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(54) Clasp, accessory bracelet, and timepiece

(57) A clasp has a frame that is connected to one of a pair of bands, and a movable unit that is connected to the other of the bands and is fit to the frame. A plurality of engaging holes are disposed in the frame lengthwise to the band. The movable unit has a case that is housed inside the frame, protruding members that protrude from the case and engage the engaging holes, and an operator that is exposed to the case surface, and operating the operator causes the protruding members to retract to the case.

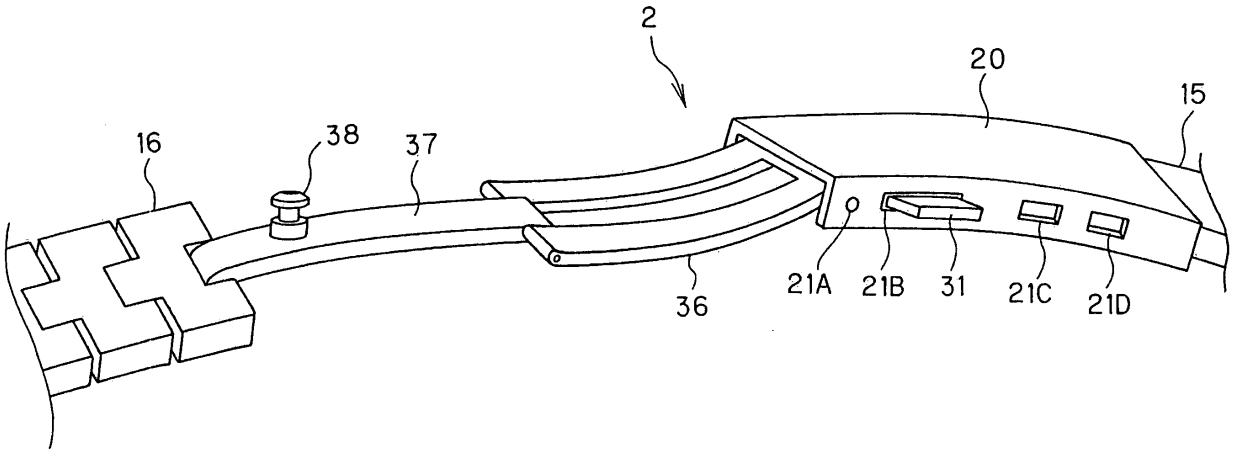

FIG. 2

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Description

BACKGROUND OF THE INVENTION

[0001] 1. Field of Invention

[0002] The present invention relates to a clasp, to an accessory bracelet having the clasp, and to a timepiece.

[0003] 2. Description of Related Art

[0004] Various kinds of clasps are used on bracelets and accessory bands such as wristwatch bands. Folding clasps, such as double folding clasps, triple folding clasps, and double deployment or butterfly clasps, are commonly used on wristwatches. Japanese Unexamined Patent Appl. Pub. JP-A-2005-270248, for example, teaches a folding clasp having a movable member that is connected to the band and is supported freely movably by the clasp cover, and has engaged inside this movable member a push button for locking and releasing the clasp in such a way that the clasp can be released and the length of the band can be slightly adjusted by operating this push button.

[0005] A problem with this related art is that the push button has two different functions, one for releasing the clasp and the other for adjusting the length, and differentiating the operations used for these functions is difficult. One method of solving this problem is to provide separate operators for releasing the clasp and adjusting the bracelet length, but it is difficult to render such operators without increasing the size of the mechanism.

SUMMARY OF THE INVENTION

[0006] A clasp according to the present invention enables adjusting the length with a simple, easy-to-understand operation, and a bracelet type accessory and timepiece according to the invention use this clasp.

[0007] A first aspect of the invention is a clasp having a frame that is connected to one of a pair of bands, and a movable unit that is connected to the other of the bands and is fit to the frame. A plurality of engaging holes are disposed in the frame lengthwise to the band. The movable unit has a case that is housed inside the frame, protruding members that protrude from the case and engage the engaging holes, and an operator that is exposed to the case surface, and operating the operating causes the protruding members to retract to the case.

[0008] Operating the operator exposed at the surface of the case in this aspect of the invention causes the protruding members to retract to the case and disengage the engaging holes, thereby allowing the movable unit to move relative to the frame. The relative positions of the frame and the movable unit, and therefore the position where the pair of bands are connected, can therefore be moved and the overall length of the band can be adjusted. The length can therefore be adjusted using a simple, easy to understand operation. The clasp is also rendered by an extremely simple arrangement using a frame and a movable unit, and a small clasp can therefore be easily achieved.

[0009] Preferably, the engaging holes are holes that pass through the frame and open to the outside of the frame.

[0010] Because the engaging holes that engage the protruding members are through-holes, whether the position of the protruding members matches the position of the engaging holes when the movable unit is moved can be easily determined visually. This makes adjusting the length even easier.

[0011] Yet further preferably, the clasp also has a subframe that has a guide channel extending lengthwise to the band between the frame and the movable unit. The lengthwise ends of the guide channels are positioned to contact the side of the protruding members when the protruding members engage the end engaging holes, and operating the operator causes the protruding members to retract into the guide channels of the subframe.

[0012] This arrangement enables moving the movable unit by operating the operator to retract the protruding members to a position inside the guide channels. In addition, the ends of the guide channels contact the sides of the protruding members when the protruding members engage the end engaging holes. As a result, if the movable unit is moved until the protruding members contact the ends of the guide channels, the protruding members are positioned to fit into the engaging holes. More specifically, the length can be easily adjusted using as a guide the position where the protruding members contact the ends of the guide channels instead of positioning the protruding members to the engaging holes.

[0013] In another aspect of the invention the clasp also has a subframe that has a guide channel extending lengthwise to the band between the frame and the movable unit. The end portions of case fit into the guide channels of the subframe; the lengthwise ends of the guide channels are positioned to contact the side of the case when the protruding members engage the end engaging holes; and operating the operator causes the protruding members to retract into the case.

[0014] This arrangement enables moving the movable unit by operating the operator to retract the protruding members into the case while the end portions of the case remain fit inside the guide channels. In addition, the ends of the guide channels contact the side of the case when the protruding members engage the end engaging holes. As a result, if the movable unit is moved until the case contacts the ends of the guide channels, the protruding members are positioned to fit into the engaging holes. More specifically, the length can be easily adjusted using as a guide the position where the case contacts the ends of the guide channels instead of positioning the protruding members to the engaging holes.

[0015] In another aspect of the invention the band and the frame are connected by an intervening plate member, the plate member is arranged foldably to the frame, and the operator is disposed to a position where the operator is covered by the plate member when the plate member

is folded together to the frame.

[0016] This arrangement hides the operator with the plate member when the plate member is folded to the frame of the clasp, thus preventing accidentally operating the operator and changing the length of the band. Accidental operation is thus reliably prevented.

[0017] Another aspect of the invention is an accessory bracelet having a clasp that connects a pair of bands. The clasp has a frame that is connected to one of a pair of bands, and a movable unit that is connected to the other of the bands and is fit to the frame. A plurality of engaging holes are disposed in the frame lengthwise to the band. The movable unit has a case that is housed inside the frame, protruding members that project from the case and engage the engaging holes, and an operator that is exposed to the case surface. Operating the operating causes the protruding members to retract to the case.

[0018] Operating the operator exposed at the surface of the case in this aspect of the invention causes the protruding members to retract to the case and disengage the engaging holes, thereby allowing the movable unit to move relative to the frame. The relative positions of the frame and the movable unit, and therefore the position where the pair of bands are connected, can therefore be moved and the length of the accessory bracelet can be adjusted. An accessory bracelet that enables adjusting the length using a simple, easy to understand operation can therefore be provided. The clasp is also rendered by an extremely simple arrangement using a frame and a movable unit, a small clasp can therefore be easily achieved, and the decorativeness of the accessory bracelet can therefore be improved.

[0019] Another aspect of the invention is a timepiece having a pair of bands that are connected to the timepiece case, and a clasp that connects the pair of bands. The clasp has a frame that is connected to one of a pair of bands, and a movable unit that is connected to the other of the bands and is fit to the frame. A plurality of engaging holes are disposed in the frame lengthwise to the band. The movable unit has a case that is housed inside the frame, protruding members that project from the case and engage the engaging holes, and an operator that is exposed to the case surface. Operating the operating causes the protruding members to retract to the case.

[0020] Operating the operator exposed at the surface of the case in this aspect of the invention causes the protruding members to retract to the case and disengage the engaging holes, thereby allowing the movable unit to move relative to the frame. The relative positions of the frame and the movable unit, and therefore the position where the pair of bands are connected, can therefore be moved and the length of the timepiece band can be adjusted. A timepiece that enables adjusting the length of the band using a simple, easy to understand operation can therefore be provided. The clasp is also rendered by an extremely simple arrangement using a frame and a movable unit, a small clasp can therefore be easily achieved, and the decorativeness of the timepiece can therefore be improved.

[0021] The invention enables operating an operator exposed at the surface of the case to retract the protruding members to the case and disengage the engaging holes, thereby allowing the movable unit to move relative to the frame. The relative positions of the frame and the movable unit, and therefore the position where the pair of bands are connected, can therefore be moved and the length of the accessory bracelet can be adjusted. The length of the band can therefore be adjusted using a simple, easy to understand operation. The clasp is also rendered by an extremely simple arrangement using a frame and a movable unit, a small clasp can therefore be easily achieved.

[0022] Other objects and attainments together with a fuller understanding of the invention will become apparent and appreciated by referring to the following description and claims taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0023] FIG. 1 is an oblique view of a wristwatch according to an embodiment of the invention.

[0024] FIG. 2 is an oblique view showing the main components when the clasp is open.

[0025] FIG. 3 is a section view showing main components of the clasp when the clasp is folded closed.

[0026] FIG. 4 is an oblique view showing the arrangement of the clasp.

[0027] FIG. 5 is an oblique view showing the arrangement of the cover.

[0028] FIG. 6 is an oblique view showing the arrangement of the guide part held inside the cover.

[0029] FIG. 7 is an oblique view showing the arrangement of the button unit held inside the cover.

[0030] FIG. 8 is an oblique view showing the arrangement of the movable unit and the end portion of the top band.

[0031] FIG. 9 is an oblique view of the movable unit with the button removed.

[0032] FIG. 10 is a section view of the movable unit with the button removed.

[0033] FIG. 11 is an oblique view showing the arrangement of the button.

[0034] FIG. 12 is a vertical section view of the movable unit.

[0035] FIG. 13 is a partial plan view showing the main parts of the clasp.

[0036] FIG. 14 is a partial plan view showing the main parts of the clasp.

[0037] FIG. 15 is a partial plan view showing the main parts of the clasp.

[0038] FIG. 16 is a partial plan view showing the main parts of the clasp according to another aspect of the invention.

[0039] FIG. 17 is a partial plan view showing the main

parts of the clasp according to another aspect of the invention.

[0040] FIG. 18 is a partial plan view showing the main parts of the clasp according to another aspect of the invention.

[0041] FIG. 19 shows the arrangement of a guide part according to another aspect of the invention.

[0042] FIG. 20 describes a method of molding the movable unit.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0043] Preferred embodiments of the present invention are described below with reference to the accompanying figures.

[0044] FIG. 1 is an oblique view showing a wristwatch 1 by way of example of a timepiece according to this embodiment of

[0045] This wristwatch 1 has a timepiece case 11 housing a movement not shown, a dial 12, and watch hands 13 in a water-resistant construction. A band 14 is connected to the lugs at the top and bottom ends of the timepiece case 11 as an accessory bracelet for holding the wristwatch 1 at an appropriate position, such as the wrist of the user in this aspect of the invention. The band 14 has a top band 15 and a bottom band 16 as the band portions that are connected to the timepiece case 11 and connected to each other by an intervening clasp 2.

[0046] The top band 15 is connected to the timepiece case 11 at the 12:00 o'clock position of the dial 12, and the bottom band 16 is connected to the timepiece case 11 at the 6:00 o'clock position. The top band 15 and the bottom band 16 are each made from a plurality of links made of stainless steel, titanium, or other metal connected to each other so that the links can pivot smoothly with the adjoining links.

[0047] FIG. 2 is an oblique view of the clasp 2 in the open position.

[0048] The clasp 2 is a so-called triple deployant folding clasp (or triple deployment folding clasp with side pushers). The clasp 2 includes a cover part 20 as a frame member that is connected to the end of the top band 15, a bottom arm 37 that is connected freely pivotably to the end of the bottom band 16, and a middle arm 36 that is connected foldably to the bottom arm 37 and the cover part 20. The connection between the cover part 20 and the middle arm 36, and the connection between the bottom arm 37 and the middle arm 36, are each made by means of a pin (not shown in the figure) so that the connections can pivot freely so that the middle arm 36 and the bottom arm 37 can fold together below the cover part 20.

[0049] The middle arm 36 has two narrow plate members disposed with a specific gap therebetween, and the bottom arm 37 is a plate member that is narrower than the gap in the middle arm 36. One end of the middle arm 36 is connected to the cover part 20 on the inside of the cover part 20, and the outside width of the middle arm 36 is narrower than the cover part 20.

[0050] FIG. 3 is a section view showing the major parts of the clasp 2 when folded closed, and showing in particular the relative positions of the middle arm 36 and the bottom arm 37. As shown in FIG. 3, when the clasp 2 is folded closed, the bottom arm 37 is disposed between the two plate members of the middle arm 36 so that the three plate members are aligned with each other. In this position the top of the bottom arm 37 is below the top of the middle arm 36. This ensures that when the clasp 2 is closed the protruding part of the button 42 described below does not touch the top of the bottom arm 37.

[0051] A lock pin 38 for holding the clasp 2 folded closed is disposed to the bottom arm 37. When the clasp 2 is closed, the lock pin 38 engages and is retained by the button unit 30 (FIG. 4) disposed to the cover part 20, and the clasp 2 is held closed by the retention force of the button unit 30. When push buttons 31 disposed as release operators are depressed, retention of the lock pin 38 by the button unit 30 is released and the clasp 2 opens.

[0052] FIG. 4 is an oblique view showing the arrangement of the clasp 2 from the underside of the cover part 20 to which the other parts are disposed. FIG. 5 is an oblique view showing the arrangement of the cover part 20, FIG. 6 is an oblique view showing the arrangement of the guide member 24 held in the cover part 20, and FIG. 7 is an oblique view showing the arrangement of the button unit 30 held inside the

[0053] The cover part 20 has side walls 22 and 23 rising from the opposite edges of a substantially rectangular flat plate 21. Spring pin insertion holes 21A are disposed in the side walls 22 and 23 at one lengthwise end part of the cover part 20, and the middle arm 36 is connected freely pivotably to the cover part 20 by a spring pin inserted to these spring pin insertion holes 21A. In addition to the spring pin insertion holes 21A, push button insertion holes 21B and rectangular engaging holes 21C and 21D are also formed in the side walls 22 and 23 of the cover part 20. The push button insertion holes 21B and rectangular engaging holes 21C and 21D are through-holes in the side walls 22 and 23.

[0054] The guide member 24 is set inside the cover part 20 as a subframe. The guide member 24 has a substantially rectangular flat part 25 and two side walls 26 and 27 rising from the opposite edges of the flat part 25, and is substantially the same shape as the cover part 20. The length of the guide member 24 is at least long enough to span the length of the cover part 20 from the push button insertion holes 21B to the engaging holes 21D. The push button insertion holes 24A are formed in the side walls 26 and 27 of the guide member 24 overlapping the push button insertion holes 21B in the side walls 22 and 23 of the cover part 20. Guide channels 24B are formed in the side walls 26 and 27. These guide channels 24B are elongated holes extending lengthwise to the guide member 24 and spanning at least all of the engaging holes 21C and 21D in the side walls 22 and 23 of the

cover part 20. A button escape 24C is also rendered in the flat part 25 lengthwise to the guide member 24.

[0055] The button unit 30, a movable unit 40, and the end link of the top band 15 that is connected to the movable unit 40 are held inside the guide member 24.

[0056] The button unit 30 has a cylindrical body that extends widthwise to the cover part 20, two push buttons 31 protruding from the opposite ends of the body, a lock pin hole 32 opened in the side wall of the body, and two lock claws 33 that are exposed inside the lock pin hole 32. These two lock claws 33 are connected to the two push buttons 31 inside the body of the button unit 30. The two lock claws 33 are normally urged together with the urging force pushing the push buttons 31 to the outside of the body. When the push buttons 31 are pushed together to the inside of the body in resistance to this urging force, the lock claws 33 move apart.

[0057] The button unit 30 is assembled to the cover part 20 and the guide member 24 by inserting the push buttons 31 through the push button insertion holes 24A in the guide member 24 and the push button insertion holes 21B in the cover part 20.

[0058] In this aspect of the invention the body of the button unit 30 is an oval cylinder and the push buttons 31 are flat pieces disposed substantially parallel to the flat part 25 of the guide member 24. The push button insertion holes 21B and the push button insertion holes 24A are therefore also ovals formed with the long axis disposed lengthwise to the cover part 20. As a result, when the push buttons 31 are inserted through the push button insertion holes 24A and the push button insertion holes 21B, the guide member 24 and the cover part 20 are held so that they are not at an angle to each other, and the cover part 20 and the guide member 24 are held stacked together.

[0059] When the clasp 2 is folded closed, the lock pin 38 protruding from the bottom arm 37 is inserted to the lock pin hole 32 of the button unit 30. The lock pin 38 inserted to the lock pin hole 32 is held between the pair of lock claws 33 that are urged as described above so that the lock pin 38 cannot fall out. When the push buttons 31 are then squeezed, the two lock claws 33 holding the lock pin 38 separate from each other and the lock pin 38 is released. The lock pin 38 can therefore be removed from the lock pin hole 32, and the clasp 2 can be opened.

[0060] The button unit 30 thus functions to hold the guide member 24 and the cover part 20 so that they do not rock, and functions to hold the clasp 2 folded closed and to release the clasp 2 by operating the push buttons 31.

[0061] The movable unit 40 that is connected to the end of the top band 15 is disposed inside the guide member 24. The movable unit 40 can be moved lengthwise to the cover part 20 by a prescribed operation, and the length of the band 14 can be adjusted by moving the movable unit 40 to connect the cover part 20 and the top band 15 at a different position.

[0062] FIG. 8 is an oblique view showing the movable unit 40 and the end part of the top band 15. FIG. 9 is an oblique view and FIG. 10 is a side section view of the movable unit 40 with the button 42 removed. FIG. 11A is an oblique view of the button 42, and FIG. 11B is an oblique view of a button 43 that is one variation of the button 42. FIG. 12 is an end section view of the movable unit 40 when the button 42 is inserted.

[0063] The movable unit 40 holds the various parts of the movable unit 40 inside a hollow case 41. A narrow connecting part 46 that fits the first link 15A of the top band 15 protrudes from the end part of the case 41 towards the top band 15. A pin insertion hole 46A is formed through the connecting part 46, and the movable unit 40 is connected pivotably to the first link 15A of the top band 15 by a pin 15B that passes through the pin insertion hole 46A.

[0064] The case 41 is a box of a width that will fit between the side walls 26 and 27 of the guide member 24. Side wall openings 41A are formed in the sides of the case 41 facing these side walls 26 and 27, and a protruding member 44 projects to the outside through these side wall openings 41A.

[0065] As shown in FIG. 9 and FIG. 10, each protruding member 44 has a basically bar-shaped shaft portion 44C housed inside the case 41, a broad shoulder portion 44B formed on the distal end side of the shaft portion 44C, a narrow end engaging portion 44A projecting from substantially the center of the shoulder portion 44B, and an angle portion 44D formed on the base end part of the shaft portion 44C. The end engaging portion 44A and the shoulder portion 44B of each protruding member 44 protrudes outside the case 41.

[0066] The end engaging portions 44A are made to a size that can be inserted in the engaging holes 21C and 21D. The section of the end engaging portions 44A is preferably a rectangle that is slightly smaller than the engaging holes 21C and 21D because fitting the end engaging portions 44A into the engaging holes 21C and 21D then secures the movable unit 40 so that the movable unit 40 cannot pivot to the flat plate 21.

[0067] The base ends of the shaft portions 44C are bent perpendicularly to an L shape at the angle portions 44D of the protruding members 44. The two protruding members 44 of the movable unit 40 are the same shape and size, and the protruding members 44 are assembled so that the distal end of each angle portion 44D contacts the shaft portion 44C of the other protruding member 44. This forms a rectangular space enclosed by the angle portions 44D in the center part of the movable unit 40. A button hole 41B is formed in the top of the case 41 at a position corresponding to this space, and the button 42 is fit as an operator into this button hole 41B. A button escape 41C is formed in the case 41 on the opposite side as the button hole 41B.

[0068] FIG. 11 is an oblique view showing the button 42 and a variation of the button. FIG. 11A shows the button 42, and FIG. 11B shows the button variation 43.

[0069] As shown in FIG. 11A, the button 42 has a trun-

cated pyramid-shaped base part 42A, a square narrow neck 42C projecting from the base part 42A, and a broad catch 42D formed on the distal end of the neck 42C with the catch 42D narrowing from the neck 42C side to the distal end. Tapers 42B are formed from the base part 42A to the neck 42C so that the width of the tapers 42B narrows from the base part 42A to the neck 42C.

[0070] When the button 42 is inserted to the button hole 41B, the catch 42D enters the rectangular space between the two angle portions 44D and pushes the angle portions 44D apart. When the button 42 is pushed further in, the neck 42C is held stably between the two angle portions 44D as shown in FIG. 12.

[0071] Springs 45 are disposed inside the case 41 between the shoulder portion 44B of one protruding member 44 and the angle portion 44D of the other protruding member 44. Two springs 45 are provided to urge the two protruding members 44. The urging force of these springs 45 urges the two protruding members 44 so that the end engaging portions 44A protrude outside the case 41 and the two angle portions 44D are pushed together inside the case 41.

[0072] When the button 42 is thus inserted to the button hole 41B, the urging force of the springs 45 causes the two angle portions 44D to hold the neck 42C, thus supporting and preventing the button 42 from falling out.

[0073] When the button 42 inserted to the button hole 41B is pushed further toward the cover part 20, the tapers 42B push the two angle portions 44D apart, thus causing the end engaging portions 44A to move inside the case 41 in conjunction with movement of the protruding members 44. In other words, pushing on the button 42 causes the two protruding members 44 protruding from the case 41 to retract inside the case 41.

[0074] The movable unit 40 is thus arranged so that operating the button 42 causes the protruding members 44 to move in and out.

[0075] By also rendering a button escape 24C in the guide member 24 as described above, the catch 42D moves inside the button escape 24C when the button 42 is pushed toward the cover part 20. This prevents the catch 42D from contacting the guide member 24.

[0076] A recess could also be provided on the underside of the cover part 20 at a position overlapping the button escape 24C so that the catch 42D does not contact the cover part 20.

[0077] The button 43 shown in FIG. 11B can be used in the movable unit 40 instead of the button 42 shown in FIG. 11A. This button 43 has a round narrow neck 43C rising from a truncated conical base part 43A, and a truncated conical catch 43D on the distal end of the neck 43C. A taper 43B rises from the base part 43A to the neck 43C.

[0078] Other than being round, this button 43 is identical to the button 42 when seen in a plane projection, and has the same effect as the button 42.

[0079] Adjusting the length of the band 14 is described next.

[0080] FIG. 13 to FIG. 15 are plan views showing the main parts of the clasp 2, and are broken out section views of the side walls 22 and 23 and the side walls 26 and 27.

[0081] In FIG. 13 shows the band 14 in its shortest state with the movable unit 40 at the position nearest the bottom band 16. In the position shown in FIG. 13 the end engaging portions 44A of the movable unit 40 are fit into the engaging holes 21C of the side walls 22 and 23 nearest the bottom band 16. The shoulder portions 44B protruding from the case 41 are near the end of the guide channels 24B and in contact with the guide channel end walls 24E.

[0082] Pressing the button 42 causes the protruding members 44 to retract inside the case 41 as shown in FIG. 14 so that the end engaging portions 44A separate from the engaging holes 21C and are inside the guide channels 24B. The end engaging portions 44A can thus move freely inside the guide channels 24B and the movable unit 40 can therefore be moved.

[0083] The movable unit 40 can then be moved towards the top band 15 while holding the button 42 depressed until the shoulder portions 44B reach the other end of the guide channels 24B and contact guide channel end walls 24F. If the force depressing the button 42 is then released when the shoulder portions 44B are touching the guide channel end walls 24F, the protruding members 44 will move outside the case 41 and the end engaging portions 44A will be inserted to the engaging holes 21D.

[0084] This operation enables moving the movable unit 40 from the engaging holes 21C to the engaging holes 21D, and thus enables lengthening the band 14. The band 14 can also be easily shortened by moving the movable unit 40 in the opposite direction while depressing the button 42.

[0085] In a wristwatch 1 according to this aspect of the invention the movable unit 40 connected to the top band 15 is fit to the cover part 20 connected to the bottom band 16, and pressing the button 42 exposed from the case 41 of the movable unit 40 causes the protruding members 44 engaging the engaging holes 21C or 21D of the cover part 20 to retract inside the case 41 so that the movable unit 40 can be moved. The length of the band 14 can therefore be adjusted by pressing the button 42 and moving the movable unit 40. The length can therefore be adjusted by means of a simple, easily understood operation. Because the construction of the clasp 2 is very simple, the clasp 2 can also be easily reduced in size and the decorativeness of the wristwatch 1 can be improved.

[0086] The position of the protruding members 44 can also be easily confirmed through the engaging holes 21C and 21D because the engaging holes 21C and 21D are through-hole passing through the side walls 22 and 23. The position of the protruding members 44 to the engaging holes 21C and 21D can also be easily visually adjusted when operating the button 42 to move the movable unit 40, and the length can therefore be easily adjusted.

[0087] When the clasp 2 is folded closed, the middle arm 36 and the bottom arm 37 are folded under the cover part 20 and cover the surface where the button 42 is exposed. Because the button 42 is hidden by the middle arm 36 and the bottom arm 37 at this time, pressure cannot be applied to the button 42 and the button 42 cannot be intentionally operated. Furthermore, because the bottom arm 37 folds between the forks of the middle arm 36 as shown in FIG. 2, the bottom arm 37 covers the button 42 when the clasp 2 is folded closed. In addition, because the bottom arm 37 is lower than the middle arm 36 as shown in FIG. 3, the bottom arm 37 will not contact the button 42 and applies no pressure to the button 42. The length of the band 14 will therefore not change when the wristwatch 1 is being worn, and the wristwatch 1 can be held securely in place.

[0088] The shoulder portions 44B contact the guide channel end walls 24E when the end engaging portions 44A of the protruding members 44 are fit in the engaging holes 21C of the cover part 20. When the end engaging portions 44A are fit in the engaging holes 21D, the shoulder portions 44B contact the guide channel end walls 24F. The user can therefore move the movable unit 40 using the guide channel end walls 24E and 24F as a guide. More specifically, when the button 42 is pressed and the movable unit 40 is moved to adjust the length, the end engaging portions 44A will slide smoothly into the engaging holes 21C or 21D if the button 42 is released when the shoulder portions 44B are stopped by the guide channel end walls 24E or 24F. The length of the band 14 can therefore be easily adjusted because adjustment does not depend on visually positioning the end engaging portions 44A, for example.

[0089] This embodiment of the invention has engaging holes 21C and 21D formed in the cover part 20, but the invention is not so limited and more engaging holes can be provided as needed. In this case the guide channel end walls 24E and 24F of the guide channels 24B are positioned to contact the shoulder portions 44B when the end engaging portions 44A are fit into the engaging holes at the ends of the guide channels 24B.

[0090] In this embodiment of the invention the movable unit 40 is held between the side walls 26 and 27, and the shoulder portions 44B and end engaging portions 44A of the protruding members 44 that protrude from the case 41 move along the inside of the guide channels 24B, but the invention is not so limited. The ends of the case 41 could extend into the guide channels 24B and the end engaging portions 44A could be retracted completely into the case 41, for example. This arrangement is described further below with reference to FIG. 16 to FIG. 18.

[0091] FIG. 16 to FIG. 18 are partially broken out section views showing the main parts of the cover part 20 according to this aspect of the invention.

[0092] In this aspect of the invention the end portions 41D of the case are inside the guide channels 24B, and the end engaging portions 44A protrude from these case end portions 41D and fit into the engaging holes 21C as shown in FIG. 16. When the button 42 is then depressed, the end engaging portions 44A are retracted to completely within the case 41 as shown in FIG. 17. Because the case end portions 41D are within the guide channels 24B, the case end portions 41D can now slide in and along the range of the guide channels 24B to move the movable unit 40. When the movable unit 40 is then moved to the top band 15 end of the guide channels 24B and the button 42 is released, the protruding members 44 can be fit into the engaging holes 21D.

[0093] As shown in FIG. 17, when the end engaging portions 44A of the protruding members 44 are seated in the engaging holes 21C of the cover part 20, the case end portions 41D contact the guide channel end walls 24E. Likewise when the end engaging portions 44A are fit in the engaging holes 21D, the case end portions 41D contact the guide channel end walls 24F. The user can therefore move the movable unit 40 using the guide channel end walls 24E and 24F as a guide. More specifically, when the button 42 is pressed and the movable unit 40 is moved to adjust the length, the end engaging portions 44A will slide smoothly into the engaging holes 21C or 21D if the button 42 is released when the shoulder portions 44B are stopped by the guide channel end walls 24E or 24F. The length of the band 14 can therefore be easily adjusted because adjustment does not depend on visually positioning the end engaging portions 44A, for example.

[0094] This aspect of the invention having the case end portions 41D fit into the guide channels 24B so that operating the button 42 completely retracts the protruding members 44 into the case 41 as shown in FIG. 16 to FIG. 18 thus has the same effect as the aspect of the invention described above.

[0095] These embodiments of the invention render the push buttons 31 of the button unit 30 as flat plate members and the push button insertion holes 24A of the guide member 24 as ovals to hold and prevent the guide member 24 from rocking relative to the cover part 20. The invention is not limited to this arrangement, however. As shown in FIG. 19, for example, bosses 24D can be provided on the surfaces of the guide member 24 where the cover part 20 and the guide member 24 touch, and recesses (not shown in the figure) can be disposed on the cover part 20 at positions corresponding to the bosses 24D. The push buttons 31 and the bosses 24D thus hold and prevent the cover part 20 and the guide member 24 from rocking.

[0096] The detailed construction of the wristwatch 1 described above can be modified as desired. For example, the case 41 can be formed by rendering a flat plate with a narrow center portion that corresponds to the connecting part 46 as shown in FIG. 20, and this plate can then be folded over at the center to form the case 41.

[0097] In this arrangement channels that become the side wall openings 41A and the hollow portion of the completed case 41 are rendered in the plate, and openings that become the button hole 41B and the button escape

41C are rendered in the channels. A rod can be inserted at the part where the plate is folded over to render the pin insertion hole 46A. This is obviously only one example, and the case 41 and other parts can be produced by various other methods.

[0098] The top band 15 and the bottom band 16 in the foregoing embodiments are not limited to bands formed by connecting a plurality of metal links together. Leather bands or rubber bands made of urethane rubber for example, can be used instead, and other aspects of the detailed arrangement can also be changed appropriately.

[0099] The invention is also not limited to a triple deployant clasp such as described above, and can be widely applied to other types of clasps including double folding clasps and butterfly clasps.

[0100] The invention has also been described using the band of a wristwatch by way of example, but can be widely applied to other types of band or bracelet type accessories, including jewelry bracelets, necklaces, clothing belts, and belts for handbags and other accessories.

[0101] Although the present invention has been described in connection with the preferred embodiments thereof with reference to the accompanying drawings, it is to be noted that various changes and modifications will be apparent to those skilled in the art. Such changes and modifications are to be understood as included within the scope of the present invention as defined by the appended claims, unless they depart therefrom.

Claims

1. A clasp comprising:

a frame that is connected to one of a pair of bands; and
a movable unit that is connected to the other of the bands and is fit to the frame;
wherein a plurality of engaging holes are disposed in the frame lengthwise to the band;
the movable unit has a case that is housed inside the frame,
protruding members that protrude from the case and engage the engaging holes, and
an operator that is exposed to the case surface; and
operating the operating causes the protruding members to retract to the case.

2. The clasp described in claim 1, wherein the engaging holes are holes that pass through the frame and open to the outside of the frame.

3. The clasp described in claim 1 or 2, further comprising:

a subframe that has a guide channel extending lengthwise to the band between the frame and the movable unit;
wherein the lengthwise ends of the guide channels are positioned to contact the side of the protruding members when the protruding members engage the end engaging holes; and
operating the operator causes the protruding members to retract into the guide channels of the subframe.

4. The clasp described in claim 1 or 2, further comprising:

a subframe that has a guide channel extending lengthwise to the band between the frame and the movable unit;
wherein the end portions of case fit into the guide channels of the subframe;
the lengthwise ends of the guide channels are positioned to contact the side of the case when the protruding members engage the end engaging holes; and
operating the operator causes the protruding members to retract into the case.

5. The clasp described in claim 1, wherein the band and the frame are connected by an intervening plate member,
the plate member is arranged foldably to the frame, and
the operator is disposed to a position where the operator is covered by the plate member when the plate member is folded together to the frame.

6. An accessory bracelet comprising a clasp that connects a pair of bands, wherein:

the clasp has a frame that is connected to one of a pair of bands; and
a movable unit that is connected to the other of the bands and is fit to the frame;
a plurality of engaging holes are disposed in the frame lengthwise to the band;
the movable unit has a case that is housed inside the frame,
protruding members that protrude from the case and engage the engaging holes, and
an operator that is exposed to the case surface; and
operating the operating causes the protruding members to retract to the case.

7. A timepiece comprising:

a pair of bands that are connected to the timepiece case; and
a clasp that connects the pair of bands;

wherein the clasp has a frame that is connected to one of a pair of bands; and
a movable unit that is connected to the other of the bands and is fit to the frame;
a plurality of engaging holes are disposed in the frame lengthwise to the band;
the movable unit has a case that is housed inside the frame,
protruding members that protrude from the case and engage the engaging holes, and
an operator that is exposed to the case surface; and
operating the operating causes the protruding members to retract to the case.

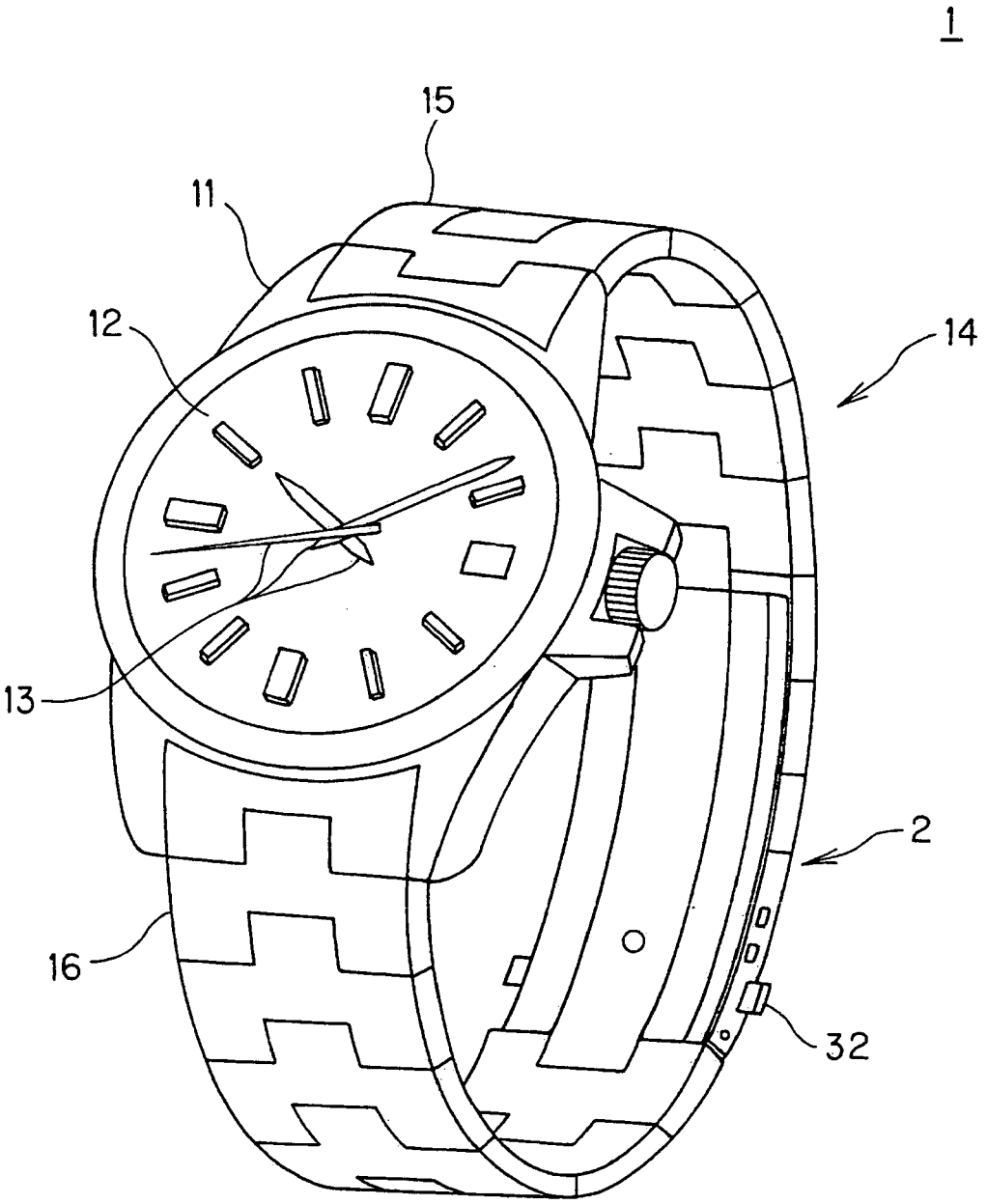


FIG. 1

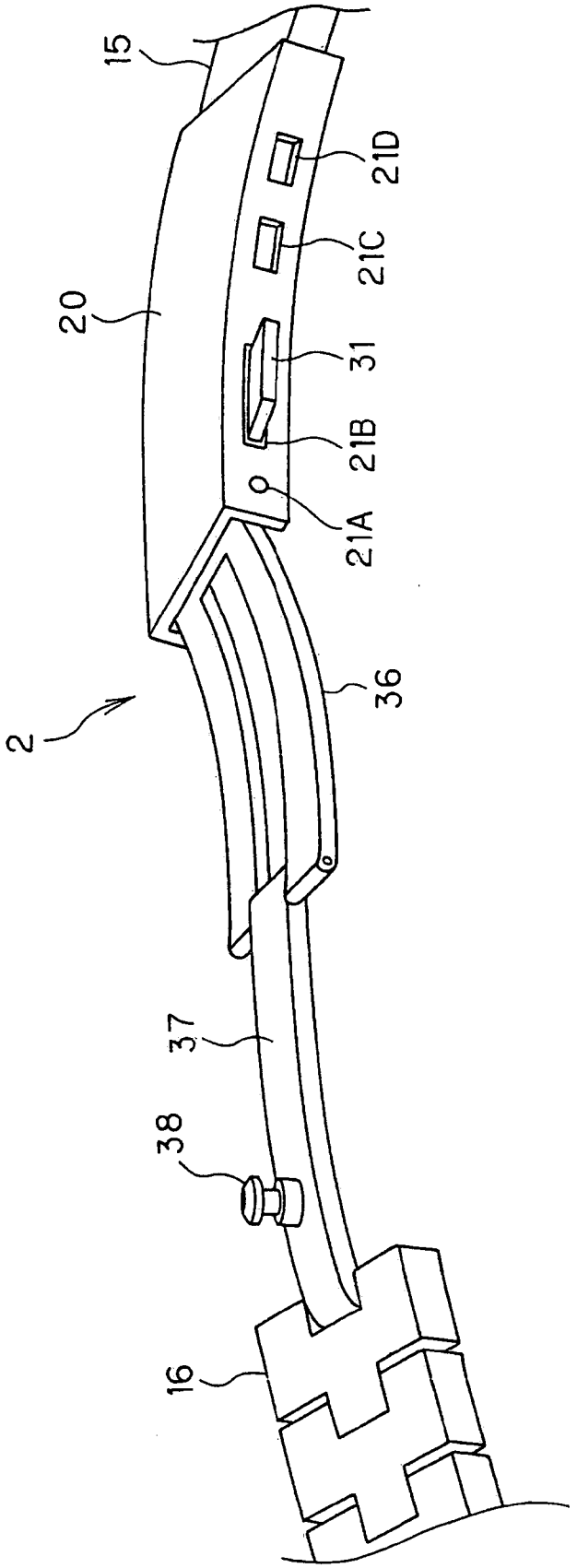


FIG. 2

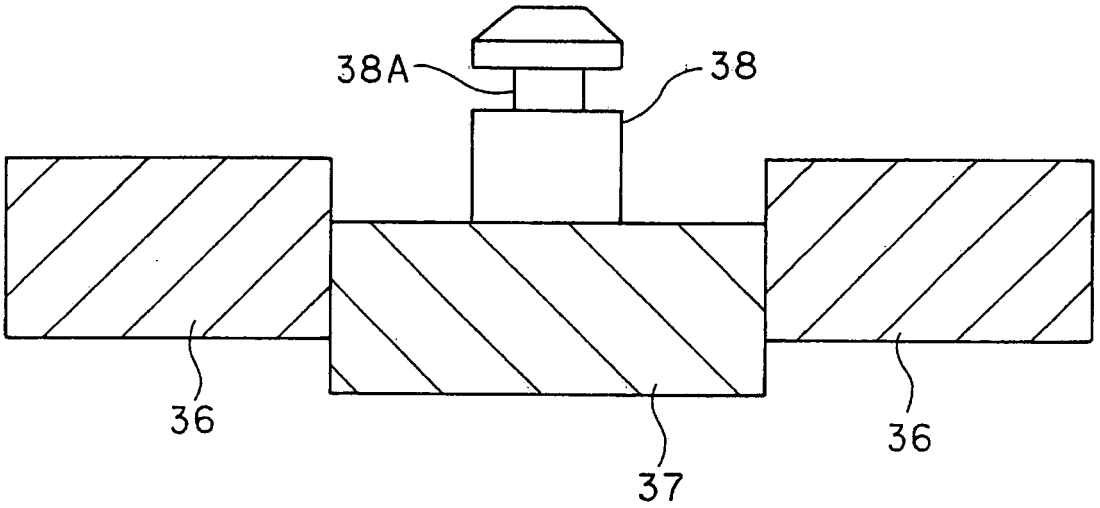


FIG. 3

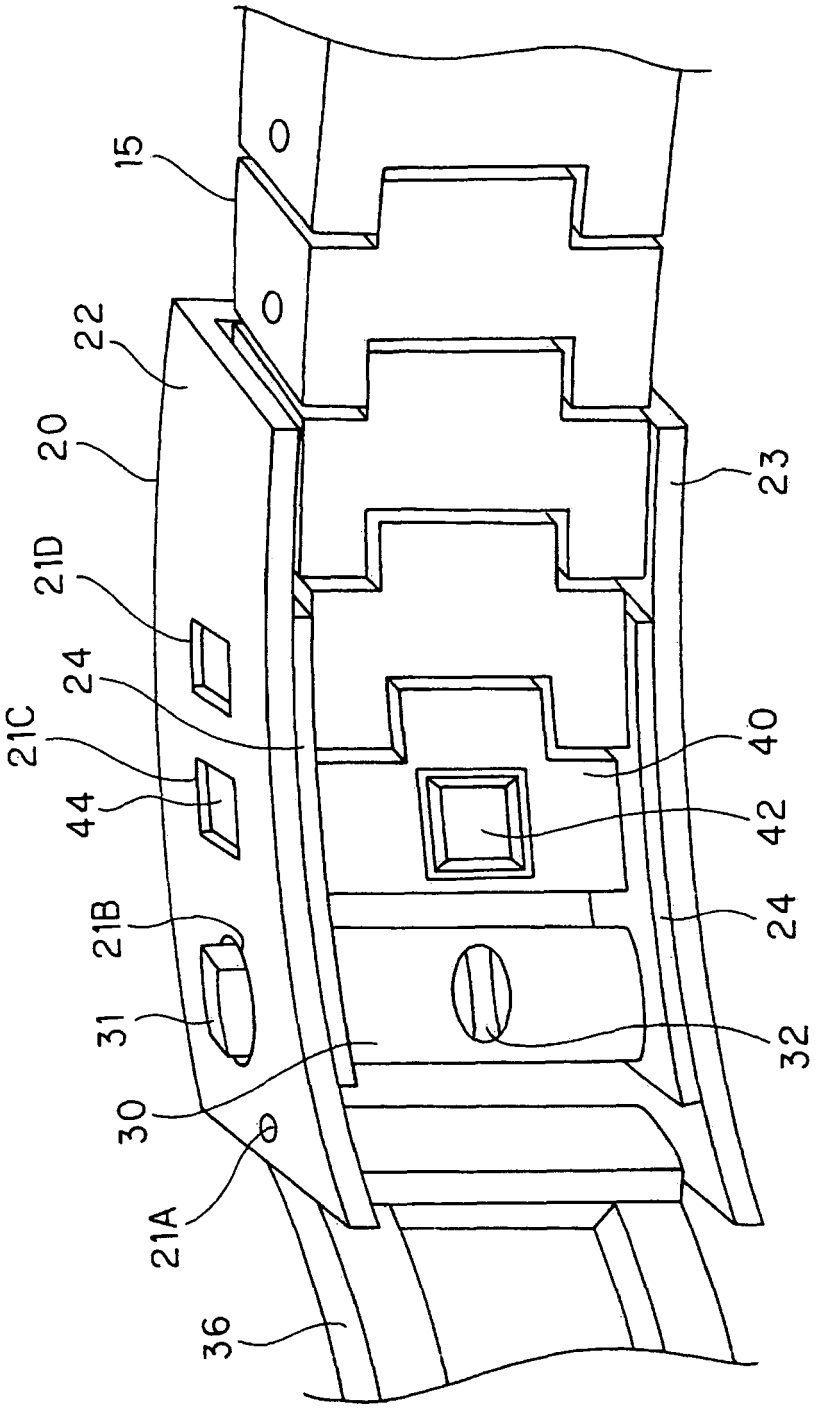
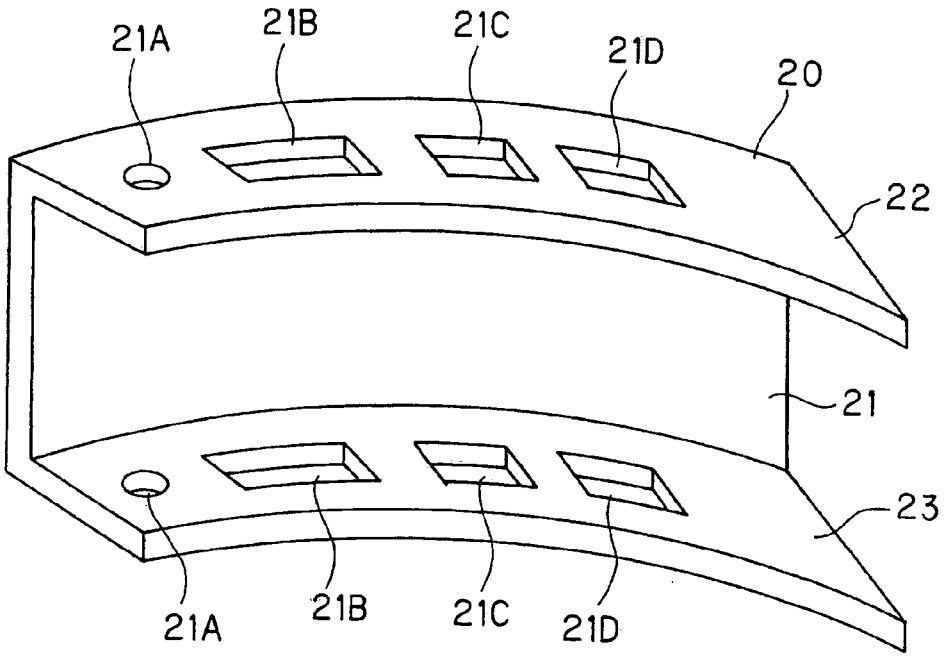


FIG. 4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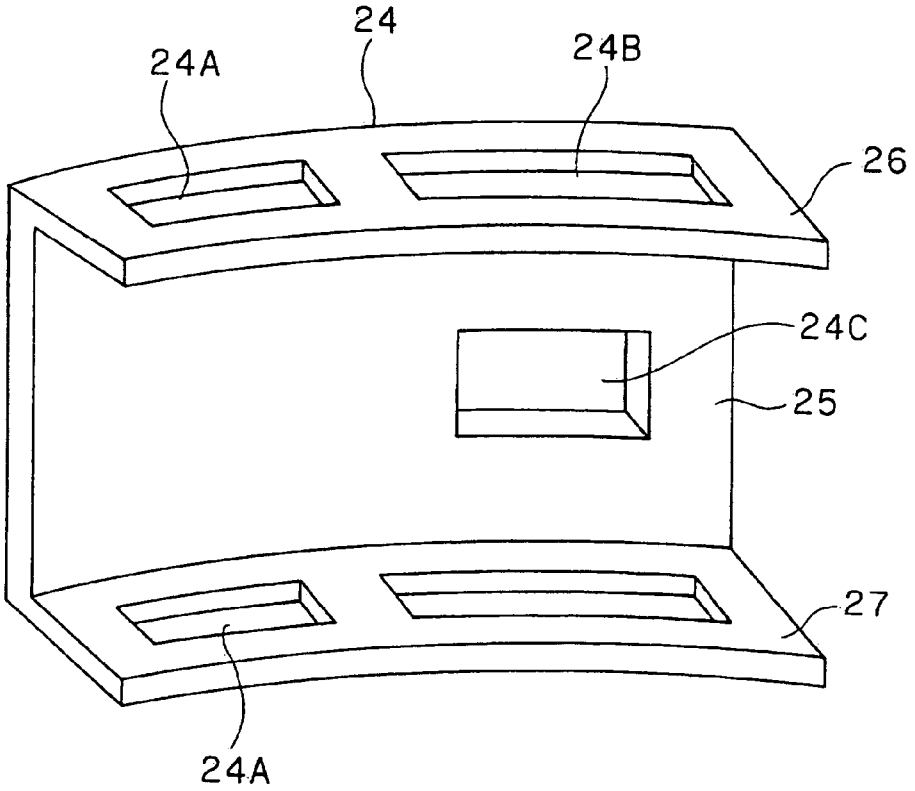
21D
20
22
21
23
21A
21B
21C
21D

FIG. 5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24A
24B
26
24C
25
27
24A

FIG. 6

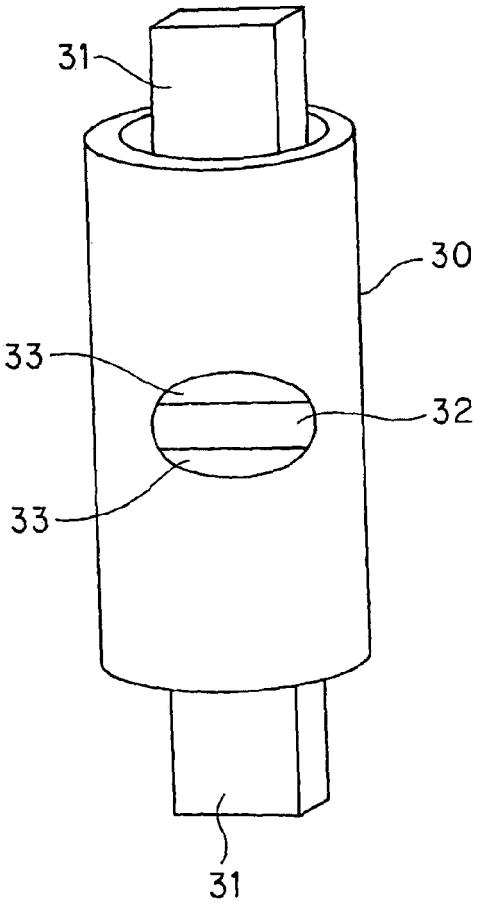


FIG. 7

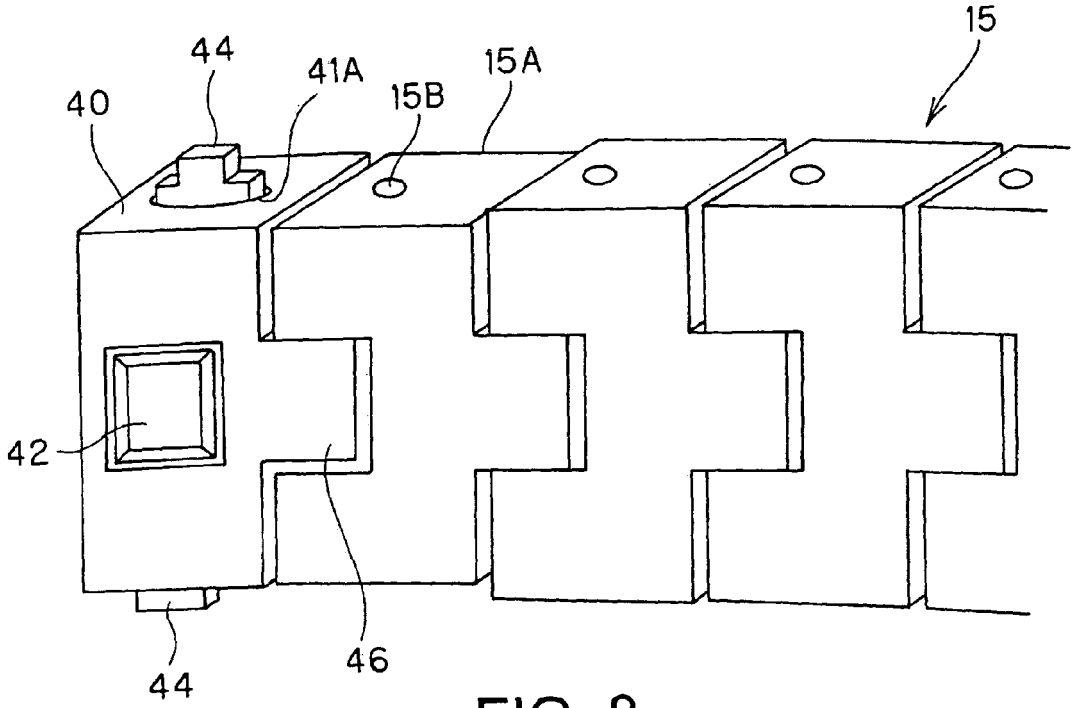


FIG. 8

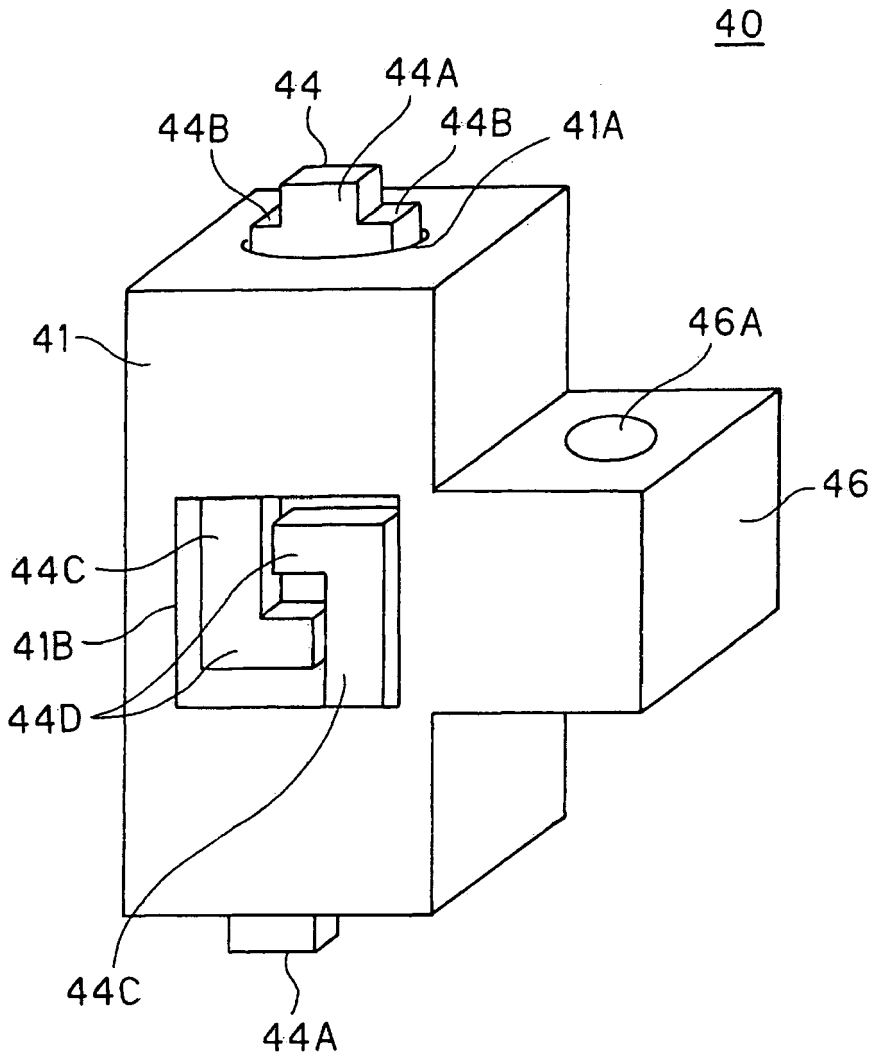


FIG. 9

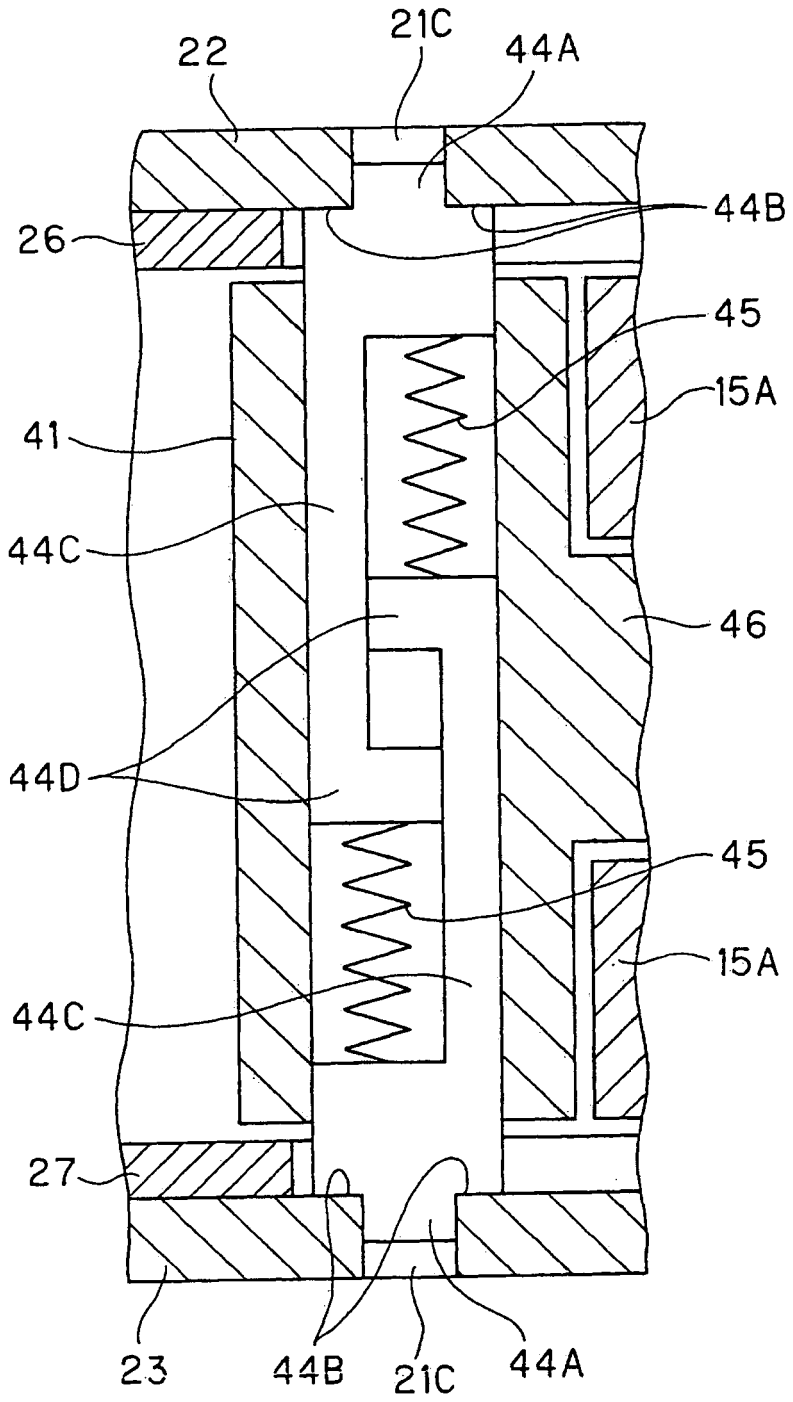


FIG.10

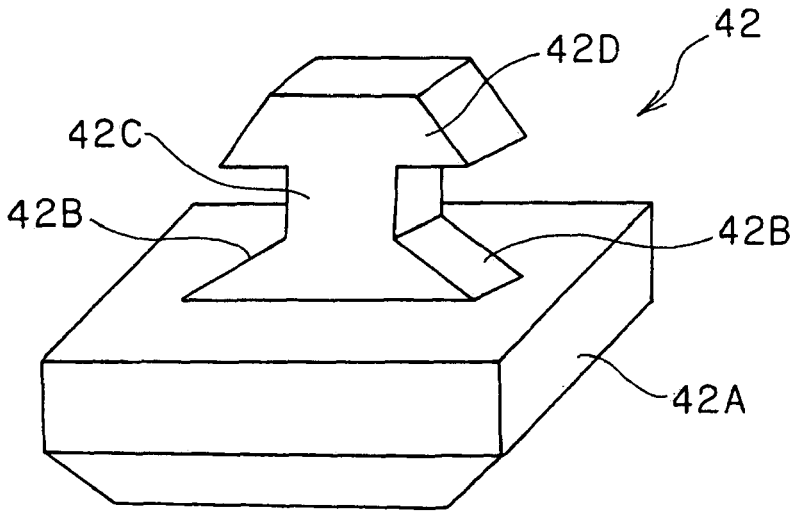


FIG.11A

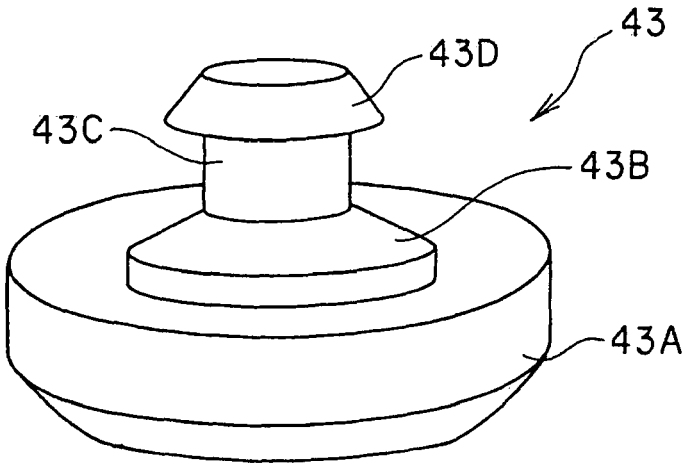


FIG.11B

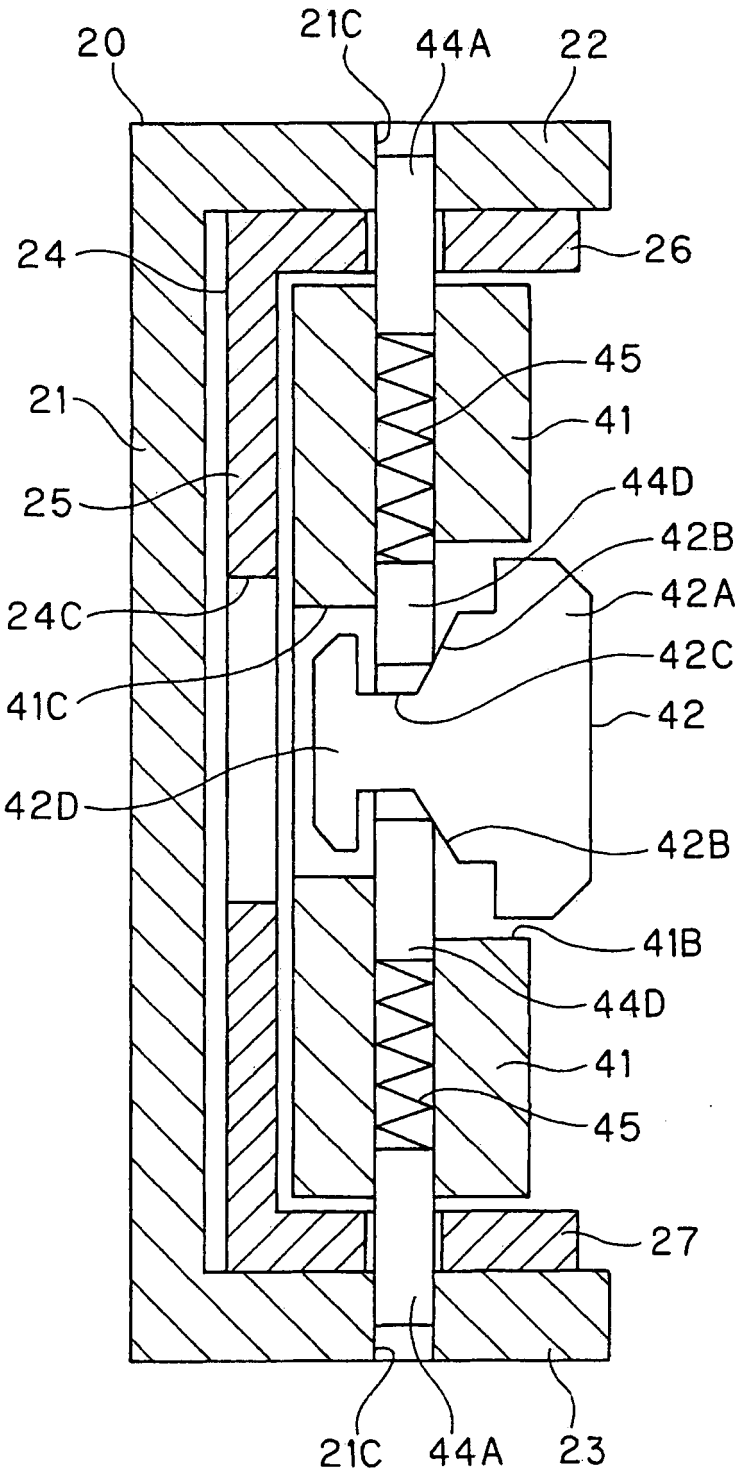
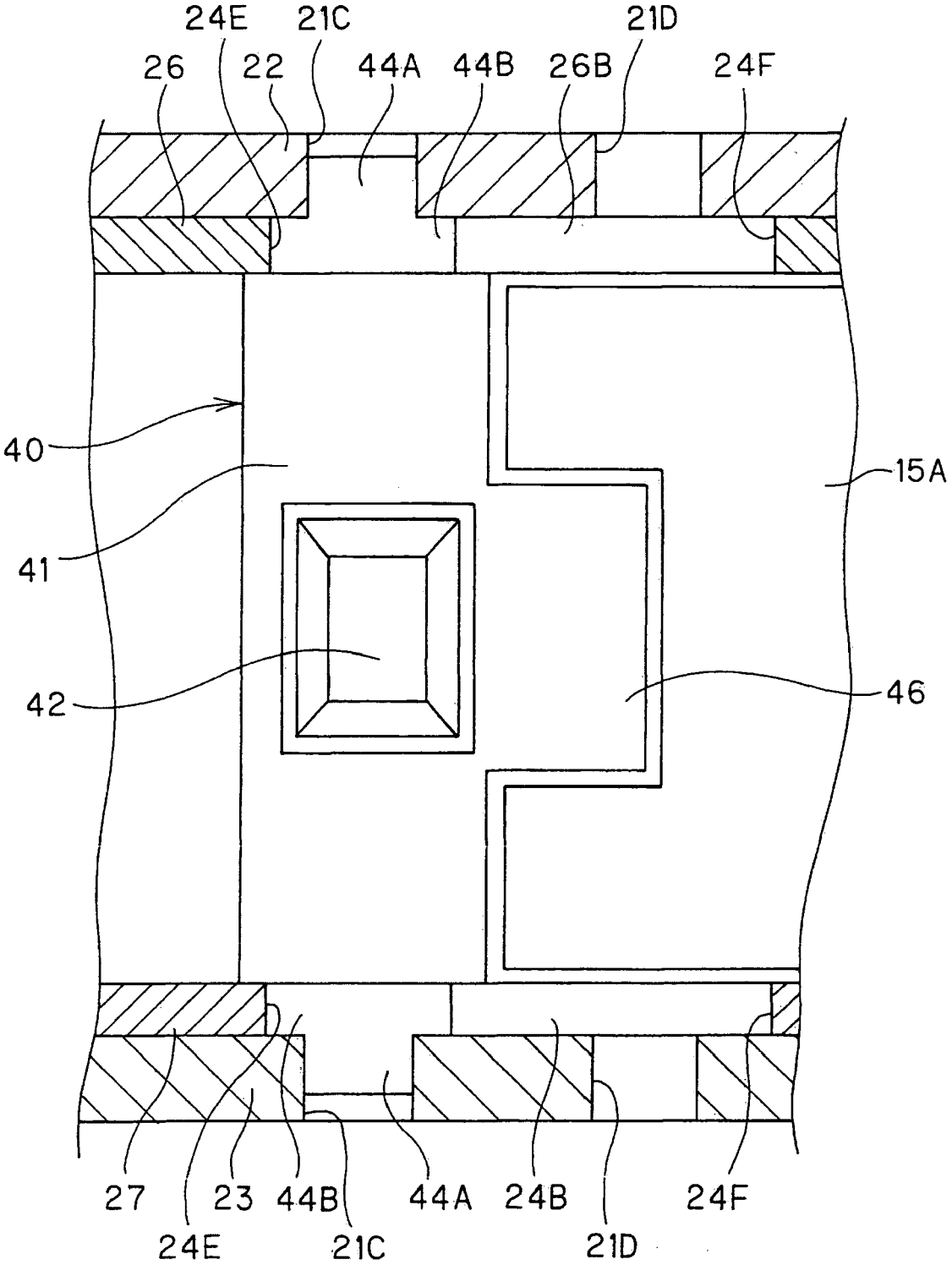

20
21C
44A
22
24
26
45
21
41
25
44D
42B
42A
24C
42C
41C
42
42D
42B
41B
44D
41
45
27
21C
44A
23

FIG.12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26
22
44A
44B
26B
24F
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42
46
27
23
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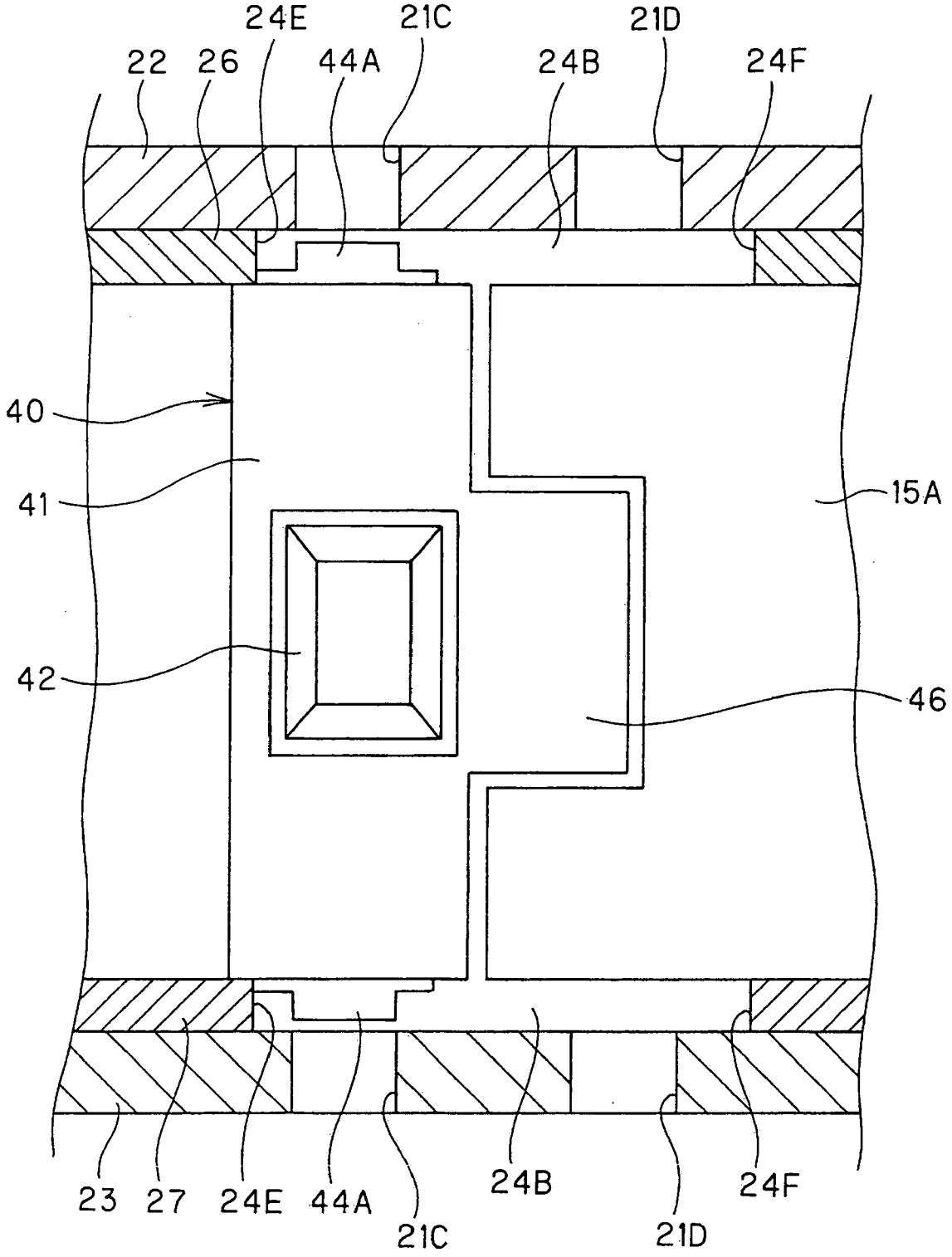
24B
24F
24E
21C
21D

FIG.13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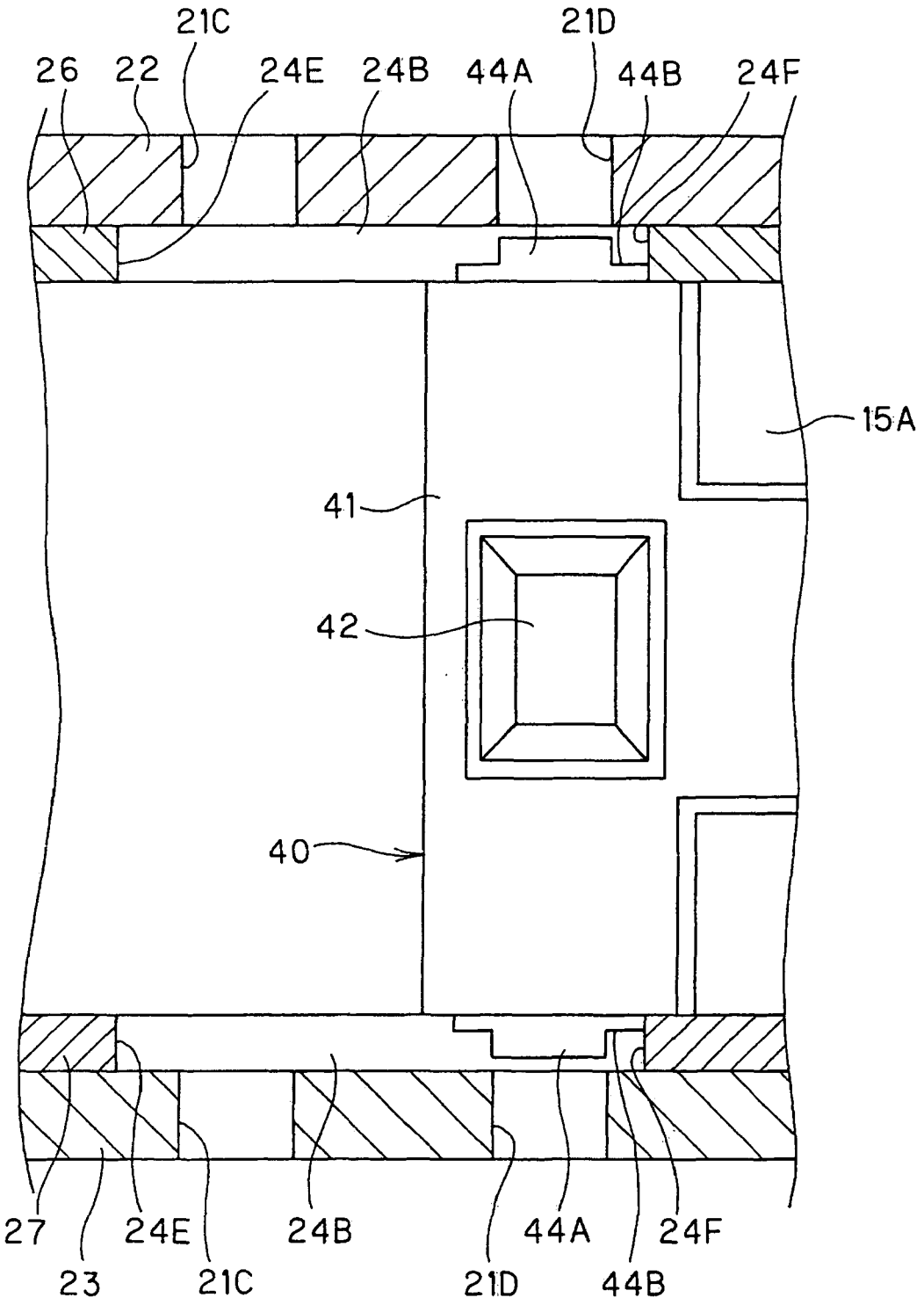
44A
21C
24B
21D
24F

FIG.14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24E
24B
44A
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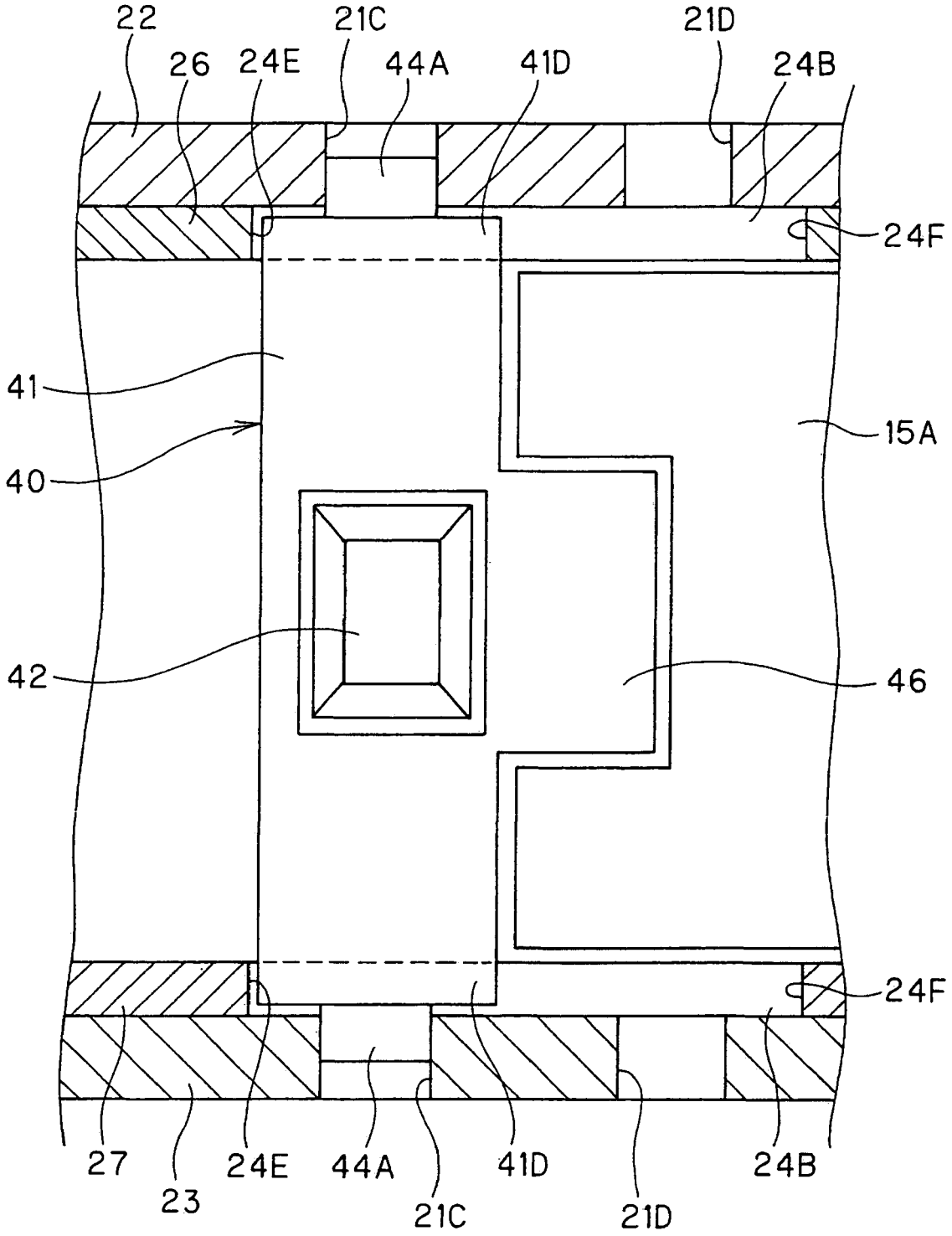
24B
44A
24F
23
21C
21D
44B

FIG.15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21D
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24E
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41D
24B
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24F
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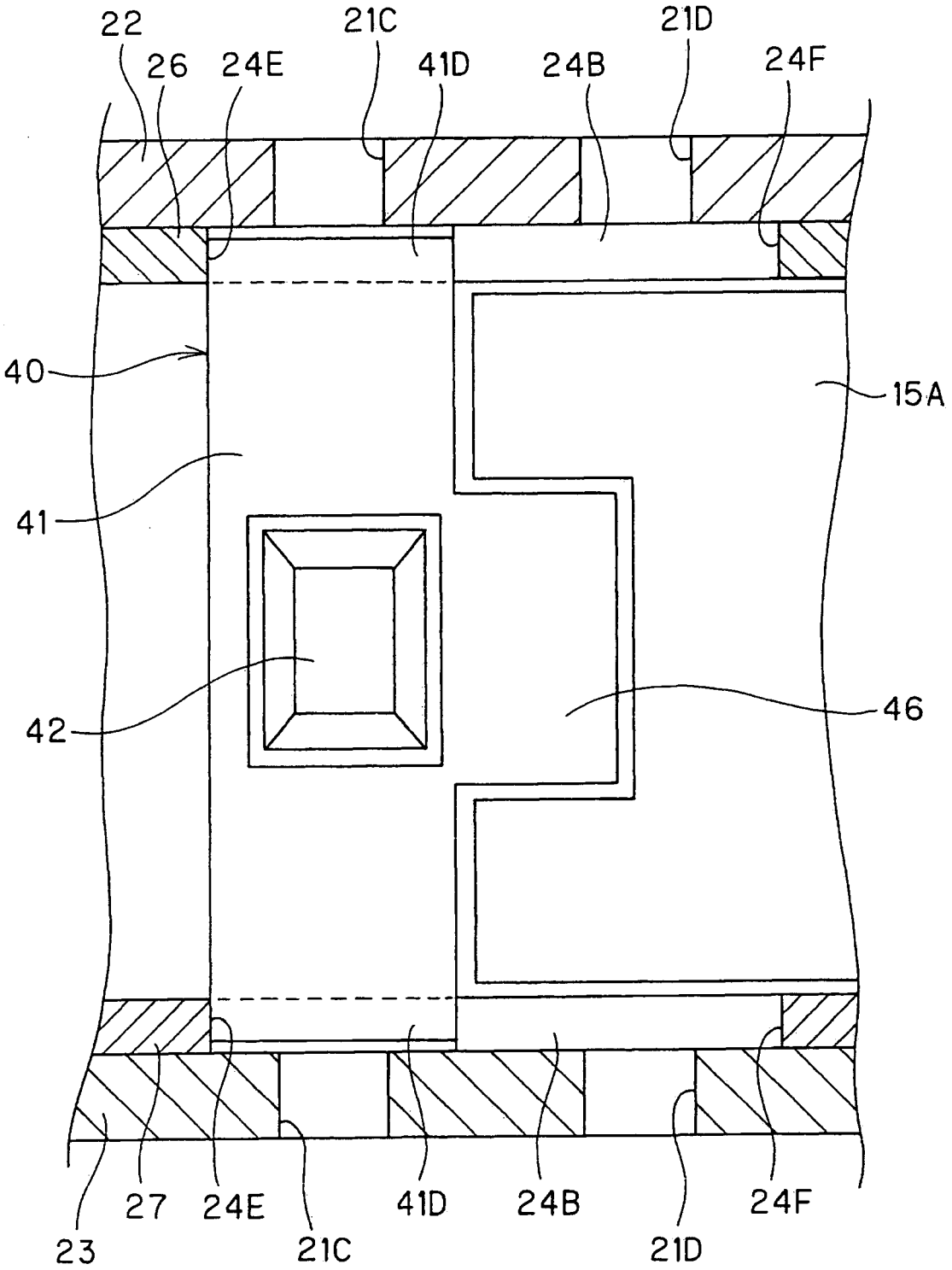
44A
21C
41D
21D
24B

FIG.16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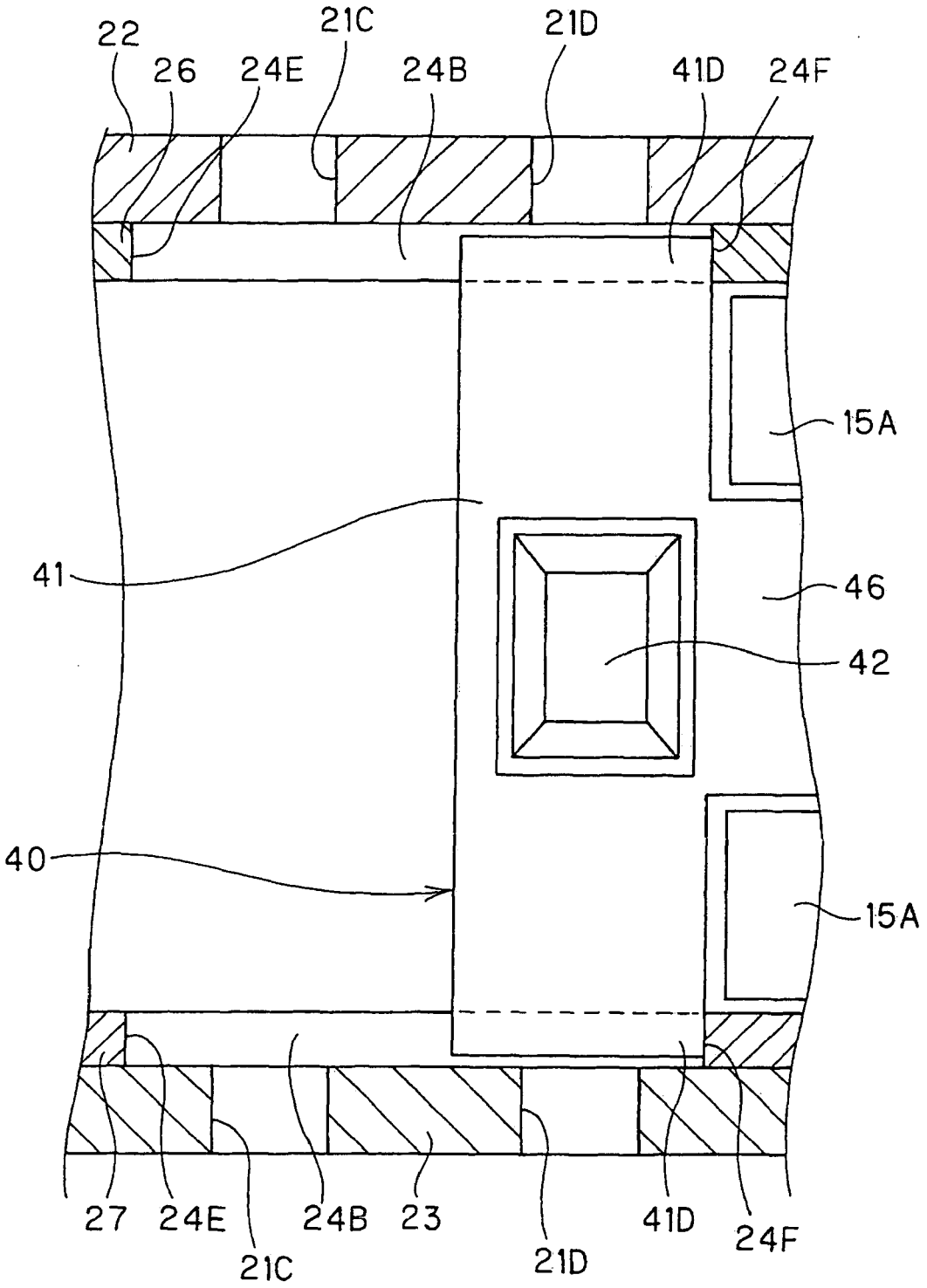
21D
24F

FIG.17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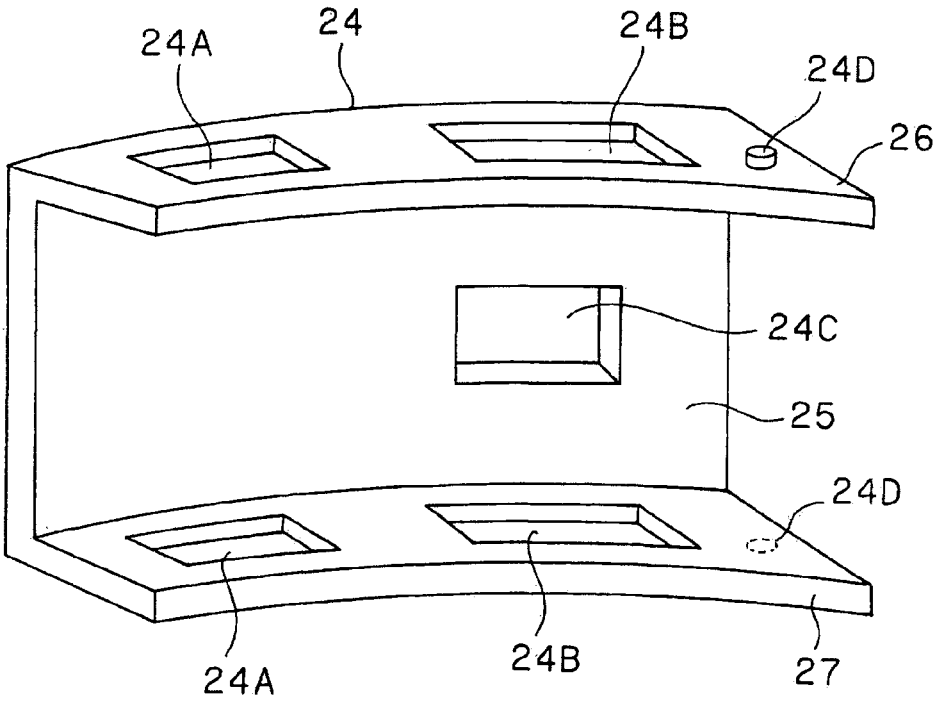
41D
24F

FIG.18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24C
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24D
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24B
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FIG.19

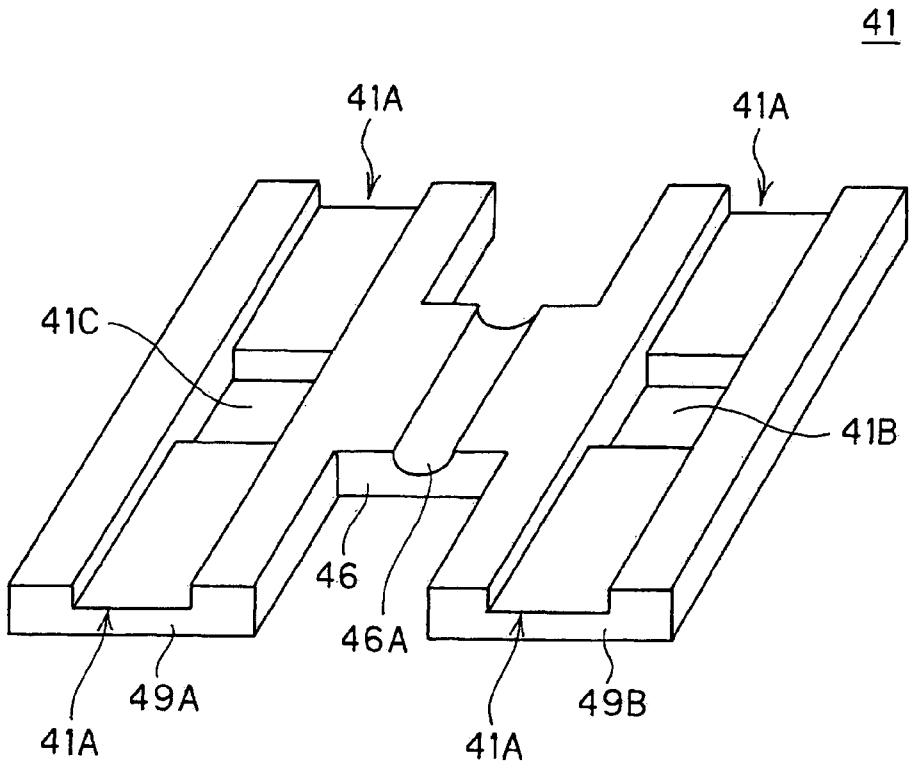
41
41A
41A
41C
41B
46
46A
49A
49B
41A
41A

FIG.20

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- JP 2005270248 A **[0004]**