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(71) Applicant : **CANDY S.p.A.**
Via Privata Eden Fumagalli
I-20047 Brugherio (Milano) (IT)

(72) Inventor : **Fumagalli, Silvano**
c/o Candy S.p.A., Via Privata Eden Fumagalli
I-20047 Brugherio (Milano) (IT)

(74) Representative : **Cicogna, Franco**
Ufficio Internazionale Brevetti Dott.Prof.
Franco Cicogna Via Visconti di Modrone, 14/A
I-20122 Milano (IT)

(54) **Safety device for electric household appliances including a movable cover, in particular for gas and electric ranges.**

(57) The present invention relates to a safety device for electric household appliances, including a movable cover, in particular for gas and electric ranges, characterized in that it comprises a safety slider element including a plurality of recesses for housing therein control knobs, the slider element being arranged at a first position, or safety position, in which it is flush located with respect to the front portion of knobs, so as to prevent the control knobs from being operated, and at a second position, or use position, therein the control knobs project from the slider element, driving means being moreover provided for driving the slider element, which driving means are operatively associated with the cover of the range or the like.

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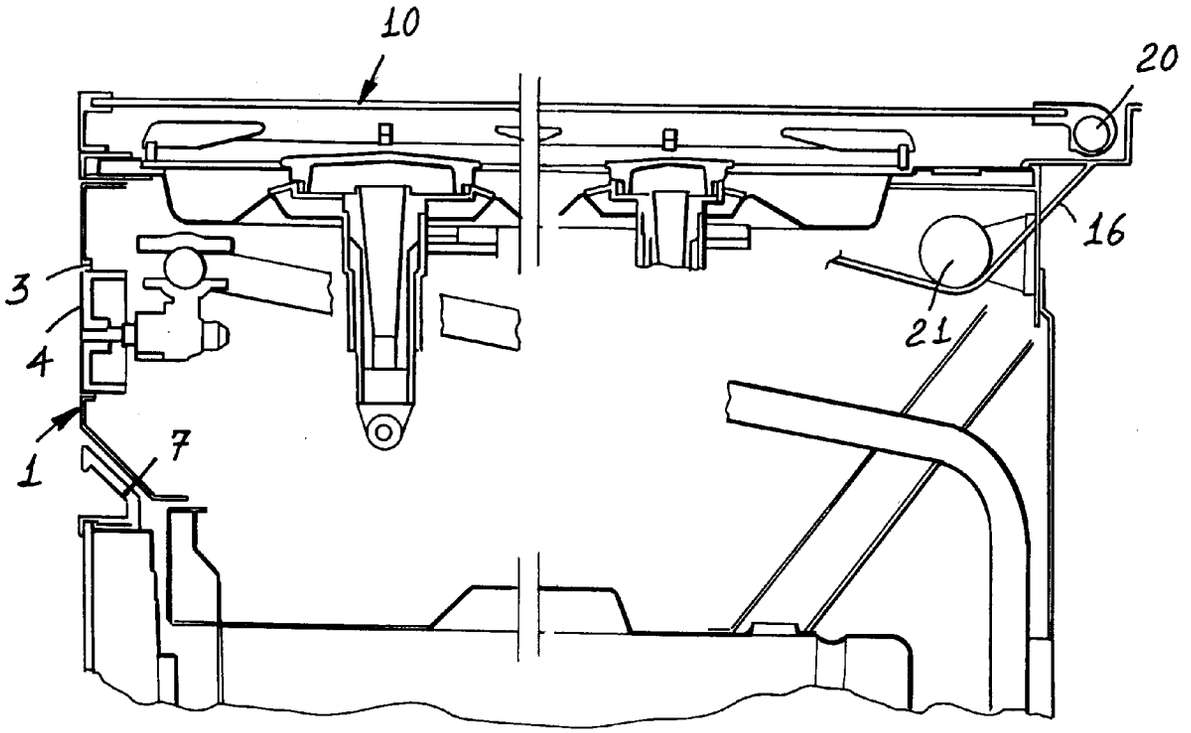

FIG. 1

BACKGROUND OF THE INVENTION

The present invention relates to a safety device for electric household appliances including a movable cover, in particular for gas and electric ranges.

As is known, at present, the use conditions of a generic cooking apparatus, in particular of an intermediate quality standard, exclusively depend on a proper opening and closing operation of the supply source by the user.

Actually, in its rest condition, the electrical household appliance is not or can not be actuated by erroneous operations, for example in a mixed gas and electrically supplied range, or, as it frequently occurs, by children handling the control knobs of the apparatus, with a consequent very great danger.

Recently, thermal safety systems have been developed, specifically designed for locking the gas outflow as the flame is lacking, which systems are usually based on the use of thermocouples.

Another system, which is mainly used in northern countries provides for the use of mechanical shutoff valves which are driven as the appliance cover is displaced, thereby exclusively with the cover in its open condition the gas ejectors of the appliance are supplied with gas.

Such an approach, however, is very complex construction wise, since the provision of a mechanical valve originates great wear problems, with consequent possible leakages.

Moreover, it is possible to operate the control knobs to their open condition both with the cover open and with the cover closed, which thing represents a possible dangerous situation.

SUMMARY OF THE INVENTION

Accordingly, the aim of the present invention is to solve the above mentioned problem, by providing a safety device for household appliances, including a cover to be driven during the use of the appliance, in particular for gas and electric ranges, which is adapted to prevent the control knobs of the appliances from being operated as the cover is in its closed condition.

Within the scope of the above mentioned aim, a main object of the present invention is to provide such a safety device which can be used in association with or in replacement of the conventional integral safety systems such as thermocouples, used in cooperation with thermoresponsive locking systems, or mechanical locking systems, such as cam systems operating on the shaft or stem of the control knobs, so as to prevent the cover of the appliance from being closed as the knob is turned for a set angle.

Yet another object of the present invention is to provide such a safety device for household appliances which is very simple construction-wise and which can be easily fitted to existing household appliances.

Yet another object of the present invention is to provide such a safety device which is very reliable in operation and which can be easily made starting from easily commercially available elements and materials and which, accordingly, is very competitive from a mere economic standpoint.

According to one aspect of the present invention, the above mentioned aim and objects, as well as yet other objects, which will become more apparent hereinafter, are achieved by a safety device for houselhold appliances, including a cover to be driven as the appliance is to be used, in particular for gas and electric ranges, characterized in that said safety device comprises a safety slider element having a plurality of recesses for housing therein control knobs, said slider element being movable to a first position, or safety position, in which it is arranged flush with a front portion of the control knobs, so as to prevent the control knobs from being operated, and to a second position,or use position, therein the control knobs project from the slider element, driving means being moreover provided for driving the slider element, said driving means being associated with the cover of the appliance or range and the like.

BRIEF DESCRIPTION OF THE DRAWINGS

Further characteristics and advantages of the invention will become more apparent hereinafter from the following detailed disclosure of some preferred embodiments thereof, which are illustrated, by way of an indicative, but not limitative, example, in the figures of the accompanying drawings, where:

Figure 1 is a schematic view illustrating the cooking panel of a range with its cover arranged in a closed position;

Figure 2 illustrates a detail of the slider element arranged withdrawn with respect to its control knob, which can be thus used;

Figure 3 illustrates the slider element arranged at a first position thereof, flush with the front portion of the control knob, in an embodiment thereof in which it also prevents the range oven from being opened;

Figure 4 illustrates an embodiment in which the driving means of the slider element are made by a small cable and an operating lever;

Figures 5 illustrates driving means with a lever actuated by a spring;

Figure 6 illustrates the device shown in Figure 5 cross-sectioned along a plane passing through the control lever;

Figure 7 is a schematic cross-sectional view illustrating driving means comprising a driving lever operating on the slider element and directly operated by the cover;

and

Figures 8, 9 and 10 illustrate a driving lever driven

by cams respectively: by a front view in its operating position, as cross-sectioned, and by a closure front view.

DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference to the figures of the accompanying drawings, and more specifically to Figures 1 to 6, the safety device for household appliances, including a movable cover, in particular for gas and electric ranges, according to the present invention, comprises a slider element which practically provides the "control dashboard" of a range generically indicated at the reference number 2.

The slider element 1 is provided with a plurality of recesses 3, in which there are arranged the control knobs 4 which can operate in order to actuate the several flames or electric plates of the range.

The slider element 1 can be moved to a first position, shown in Figure 1, which will be called the "safety position" since said slider element is arranged flush with respect to the front portion of the control knob 4 so as to prevent the latter from being operated, even deliberately.

As shown in Figure 2, the slider element can be moved to a second position, in which the slider is withdrawn, thereby the control knobs project from said slider so as to allow the control knobs to be operated.

Moreover, as is clearly shown in Figures 2 and 3, the slider element can also operate as a safety element for the opening of the range oven since, by its bottom edge portion, it can close the slot for accessing the profiled element 7 of the door 8 of the oven which, accordingly, can not be actuated.

The mentioned slider element is slidably driven by driving means, which are operatively associated with the cover 10 of the range.

As shown in Figures 4 to 6, these driving means comprises a small cable 16 which, at one end thereof, is associated with the hinge 20 of the cover 10 and is entrained on a transmission roller 21 supported, for example, by the sidewalls of the range casing or cabinet.

At the other end thereof, the cable 16 is connected to one end of a lever 22 pivoted to the fixed structure, at its intermediate position, and controlled by a flexure spring 23 operating between, said lever and the fixed casing or structure.

At its end 24, the lever 22 engages in the slot 26 of the sidewalls 27 coupled to the slider element and supported by guide wheels 28 which are slidably engaged in a supporting section member or profiled element 29 associated with the range side walls.

With the disclosed arrangement, as the cover is in its closed condition, as shown in Figure 4, the cable 16 will overcome the resilient biassing of the flexure spring 23, thereby the lever 22 will be turned so that its end portion 24 will hold the sidewalls 27 and, accordingly, the slider element 1 at an advanced position, that is the first position, or safe position, in which said slider element will be flush with the front portion of the control knobs, which, accordingly, can not be actuated.

As the range cover is opened, as is shown in Figure 5, the spring 23 will turn the lever 22 and, accordingly, will withdraw the sidewalls 27 and the slider element 1, thereby the control knobs 4 can project by a quantity sufficient to allow them to be freely actuated.

In the disclosed arrangement, the driving means practically comprise a flexible element provided for driving the lever 22, depending on the specific position of the cover, so as to prevent the control knobs from being operated as the cover is in its closure position.

As is shown in Figure 7 to 10, a rigid connection for the driving means can be used, that is by a driving lever which directly operates on slide or the like means connected to the slider element.

More specifically, as is shown in Figure 7, a operating lever 30 is provided, including locating resilient means and pivoted at an intermediate position thereof, said driving lever 30 being provided with a sensor arm 31 projecting laterally through the top portion of the cooking panel, in order to cooperate with the cover, whereas its bottom arm 32 is coupled to a bracket 33, guided by guiding pads, i.e. a front pad 34 and a rear pad 35, which bracket is directly connected to the slider element also indicated at 1.

With the cover in its open position, the lever 30 will turn in a closkwise direction (Figure 7) so as to cause the slider element 1 to withdraw.

As the cover is closed, the engagement between the cover and sensor arm 31 will cause the lever to turn, thereby displacing the slider element, which will house inside it the control knobs, so as to prevent the latter from turning.

As shown in Figures 8 to 10, a second operating lever, indicated at 40, is provided, which is pivoted, at an intermediate portion 41 thereof, to the fixed structure and being provided with a top arm 42 cooperating with a cam 43 associated with the pivoting portion of the cover, also indicated at 10.

The bottom arm 45 of the lever 40, associated with resilient locating means 100, engages with a driving bar 46, which is also connected to the slider element, so as to provide a drive like that which has been above disclosed.

From the above disclosure it should be apparent that the safety device according to the invention has been specifically adapted to provide a direct relationship between the position of the cover and the position of the slider element which is so arranged as to prevent the access to the control knobs as the cover is in its closed condition.

On the other hand, as the cover is opened, the

slider element will be withdrawn, so as to allow the control knobs to project, and to be operated by the user.

In this connection it should be moreover pointed out that the slider element, in addition to providing the safety of the device, also offers the great advantages of providing the range with a very good aesthetic aspect, since it provides a frontal alignment of the dashboard, to prevent the control knobs from projecting as the cover is in its closure condition.

While the invention has been disclosed and illustrated with reference to a preferred embodiment thereof, it should be apparent that the disclosed embodiment is susceptible to several modifications and variations all of which will come within the spirit and scope of the appended Claims.

Claims

1. A safety device for household appliances, including a cover to be driven as the appliance is to be used, in particular for gas and electric ranges, characterized in that said safety device comprises a safety slider element having a plurality of recesses for housing therein control knobs, said slider element being movable to a first position, or safety position, in which it is arranged flush with a front portion of the control knobs, so as to prevent the control knobs from being operated, and to a second position, or use position, therein the control knobs project from the slider element, driving means being moreover provided for driving the slider element, said driving means being associated with the cover of the appliances or ranges and the like.

2. A safety device according to Claim 1, characterized in that said slider element is adapted to cooperate with the gripping portion of the door of the range oven in order to prevent this door from being opened as the slider element is arranged in its first position.

3. A safety device according to Claims 1 and 2, characterized in that the driving means for driving said slider element comprise flexible or resilient means operating between said slider element and the articulation region of the range cover.

4. A safety device according to one or more of the preceding claims, characterized in that said flexible means comprises at leas a cable associated with the cover hinge assembly and connected, at the other end thereof, to an end portion of a lever pivoted at its intermediate region and connected, at the other end thereof, in a slot provided through a sidewall slidable guided by the casing of the range and associated with the slider element.

5. A safety device according to one or more of the preceding claims, characterized in that said lever is associated with a flexure spring operating between a fixed point of the range casing and said lever, the resilient biassing of said lever being exceeded by said cable as the cover is in its closure condition.

6. A safety device according to one or more of the preceding claims, characterized in that said said driving means comprise an operating lever pivoted to said casing of said range and having a top arm cooperating with said cover and a bottom arm cooperating with a driving bracket guided by front and rear pads associated with said casing, said driving bracket being connected to said slider element.

7. A safety device, according to one or more of the preceding claims, characterized in that said operating or driving lever is provided with a sensor arm flush arranged on the cooking panel of the range and cooperating with said cover.

8. A safety device, according to one or more of the preceding claims, characterized in that said driving lever is provided with a top arm cooperating with a cam portion associated with said cover at its articulation region.

9. A safety device, according to one or more of the preceding claims, characterized in that it can be used either in combination or in addition with other safety elements or devices.

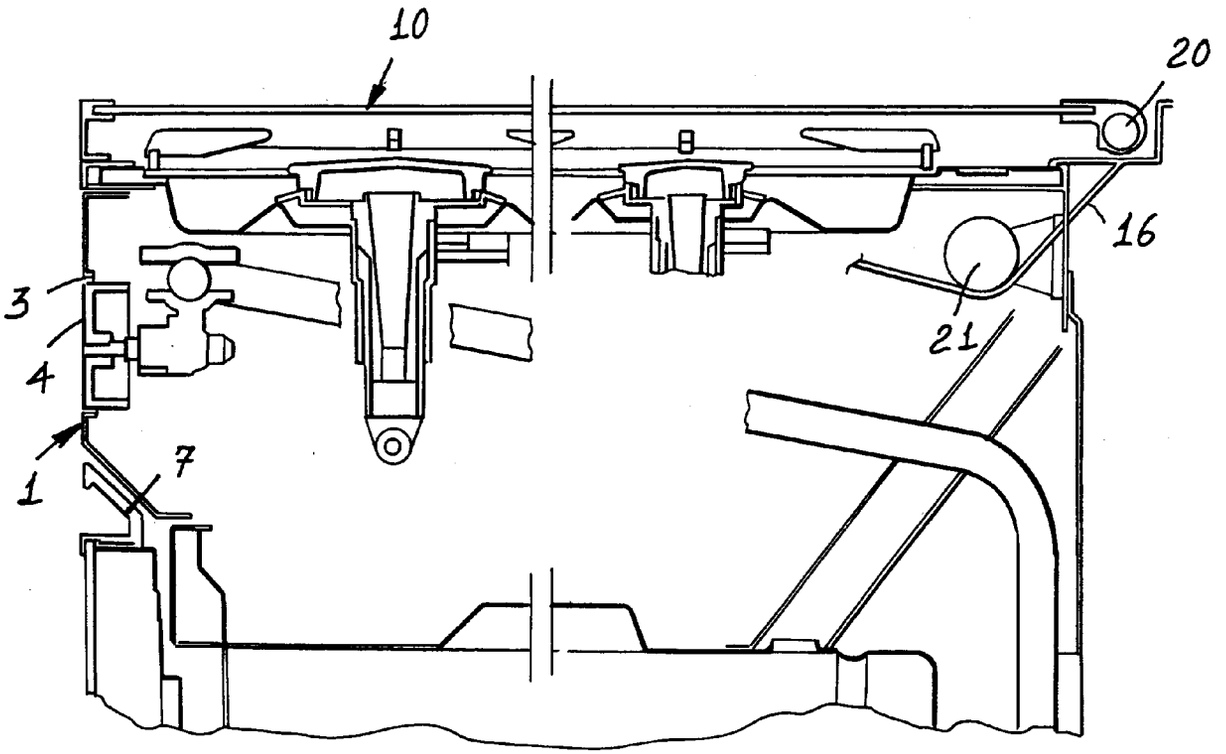

FIG. 1

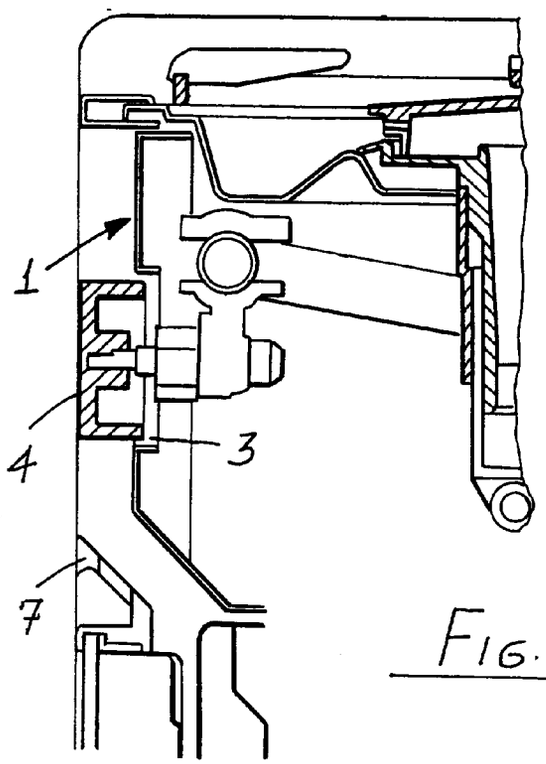

FIG. 2

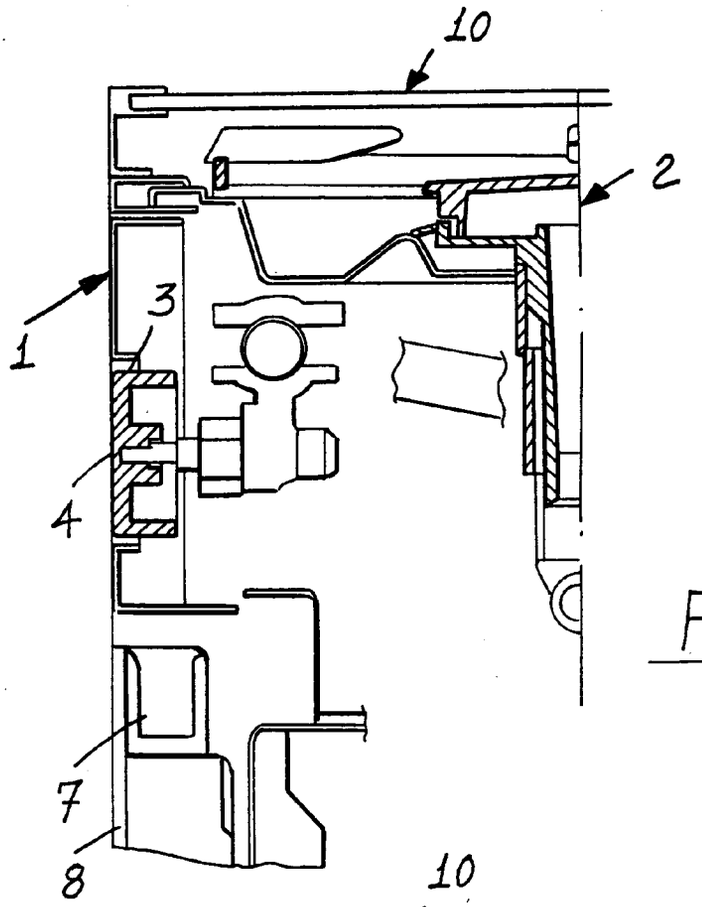

FIG. 3

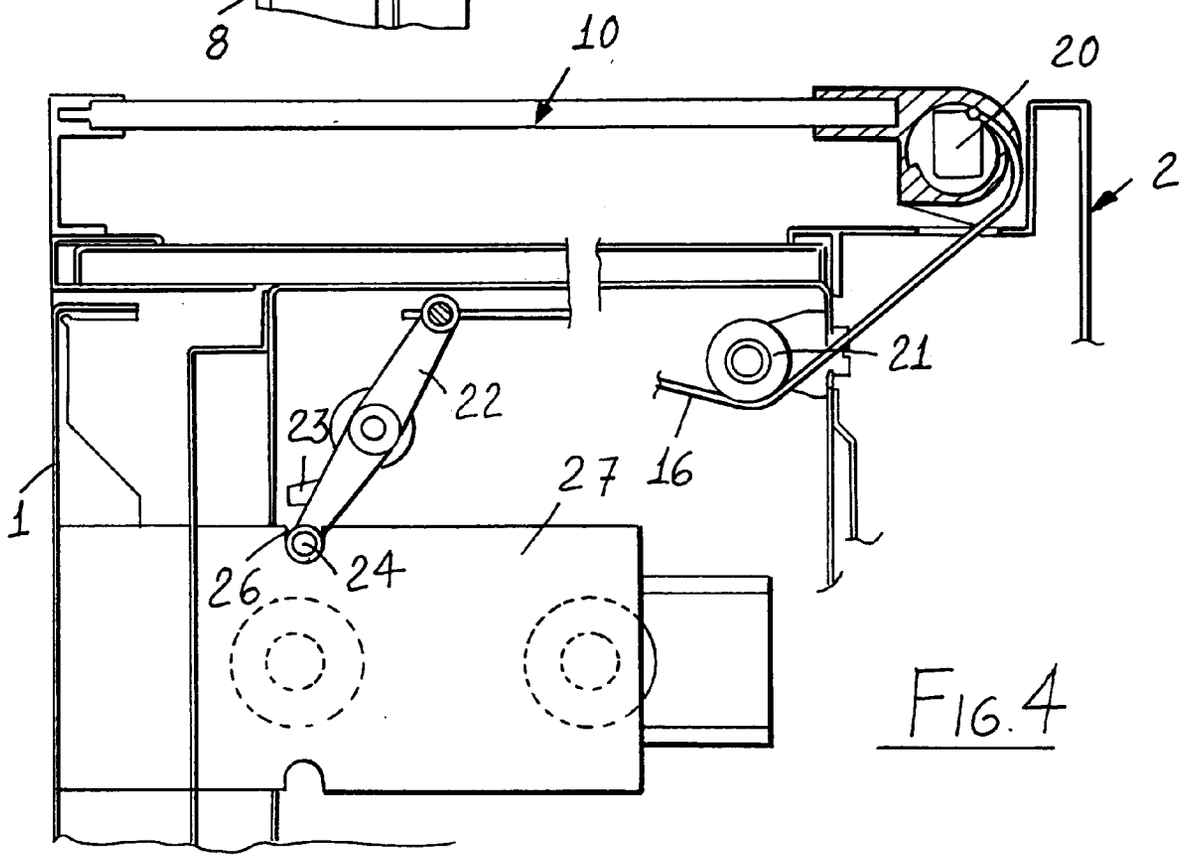

FIG. 4

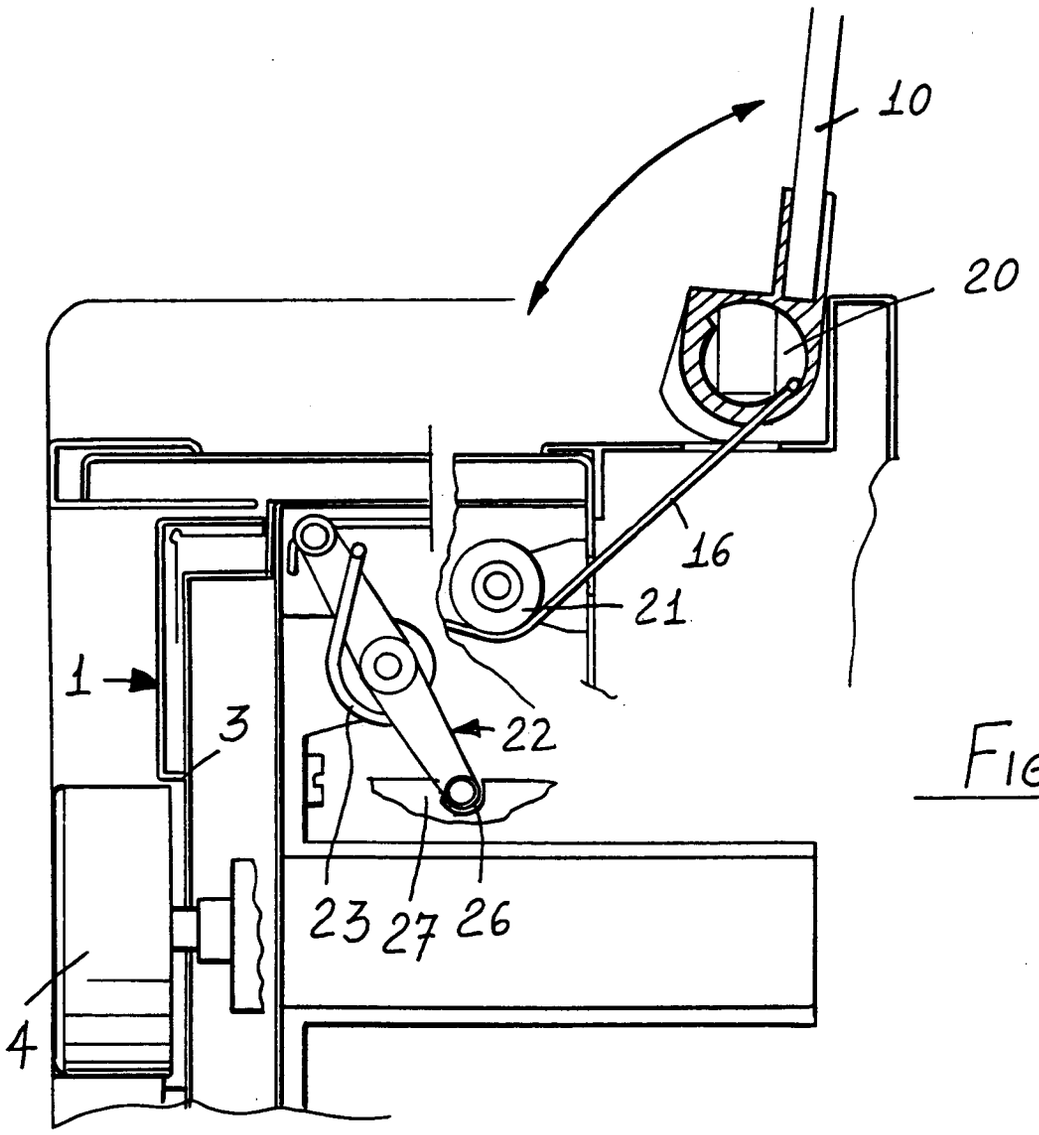

FIG.5

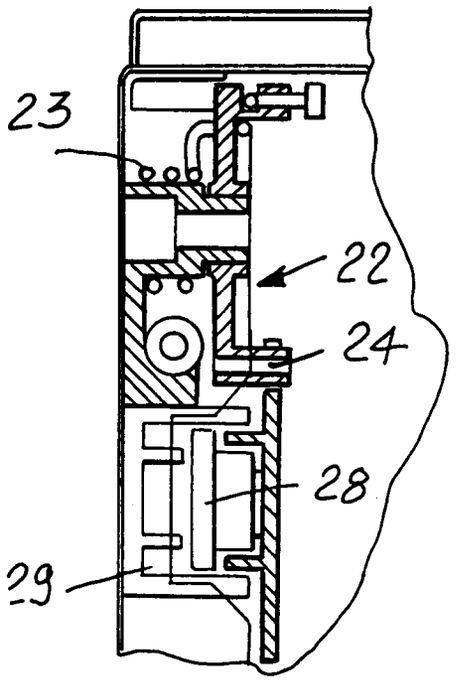

FIG.6

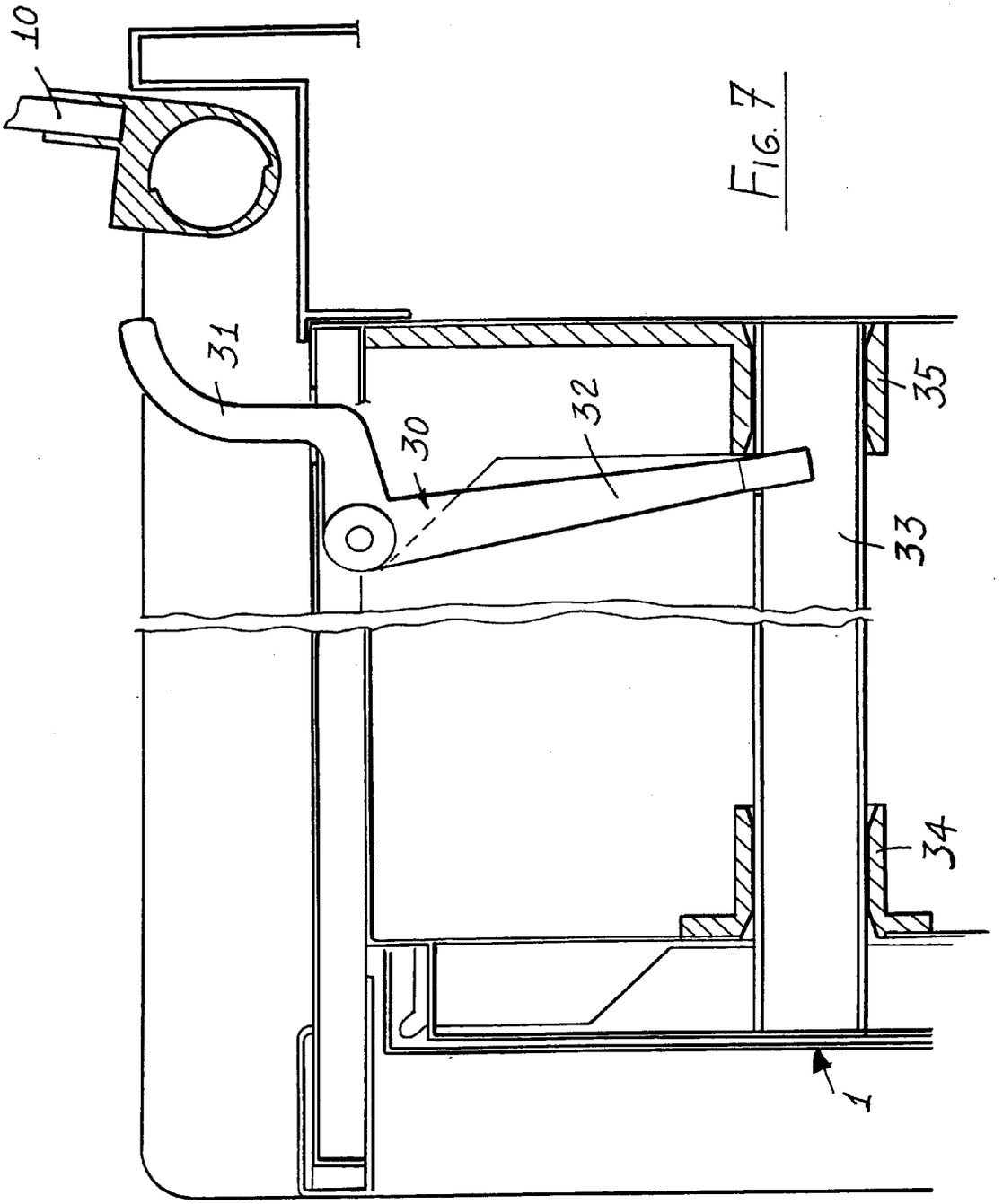

FIG. 7

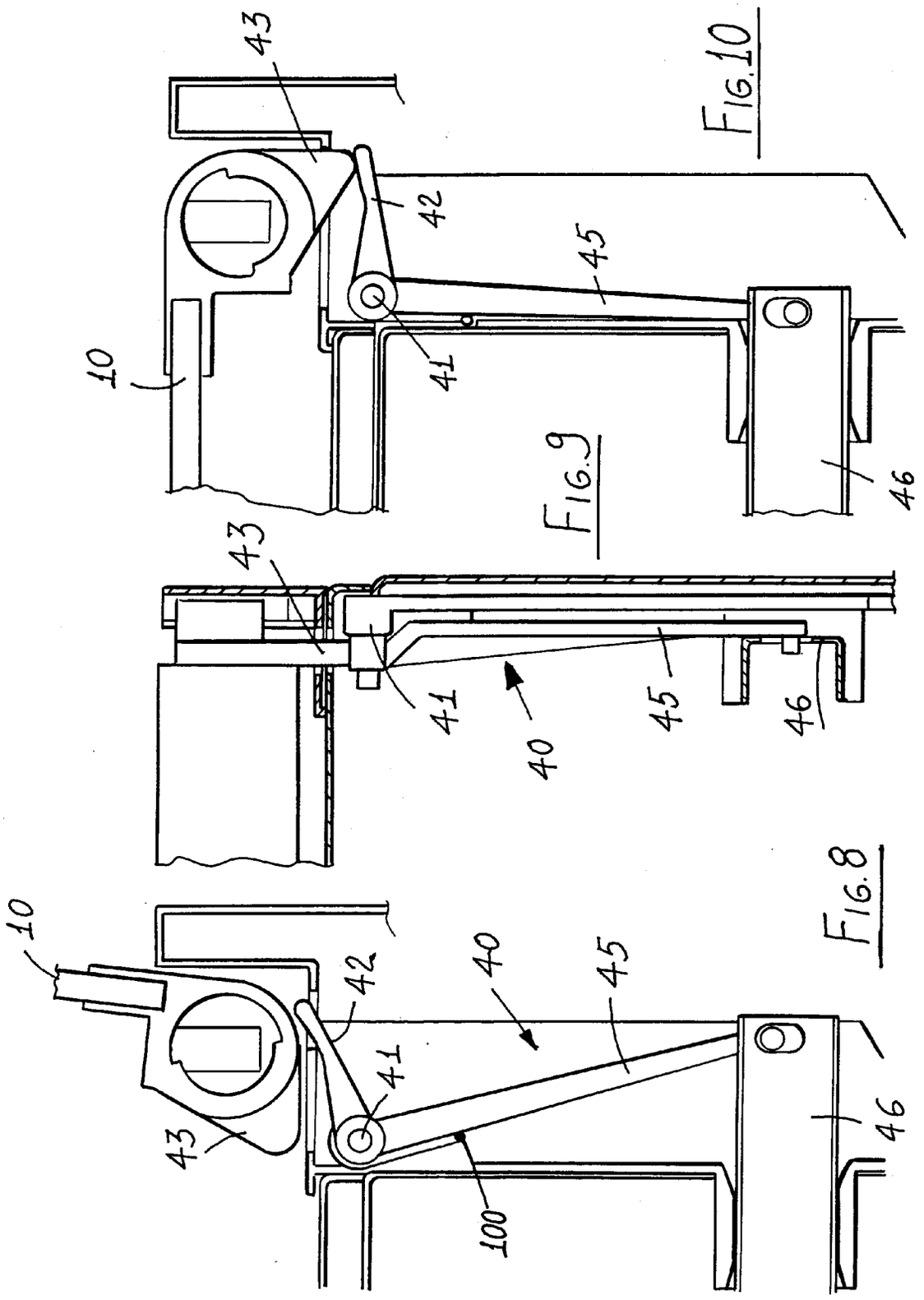

FIG. 10

FIG. 9

FIG. 8

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EUROPEAN SEARCH REPORT

Application Number
EP 92 83 0347

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	US-A-2 059 735 (KENNEDY) * the whole document *	1	F24C3/12 F24C15/12
A		6,7	
A	US-A-2 115 305 (FOX) * page 2, left column, line 21 - line 50; figures *	1,3	
A	EP-A-0 102 413 (SMEG) * claims 1,16; figures *	1,2	
A	GB-A-2 230 085 (SMEG) * abstract *	8	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			F24C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	14 OCTOBER 1992	VANHEUSDEN J.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
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