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(54) **Plastic lock for refrigeration or freezer appliances**

(57) A lock (1) for refrigeration or freezer appliances, in particular horizontal freezers, comprising a cylinder (8) rotating within a corresponding seat or hole (5), said cylinder (8) being rotated by a key (9) engaged in a passageway (19) formed in the cylinder (8), said rotation operating a locking device (12), said cylinder (8) presenting, elastically constrained thereto, a rocker element (15)

which can assume two positions, namely a first rest position, in which the element (15) is torsionally engaged with said hole (5) by a form constraint and in which rotation of the cylinder (8) is prevented, and a second position, with the key (9) completely inserted into said passageway (10), in which said element is torsionally disengaged from said hole (5), so that rotating the cylinder (8) releases or locks the locking device (12).

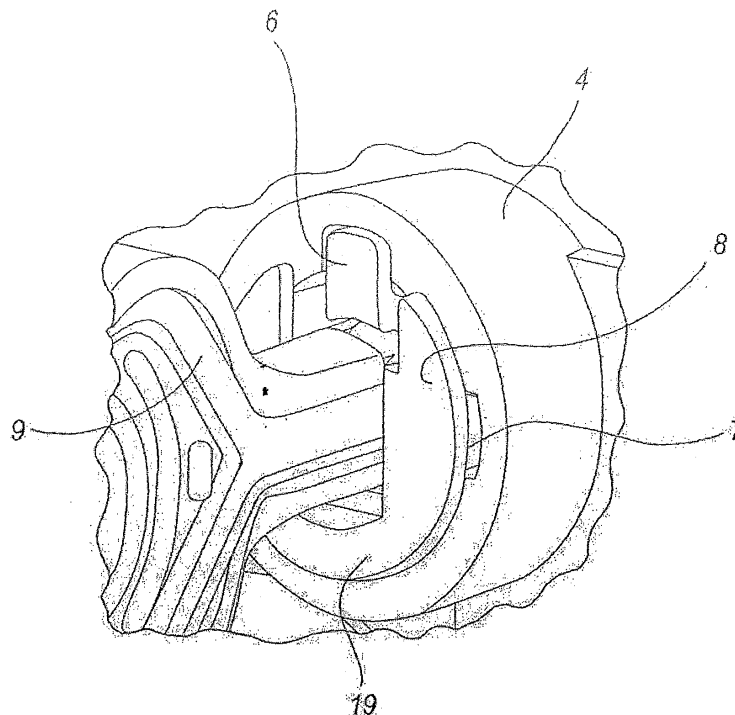


FIG. 7

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Description

[0001] The present invention relates to a mainly plastic lock for refrigeration appliances in accordance with the introduction to the main claim. It relates in particular to a lock for horizontal freezers.

[0002] Conventional vertical freezers present locks enabling the lid to be opened by a person possessing the relative key.

[0003] The locks currently installed on such freezers are of the cylinder type and substantially of metal construction.

[0004] These locks have the drawback of being fairly costly, they present oxidation problems which can result in malfunction, and are also bulky and heavy.

[0005] To overcome these technical problems, plastic locks have been used in certain applications, such as computer disk containers, compact disk containers or liquid soap containers.

[0006] However these locks present safety problems, given that they can be easily tampered with and are generally operable by any object having a profile similar to the lock recess.

[0007] An object of the present invention is to provide a lock mainly of plastic construction for use with horizontal freezers, as an alternative to those of the known art.

[0008] A further object of the present invention is to provide a lock for horizontal freezers which is able to withstand at least a "banal" break-in attempt. These and further objects which will be apparent to the expert of the art are attained by a lock in accordance with the technical teachings of the accompanying claims.

[0009] Further characteristics and advantages of the invention will be apparent from the description of one embodiment of the invention, illustrated by way of non-limiting example in the accompanying drawings, in which:

Figure 1 is a perspective view of a lock for horizontal freezers;

Figure 2 is a perspective view of the lock taken from a different angle;

Figure 3 is an exploded perspective view of the lock seen from above;

Figure 4 is a section through the lock, showing its operation, with the key partly inserted into the lock;

Figure 5 is a perspective view of the key and of the lock on which it acts;

Figure 6 is a section through the lock, with the key totally inserted therein; and

Figure 7 is an enlarged front perspective view of part of the lock of Figure 1 during use.

[0010] Said figures show a horizontal freezer lock indicated overall by 1.

[0011] It comprises a support 2 which can be fixed to the lid of a conventional horizontal freezer by holes 3.

[0012] Integral with the support 2 there is a projection

4 provided with a cylindrical through hole 5. The hole 5 presents a first groove 6 and a second groove 7 which are disposed axially along the inner surface 5a of the hole 5 and extend radially from the hole 5. Said grooves 6, 7 are spaced apart by 90° on a circumferential arc having the hole 5 as centre. Housed in the hole 5 there is a cylinder 8, well visible in Figure 5. It presents a surface in the form of a cylindrical sector 8a, which when the cylinder 8 is rotating slides along an inner surface 5a of the hole 5. Centrally, from a closed end 8b of the cylinder there extends a portion 10 of square cross-section, from which a U-shaped portion 11 extends. The portion 10 of square cross-section is intended to receive an aperture 12a of similar shape, provided in a hook-shaped element or hook 12. The aperture 12a and portion 10 of square cross-section render the cylinder 8 and hook 12 torsionally rigid.

[0013] As can be seen in the figures, the cylinder 8 is inserted into the hole 5, its collar or flange 8c abutting against the projection 4. The cylinder 8 is axially secured to the hook element 12 by a fixing washer 13. This fixing method axially blocks the cylinder 8 within the hole 5.

[0014] In use, the hook 12 cooperates conventionally with a pin (not shown) to lock the freezer lid.

[0015] The interior of the cylinder 8 presents a passageway 19 which opens in a side thereof of substantially square cross-section (see Figure 3), through which the key 9 is inserted, the use of which is clarified hereinafter.

[0016] From the cylindrical sector surface 8a of the cylinder 8 there branch two elastic appendices 16 supporting a rocker element 15. The torsionally elastic appendices 16 maintain the rocker element 15 in a rest position visible in Figure 4, i.e. with a tooth 18 projecting therefrom engaged in the groove 6. With the rocker element 15 in its rest position, the cylinder 8 is therefore unable to rotate within the hole 5, as it is torsionally engaged with the hole 5 by the form constraint provided by the tooth 18 and the grooves 6, 7.

[0017] Facing the passageway 19, the rocker element 15 presents a shaped profile 20 which by cooperating with a corresponding shaped profile 21 of the key 9 (comprising shoulders 21A defining a recess 21 B into which the profile 20 penetrates), centres the rocker element relative to the key 9 when this latter is inserted into the passageway 19.

[0018] The insertion of the key 9 into the passageway 19 does not change the position of the rocker element 15 until the key 9 is inserted completely into the passageway 19, i.e. substantially until the position of the key 9 is that shown in Figure 4 and in Figure 5.

[0019] As can be seen, the key 9 presents, in addition to the profile 21 corresponding to the profile 20 of the rocker element, a seat 23 enabling the rocker element 15 to move towards the key and substantially to receive it with the tooth 18 disengaged from the groove 6, 7.

[0020] In this respect, when the key 9 has been completely inserted into the passageway 19, a protuberance 24 of the rocker element 15 contacts its profile 21, move-

ment of the key 9 in the direction of the arrow F of Figure 6 causing the rocker element 15 to rotate in the direction of the arrows G about the elastic appendices 16.

[0021] Hence with the key 9 abutting against a stop 25, the tooth 18 of the rocker element 15 is disengaged and free from the groove 6, and the key 9 (and consequently the cylinder 8) can be rotated to enable the hook 12 to be freed from the pin (not shown) and the lid to be opened.

[0022] With the tooth 15 disengaged from the second groove 7, and hence with the key 9 extracted from the passageway 19, the hook 12 is horizontal and the lid hence unlocked.

[0023] To complete the description it should be noted that the cylinder 8, the hole and all illustrated devices are covered by a plastic masking element 50 (Figure 3).

[0024] Advantageously the key 9, cylinder 8, support 2, fixing washer 13 and hook 12 are made of ABS.

[0025] A preferred embodiment has been illustrated, however others can be conceived using the same inventive concept.

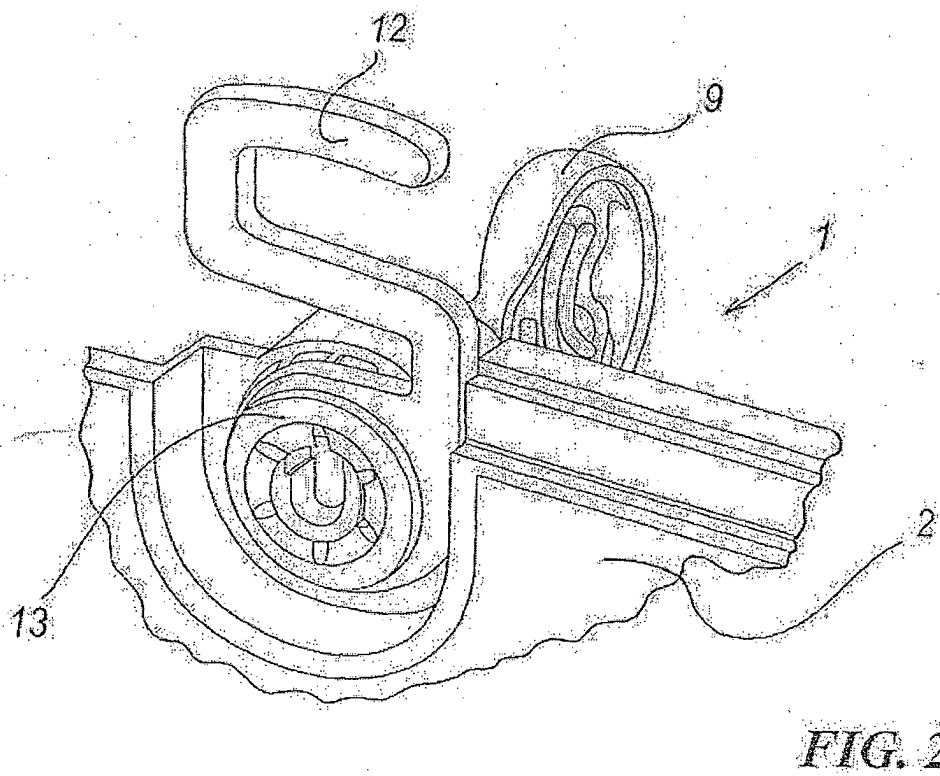
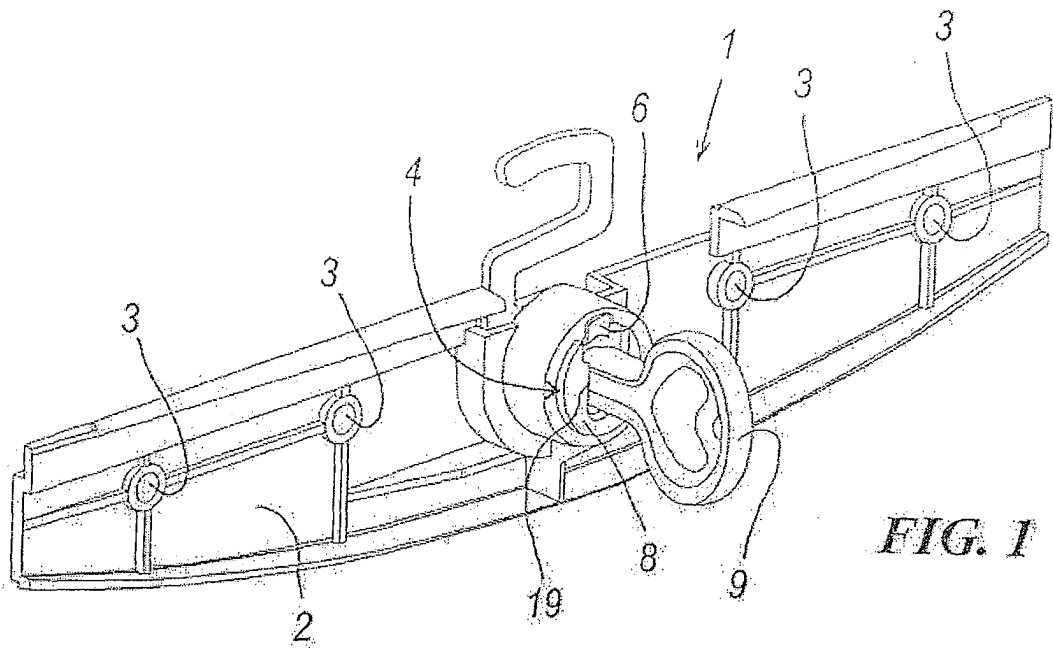
[0026] For example, the tooth 18 can be provide integral with the hole 5, while the groove 6, 7 can be provided in the rocker element 15.

Claims

1. A lock (1) for refrigeration or freezer appliances, in particular horizontal freezers, comprising a cylinder (8) rotating within a corresponding seat or hole (5), said cylinder (8) being rotated by a key (9) engaged in a passageway (19) formed in the cylinder (8), said rotation operating a locking device (12), **characterised in that** said cylinder (8) presents, elastically constrained thereto, a rocker element (15) which can assume two positions, namely a first rest position, in which the element (15) is torsionally engaged with said hole (5) by a form constraint and in which rotation of the cylinder (8) is prevented, and a second position, with the key (9) completely inserted into said passageway (10), in which said element is torsionally disengaged from said hole (5), so that rotating the cylinder (8) releases or locks the locking device (12).
2. A lock as claimed in claim 1, wherein said form constraint is provided by a tooth (18) engaging in a groove (6, 7).
3. A lock as claimed in claim 2, **characterised in that** said tooth (18) is provided on said rocker element (16), said groove (6, 7) being provided in the inner surface (5a) of said hole (5).
4. A lock as claimed in claim 1, **characterised in that** said locking device is a hook (12) torsionally rigid with said cylinder (8), said hook (12) cooperating with

a pin to lock said appliance.

5. A lock as claimed in claim 4, **characterised in that** said hook (12) presents an aperture (12a), said aperture being torsionally engaged on a portion (8b) of the cylinder (8).
6. A lock as claimed in claim 1, **characterised in that** said cylinder (8) is axially fixed into said hole (5) by a washer (13) and a collar (8c) of the cylinder (8), said washer (13) simultaneously blocking said hook (12).
7. A lock as claimed in claim 1, **characterised in that** said rocker element (15) is suspended from and secured to a pair of torsionally elastic appendices (16) projecting from said cylinder (8).
8. A lock as claimed in claim 1, **characterised in that** said rocker element (15) presents a profile (20) of shape corresponding to that (21) of said key (9), said profiles (20, 21) mutually centering the key (9) and rocker element (15) when the key (9) is inserted into the passageway (19).
9. A lock as claimed in claim 1, **characterised in that** said key (9) presents a seat (23) to receive the rocker element (15) when said rocker element (15) is in its second working position, disengaged from said groove (6, 7).
10. A lock as claimed in claim 1, **characterised in that** said rocker element (15) presents at least one protuberance (24) able to slide relatively on the profile (21) of said key (9), with the key totally inserted into the passageway (19) said protuberance (24) raising the rocker element (15) and moving it into said second position, in which said form constraint is inoperative.
11. A lock as claimed in claim 1, **characterised in that** said passageway (19) presents a travel stop (25) for said key (9).
12. A lock as claimed in claim 1, **characterised in that** said cylinder (8) and said key (9) are of plastic construction.



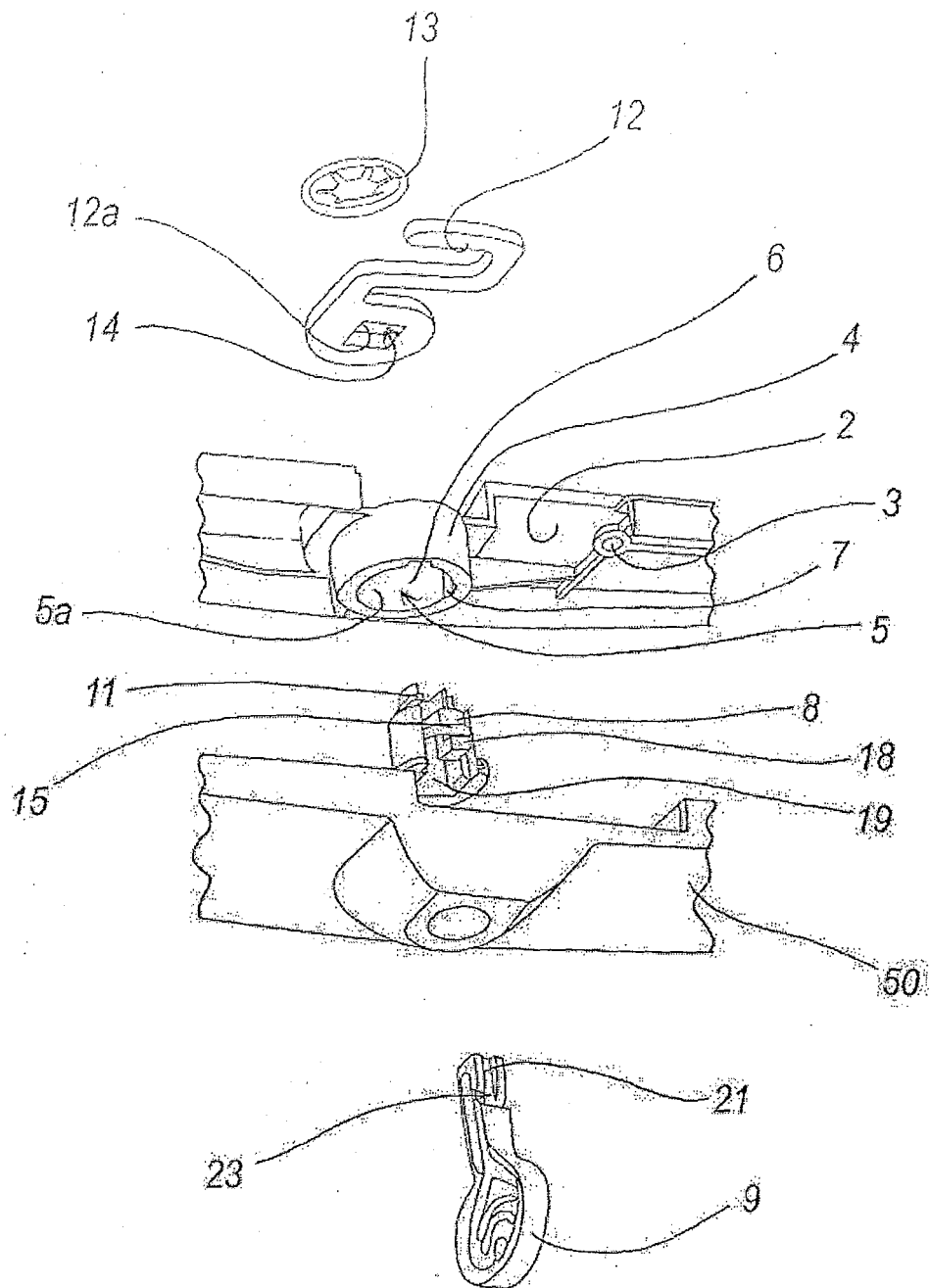


FIG. 3

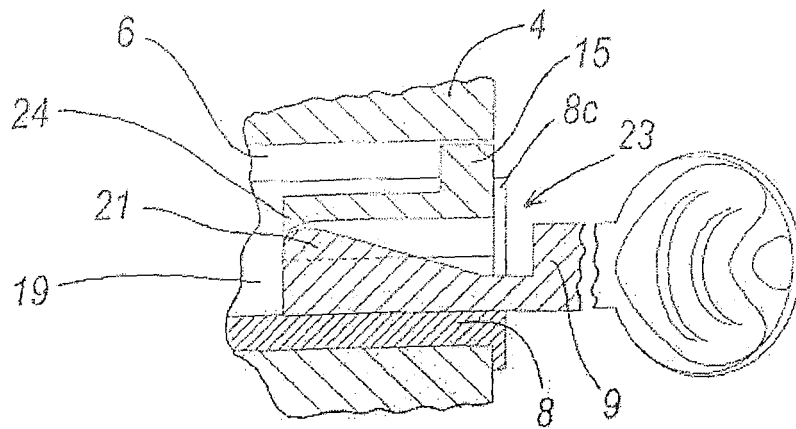


FIG. 4

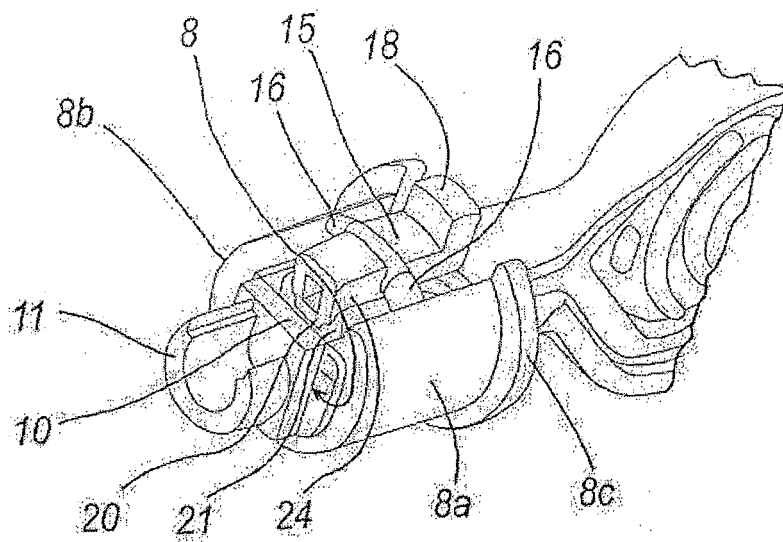


FIG. 5

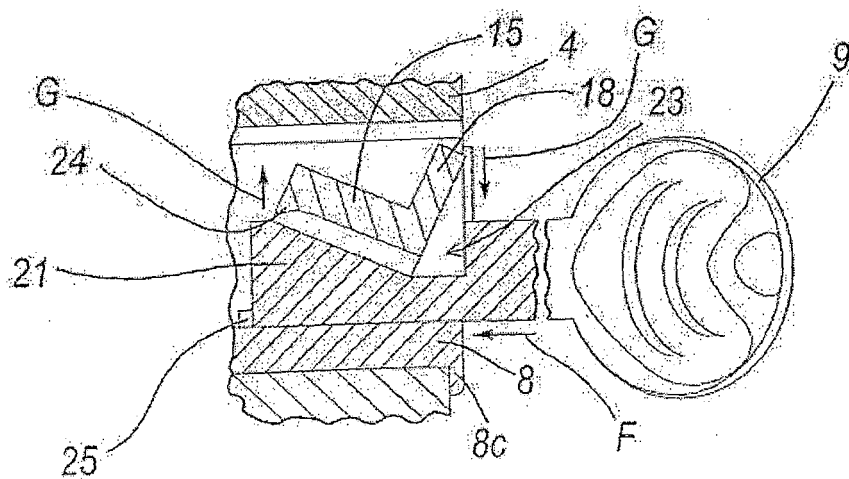


FIG. 6

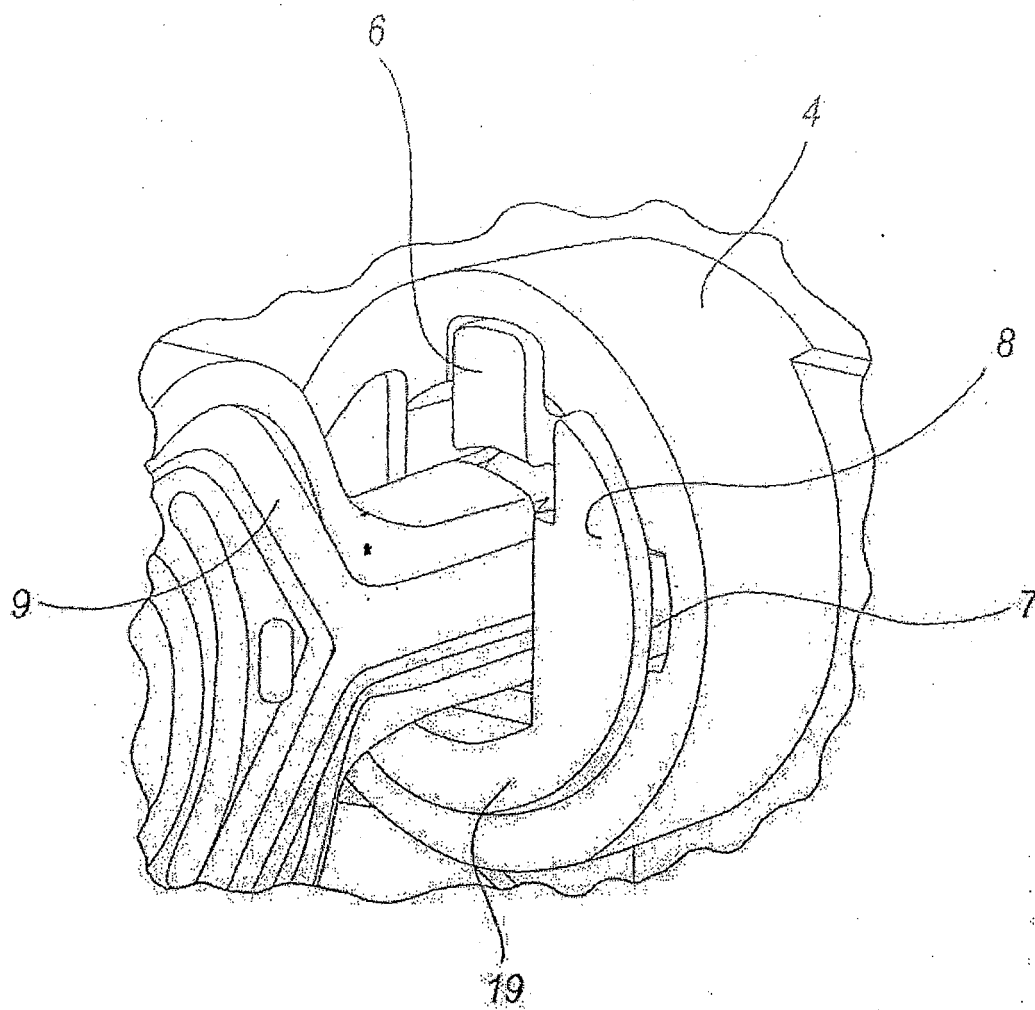


FIG. 7