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(54) Safety lock for oven doors

(57) The device (A) according to the invention comprises at least one door safety mechanism (E) positioned between its static body (3) and at least one moving door (1). And the door safety mechanism (E) includes a pin (4) in the form of a projection on the door (1) and the body (3); a flexible arm (6) in the form of a twisted plate and located on the body (3) or on the door (1), and on which the pin (4) is interlocked when the door (1) is closed.

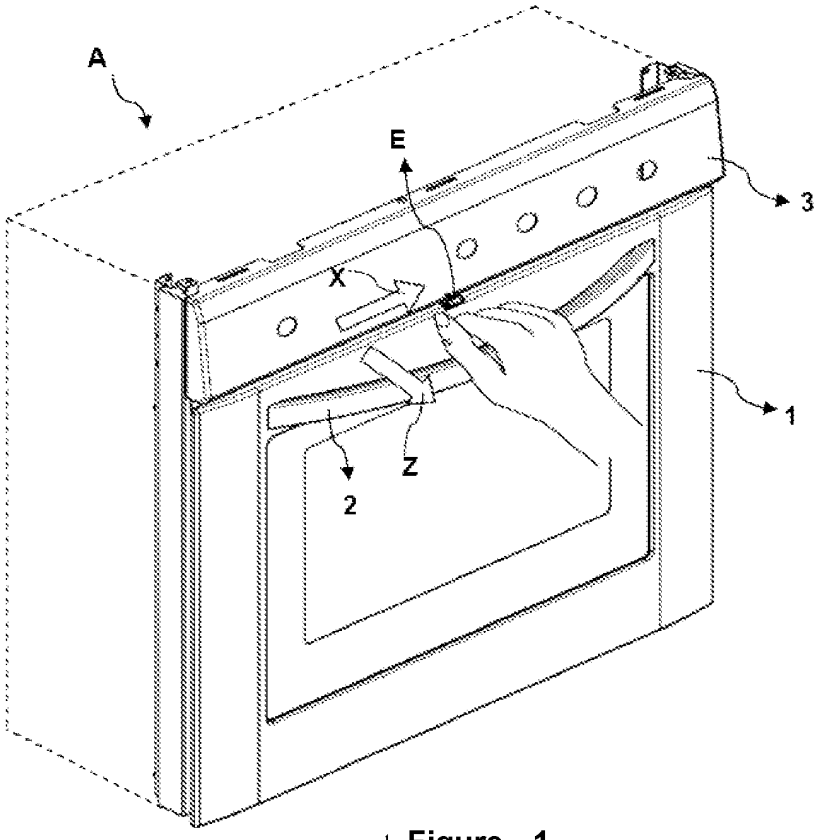

Figure - 1

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Description

Technical Field

[0001] This invention is related with the safety mechanisms on device doors.

Prior Art

[0002] Door safety mechanisms are developed in order to prevent unintended opening of the doors on the devices while using various devices. As already known, such cooking devices as electrical and gas ovens, which are used in preparing the food products, have a closed compartment for baking or heating the product, and there are doors which are used for access to this compartment. From time to time, some of these devices which perform cooking at very high temperatures have the mentioned door safety mechanisms. During the operation of the devices, unintended opening of the doors of these devices by the users and especially by children poses a danger. Therefore, the safety locks that ensure the doors are opened only on purpose have been developed. For example, in the published patent application EP0678710 of the prior art, an oven door safety lock mechanism is disclosed. Here, in the mentioned mechanism, the use of many components both makes the production and installation difficult and increases the cost. Besides, the adjustment required by the mechanism from time to time appears as another problem.

Short Description of Invention

[0003] The device according to invention includes at least one door safety mechanism positioned between its static body and at least one moving door. The door safety mechanism includes a pin formed as a projection installed on the door or body; a twisted plate in the form of flexible arm which is placed on the body or door and into which the pin acts when the door is closed. Pulling and opening the door is only possible through flexing the arm of the mechanism. Thus, the unintended or unconscious opening of the door is prevented. Besides, by using very little number of pieces in the mechanism, a structure easy-to-produce and install is obtained.

Object of the Invention

[0004] The purpose of this invention is to provide a device door safety mechanism.

[0005] Another purpose of the invention is to prevent unintended opening of the device door with the mentioned mechanism.

[0006] Another purpose of the invention is to provide a door safety mechanism which is easy-to-use and occupies little space.

[0007] Another purpose of the invention is to provide a reliable door safety mechanism which is cost-effective and easy-to-produce and which is able to achieve the foregoing purposes.

Description of Figures

[0008] A sample device according to the invention and the door safety mechanism used therein are shown in the attached figures and the invention has been described with reference to the following figures on which various parts of the invention are shown with assigned numbers:

Figure 1 is the general elevation of a sample device and its door.
Figure 2 is the elevation of the device door.
Figure 3 the detail view of a piece of Figure 2.
Figure 4 is the general elevation of the mechanism's arm as installed on the device's body.
Figure 5 the detail view of a section of Figure 4.
Figure 6 the general elevation of the mechanism's arm.

[0009] The components on the figures are individually numbered and the numbers refer to the components as listed below.

Device (A)
Safety mechanism (E)
Door (1)
Handle (2)
Device body (3)
Pin (4)
Fitting (5)
Mechanism arm (6)
Protective piece (7)
Connection element (8)
Hole (11)
Installation surface (60)
Hole (61)
Twisting axis (62)
Lateral surface (63)
Back twist (64)
Lateral surface (65)
Twist axis (66)
Front surface (67)
Installation surface (68)
Socket (69)
Edge (70)
Detail zone (D1)
Detail zone (D2)
Direction of door opening (Z)
Direction of the movement of arm (X)

Description of Invention

[0010] In figure 1, a general elevation of the invented device (A) (symbolically shown with dashed line, a sample cooking device is given in the following explanations)

and of the device door (1) is shown. On at least one door (1) of the device (A), there is at least one handle (2), which is created for the user to comfortably open the door (1) (the door (1) can be opened linearly or by turning around an axis). In a section between the door (1) and the device body (3) (shown in figure 1-3 as an example on the top part of the door (1)), there is at least one safety mechanism (E) which can be opened with the intervention of the user. Some of the components of the mechanism E are located on the door (1) and some are on the body (3). Besides, the mechanism (E) and the handle (2) are located near to each other, and allow the user to pull the door with one hand (on "Z" direction) and flex the mechanism arm (6) with the same hand (in "X" direction) (as shown in figures 4-6). Opening the door (1) by pulling is possible only after the arm (6) of the mechanism is flexed. Therefore, unintended and accidental opening of the door (1) is prevented.

[0011] Figure 2 provides an elevation of the device door (1). Here, the indicated detail zone (D1) is the sample settlement of the parts (particularly of the pin (4)) of the safety mechanism (E) which are installed on the door (1). The detail zone (D1) mentioned in Figure 3 is shown in detail. Among the components which are shown in disassembled state in Figure 3, the pin (4) is a piece on which the mechanism arm (6) (Figure 4-6) is locked (when the door (1) is closed). The pin (4) is arranged so as to create a projection away from the door (1) (as shown in figure 2). The pin (4) can be either integrated with the door (1), or as shown in figure 3, it can be a component installed in a hole (11) on the door. In this case, in order to secure the pin (4) in the hole (11), a fitting (5) (for example a nut-like element if the pin's one side is in screw form) is used.

[0012] Figure 4 provides a general elevation of the mechanism arm (6) as installed on the device body (3). Here, the mentioned detail zone (D2), is the installation point of the pieces (particularly of the arm (6)) of the safety mechanism (E) that remain on the body (3). The detail zone (D2), which is also mentioned in Figure 5 is shown in detail. The mechanism arm (6) is a piece created by forming the plate-formed material by means of various twists. As a result of this forming, the arm acts like a spring (6) since it gained the capability of flexing at certain parts. The arm (6) is installed on the body (3) by means of at least one fitting (8) (shown in figure 5 with a screw as an example). On the furthermost end of the arm (6), a protective piece (7) is installed in order to protect the user's hand. Since the arm (6) is preferably in thin plate form, in order to prevent the user from cutting his/her hand, (also if the device (A) is an oven type of cooking device, in order to prevent being affected from the device's heat), using a thermally isolated protective piece, (7) which is thicker than the wall thickness of the arm (6), is preferred in one of the embodiments of the invention.

[0013] Figure 6 also provides an elevation of the arm (6) of the mechanism. The arm (6) comprises an installation surface (60) on the one side, which is created to fix it on the body (3). On this surface (60), there is at least one hole (61), opened for fixing the arm (6) to the body. The fittings (8) installed on the holes (61) (mentioned here above) are also installed to the holes on the body (3) (not shown in the figures), so that the arm (6) is fixed onto the body (3).

[0014] The installation surface (60) is twisted laterally (preferably with a right angle) on an axis (62), so as to move away from the body (3), and a lateral (63) surface is obtained here. On this lateral surface (63), with a full return back twist (64) (e.g. in "U" or "V" form) behind the arm (6) (preferably with an angle of 180 degrees), a second lateral surface (65) is created towards the front side. The second lateral surface (65) is twisted on the longitudinal axis (66) of this surface (65) (preferably with right angle) and a front surface (67) is created. At the end portion of the front surface (67), there is a second installation surface (68) (which is preferably created with another twist) on which the protective piece (7) is installed. The front surface (67) is preferably arranged in parallel with the installation surface (60), such that it fits into the clearance between the body (3) and the door (1) (thus it takes up a little space) and moves laterally in this clearance. Therefore, the front surface (67) is created by twisting the second side surface (65) as mentioned here above (according to the mentioned axis (66)). The second installation surface (68) on which the protective piece (7) is installed projects outwardly between the door (1) and body when the arm (6) is installed to the body (3) (for the user to easily access).

[0015] Another property of the front surface (67) is the existence of a socket (69), which opens as a lateral recession thereon, and the pin (4) on the door (1) is fit into this socket (69) (when the door (1) is closed). In order to release the pin (4) from the socket (69), the front surface (67) is moved to a side so that the socket (69) moves away from the pin (4) and the arm (6) flexes at the back twist (64) side. When the arm (6) is released after the door (1) opens, it re-flexes and returns to its previous state. The arm (6) can be flexed by the user again while the door (1) closed, so the pin (4) can be placed in the socket (69) from the lateral side. Or while closing the door (1), the pin (4) contacts to an angled edge (70) which is at the lateral side of the front surface and in front of the socket (69). Due to the angle of the edge (70), the pin (4) pushes the front surface (67) aside while advancing and flexes the arm (6); then, after the pin (4) enters the socket (69) from the side, the arm (6) flexes back and takes its previous position.

[0016] According to the foregoing sample embodiment which is also shown in the figures, among the components of the safety mechanism (E), the pin (4) is positioned on the moving door (1), and the arm (6) is positioned on the static body (3). In an alternative embodiment of the invention, the pin (4) can be positioned on the fixed body (3) while the arm on the moving door (1) such that the invention can realize the foregoing functions.

[0017] The invention can be implemented on the doors of different devices, for example on the doors of household appliances, particularly on the doors of the cooking devices for food products.

Claims

1. A device (A) comprising at least one door safety mechanism (E) positioned between the static body (3) and at least one moving door (1) **characterized in that** the said door safety mechanism (E) comprises;
   a pin (4) in the shape of a projection on the door (1) or on the body (3); an arm which can be flexed by the user by applying force, which is in the form of a twisted plate and located on the body (3) or on the door (4), and on which the pin (4) is interlocked when the door (1) is closed; and the arm (6) has,
   an installation surface (60) on one side, which is created for fixing on the body (3) or on the door (1);
   a lateral surface (63) which is obtained by laterally twisting the installation surface (60) over an axis (62) in a manner to move away from the body (3) or door (1);
   a second lateral surface (65) towards the front formed by the lateral surface (63) which continues with a full turn back twist behind the arm (6);
   a front surface (67) formed by the second lateral surface (65) which twists along the longitudinal axis (66) of this surface (65);
   a socket (69) on the front surface (67) which opens as a lateral recession and into which the said pin (4) enters from the side by flexion of the arm (6) while the door (1) is closed.

2. A device (A) according to Claim 1 **characterized in that** the arm (6) flexes at the side of the mentioned back twist (64) and so the front surface (67) moves laterally.

3. A device (A) according to Claim 1 **characterized in that** the door (1) comprises an angled edge (70) which is in front of the socket (69) and on the lateral side of the front surface, to which the pin (4) contacts and pushes the front surface (67) to the side while the door (1) is closed.

4. A device (A) according to Claim 1 **characterized in that** the front surface (67) is located in the clearance between the body (3) and the door (1).

5. A device (A) according to Claim 1 **characterized in that** the installation surface (60) on which a fitting (8) is installed has at least one hole (61).

6. A device (A) according to Claim 1 **characterized in that** there is a right angle between the lateral surface (63) and the installation surface (60).

7. A device (A) according to Claim 1 **characterized in that** there is a right angle between the front surface (67) and the second lateral surface (65).

8. A device (A) according to Claim 1 **characterized in that** the front surface (67) comprises a protective piece (7) fixed on its end portion.

9. A device (A) according to Claim 9 **characterized in that** the thickness of the protective piece (7) is larger than the wall thickness of the arm (6).

10. A device (A) according to Claim 9 **characterized in that** the protective piece (7) is thermally insulated.

11. A device (A) according to Claim 9 **characterized in that** the front surface (67) on which the protective piece (7) is installed comprises a second installation surface (68) on the end portion.

12. A device (A) according to Claim 11 **characterized in that** the second installation surface (68) projects outwardly between the door (1) and the body (3).

13. A device (A) according to Claim 1 **characterized in that** it includes at least one door handle (2) at the region near to the mechanism (E).

14. A device (A) according to Claim 1 **characterized in that** the device (A) is a cooking device for food products.

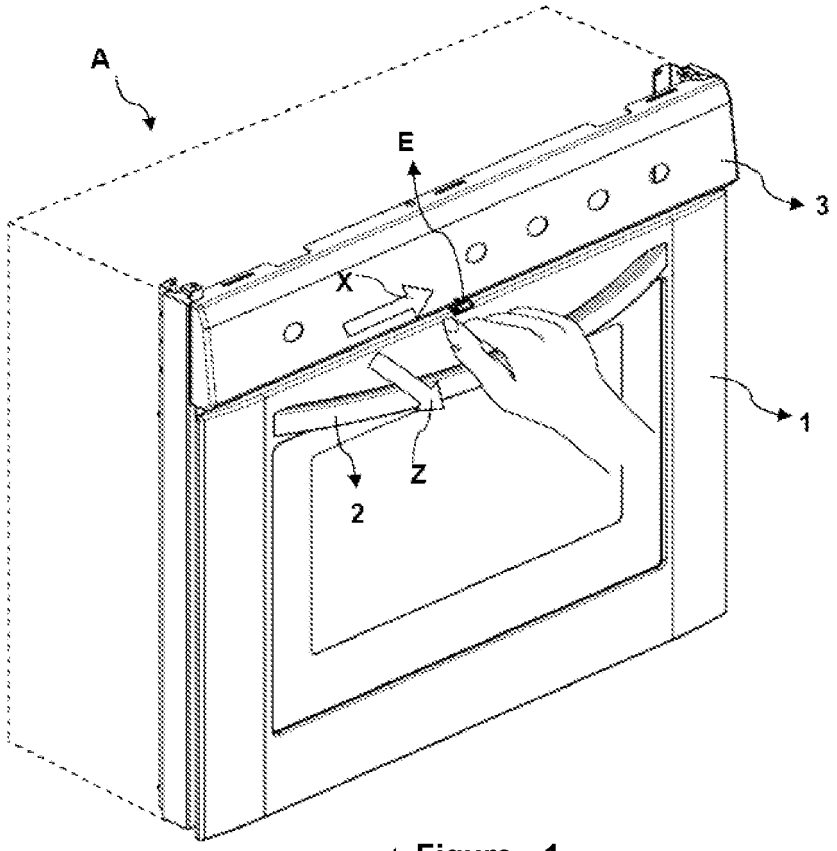

Figure - 1

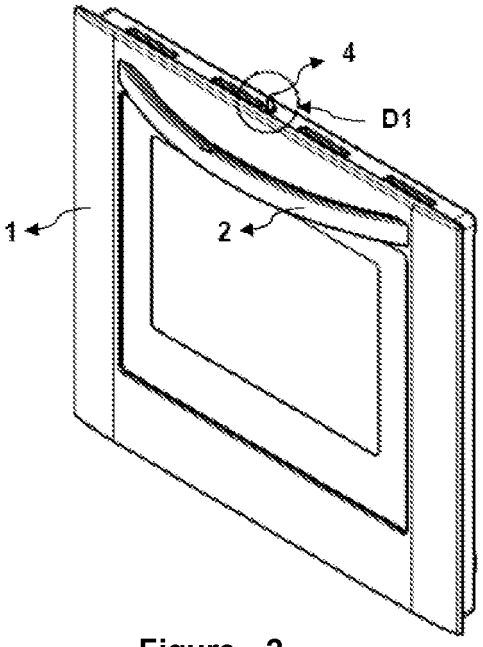

Figure - 2

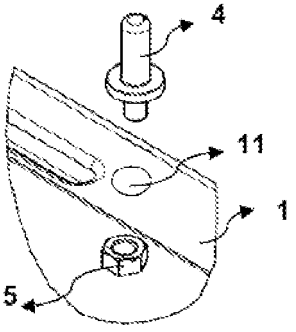

Figure - 3

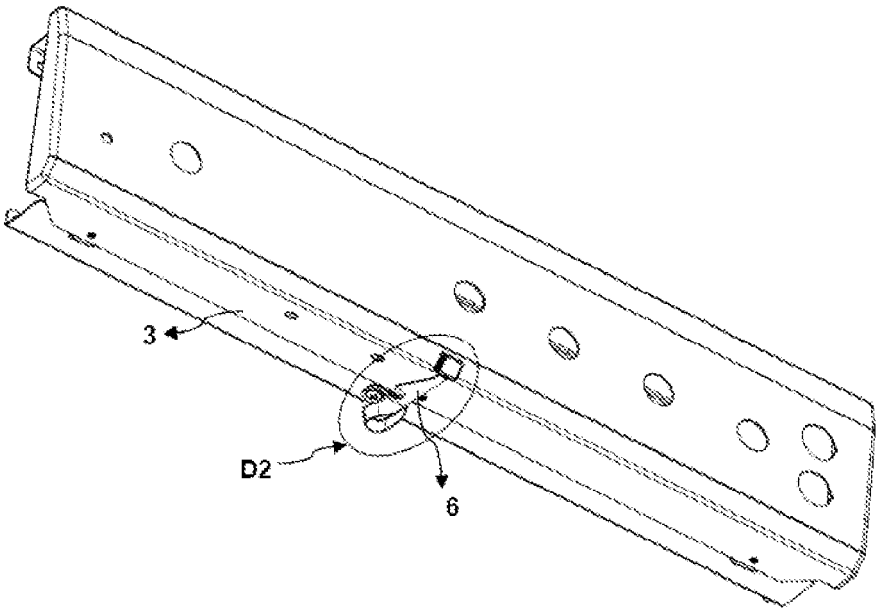

Figure - 4

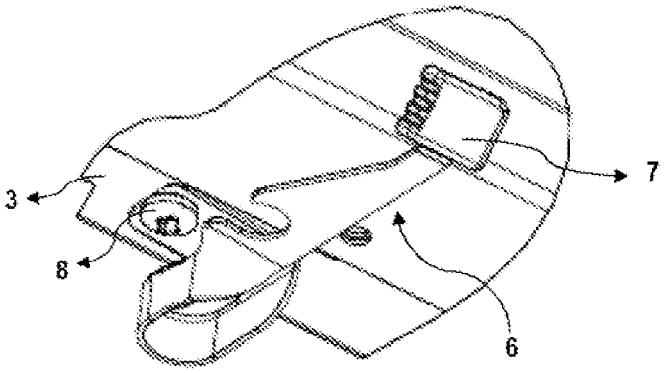

Figure - 5

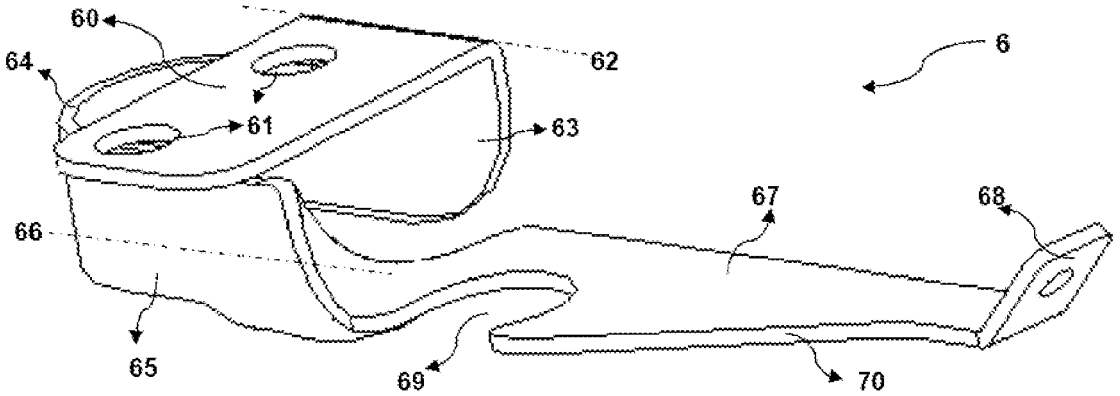

Figure - 6

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EUROPEAN SEARCH REPORT

Application Number
EP 10 15 9072

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 2004/005653 A1 (BSH BOSCH SIEMENS HAUSGERAETE [DE]; HUBER PETER [DE]; SCHESSL BERND [D]) 15 January 2004 (2004-01-15) * page 6, paragraph 2; figures 1,2 *	1-14	INV. F24C15/02
A	EP 0 829 600 A1 (CANDY SPA [IT]) 18 March 1998 (1998-03-18) * figure 5 *	1	
A	US 6 474 702 B1 (MALONE CHARLES [US] ET AL) 5 November 2002 (2002-11-05) * figure 1 *	1	

TECHNICAL FIELDS SEARCHED (IPC)

F24C
E05C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	2 February 2011	Meyers, Jerry

CATEGORY OF CITED DOCUMENTS

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2004005653 A1	15-01-2004	AU 2003246654 A1	23-01-2004
		DE 10230708 A1	22-01-2004
		EP 1521892 A1	13-04-2005
EP 0829600 A1	18-03-1998	DE 69712579 D1	20-06-2002
		DE 69712579 T2	19-12-2002
		ES 2175263 T3	16-11-2002
		IT MI960612 U1	16-03-1998
US 6474702 B1	05-11-2002	NONE	

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- EP 0678710 A **[0002]**