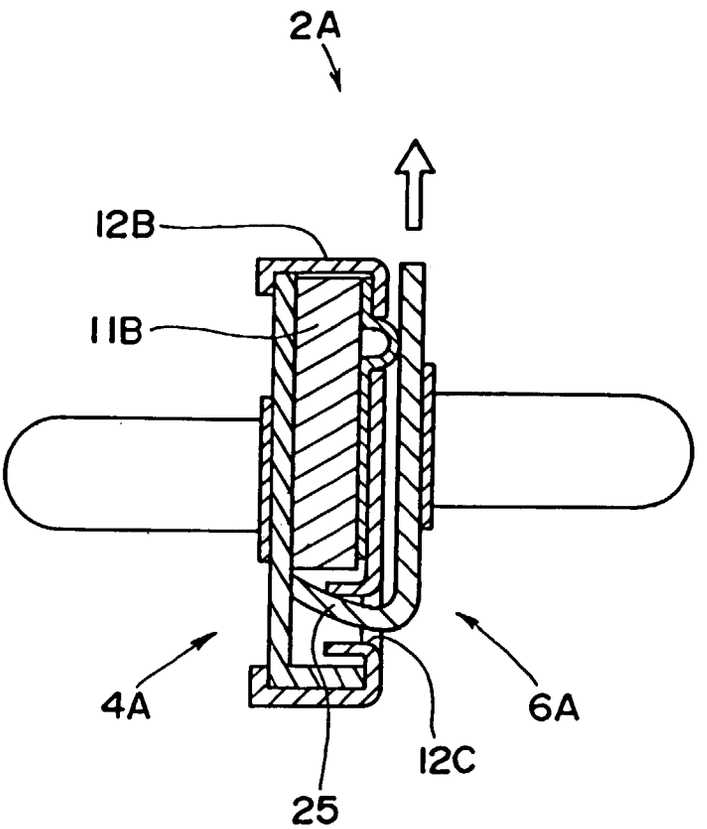


FIG. 16



INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP97/03076

A. CLASSIFICATION OF SUBJECT MATTER

Int. Cl^6 H01F7/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Int. Cl^6 H01F7/02

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Jitsuyo Shinan Koho 1926 - 1997
Kokai Jitsuyo Shinan Koho 1971 - 1997

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP, 6-84633, A (K.K. Oyo Gijutsu Kenkyusho), March 25, 1994 (25. 03. 94), Claim (Family: none)	1 - 6

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
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"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
October 17, 1997 (17. 10. 97)	October 28, 1997 (28. 10. 97)
Name and mailing address of the ISA/ Japanese Patent Office Facsimile No.	Authorized officer Telephone No.

Form PCT/ISA/210 (second sheet) (July 1992)