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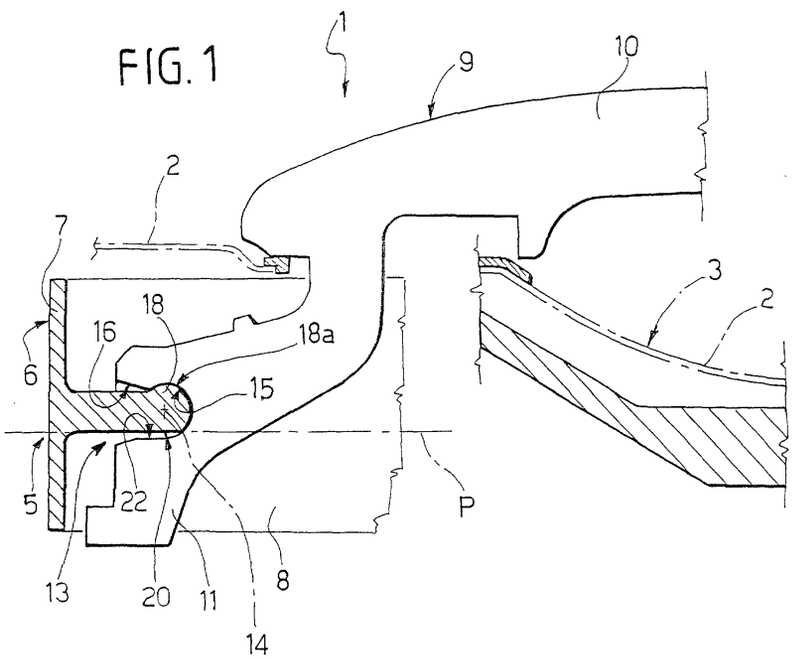
(54) Vehicle door handle

(57) A handle (1) for a vehicle door (3), comprising a frame (5) fittable to the door (3); a control lever (9) which is gripped by a user; and hinge means (13) for hinging the lever (9) to the frame (5) to permit rotation of the lever with respect to the frame; characterized in that the hinge means (13) comprise at least one cylindrical seat (15) coaxial with a fixed hinge axis (14) and carried by one of said frame (5) and said lever (9); and at least one substantially cylindrical first head (18) carried by the other of the frame and the lever; the first head (18) being defined laterally by a lateral surface complementary to at least one portion of the surface defining said seat (15) and coaxial with the axis (14) to engage the seat (15) in rotary manner; and elastic forcing means (26) being provided to maintain mutual contact of the surfaces regardless of the position of the lever (9) with respect to the frame (5), and being deformable to permit withdrawal of the first head (18) from the seat (15).

FIG. 1



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Description

[0001] The present invention relates to a vehicle door handle.

[0002] Vehicle doors in general, and motor vehicle doors in particular, are opened by means of a handle, wherein an elongated frame is fitted inside the door and supports an operating lever. The lever normally has a control end portion connected, in use, to the respective lock, and an opposite end portion connected to the frame to rotate, with respect to the frame, between an extracted lock-release position and a withdrawn rest position.

[0003] The hinge of known handles of the above type must allow the operating lever to rotate with respect to the frame, and also permit connection of the lever to the frame when the frame is fitted inside the door. For which reason, the frame of known handles normally has a fixed hinge pin parallel to the hinge axis; and the lever terminates in a fork, the arms of which extend substantially perpendicularly to the pin to define an extension of the lever, and house the pin in between. The pin is retained between the arms by one or more portions of the lever, which, when the lever is connected to the frame, face respective shoulders or contact surfaces on the frame at all times.

[0004] Though widely used, known handles of the above type are unsatisfactory, mainly on account of the way in which the handle is hinged to the frame failing to ensure pure rotation of the lever about a fixed hinge axis. That is, the slack always present between the pin and the fork, and the distance between the lever surfaces and the shoulders on the frame, allow the lever to translate freely in directions perpendicular to the pin, thus resulting, when rotating the lever, in annoying, undesired vibration and relative sliding of the lever and frame, which increase release resistance and, therefore, the force required of the user on the lever, and result in scoring and/or abrasion of the sliding surfaces, which, when visible, impair the appearance of the handle.

[0005] It is an object of the present invention to provide a handle designed to provide a straightforward, low-cost solution to the above problems.

[0006] According to the present invention, there is provided a handle for a vehicle door, the handle comprising a frame fittable to the door; a control lever which is gripped by a user; and hinge means for hinging said lever to said frame; characterized in that said hinge means comprise at least one cylindrical seat coaxial with a fixed hinge axis and carried by one of said frame and said lever; and at least one substantially cylindrical first head carried by the other of said frame and said lever; the first head being defined laterally by a lateral surface complementary to at least one portion of the surface defining said seat and coaxial with said axis to engage the seat in rotary manner; and elastic forcing means being provided to maintain mutual contact of said surfaces regardless of the position of the lever with respect to the frame, and being deformable to permit withdrawal of the first head from said seat.

[0007] In the handle defined above, said first head, said seat, and said elastic means preferably form part of a releasable click-on connecting device.

[0008] A non-limiting embodiment of the invention will be described by way of example with reference to the accompanying drawings, in which:

Figures 1 and 2 show two different sections, with parts removed for clarity, of a preferred embodiment of the handle according to the present invention;
Figure 3 shows a view in perspective, with parts removed for clarity, of an end portion of the Figure 1. and 2 handle.

[0009] Number 1 in the accompanying drawings indicates as a whole a handle fittable to a body 2 of a door 3 (shown partly) of a vehicle (not shown) to control a lock (not shown) on door 3.

[0010] Handle 1 comprises a frame 5 fittable inside door 3 and in turn comprising an end portion 6 having an end wall 7, and two facing lateral walls 8 extending from end wall 7.

[0011] The frame is fitted with a lock-control lever 9 comprising an elongated intermediate portion 10 which is gripped by the user; an end portion (not shown) connected to the lock; and an opposite end portion 11 hinged to portion 6 of frame 5 by a releasable click-on hinge device 13 to rotate about a fixed hinge axis 14 perpendicular to walls 8 and parallel to wall 7.

[0012] As shown in Figure 3 and particularly in Figures 1 and 2, hinge device 13 comprises an elongated cylindrical seat 15 coaxial with axis 14, formed in portion 11 of lever 9, and communicating with the outside through a flared, elongated inlet opening 16 facing end wall 7 and defining, together with cylindrical seat 15, an axial keyhole-shaped groove.

[0013] Seat 15 is engaged by two heads 18 and by a head 19, which are all substantially semicylindrical, form part of device 13, and are arranged side by side along axis 14. More specifically, heads 18 are lateral heads, extend on opposite axial sides of head 19 (Figure 3), and are defined laterally by respective identical cylindrical surfaces 18a, each complementary to a respective portion of the cylindrical surface defining seat 15, so as to engage seat 15 solely in rotary manner about axis 14. Heads 18 are each connected integrally to a respective lateral wall 8 and to end wall 7, are conveniently formed in one piece with frame 5, and have respective outer lateral milled portions 20 lying in a common plane P parallel to axis 14 and perpendicular to walls 7 and 8. As shown, particularly in Figure 1, plane P extends facing a flat surface 22 connecting cylindrical seat 15 to inlet opening 16 (Figures 1 and 3), and at such a distance from surface 22 that, when milled portions 20 are positioned contacting surface 22, heads 18 can be detached from seat 15 by simply withdrawing heads 18 in a direc-

tion substantially perpendicular to axis 14.

[0014] As shown in the accompanying drawings, head 19 is the same shape and size as heads 18, but rotated 180° with respect to heads 18 about an axis perpendicular to axis 14 and wall 7. More specifically, head 19 is defined laterally by a cylindrical surface 19a complementary to a respective portion of the cylindrical surface defining seat 15, so as to engage 15 solely in rotary manner about axis 14. Like heads 18, head 19 also has an outer lateral milled portion 24, which lies in a plane P1 parallel to and at a distance from plane P and on the diametrically opposite side of axis 14 to plane P, and extends facing a portion of seat 15 adjacent to opening 16 (Figure 2).

[0015] Head 19 is connected integrally to the end of an elastic arm 25, which projects from wall 7, perpendicularly to axis 14 and to wall 7, to define, together with head 19, an elastic device 26 for keeping heads 18 inside seat 15, and which is deformable elastically to permit withdrawal of heads 18 from seat 15. Arm 25, head 19, frame 5, and heads 18 conveniently define a one-piece body.

[0016] As of the condition in which heads 18 and 19 engage seat 15 in rotary and transversely fixed manner, lever 9 is disconnected from frame 5 as follows: to begin with, using portion 10, portion 11 of lever 9 is rotated and at the same time conveniently moved in a direction parallel to walls 7 and 8 to detach it from fixed heads 18; during this movement, the force exerted by head 19 on arm 25 gradually flexes arm 25 (Figure 2), gradually detaches surfaces 18a of heads 18 from the surface defining the inside of seat 15, and gradually moves milled portions 20 towards surface 22; upon milled portions 20 contacting surface 22, lever 9 is pulled in a direction substantially perpendicular to axis 14, so that head 19 and milled portions 20 slide along flat surface 22, and heads 18 and 19 are gradually withdrawn from seat 15 to release lever 9 angularly from frame 5.

[0017] Lever 9 is reassembled to frame 5 by simply inserting heads 18 and 19 inside inlet opening 16 and pushing lever 9 towards end wall 7. When so doing, the force exerted on head 19 flexes arm 25 to allow portion 11 of lever 9 to be pushed towards end wall 7 until heads 18 and 19 click inside seat 15.

[0018] The presence of heads 18 and 19 and the particular way in which heads 18, 19 are connected to frame 5 therefore provide, on the one hand, for simply clicking lever 9 onto frame 5, and, on the other, once the connection is made, for rotating lever 9 about a fixed hinge axis, thus preventing any translation of lever 9 in directions crosswise to the hinge axis.

[0019] Providing an elastic member for maintaining contact between heads 18, 19 and the surface defining cylindrical seat 15 eliminates any vibration of lever 9 and, therefore, any annoying noise.

[0020] Finally, the fact that the hinge method described prevents any translation of the lever with respect to the frame, the resulting handles, as compared with known types, are more attractive in appearance by eliminating scoring and/or abrasions on the mating surfaces in relative motion.

[0021] Clearly, changes may be made to handle 1 as described herein without, however, departing from the scope of the present invention. In particular, seat 15 formed on the lever, and heads 18 and 19 may differ from those indicated by way of example. Also, seat 15 may be formed on frame 5, and heads 18 and 19 be carried by the lever, still, however, in such a manner as to prevent translation of the lever in directions perpendicular to the hinge axis.

[0022] Finally, the lever may be formed otherwise than as shown by way of example, and be hinged to a different portion of frame 5; different elastic means may be provided for forcing the heads inside the seat; and, obviously, a cylindrical seat may be provided for each head.

Claims

1. A handle (1) for a vehicle door (3), the handle (1) comprising a frame (5) fittable to the door (3); a control lever (9) which is gripped by a user; and hinge means (13) for hinging said lever (9) to said frame (5) to permit rotation of said lever (9) with respect to said frame (5); **characterized in that** said hinge means (13) comprise at least one cylindrical seat (15) coaxial with a fixed hinge axis (14) and carried by one of said frame (5) and said lever (9); and at least one substantially cylindrical first head (18) carried by the other of said frame (5) and said lever (9); the first head (18) being defined laterally by a lateral surface complementary to at least one portion of the surface defining said seat (15) and coaxial with said axis (14) to engage the seat (15) in rotary manner; and elastic forcing means (26) being provided to maintain mutual contact of said surfaces regardless of the position of the lever (9) with respect to the frame (5), and being deformable to permit withdrawal of the first head (18) from said seat (15).

2. A handle as claimed in Claim 1, **characterized in that** said first head (18), said seat (15), and said elastic means (26) form part of a releasable click-on connecting device (13).

3. A handle as claimed in Claim 1 or 2, **characterized in that** said first head (18) has an outer lateral milled portion (20) parallel to said axis (14).

4. A handle as claimed in any one of the foregoing Claims, **characterized in that** said elastic means (26) comprise at least one further substantially cylindrical head (19) defined laterally by a surface (19a) complementary to at least one portion of said seat (15), and housed inside said seat (15).

5. A handle as claimed in Claim 4, **characterized in that** said further head (19) has an outer lateral milled portion (24) parallel to said axis (14).

6. A handle as claimed in Claim 3 and 5, **characterized in that** said lateral milled portions (20)(24) lie in respective planes (P)(P1) spaced apart and on diametrically-opposite sides of said axis (14).

7. A handle as claimed in Claim 4 or 5, **characterized in that** said hinge means (13) comprise two said first heads (18) aligned along said axis and on opposite axial sides of said further head (19).

8. A handle as claimed in any one of the foregoing Claims, **characterized in that** said seat (15) is carried by said lever (9).

9. A handle as claimed in any one of the foregoing Claims, **characterized in that** said first head (18) is fixed with respect to said frame (5).

10. A handle as claimed in Claim 4, **characterized in that** said further head (19) is carried by said frame (5).

11. A handle as claimed in Claim 10, **characterized in that** said elastic means also comprise an elastic arm (25) interposed between said frame (5) and said further head (19).

12. A handle as claimed in Claim 11, **characterized in that** said frame (5), said arm (25), and said heads (18) (19) form part of a single one-piece body.

FIG. 1

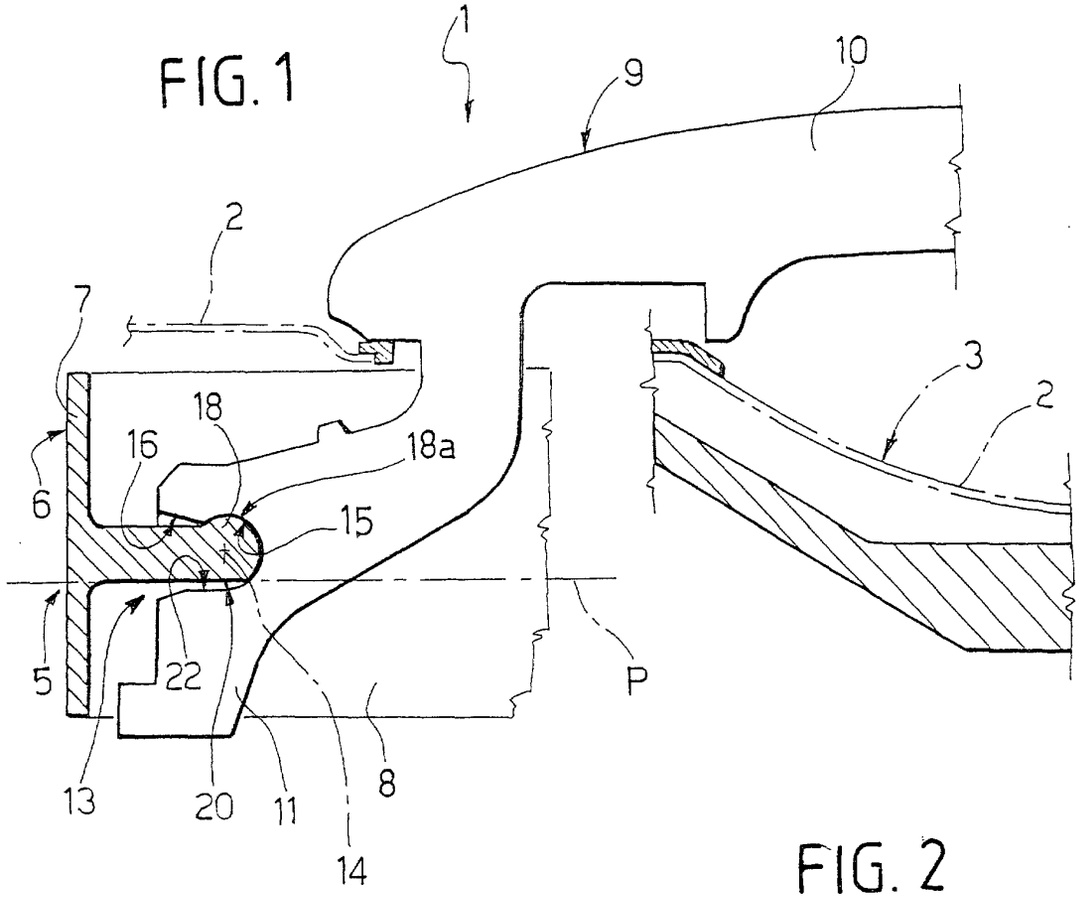
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FIG. 2

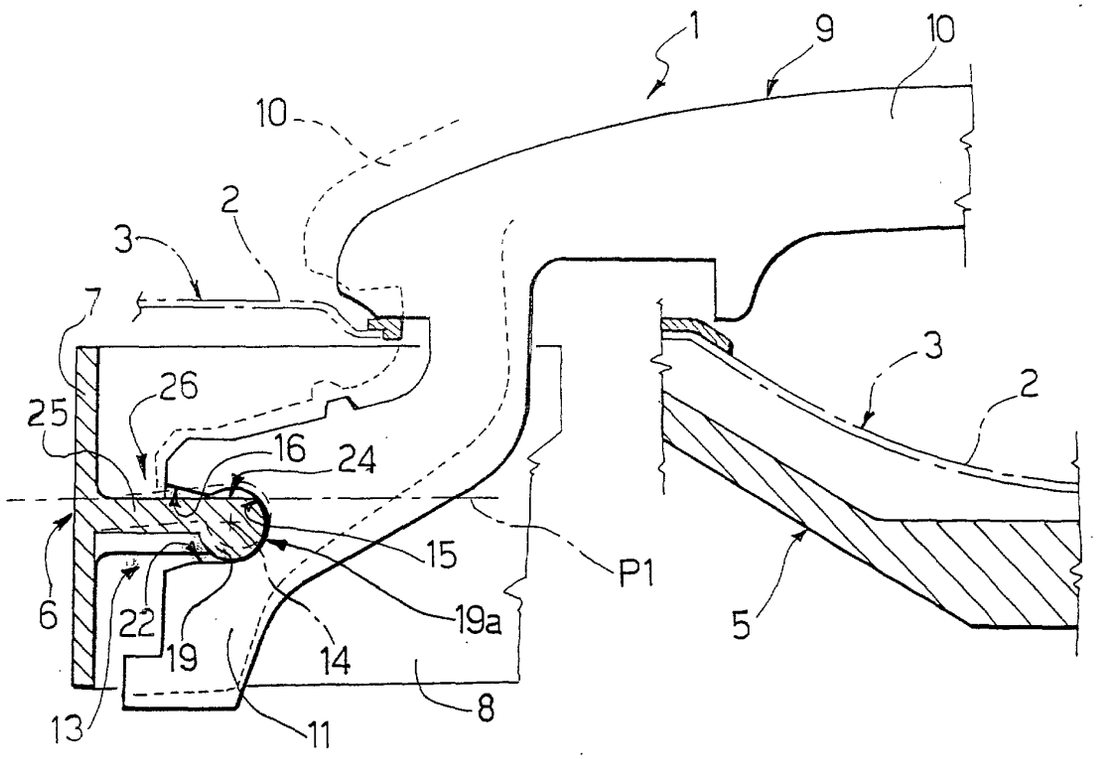
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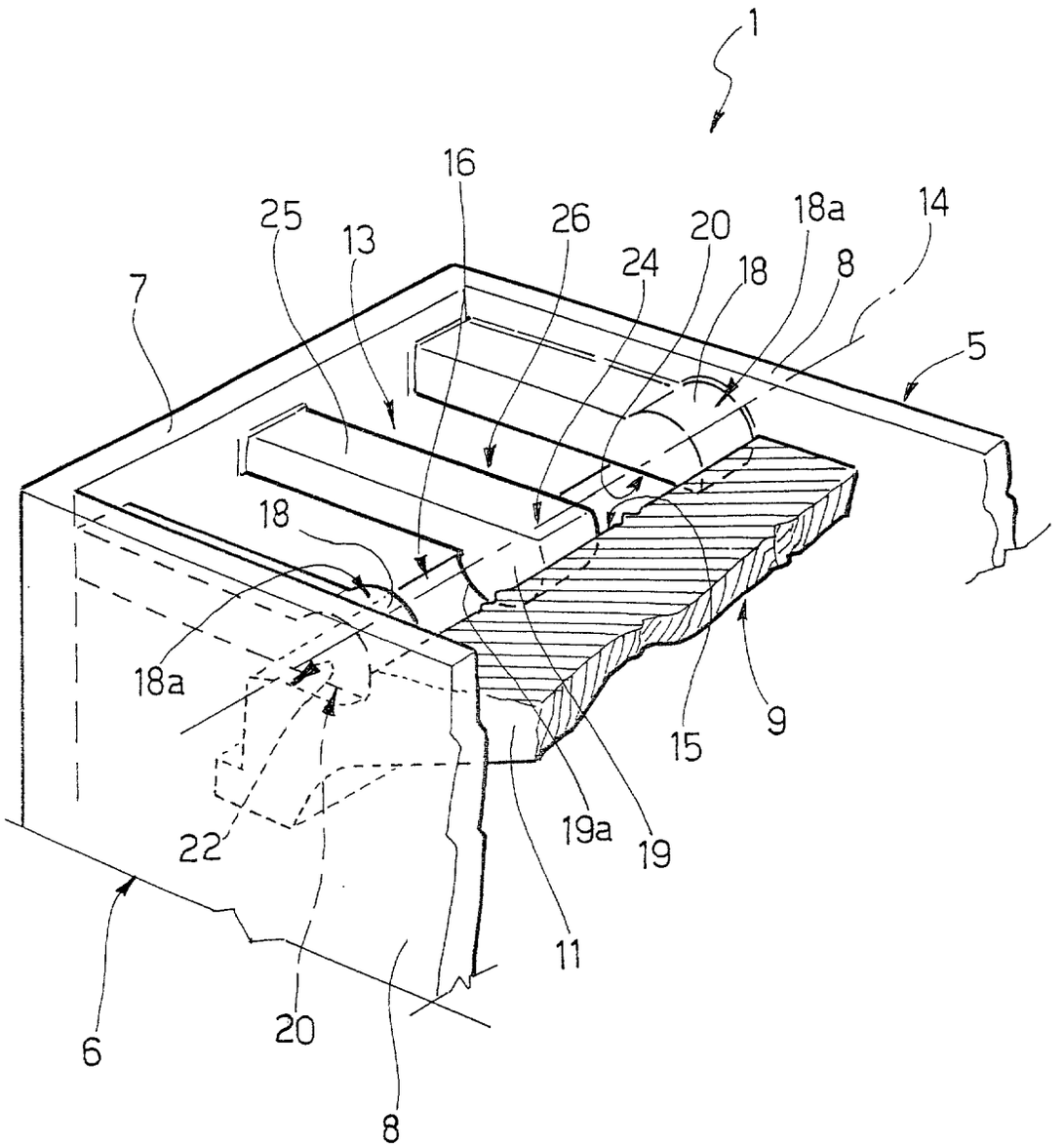
FIG. 3



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EUROPEAN SEARCH REPORT

Application Number
EP 01 83 0461

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X A	DE 32 31 210 A (EWALD WITTE & CO) 23 February 1984 (1984-02-23) * page 7, line 22 - page 8, line 9; figures *	1-3,6,8, 9 7,12	E05B65/20
X A	EP 1 031 684 A (VALEO SICUREZZA ABITACOLO S.P.A.) 30 August 2000 (2000-08-30) * column 2, line 5 - column 2, line 55; figures *	1-3,6,8, 9 7,12	
A	US 5 651 163 A (TAMAKI) 29 July 1997 (1997-07-29) * figures *	1,2,7-9, 12	

TECHNICAL FIELDS SEARCHED (Int.Cl.7)

E05B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
MUNICH	12 December 2001	Vacca, R

CATEGORY OF CITED DOCUMENTS

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12-12-2001

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