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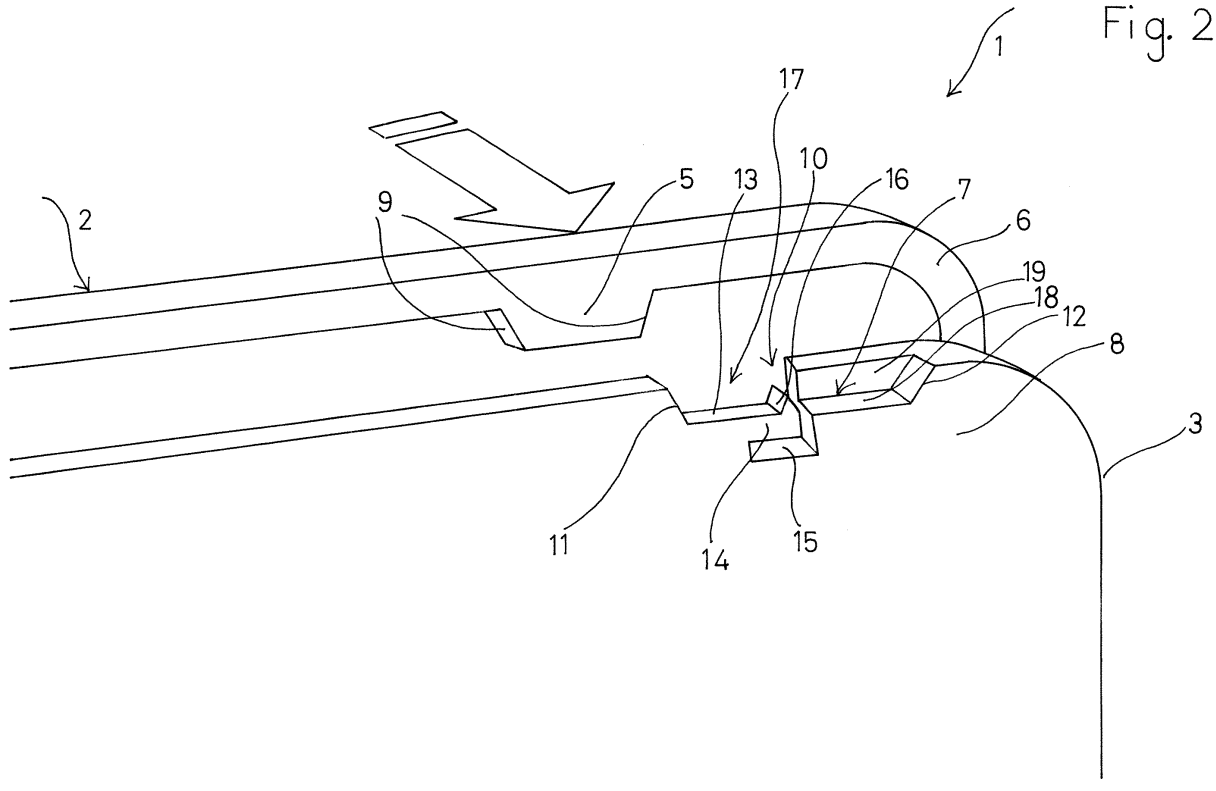
(54) Device for fast-fit assembly of a sanitary fixture control plate to a supporting frame

(57) A device (1), for assembling a sanitary fixture control plate (2) to a supporting frame (3), has at least one tooth (5) and a seat (7) cooperating with each other and carried by the plate (2) and the frame (3) respectively, or vice versa; and a flexible member (13) associated with the seat (7) and cooperating with the tooth (5). The flexible member (13) is aligned with the seat (7) in a direction parallel to the plate (2) and in a predetermined slide direction (A), and the portion of the flexible member close to the seat (7) in the slide direction (A) has a projection (16). When assembling the plate (2) to the frame (3), the tooth (5) cooperates with the flexible member (13) in the slide direction (A) to engage he seat (7).

Fig. 2



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Description

[0001] The present invention relates to a device for fast-fit assembly of a sanitary fixture control plate to a supporting frame.

[0002] As is known, in recessed sanitary fixture flush tanks, the flush control devices are installed in the wall; the drain valve actuating members are fitted through an inspection opening in the wall; and the inspection opening is closed by a plate (on which the user control buttons are mounted) connected to a frame, fixed to the wall, by an assembly device enabling removal of the plate for access to the actuating members when necessary.

[0003] Known assembly devices employ joint or click-on systems, in which the plate, e.g. by means of flexible tabs, is attached to the edge of the frame by exerting pressure substantially perpendicularly to the plate. Though widely used, such systems are not without drawbacks. In fact, they are awkward to use, especially when detaching the plate from the frame, which calls for the use of tools to lever the plate off the wall, and which may seriously damage the outside of the plate where the damage is most visible.

[0004] It is an object of the present invention to provide a device for assembling a sanitary fixture control plate to a supporting frame, designed to provide a straightforward, low-cost solution to the drawbacks of known solutions, and which, in particular, is extremely easy to produce, assemble, and disassemble, while at the same time being highly efficient and reliable.

[0005] According to the present invention, there is provided a device for fast-fit assembly of a sanitary fixture control plate to a supporting frame, comprising at least one tooth and a seat cooperating with each other to secure the plate to the frame, and carried by the plate and the frame respectively, or vice versa; and a flexible member associated with the seat and cooperating with the tooth; the device being characterized in that the tooth engages the seat, in opposition to the flexible member, by sliding in a predetermined slide direction substantially parallel to the plate.

[0006] The above design enables the plate to be fitted to and detached from the frame extremely easily. At the same time, the assembly device according to the invention is cheap to produce and assemble, and, above all, highly efficient and reliable.

[0007] A non-limiting embodiment of the present invention will be described by way of example with reference to the accompanying drawings, in which:

Figure 1 shows a schematic view in perspective of a device, in accordance with the invention, for assembling a sanitary fixture control plate to a supporting frame;

Figures 2, 3 and 4 show schematic, larger-scale views of a detail of the Figure 1 device at different assembly stages.

[0008] Number 1 in Figure 1 indicates as a whole a device for assembling a sanitary fixture control plate 2 to a supporting frame 3. In the example shown, plate 2 is a dual-flush-button control plate of a recessed lavatory flush tank, and frame 3 is fixed in known manner to a wall, about an inspection opening through which, as is known, the flush tank drain valve actuating members 4 - pneumatic in the example shown - are fitted.

[0009] Plate 2 is generally flat, substantially quadrangular, and has a number of teeth 5 (four shown in the drawing, purely by way of a non-limiting example) which project from a radially outer peripheral edge 6 to engage respective seats 7 formed in a peripheral border 8 of frame 3. The preferred embodiment in Figure 1 has two pairs of teeth 5 carried respectively by two opposite, e.g. top and bottom, sides of plate 2. It is understood, however, that one pair of teeth 5 may be provided on only one side of plate 2, the opposite side having conventional fasteners.

[0010] With particular reference to Figure 2, each tooth 5 projects perpendicularly from edge 6 of plate 2, is substantially trapezoidal, and is bounded by two sloping, converging sides 9.

[0011] Frame 3 lies substantially in a plane parallel to plate 2, and is inserted inside edge 6 of plate 2.

[0012] The border 8 of frame 3 has a recess 10 at each tooth 5 on plate 2 (and, therefore, has four recesses 10 in the example shown).

[0013] Each recess 10 extends parallel to plate 2 and to frame 3 in a predetermined direction A, and is bounded in direction A by two sloping, converging end walls 11, 12.

[0014] A flexible member 13, aligned with a respective seat 7, projects in direction A from wall 11 of each recess 10.

[0015] Each flexible member 13 is defined by a substantially prismatic blade 14, which projects inside recess 10 and is separated from border 8 by an underside recess 15 which, together with the intrinsic flexibility of the material of which blade 14 is made, allows flexible member 13 to flex substantially perpendicularly to direction A. The portion close to seat 7, i.e. the free end, of each flexible member 13 comprises a transverse projection 16 bounded by two converging sides.

[0016] Wall 11, projection 16, and blade 14 define a cavity 17 of the same shape as a tooth 5; and, similarly, wall 12, projection 16, and a portion 18 of border 8 define a seat 7 of the same shape as a tooth 5. Each seat 7 is also bounded, substantially perpendicularly to direction A, by a front wall 19 facing plate 2.

[0017] At the installation stage, once frame 3 is fixed in known manner to the wall, about the inspection opening, the fitter assembles plate 2 to frame 3 by aligning teeth 5 with respective cavities 17 in a direction substantially perpendicular to plate 2, so that each tooth 5 rests on the respective flexible member 13, as shown in Figure 3. Each tooth 5 thus assumes a preassembly position (Figure 3) in which tooth 5 is outside seat 7 and aligned with seat 7 in direction A.

[0018] Plate 2 is then locked to frame 3 by pushing plate 2 in direction A (rightwards in Figure 3). Each tooth 5 passes over projection 16, by virtue of both the thrust exerted by the fitter in direction A and the flexibility of flexible member 13, and is accompanied by a clearly audible "click" on reaching seat 7.

[0019] With reference to Figure 4, once past projection 16, each tooth 5 reaches seat 7, by which it is locked firmly and effectively by the combination of projection 16, wall 12, and front wall 19. Tooth 5, in fact, rests against wall 12, projection 16 prevents tooth 5 from moving in direction A (leftwards in Figures 3 and 4), and front wall 19 rests against tooth 5 in a direction substantially perpendicular to direction A.

[0020] Tooth 5 thus assumes a lock position (Figure 4), in which tooth 5 engages seat 7, and is retained inside seat 7 in a direction perpendicular to direction A.

[0021] Tooth 5 moves between the preassembly position and the lock position, in opposition to flexible member 13, by sliding parallel to plate 2 and, in particular, in direction A, which thus defines a slide direction of tooth 5; and flexible member 13 is flexible substantially crosswise to direction A to allow tooth 5 to slide between the preassembly position and the lock position.

[0022] Plate 2 is removed by simply performing the assembly operations in reverse. That is, by pushing plate 2 in direction A (leftwards in Figure 4) to release tooth 5 from seat 7 and get past projection 16, and then lifting plate 2 substantially perpendicularly to direction A and away from the wall.

[0023] Clearly, changes may be made to the device as described herein without, however, departing from the scope of the accompanying Claims.

Claims

1. A device (1) for fast-fit assembly of a sanitary fixture control plate (2) to a supporting frame (3), comprising at least one tooth (5) and a seat (7) cooperating with each other to secure the plate to the frame, and carried by the plate (2) and the frame (3) respectively, or vice versa; and a flexible member (13) associated with the seat (7) and cooperating with the tooth (5); the device (1) being **characterized in that** the tooth (5) engages the seat (7), in opposition to the flexible member (13), by sliding in a predetermined slide direction (A) substantially parallel to the plate (2).

2. A device as claimed in Claim 1, **characterized in that** the tooth (5) moves between a preassembly position, in which the tooth (5) is outside the seat (7), and a lock position, in which the tooth (5) engages the seat (7) and is retained inside the seat (7); the tooth (5) moving between the preassembly position and the lock position, in opposition to the flexible member (13), by sliding in said slide direction (A).

3. A device as claimed in Claim 2, **characterized in that** the flexible member (13) is flexible substantially crosswise to said slide direction (A) to allow the tooth (5) to slide between the preassembly position and the lock position.

4. A device as claimed in Claim 2 or 3, **characterized in that**, in the preassembly position, the tooth (5) is outside the seat (7) and aligned with the seat (7) in said slide direction (A).

5. A device as claimed in one of Claims 2 to 4, **characterized in that**, in the lock position, the tooth (5) is retained inside the seat (7) in a direction perpendicular to said slide direction (A).

6. A device as claimed in one of the foregoing Claims, **characterized in that** the flexible member (13) is aligned with the seat (7) in said slide direction (A).

7. A device as claimed in Claim 6, **characterized in that** the portion of the flexible member (13) close to the seat (7) comprises a projection (16).

8. A device as claimed in one of the foregoing Claims, **characterized in that** the flexible member (13) is associated with an underside recess (15), so as to flex substantially perpendicularly to said slide direction (A).

9. A device as claimed in one of the foregoing Claims, **characterized in that** the seat (7) comprises a front wall (19) cooperating with the tooth (5) substantially perpendicularly to said slide direction (A) when the tooth (5) engages the seat (7).

10. A device as claimed in one of the foregoing Claims, **characterized in that** the seat (7) comprises a wall (12) cooperating with the tooth (5) in said slide direction (A) when the tooth (5) engages the seat (7).

11. A device as claimed in one of the foregoing Claims, **characterized in that** the flexible member (13) defines a cavity (17) aligned with the seat (7) in said predetermined direction (A); the tooth (5) being inserted into said cavity (17) in a direction substantially perpendicular to the predetermined direction (A), and then translated into said seat (7) in said slide direction (A).

12. A device as claimed in one of the foregoing Claims, **characterized in that** the tooth (5) is carried by an edge (6) of the plate (2), and the seat (7) and the flexible member (13) are carried by the frame (3).

13. A device as claimed in one of the foregoing Claims, **characterized by** comprising two teeth (5) located along the same edge of the plate (2).

14. A device as claimed in one of the foregoing Claims, **characterized by** comprising two pairs of teeth (5) carried respectively by two opposite sides of the plate (2).

Fig. 1

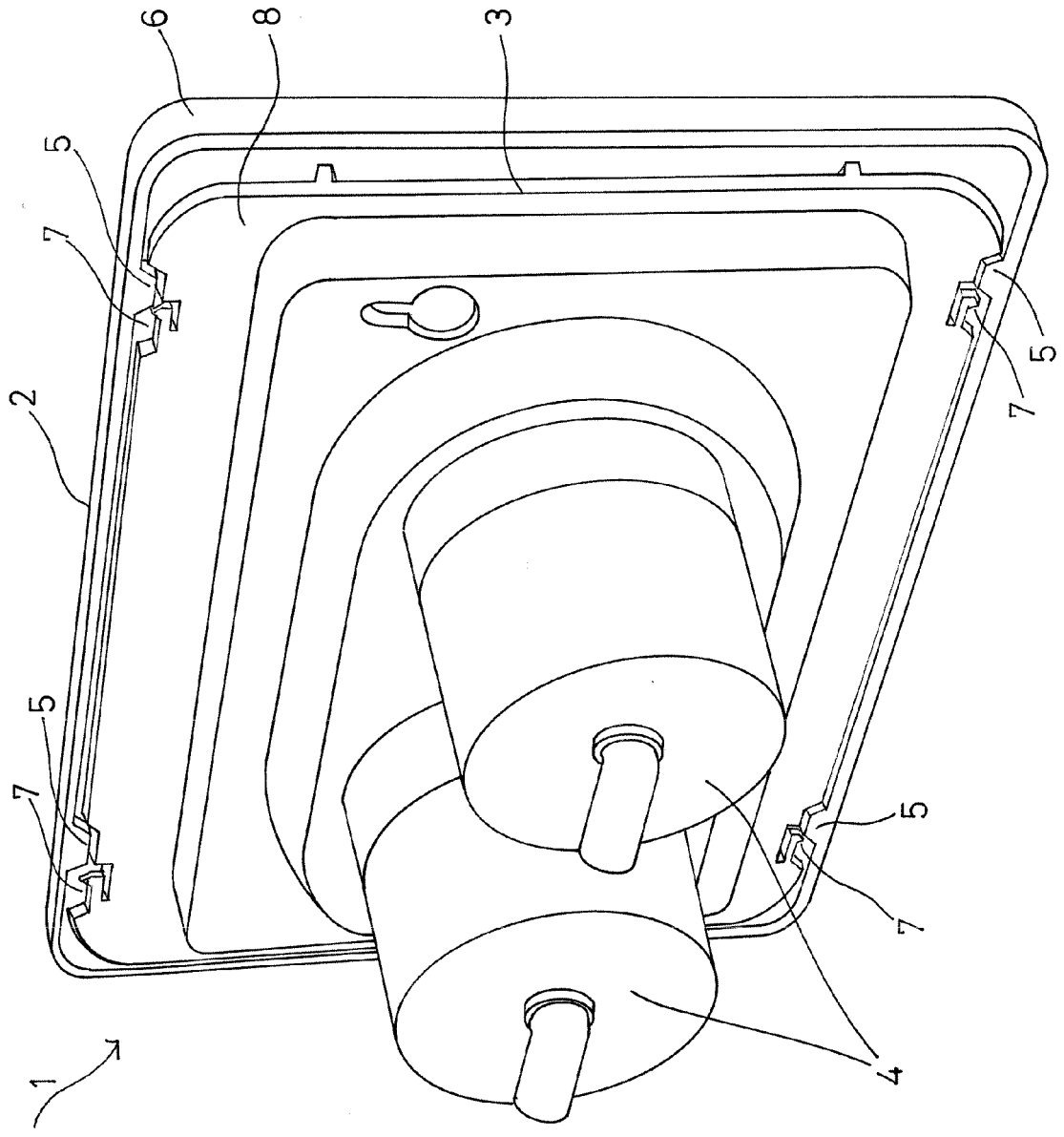

Fig. 2

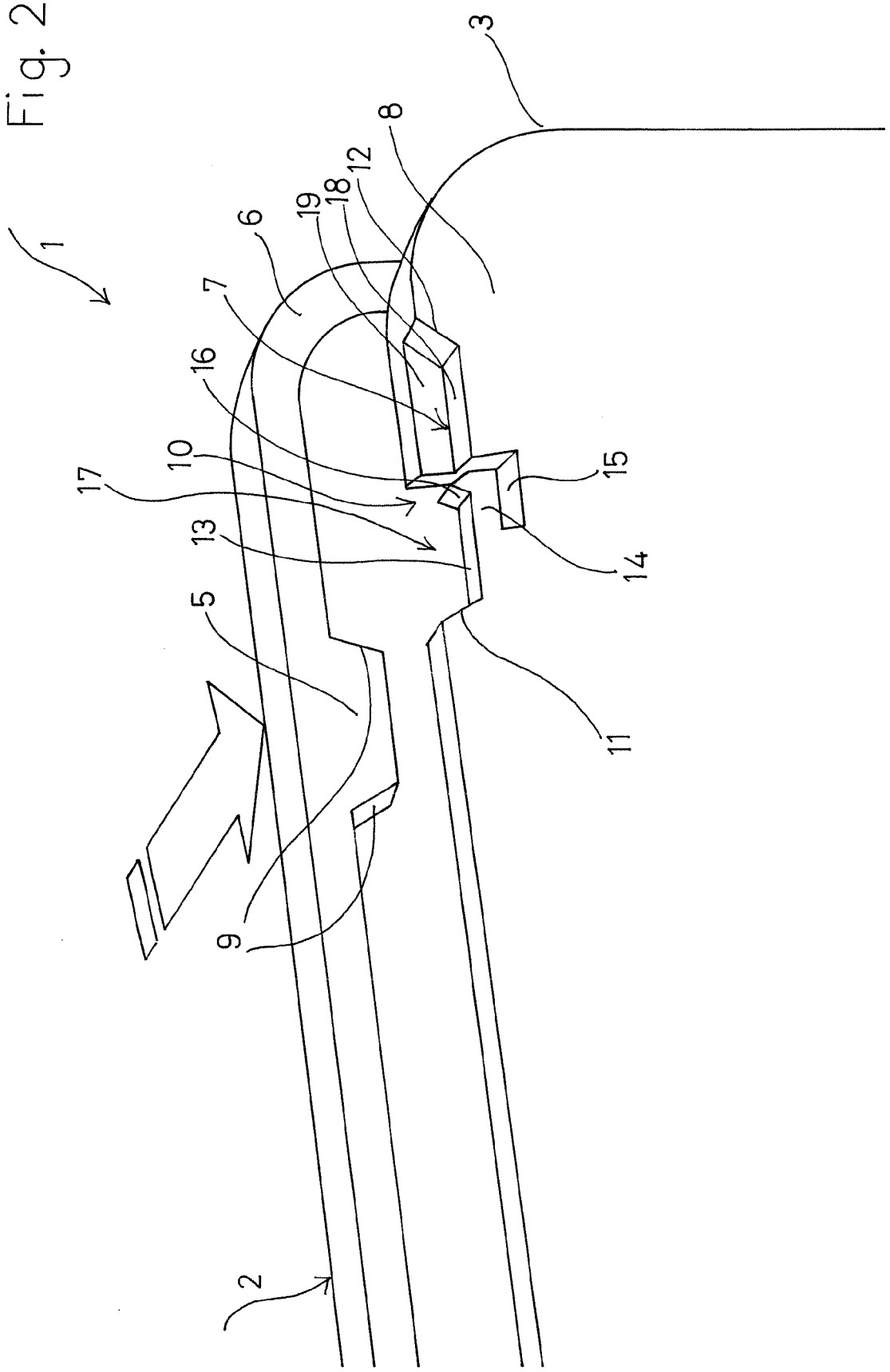

Fig. 3

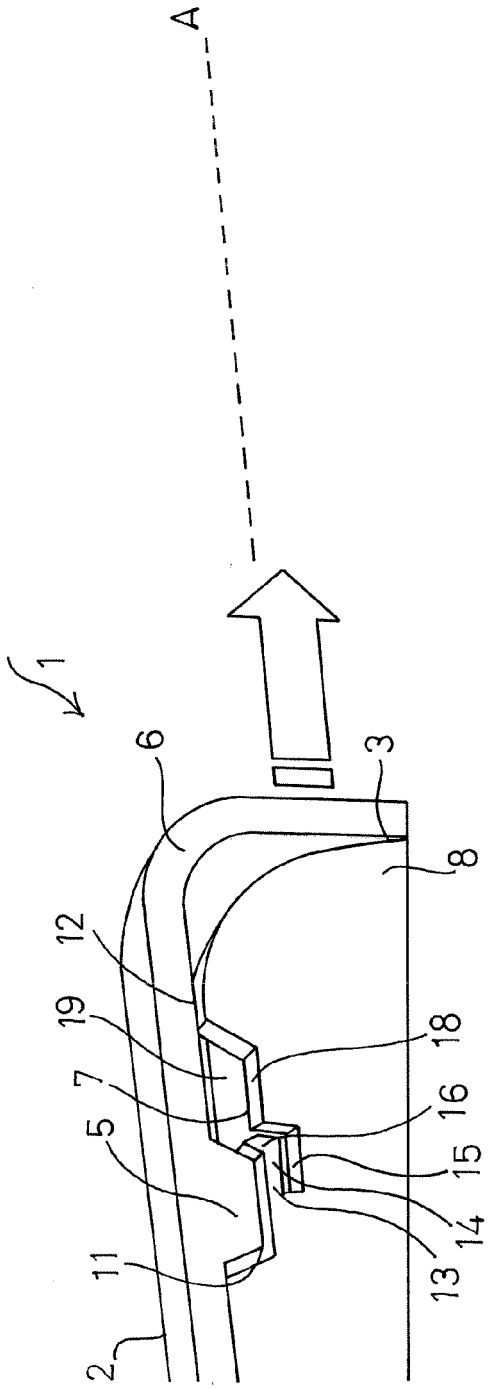

Fig. 4