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(54) **DOOR STOPPER**

(57) The door stopper comprises a fastening element 1 in a permanently fixed position and a movable fixing element 2, which are rotatably connected to each other with a joint 3. The fixing element 2 allows the door stopper to have two positions at different angles in relation to the fastening element 1: the working position and the stand-by position. The door stopper can be used in different locations in relation to the door: the door stoper can be installed on the door, the door jamb, or the floor.

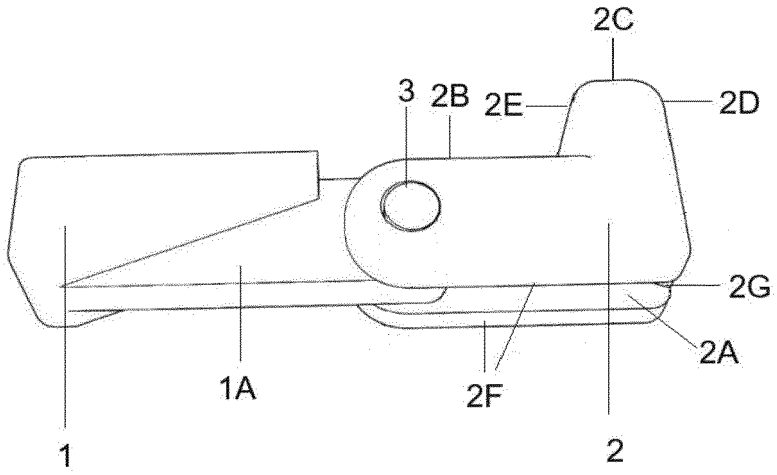

FIG 1

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Description

Technical Field

[0001] The invention belongs to the field of door devices and, more specifically, concerns a door stopper that can be used in several positions and locations, is small in size, and portable.

Prior Art

[0002] There is a well-known door stopper, https://espak.ee/epood/toode/ukse-kiiltokis-35/, which has a triangular cuboid made of rubber placed on the base. To keep the door open, a door stopper is placed between the floor and the door. The disadvantage of this solution is that the door stopper easily detaches and the door closes, and it can only be used in one position and one location, between the door and the floor.

[0003] A door and window stopper is known (EP 1 472 426 B1, Frank F. E. Mayer, published on July 26, 2006), which is a portable element cut out in an S-shape from elastic rubber to keep the door or window open; it is placed between the floor and door or window and window frame/window sill. The disadvantage of this solution is that it is quite large in size and that it can easily move off from between the door or the window, and as a result, it does not fulfill its original purpose.

[0004] A door stopper is known (US11591836 B1, Scott W. Johnson, published February 28, 2023) and is configured so that the door is in a partially open position. The door stopper comprises a fastener that is permanently attached to the door frame, plus a door bolt and it's receiving element. To hold the door in the open position, the latch receiving element engages the door latch and secures the door in a partially open position in several aspects. The disadvantage of this solution is that the door stopper consists of several assembly parts connected with screws and is permanently screwed to the door jamb, and it can only be used in one position and in one location, between the door and the door jamb.

[0005] A portable door stopper is known (US2020208447 A1, Abraham Farkas, published on July 02, 2020), which holds the door in the open position. The portable door stopper consists of one piece and comprises a body with a flat part and a bent part, with magnets in the flat part and the bent part; and a secondary part. The disadvantage of this solution is that the magnets are for additional fixing of the door stopper, which makes the device difficult and expensive to manufacture, and the door stopper can only be used in one position and one location, between the door and the door jamb.

[0006] The closest analog of the invention in terms of technical nature is a collapsible door stopper (CN217760535U, MA YEQIANG, published on November 08, 2022), which comprises a fastening element, a movable support, an extendable support leg, a support element, a magnet, a height-adjusting element, and an anti-slip element. The fastening element and the movable support are connected to each other by a joint. The disadvantage of this solution is that it consists of several interconnected assembly parts, where the fastening element comprises a magnet, which makes the device expensive to manufacture, and this door stopper can only be used in one position and one location - between the door and the floor.

Summary of the invention

[0007] The purpose of the invention is to develop a small-sized and portable door stopper that can be used in several positions and locations.

[0008] The door stopper comprises a fastening element and a fixing element, which are connected to each other with a joint. The fixing element is a cuboid, which can be moved to the working or standby position with a joint. The fastening element is a special-shaped cuboid with a projection on the upper face and a connecting element - double-sided tape or glue or a screw - on the lower face. The fixing element includes a horizontal cuboid and a vertical cuboid, which are connected to each other at an angle of 90 degrees. The fixing element comprises a channel where the sides of the channel have top surfaces, and the wider side surfaces of the vertical cuboid are stopper surfaces. The fixing element of the door stopper is at an angle to the fastening element, the size of which depends on the place of use of the door stopper - the door stopper is used either on the door, door jamb, or on the floor.

List of Figures

[0009]

Figure 1 shows the fixing element of the door stopper in the open (horizontal) position in axonometry.

Figure 2 shows the bottom view of the door stopper in the horizontal open position.

Figure 3 shows the fixing element of the door stopper in the end view.

Figure 4 shows the fixing element of the door stopper in the closed (folded) position in axonometry.

Fig. 5 and Fig. 6 show the use of the door stopper in two versions in the working position between the door and the floor.

Fig. 7 and Fig. 8 show the use of the door stopper in two versions in the standby position between the door and the door jamb.

[0010] An example of the implementation of the invention

[0011] The door stopper of the invention comprises two elements: a permanently fixed fixing element 1 and a movable fixing element 2, which are rotatably connected to each other with a joint 3. The door stopper is designed to be attached to the door, door jamb, or floor using the connecting element of the fastening element 1. The fixing element 2, which is intended to either prevent or release the movement of the door, allows the door stopper to have two positions: the working position, where the door stopper is intended to prevent the door from closing or opening too much, and the standby position, where the door stopper does not prevent the door from closing.

[0012] The door stopper prevents self-closing doors from closing (e.g., when closing due to a closing mechanism or as a result of a draft) or also limits the door from opening too wide. It can be mounted on a door, door jamb, or floor, creating an obstacle between the door and the door jamb or between the door and the floor. The door stopper is attached to the floor, door, or door jamb by means of a connecting element.

[0013] The fastening element 1 is a triangular cuboid, the upper face of which comprises a horizontal rectangular protrusion 1A in the middle part, and the lower face of which accommodates a connection element (not shown in the figures), by means of which the door stopper is attached to the door, door jamb or floor. The connecting element is double-sided tape or glue or a screw passing through the fastening element 1. The height of the fastening element 1 is lower than the gap between the door and the floor.

[0014] The fixing element 2 is a cuboid, which can be moved to the working and standby position with joint 3. The fixing element 2 comprises a horizontal cuboid 2B and a vertical cuboid 2C, which are connected to each other at an angle of 90 degrees, which makes the fixing element 2 L-shaped. The wider side surfaces of the vertical cuboid 2C are stopper surfaces 2D and 2E. The horizontal cuboid 2B contains a channel 2A, the sides of which are formed by the top surfaces 2F. At the lower end of the vertical cuboid 2C is a partial indentation 2G.

[0015] Fixing element 2 is used in two positions:

- the fixing element 2 is in the closed position - the fixing element is folded (the fixing element "sits" on the fastening element) in such a way that the stopper surface 2D of the fixing element forms an angle of approximately 100-135 degrees with respect to the rectangular projection 1A of the upper face of the fastening 1;
- the fixing element 2 is in the open position - the fixing element 1 and the fixing element 2 are substantially aligned with each other (horizontally extended) and form an angle of approximately 135-180 degrees.

[0016] The joint 3 is at the distal end of the fastening element 1 of the rectangular projection 1A of the fastening element 1 and at the end (which is convex in the preferred embodiment) of the horizontal cuboid 2B of the fixing element 1, which is not connected to the vertical cuboid 2C.

[0017] At the lower end of the vertical cuboid 2C, there is a partial indentation 2G, which allows the fixing element 2 to "sit" on the fastening element 1 in such a way that the surfaces 2F are in full contact with the upper face of the fastening element 1.

[0018] The size of the angle formed between the fastening element 1 and the fastening element 2 depends on where the door stopper is placed - between the door and the floor or between the door and the door jamb.

[0019] The height of the vertical cuboid 2C of fixing element 2 is chosen in such a way that the door stopper does not prevent the door from closing in the standby position when used on the floor and prevents the door from closing in the working position.

[0020] By moving the fixing element 2 with the help of joint 3, the door stopper can be moved to different positions. When the fixing element 2 is folded using joint 3, the cuboid projection 1A of the fixing element 1 enters the channel 2A and the indentation 2G of the fixing element 2, and the fixing element 2 "sits" fixedly with the upper surfaces 2F on the fixing element 1.

[0021] If you install the door stopper on the floor, the door stopper limits the opening of the door away from the doorway or the closing of the door in the direction of the doorway.

[0022] If the door stopper is used on the floor and the door stopper is in the open position (in a horizontal position, at approximately 160-180 degrees, in an extended position), the door moves freely over the door stopper, and the door can be opened or closed (the door stopper is in the standby position).

[0023] If the door stopper is used on the floor and the door stopper is in the folded position, the door does not move freely (the door stopper is in the working position). Fixing element 2 is in the raised, folded position. If the door is open and the door stopper is in the part between the door and the doorway, the stopper surface 2E or 2D of the door stopper prevents the door from closing (depending on which direction the door stopper is attached to the floor). The door stopper is also used on the floor to prevent the door from opening too much (e.g., the door does not hit the wall when it opens too much). If the door is open and the door stopper is behind the door (not in the part between the door and the doorway), then the stopper surface 2E or 2D of the door stop prevents the door from opening too far (depending on which direction the door stopper is attached to the floor).

[0024] If the door stopper is used on a door or door jamb and the door stopper is in the open position, the door does not move freely (the door stopper is in the working position). The door stopper fastening element 1 is attached to the side of the door or to the door jamb in such a way that the upper surfaces 2F of the horizontal cuboid 2B of the door stopper create an obstacle between the door and the door jamb when the door closes, which

prevents the door from closing completely. If the door stopper is used on a door or door jamb and the door stopper is in the folded position, the door closes freely (the door stopper is in the standby position).

[0025] The peculiarity of the door stopper is that its position can be changed as needed. When installed on the floor, the position of the door stopper can be changed in such a way that it restricts the movement of the door in the folded, i.e., working position (the fixing element 2 "sits" on the fixing element 1 and creates resistance between the door and the floor) and allows the door to move freely over itself in the open or standby position (the fixing element 2 and the fixing element 1 are away from each other in a horizontally spaced position). When installed on a door or door jamb, the position of the door stopper can be changed in such a way that it allows the door to close freely in the folded or standby position and restricts the closing (movement) of the door in the open or working position, when it creates an obstacle between the door and the door jamb.

[0026] The door stopper is easy to install. The door stopper is portable, and the user can carry the door stopper with him/her and optionally use it if he/she wants.

[0027] The door stopper is useful:

- for temporarily leaving the self-closing door open;
- when keeping the door open, if the door suddenly closes (e.g., as a result of a draft);
- when limiting the opening trajectory of the door (e.g., to prevent the door from "breaking" if it opens excessively);
- when opening the door to prevent damage to the surface behind the door (e.g., wall or cabinet) with the door if there is a physical obstacle behind the door when it opens too wide.

Claims

1. A door stopper that comprises a fastening element (1) and a fixing element (2) connected to each other by a joint (3), **characterized in that**

- the fastening element (1) is a triangular cuboid;
  - ◦ the upper face of the fastening element (1) comprises a horizontal rectangular projection (1A);
  - ◦ the fastening element (1) comprises a connecting element;
- the fixing element (2) comprises a horizontal cuboid (2B), a vertical cuboid (2C), and a channel (2A);
  - ◦ the horizontal cuboid (2B) and the vertical cuboid (2C) are connected to each other at an angle of 90 degrees;
  - ◦ the wider side surfaces of the vertical cuboid (2C) are the stopper surfaces (2D) and (2E);
  - ◦ the sides of the channel (2A) form the upper surfaces (2F);
  - ◦ at the lower end of the vertical cuboid (2C) is a partial indentation (2G);
- the joint (3) is at the distant end of the fastening element (1) of the rectangular projection (1A) of the fastening element (1) and at the end of the horizontal cuboid (2B) of the fixing element (1) which is not connected to the vertical cuboid (2C);
- the fastening element (1) is in a fixed position, and the fixing element (2) can be moved to the working position and the standby position with the joint (3);
- the fixing element (2) is at a changeable angle relative to the fastening element (1), depending on the position of the door stopper.

2. The door stopper according to claim 1, **characterized in that** the fixing element (2) is located in the closed position in the rectangular projection (1A) of the fastening element (1) with the channel (2A) of the horizontal cuboid (2B), resting on the fastening element (1) with the upper surfaces (2F) of the sides of the channel (2A) and with the indentation (2G) of the lower end of the cuboid (2C) in such a way that the stopper surface (2D) forms an angle of approximately 100-135 degrees with respect to the projection (1A).

3. The door stopper, according to claim 1, is **characterized in that** the fixing element (2) is placed substantially at an angle of approximately 135-180 degrees horizontally with the fastening element (1) in the open position.

4. The door stopper, according to claim 1, is **characterized in that** the height of the fastening element (1) is lower than the distance between the door and the floor.

5. The door stopper, according to claim 1, is **characterized in that** the height of the vertical cuboid (2C) of the fixing element (2) is selected in such a way that the door stopper does not prevent the door from closing in the standby position when used on the floor and prevents the door from closing in the working position.

6. The door stopper, according to claim 1, is **characterized in that** the location of the door stopper is on the door.

7. The door stopper, according to claim 1, is **charac-**

terized in that the location of the door stopper is on the door jamb.

8. The door stopper, according to claim 1, is **characterized in that** the location of the door stopper is on the floor.

9. The door stopper, according to claim 1, is **characterized in that** the connection element is a double-sided tape on the lower face of the fastening element (1).

10. The door stopper, according to claim 1, is **characterized in that** the connection element is an adhesive on the lower face of the fastening element (1).

11. The door stopper, according to claim 1, is **characterized in that** the connection element is a screw passing through the fastening element (1).

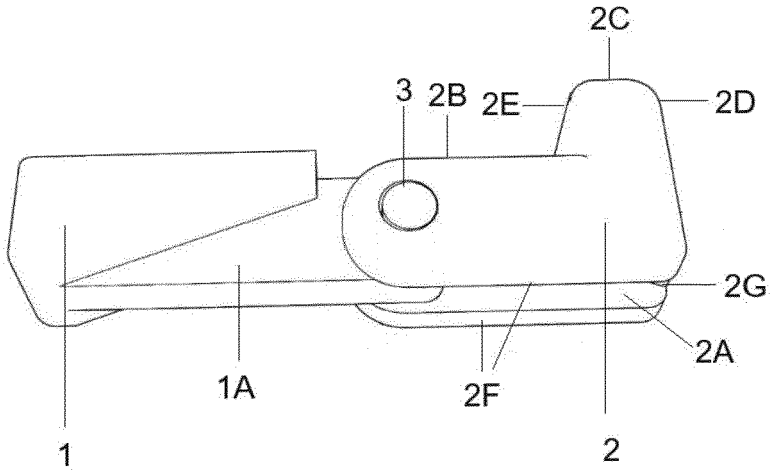

FIG 1

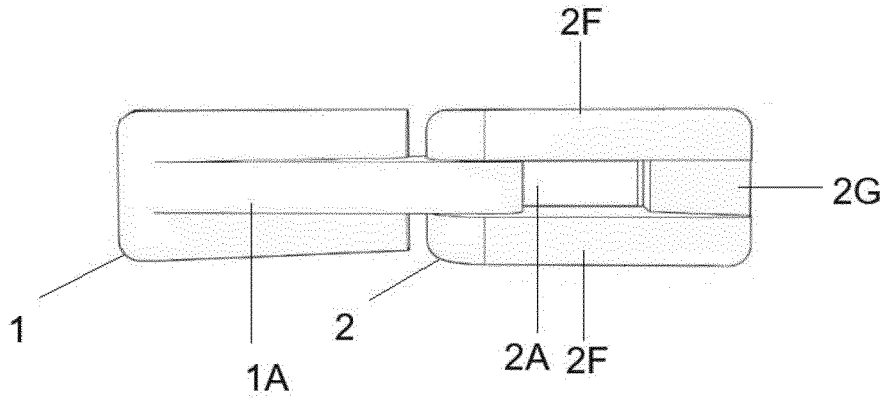

FIG 2

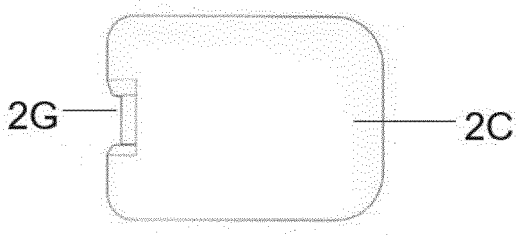

FIG 3

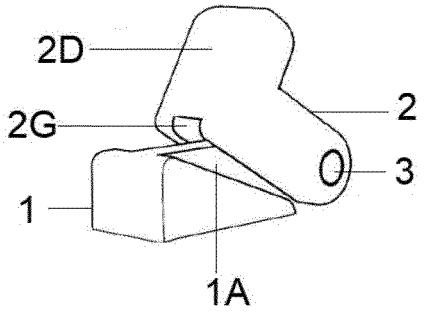

FIG 4

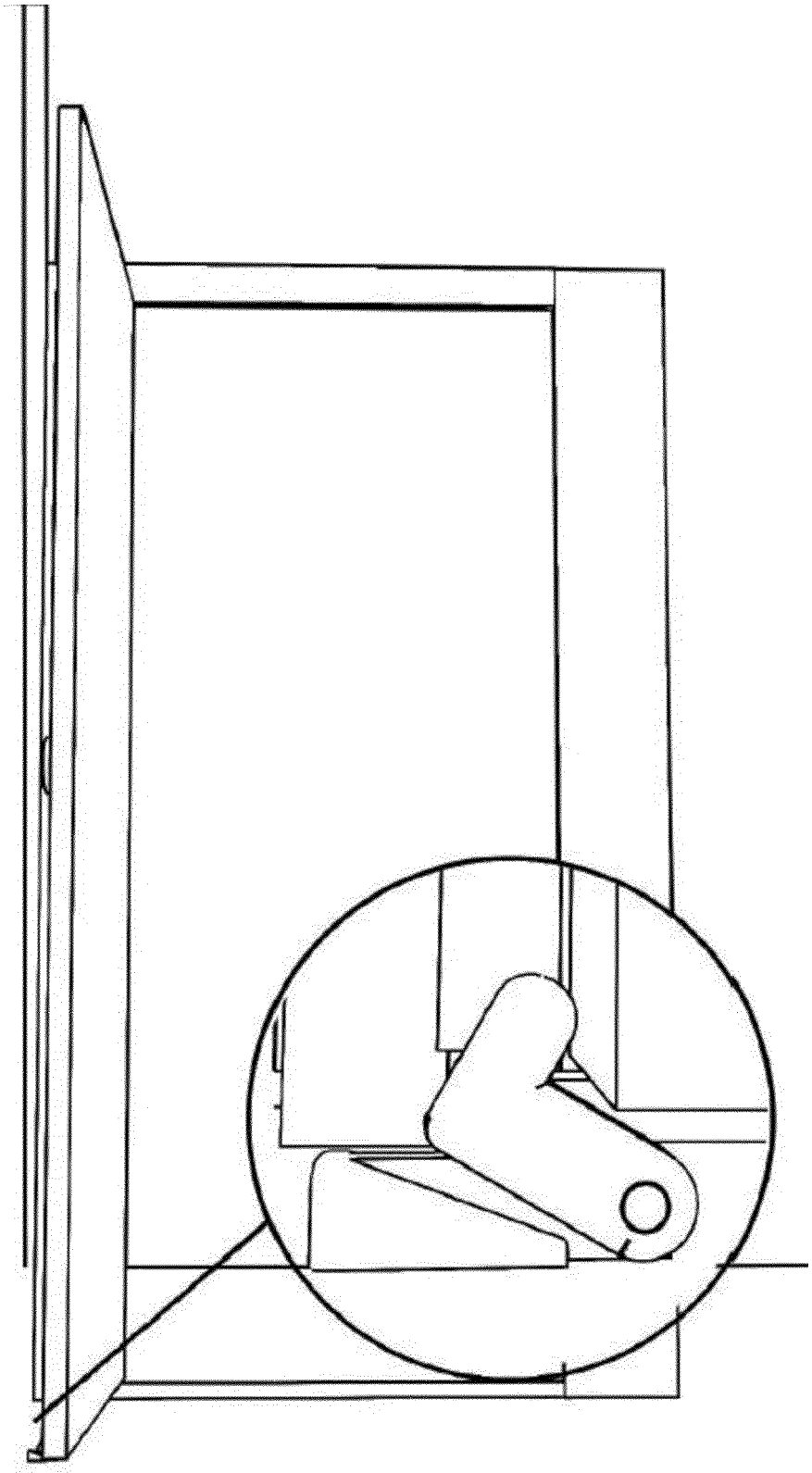

FIG 5

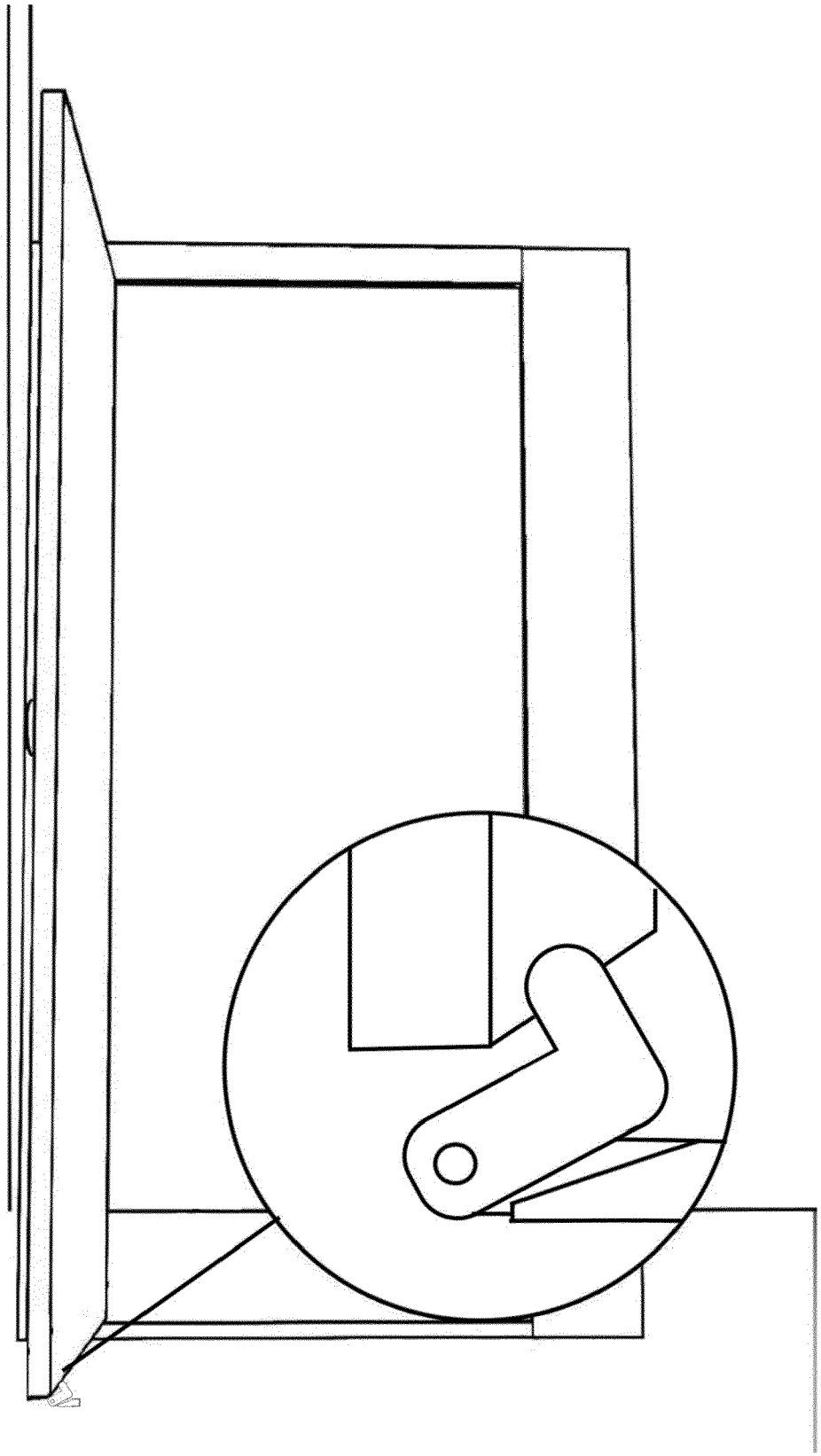

FIG 6

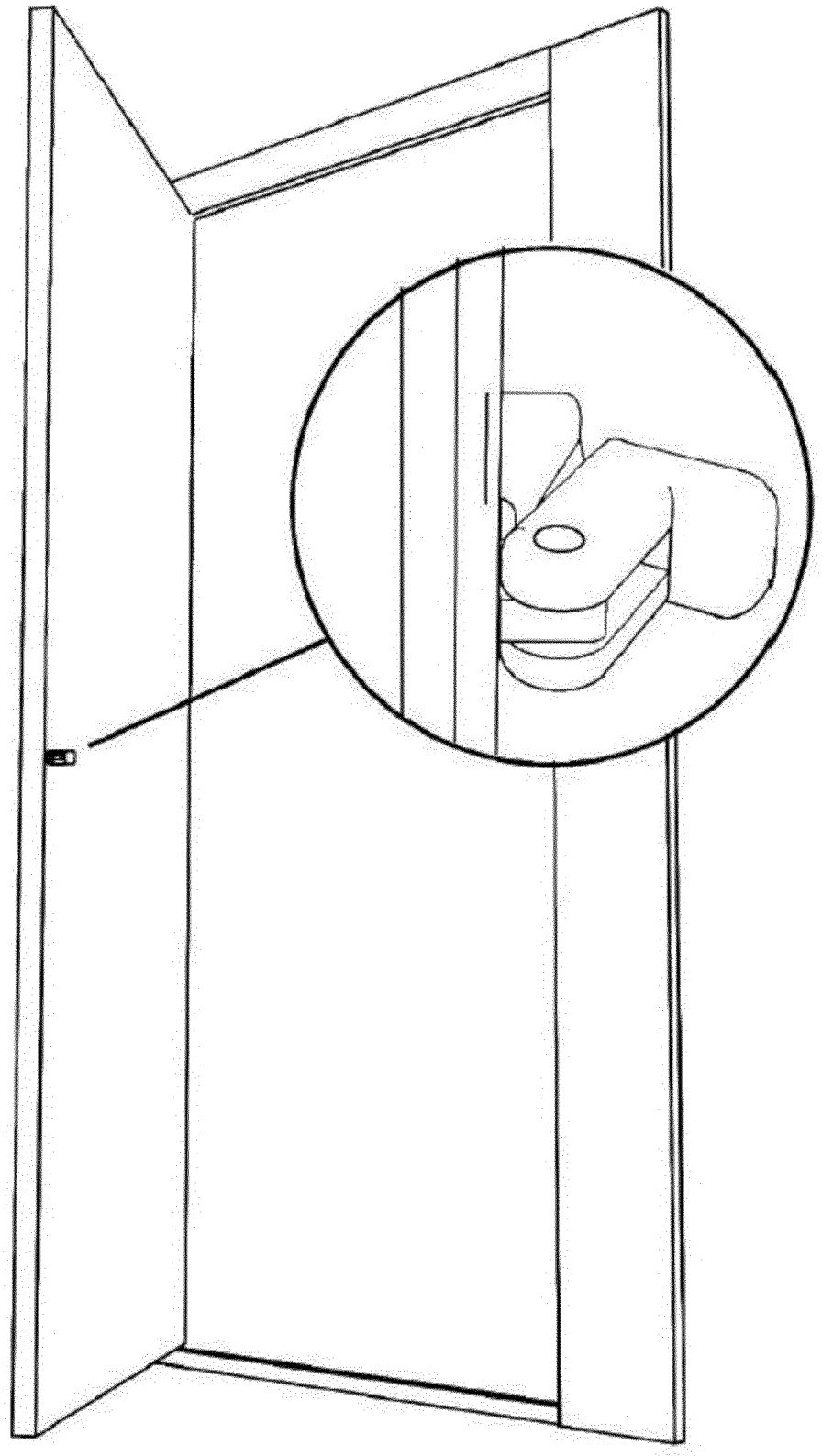

FIG 7

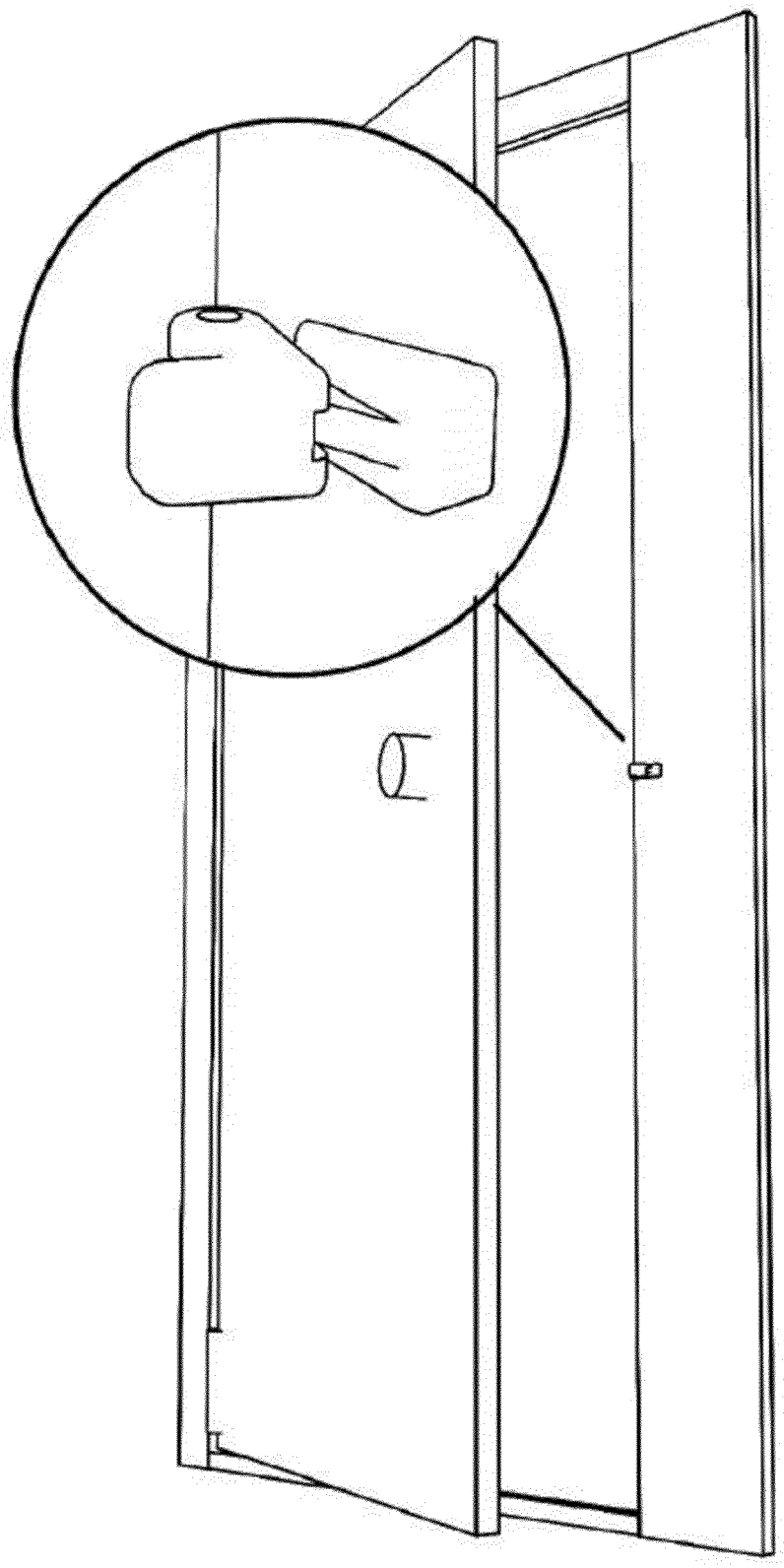

FIG 8

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EUROPEAN SEARCH REPORT

Application Number
EP 23 02 0551

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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TECHNICAL FIELDS SEARCHED (IPC)

E05C
E05B
E05F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	4 June 2024	Koster, Michael

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04-06-2024

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