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(54) **A locking member of a hinge latch**

(57) The subject of the invention is a locking part of a latch for the door hinge and provides technical solution of locking the door hinge in those hinges with small latches due to limited space. The subject of the invention may also be applied to other latches where there is no space limitation, since the technical solution provides not only compact design but also mechanical characteristics and last but not least, convenient price.

The locking part of the latch features a simple design and is made of a single metal piece. Both arms of the lower part of the latch locking part are secured with an axle of the latch locking part, routed through a guide executed on the latch. The latch guide enables travelling of the axle of the locking part of the latch along the guide. On the upper part of the locking part of the latch a lock member of the locking part of the latch is configured, which enables form fitting of the latch with the locking part of the latch once the locking part is in the locked position.

After inserting the latch into the supporting profile, the door is slightly opened, which enables the moving of the locking part of the latch to the locked position. By closing the door the axle of the locking part of the latch is autonomously moving along the executed guide of the latch until it reaches the appropriate position, where the lock member of the locking part of the latch sits into the contact surface of the latch, i.e. it snaps into the space between the latch and the supporting profile. The lock member of the locking part of the latch is designed to enable, once it is mounted, that the supporting profile is pushing it into the correspondingly shaped contact sur-

face of the latch, thus the idle motion and vibration of the kitchen cabinet door is prevented.

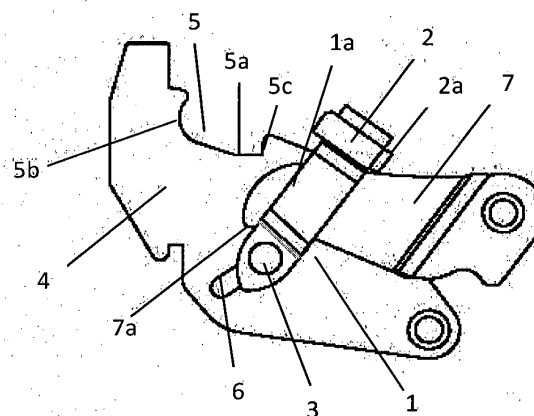


Fig. 1

Description

Field of Technology

[0001] Closing of the oven door or any other cooking appliance door; closing of the kitchen appliances doors; hinges for closing of door; spring action; damping; separating door from appliance.

Technical Problem

[0002] Commercial and domestic appliances have become advanced and sophisticated devices. In order to assure their competitive position on the market, the manufacturers are forced to manufacture better appliances at reasonable costs. In view of this, they must assure quality component parts, the cost price of which must make them eligible for incorporation into final product.

[0003] Not only the cost-effectiveness limitation, but also limited space for mounting, result in the need for compact dimensioning of each separate component part of the appliance, where in spite of the compact design, all of the individual component parts must assure required mechanical characteristics, safety of the user and reliable operation.

[0004] In case the door is mounted on the cooking appliance, e.g. cooker, oven, microwave oven..., where there is little space for the latch, a proper latch locking part must be designed in order to enable mounting of the door on the cooking appliance and locking of the door once it is mounted.

[0005] Functions of the latch locking part are:

- setting the position of the hinge latch as to enable mounting and disassembly of the hinge onto the door of the appliance;
- with activated latch locking part, i.e. when the latch locking part is in a locked position, the door is locked, i.e. fixed to the appliance once the latch is inserted into the supporting profile;
- by deactivating the latch locking part, i.e. when the latch locking part is in an unblocked position, the door may be detached from the appliance, for example in case of leaning or servicing operations;
- the latch locking part assembly and the latch is designed in such a manner that when the door is fixed to the appliance, with the activation of the latch locking part the distance between the door and the appliance body caused by eventual errors during assembly or different tolerances of the appliance component parts, is compensated.

State of the art

[0006] The use of hinges for opening/closing of the door have been known and used on the market for decades. Advanced types of hinges have also been in use for decades, be it for controlled closing of the doors and

windows in the buildings, vehicles but also for closing of various appliances.

[0007] Some appliance, for example cookers or dishwashers are equipped with doors, which are designed for vertical opening, i.e. from upward down, meaning they have a horizontal axle and hinges must be mounted on the axle or nearby the axle joining the appliance and the respective door of the appliance.

[0008] After mounting the door into the supporting profile, i.e. when the latch is inserted in the supporting profile, the door hinge, i.e. the door hinge latch, must be locked in a manner where the door is permanently fixed to the appliance. This is done by means of the locking part. There are several designs of hinge latch locking parts, for example lever locking part, as shown in patent SI24023.

[0009] Latch locking parts may be made in various manners, in most cases the latch locking part is made such that the latch is pivoting around the fixed horizontal axle. This means, that the latch locking part and the latch are connected in single point through the axle, which enables pivoting, i.e. moving of the latch from the unlocked position to the locked position. By pivoting around the fixed axle the latch locking part rotates from the unlocked position to the locked position and vice versa. With such design of the latch locking part, the activation of the latch locking part, i.e. in the locked position when the door is fixed to the appliance, is carried out directly to the hinge body. Such a design of the latch locking part does not enable the optimum manufacturing of latch locking part in hinges with small latches due to limited space during access at manipulation and at movement of other component parts of the hinge.

Description of a new solution

[0010] The present invention relates to a latch locking part for a door hinge with horizontal axle and provides a solution to the technical problem related to locking the door hinge for hinges with a small latch due to the space limitation. The latch locking part for the door hinge according to invention can also be used in other latches where there is no space limitation, since the presented technical solution not only assures the compact manufacturing and required mechanical characteristics, but also good value for money solution. The latch locking part is not coupled to the latch with a spot welding, but the latch features a guide which is in fact an elongated aperture with straight lengthwise sides, wherein an axle of the latch locking part is travelling when the latch locking part rotates from the locked position to the unlocked position. In the locked position the latch axle is positioned in the lower part of the guide, and in the unlocked position the axle is positioned in the upper part of the guide. The activation of the latch locking part is not executed directly to the hinge body, but it is executed on a connecting link of the hinge. The connecting link of the latch is a movable part of the door hinge, which enables the transfer of trans-

latory motion of the door hinge to the movement of the latch.

[0011] The latch locking part is manufactured symmetrically, made of a single metal piece. It consists of two arms, coupled in their upper part, in a manner assuring the cross section of the latch locking part has a rough shaped upside down letter U. Each arm of the locking part is, with the reference to the latch centre line in the area of latch fixing to the connecting link, designed with an embossment. The distance between both arms in the area of the embossment is slightly larger than the total thickness of the contact of the latch with the connecting link in order to enable smooth transition of the latch locking part from one to another position. In the lower part and in the upper part of the latch locking part the individual arms are brought closer together so that the distance between individual arms is slightly larger than the thickness of the latch. Each of the two arms is in its lower part spot-welded to the axle of the latch locking part in a standard manner, wherein the axle of the latch is routed through the guide provided on the latch. Along the guide the axle of the latch is traveling. The upper part, where the arms of the latch locking part are brought closer together, represents a lock member of the latch locking part. The lock member of the latch locking part fits by shape into the contact surface of the latch, when the latch locking part is in the locked position. The contact surface of the latch is designed as a groove which is on one side, the side facing the supporting profile, designed as a curved section, and on the other side, the side facing the door of the appliance, is designed as a straight section with negative angle in relation to the level surface of the supporting profile. Therefore the lock member of the latch locking part is approximately of the same length as the length of the groove, and on the part contacting the straight section of the groove, the lock member features a constriction, so that the distance between both arms in this part is smaller than the thickness of the latch. Such a design of the groove enables the lock member of the locking part to firmly sit into the groove once the locking part is in the locked position.

[0012] Apart for the function of blocking the latch locking part, i.e. when the latch locking part is in the locked position, blocking of the connecting link of the latch in a position for mounting the door of the appliance or the kitchen cabinet onto the appliance or the kitchen cabinet is enabled. In the position appropriate for mounting of the door the latch locking part for a door hinge is in the unlocked position, wherein the connecting link of the latch is blocked, thus preventing an uncontrolled closing of the latch and eventual injuries to the installer or user during the procedure of mounting the door of the kitchen cabinet to the kitchen cabinet. For enabling this the connecting link features a cog shaped projection in the part interacting with the latch locking part, onto which the latch locking part is fixed on both sides, when the latch locking part is in the unlocked position.

[0013] After inserting the latch into the supporting pro-

file the door is slightly opened, and the latch locking part travels from the unlocked position to the locked position. In doing so, the axle of the latch locking part travels along the guide from the upper part of the guide to the lower part of the guide, where the lock member of the latch locking part sits into the contact surface of the latch, i.e. it snaps into space between the latch and the supporting profile - this is enabled by the movable axle of the lock.

[0014] The detailed explanation of the scope of invention will be described, including the preferred embodiment of the invention and the enclosed drawings, wherein the drawings form a part of the present application and present:

Figure 1 presents a side view of the latch locking part in an unlocked position with a blocked connecting link;

Figure 2 presents a side view of the latch locking part in a locked position; the door of the appliance is closed;

Figure 3 presents a side view of the latch locking part in a locked position; the door of the appliance is opened;

Figure 4 presents a 3D view of the latch locking part in a locked position; the door of the appliance is opened;

Figure 5 presents a side view of the latch locking part with a complete hinge of the door in an unlocked position with blocked connecting link;

Figure 6 presents a side view of the latch locking part with a complete hinge of the door in a locked position; the door of the appliance is opened;

Figure 7 presents a side view of the latch locking part with a complete hinge of the door in a locked position; the door of the appliance is closed.

[0015] In the described embodiment of the invention the functioning of the latch locking part 1 for a hinge 8 of the door is shown.

[0016] Figure 1 presents locking part 1 of the latch 4 in position appropriate for mounting. Locking part 1 of the latch 4 is manufactured symmetrically and made of a single metal piece. It consists of two arms 1a. Both of the two arms 1a of the locking part 1 of the latch 4 are, with reference to the centre line of the locking part 1, in the area of fixing the latch 4 to a connecting link 7 designed with an embossment 1c, so that the distance between both arms 1a in the area of the embossment 1c is slightly larger than the total thickness of the contact area of the latch 4 with the connecting link 7 in order to enable smooth movement of the locking part 1 of the latch 4 from one position to another position. In the lower and in the

upper part of the locking part 1 of the latch 4 the individual arms 1a are brought closer together so that the distance between individual arms 1a is only slightly larger than the thickness of the latch 4. Each of the arms 1a is in its lower part spot welded to the axle 3 of the locking part 1 of the latch 4, where the axle 3 of the locking part 1 of the latch 4 is routed through a guide 6, executed on the latch 4. Axle 3 of the locking part 1 of the latch 4 travels along the guide 6. The upper part where the arms 1a of the locking part 1 of the latch 4 are again brought back together represents a lock member 2 of the locking part 1 of the latch 4. The lock member 2 of the locking part 1 of the latch 4 is shaped to fit into a contact surface 5 of the latch 4. The contact surface 5 of the latch 4 is configured as a groove 5a, which is on one side, i.e. the side facing the supporting profile (not shown in the Figure), designed as a curved section 5b, and on the other side, the side facing toward the appliance door (not shown in the Figure), it is designed as a straight section 5c with negative angle in relation to the level surface of the supporting profile. In the position appropriate for mounting of the door the locking part 1 of the latch 4 is in an unlocked position, thus blocking the connecting link 7 of the latch 4. In the position shown, the axle 3 of the locking part 1 of the latch 4 is positioned in the upper part of the guide 6. The connecting link 7 features in the part interacting with the locking part 1 of the latch 4 a projection shaped as cog 7a, onto which the locking part 1 of the latch 4 is fixed on both sides, when the locking part 1 of the latch 4 is in the unlocked position, i.e. in a position for mounting.

[0017] Figures 2, 3 and 4 show the locking part 1 of the latch 4 in a locked position. The lock member 2 of the locking part 1 of the latch 4 fits into the contact surface 5 of the latch 4. The lock member 2 of the locking part 1 of the latch 4 has approximately the same dimension as the length of the groove 5a, in a part where it sits onto the straight section 5c of the groove 5a, the lock member 2 is designed with a constriction 2a so that the distance between both arms 1a in this area is smaller than the thickness of the latch 4. In this position the axle 3 of the locking part 1 of the latch 4 is positioned in the lower part of the guide 6. The cog 7a of the connecting link 7 is not fixed to the locking part 1 of the latch 4, so that the connecting link 7, which is a movable part of the hinge 8 of the door, is freely movable around the axle 7b, by means of which the connecting link 7 is fixed to the latch 4.

[0018] Figure 5 shows the complete hinge 8 of the door with the locking part 1 of the latch 4, where the locking part 1 of the latch 4 is in the unlocked position. Figures 6 and 7 shows the complete hinge 8 of the door with the locking part 1 of the latch 4, where the locking part 1 of the latch 4 is in the locked position. After inserting the latch 4 into the supporting profile, the door is slightly opened which enables moving of the locking part 1 of the latch 4 into the locked position. By closing the door, the axle 3 of the locking part 1 of the latch 4 is freely travelling along the guide 6 of the latch 4 until it reaches the cor-

responding position, where the lock member 2 of the locking part 1 of the latch 4 adapts to the distance between the latch 4 and the supporting profile and sits into the contact surface 5 of the latch 4.

[0019] It shall be understood that the described solution may be carried out also in other design version, which however does not change the scope of the invention.

10 Claims

1. A locking part of a latch with a horizontal axle, wherein the latch (4) is coupled with a hinge (8) of the door through a connecting link (7) and the connecting link (7) is movable part of the hinge (8), enabling the transfer of translatory motion of the door hinge (8) to the movement of the latch (4), **characterised in that** a locking part (1) of the latch (4) is manufactured symmetrically made of a single metal piece and consists of two arms (1a), which are interconnected in their upper parts, thus forming a lock member (2) of the locking part (1) of the latch (4), whereby each of the arms (1a) is in its lower part spot welded onto an axle (3) of the locking part (1) of the latch (4), wherein the axle (3) of the locking part (1) of the latch (4) is routed through a guide (6) executed on the latch (4) and the lock member (2) of the locking part (1) of the latch (4) is shaped to fit into a contact surface (5) of the latch (4) and the connecting link (7) features in a part interacting with the locking part (1) of the latch (4) a projection shaped as cog (7a).
2. The locking part of the latch for door hinge according to claim 1, **characterised in that** the contact surface (5) of the latch (4) is configured as a groove (5a), which is on the side facing the supporting profile designed as a curved section (5b), and on the side facing the appliance door the groove (5a) is designed as a straight section (5c) with negative angle with relation to the level surface of the supporting profile.
3. The locking part of the latch for the door hinge according to previous claims, **characterised in that** each of the arms (1a) of the locking part (1) of the latch (4) with reference to the central line of the locking part (1) in the area of fixing the latch (4) to the connecting link (7) is shaped with an embossment (1c), so that the distance between both arms (1a) in the area of the embossment (1c) is slightly larger than the total thickness of the contact area of the latch (4) with the connecting link (7), and in the lower and in the upper part of the locking part (1) of the latch (4) both arms (1a) are brought closer to one another, so that the distance between individual arms (1a) is slightly larger than the thickness of the latch (4).
4. The locking part of the latch for the door hinge ac-

cording to previous claims, **characterised in that** lock member (2) of the locking part (1) of the latch (4) is approximately the same length as the length of the groove (5a), and in part where it sits onto the straight section (5c) of the groove (5a) the lock member (2) is configured with a constriction (2a), so that the distance between both arms (1a) in this area is slightly smaller than the thickness of the latch (4).

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5. The locking part of the latch for the door hinge according to previous claims, **characterised in that** in the position appropriate for mounting the door, the locking part (1) of the latch (4) is in an unlocked position, wherein the connecting link (7) of the latch (4) is blocked, the axle (3) of the locking part (1) of the latch (4) is positioned in the upper part of the guide (6), the cog (7a) of the connecting link (7) is fixed to the locking part (1) of the latch (4), thus the uncontrolled closing of the latch (4) is prevented.

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6. The locking part of the latch for the door hinge according to previous claims, **characterised in that** by closing the door, the axle (3) of the locking part (1) of the latch (4) is freely travelling along the executed guide (6) of the latch (4) from the upper part of the guide (6) to the lower part of the guide (6) until a position where the lock member (2) of the locking part (1) of the latch (4) sits into the contact surface of the latch (5) is reached.

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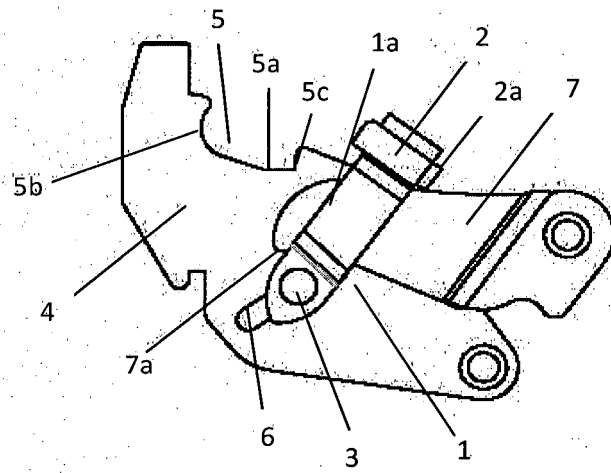


Fig. 1

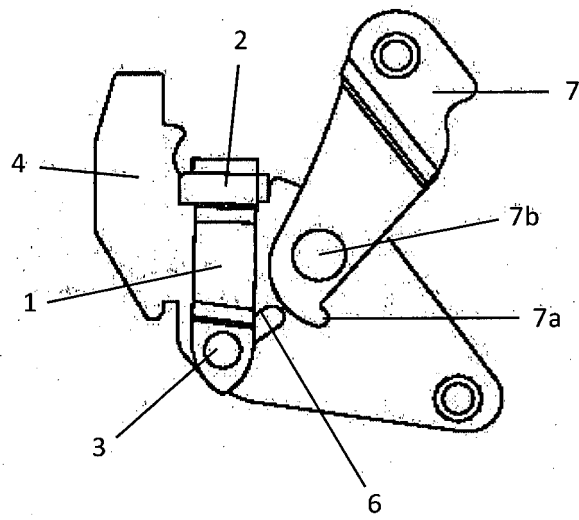


Fig. 2

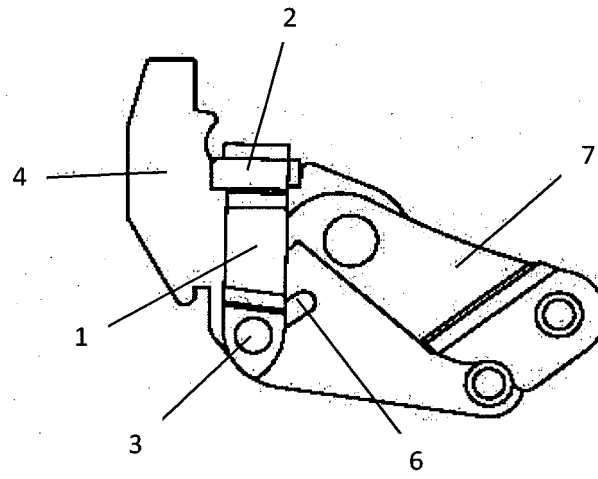


Fig. 3

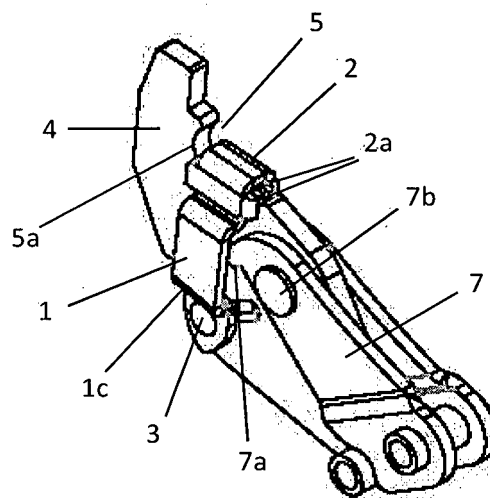


Fig. 4

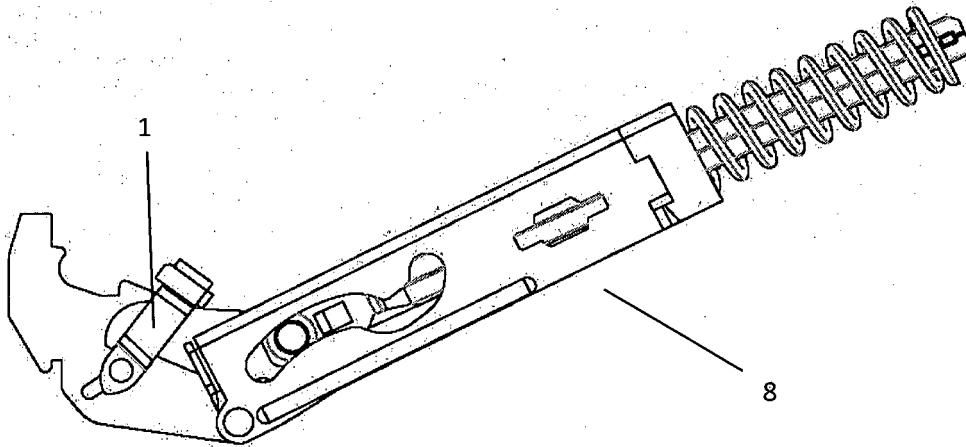


Fig. 5

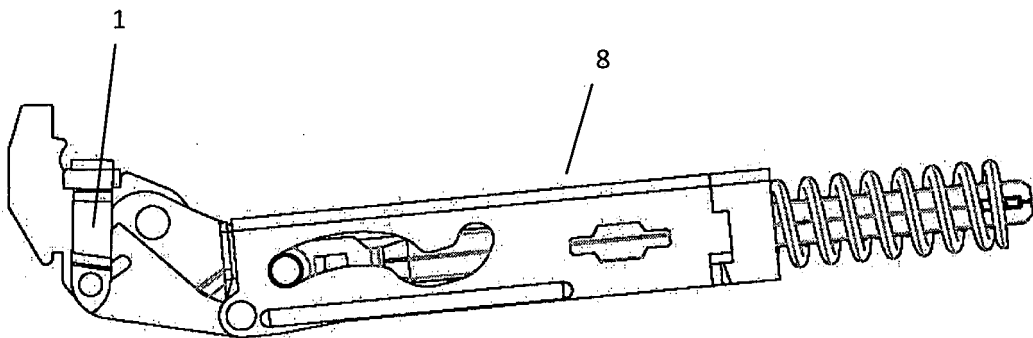


Fig. 6

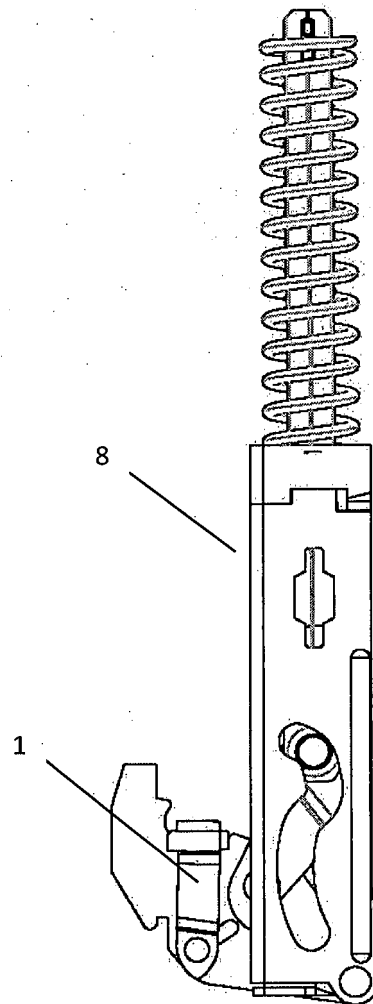


Fig. 7



EUROPEAN SEARCH REPORT

Application Number
EP 15 00 1673

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			TECHNICAL FIELDS SEARCHED (IPC)
			E05D E05F F24C A47L
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		30 September 2015	Rémondot, Xavier
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 15 00 1673

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The members are as contained in the European Patent Office EDP file on
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