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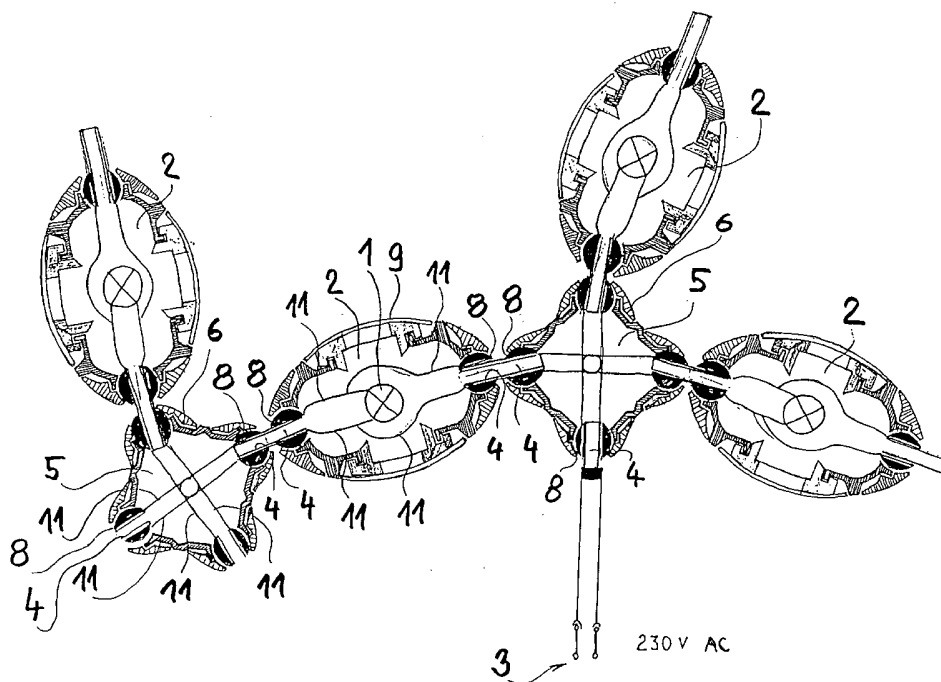
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(54) Title: LIGHTING STRUCTURE



(57) Abstract: The lighting structure comprising at least two cases (2), in at least one of which a light source (1) is placed, the light source (1) being connected to an electric power source (3). Each case (2) is provided at least at one of its ends with an articulated connection element (4) for dismountable mechanic-electrical connection with another case (2) and/or with a connector (5).



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## Lighting Structure

### Technical Field

The invention relates to a lighting structure comprising at least two cases, in at least one of which a light source is placed, the light source being connected to an electric power source.

### Background Art

There are many lighting devices that comprise of sets of interconnected light sources. Such light structures are used particularly for decorative and advertising purposes.

The characteristic example is Christmas lighting system comprising of sets of colour light sources connected with flexible conductors. Such a lighting system is known for example from the document US 6,056,422.

Lighting networks for advertising purposes are known for example from the documents US 6,135,616 and US 6,010,356.

It is also known that point reflectors can be connected to a common suspended element that enables individual positioning of the point reflectors.

A common drawback of all known lighting devices of the above type is that they do not enable to create arbitrary three-dimensionally shaped lighting systems without necessary use of complicated supporting structures.

### Disclosure of Invention

These drawbacks are eliminated by a lighting structure comprising at least two cases, in at least one of which a light source is placed, the light source being connected to an electric power source. Each case is provided at least at one of its

ends with an articulated connection element for dismountable mechanic-electrical connection with another case and/or with a connector.

The advantage of the lighting structure according to the invention is that it enables to compose arbitrary three-dimensionally shaped systems that distribute power in all branches and terminals. Both power appliances, among them light sources, and power sources, like accumulators, can be positioned in any place of the structure. The final structure is both a self-supporting one and depending in the used materials it can be a bearing one like in the form of light bridges.

The advantageous form for the case is longish with articulated connection elements at both ends that are connected with conductors.

According to another advantageous embodiments the connector comprises a cover provided with at least one articulated connection element for dismountable mechanic-electrical connection with the case.

According to another advantageous embodiments the articulated connection elements are in the case and/or in the cover mounted in a self-locking ball joint

In another advantageous form there is an electric power source or a transformer mounted in the case and/or in the connector.

As to other advantageous forms, the articulated joints comprise of a set of articulated male and female plugs or articulated thread joints or articulated bayonet joints.

According to another advantageous embodiments the case and/or the connector is provided with elements for connecting to the fixed base or for placing on the fixed base.

### Brief Description of Drawings

The lighting structure as to the invention shall be better particularized using drawings on which the individual figures shall demonstrate:

Figure 1 - example of an embodiment of the lighting structure according to the invention

Figure 2 - example of an embodiment of the lighting structure branched with a connector

Figure 3 - another embodiment of the branched lighting structure

Figure 4 - part of the lighting structure with an accumulator in a case

Figure 5 - part of the lighting structure with a transformer in a case

Figure 6 - part of the lighting structure with a transformer in the end connector

Figure 7 - part of the lighting structure with an accumulator in the end connector

Figures 8 and 9 - examples of electric connections of light sources

### Modes for Carrying Out the Invention

A part of the lighting structure is shown in Fig. 1 and comprises two cases 2 that are connected to the wall 10 with a connector 5. In each case 2 there is a light source 1. In this embodiment the light source 1 is formed by a bulb having wattage of 40W. Each case 2 has an elongated shape and has been mounted of plastic parts. Each case 2 has a transparent shield 9 in its middle part. At both ends the cases 2 are provided with an articulated connection element 4 for a dismountable mechanic-electrical connection.

The connector 5 comprises a plastic cover 6 that bears an articulated connection element 4 for a dismountable mechanic-electrical connection with a connected case 2.

The connection elements 4 have been formed by a combination of male-female plugs which are in the cases 2 and in the covers 6 of the connector 5 mounted in a self locking ball joints 8. Each case 2 has a corresponding female plug at its one end and a male plug at its other end and they both are connected with conductors 11 to which a bulb base for the light source 1 has been parallel connected. The combination male-female plugs creates both a mechanical connection of cases 2 and connectors 5 and an electric connection of both light sources 1 with the electric power source 3 which in this case is the alternating network of 230V.

When assembling the arbitrary long lighting structure it is sufficient to insert two individual male-female plugs of connection elements 4 one in another and thanks to the self locking ball joints 8 the cases 2 can lean towards each other in the space. It is clear that some cases 2 need not necessarily bear the light source 1 and that they serve as a bearing element in the whole structure. The assembled light structure creates a self-supporting structure the bearing capacity of which can be influenced by selection of known materials.

As is apparent from the schematic drawing in Fig. 1, the light sources 1 are connected with conductors 11 in parallel so that a defect of one light source 1 shall not cause any outage of the whole lighting installation.

For the sake of simplicity, the articulated connection elements 4 for dismountable mechanic-electrical connection have been displayed as male-female plugs in all drawings that are mounted in self locking ball joints 8, however, the experts are aware that the articulated connection element 4 for the dismountable mechanic-electrical connection can be created with any known element that will enable the cases 2 and/or the connectors 6 to lean to each other and distribute electric power. As an example we can give articulated thread or bayonet joints provided with electric wire.

The cases 2 need not be arranged one after another as shows Fig. 1, they can branch out arbitrary, too. Connectors 6 with several connection elements 4 are intended for these purposes.

For instance, in Fig. 2 there is a connector 5 with four articulated connection elements 4 to which three cases 2 with light sources 1 and another connector 5 with one connection element 4 are connected. The connector 5 having only one connection element 4 has been fixing the whole space lighting structure on the wall 10. The structure of the elements is similar to the above-mentioned embodiment.

Connectors 5 need not have articulated connection elements 4 arranged in one plane. Using the cases 2 and perhaps connectors 5 it is possible to create spatially branched light structures that can be fastened to a wall, a ceiling or can be placed freely on a floor, a table or any other piece of furniture. According to the invention the lighting structure also can create a bearing structure of buildings.

An example of a free situated light structure is given in Fig. 3. The lighting structure comprises of four cases 2 and two connectors 5. Free connection elements 4 of end cases 2 can be replaced with not-drawn blind plugs. The lighting structure is connected through one of the connectors 5 to the 230V alternating network.

The light source 1 need not be present in all cases 2. Some cases 2 can serve as a bearing element only in the whole structure, other can bear an accumulator 12, a transformer 7, a plug for electric power consumption etc.

Fig. 4 shows a part of a lighting structure the light sources 1 of which are created by halogen bulbs with wattage of 10W. Instead of light source 1 there is an accumulator 12 placed in one of the cases 2. The accumulator 12 feeds all the light sources 1. The case 2 with the accumulator 12 has the articulated connection element 4 at only one end and at the other one there is a blind plug 13. When the

accumulator 12 is used, a movable lighting structure is created independent on the mains.

Fig. 5 shows another lighting structure having a transformer 7 in one of the cases 2 instead of the light source 1. The transformer 7 serves to feed halogen bulbs in the whole lighting structure. The case 2 that is connected as an end one has an articulated connection element 4 on the one end only and a blind plug 13 on the other end.

To place various sources of power we can use not only cases 2 but also connectors 5. In Fig. 6 there is a part of a lighting structure that has a transformer 7 mounted in the connector 5. In Fig. 7 you can see an embodiment with an accumulator 12 in the connector 5.

The electric schemes examples of parallel connections of light sources 1 have been demonstrated in Fig. 8 and 9.

The lighting structure according to the invention can be employed to assemble an arbitrarily branched structure that distribute electric power. The electric power can be consumed in specific places, for instance in light sources, or it can be withdrawn. The lighting structure as to the invention can create also bearing parts of buildings.

## CLAIMS

1. A lighting structure comprising at least two cases (2), in at least one of which a light source (1) is placed, the light source (1) being connected to an electric power source (3), **characterized by the fact** that each case (2) is provided at least at one of its ends with an articulated connection element (4) for dismountable mechanic-electrical connection with another case (2) and/or with a connector (5).
2. The lighting structure as in Claim 1, **wherein** the case (2) has a longish shape and at its both ends there are articulated connection elements (4) interconnected with conductors (11).
3. The lighting structure as in Claim 1 or 2, **wherein** the connector (5) comprises a cover (6) provided with at least one articulated connection element (4) for dismountable mechanic-electrical connection with the case (2).
4. The lighting structure as in any of the Claims 1 to 3, **wherein** the articulated connection elements (4) are in the case (2) and/or in the cover (6) mounted in a self locking ball joint (8).
5. The lighting structure as in any of the Claims 1 to 4, **wherein** in the case (2) and/or in the connector (5) there is mounted an electric power source (3).
6. The lighting structure as in any of the Claims 1 to 5, **wherein** in the case (2) and/or in the connector (5) there is mounted a transformer (7).
7. The lighting structure as in any of the Claims 1 to 6, **wherein** the articulated connection elements (4) are created by a system of articulated male and female plugs.
8. The lighting structure as in any of the Claims 1 to 7, **wherein** the articulated connection elements (4) are created by a system of articulated thread joints.



9. The lighting structure as in any of the Claims 1 to 8, **wherein** the articulated connection elements (4) are created by a system of articulated bayonet joints.

10. The lighting structure as in any of the Claims 1 to 9, **wherein** the case (2) and/or the connector (5) is provided with elements for connecting to the fixed base or for placing on the fixed base.

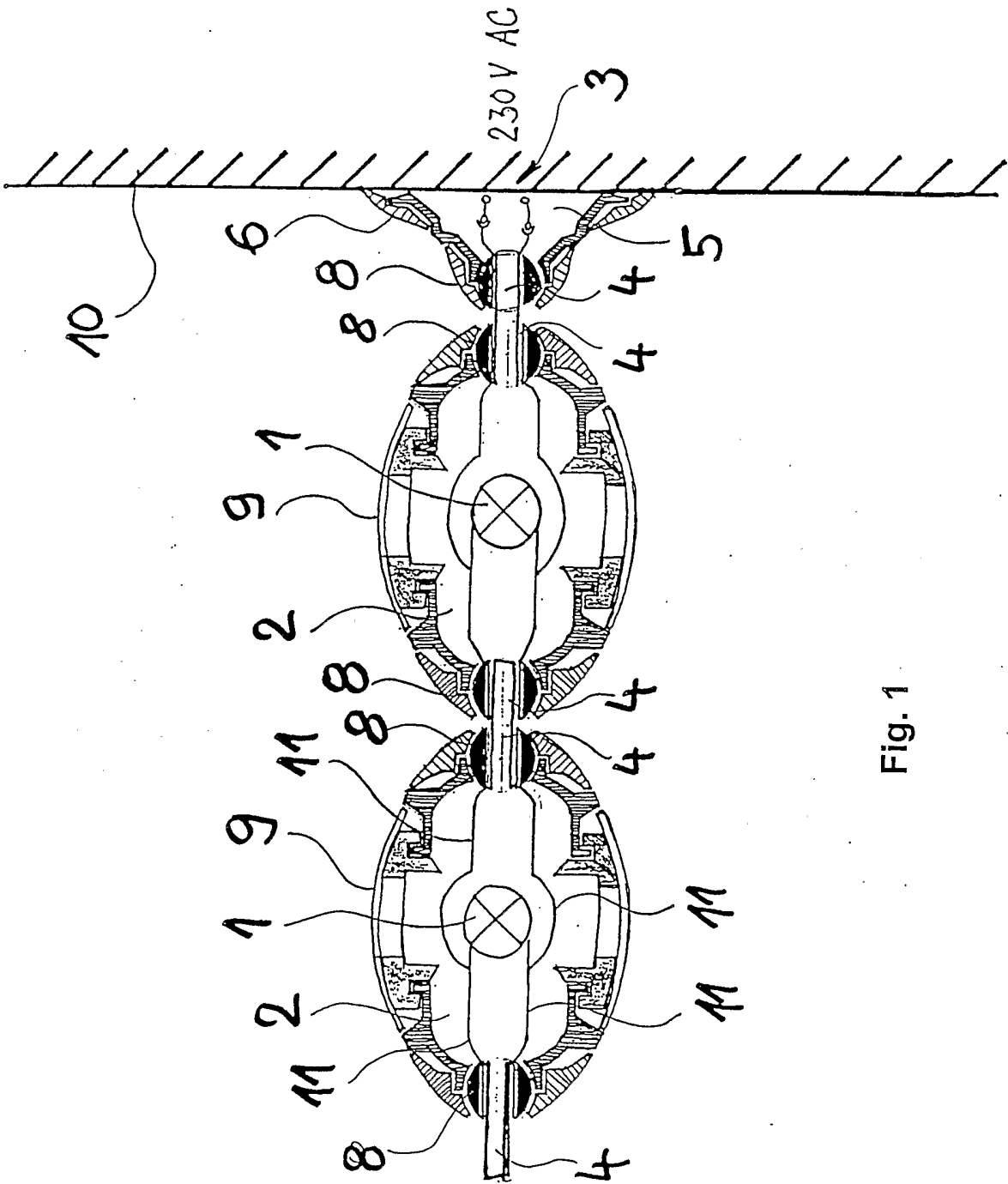


Fig. 1

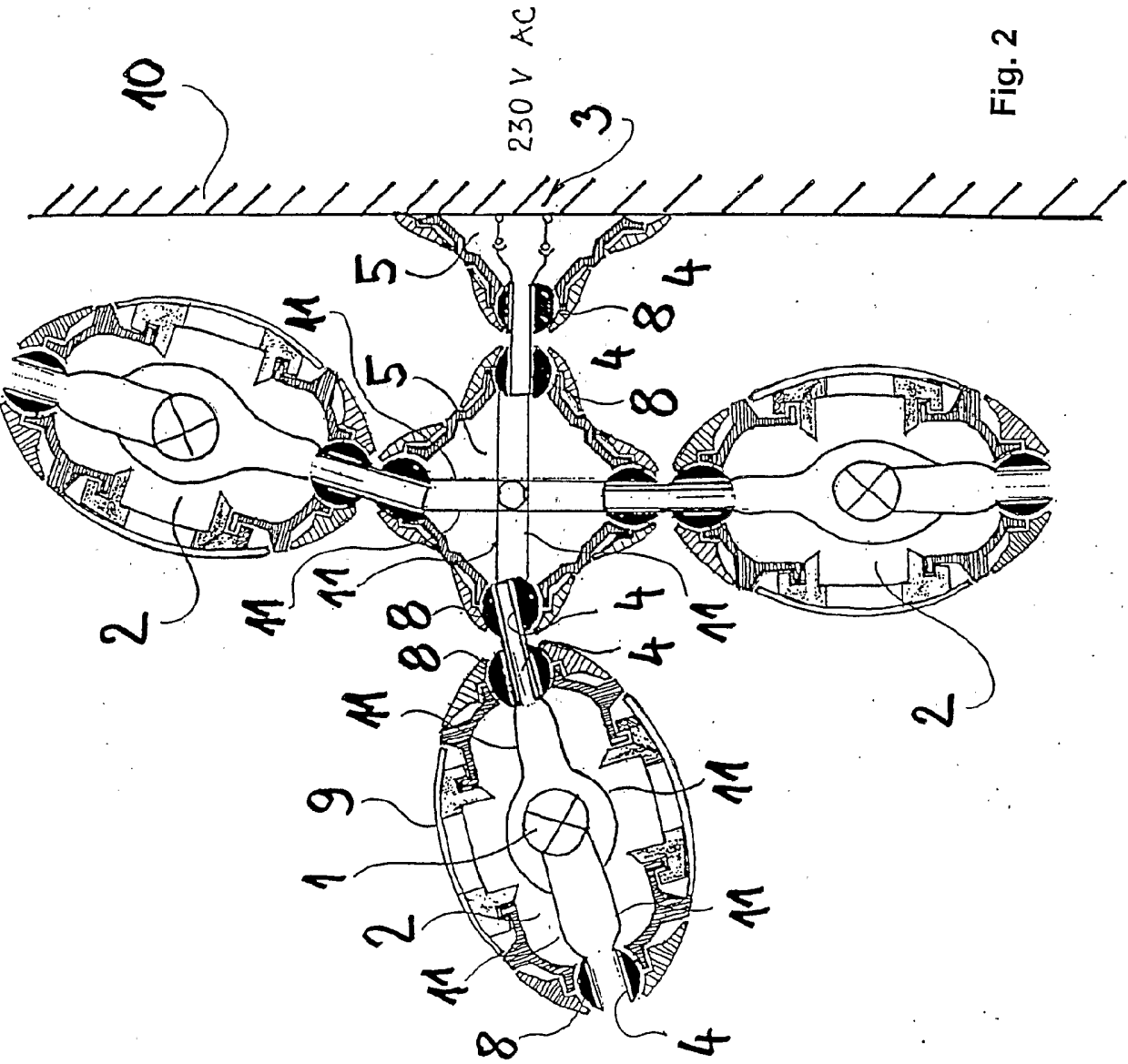
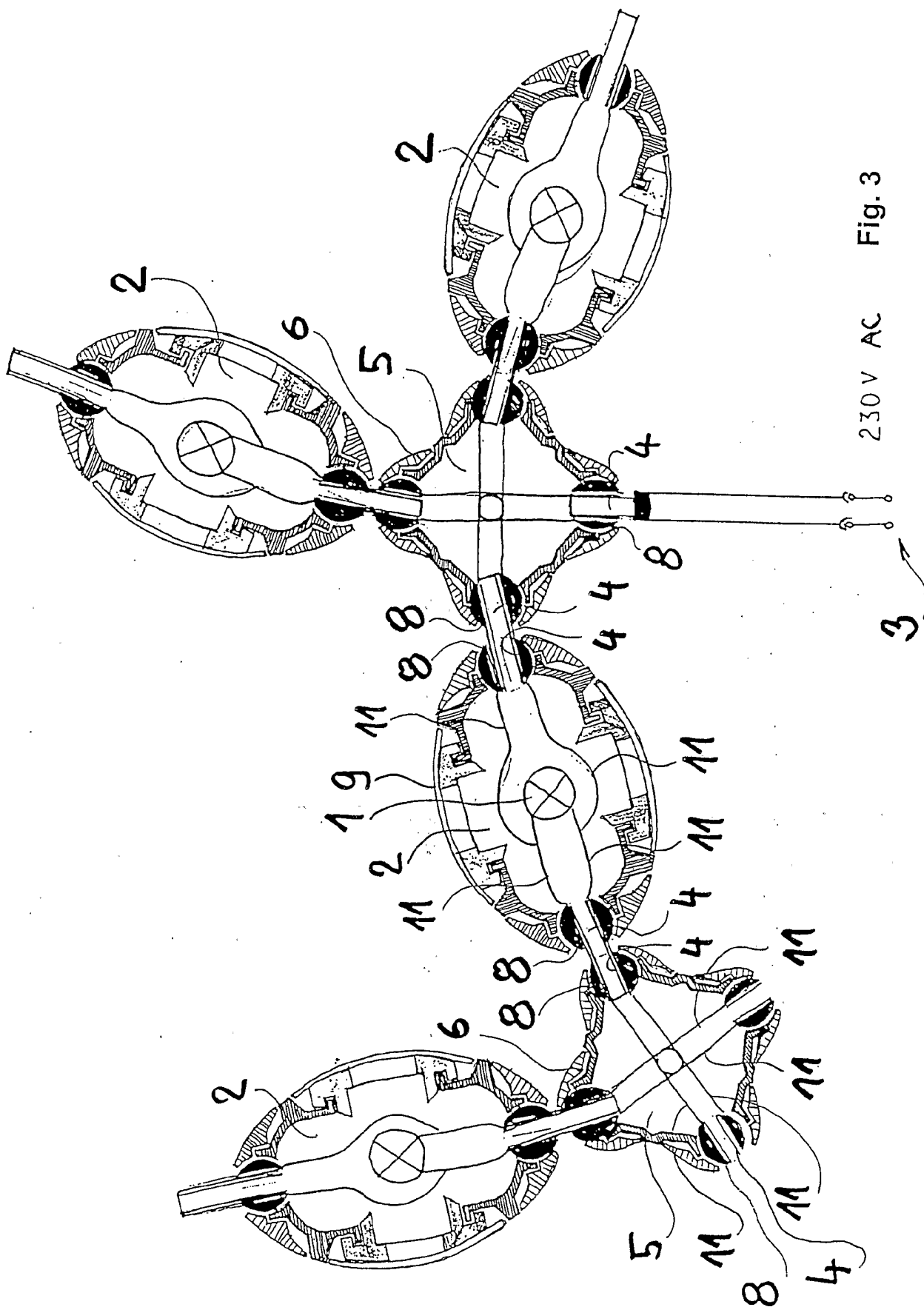


Fig. 2



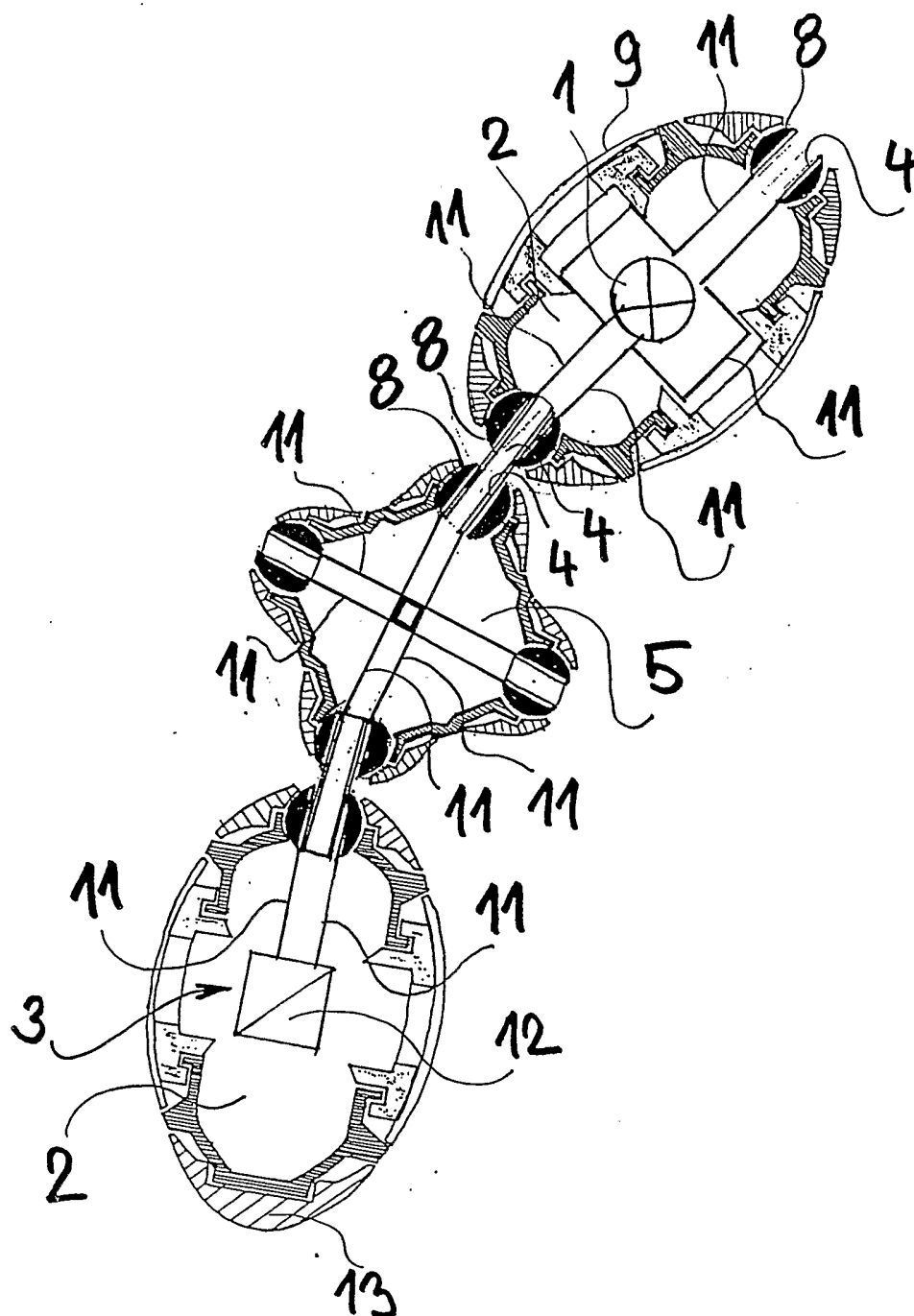


Fig. 4

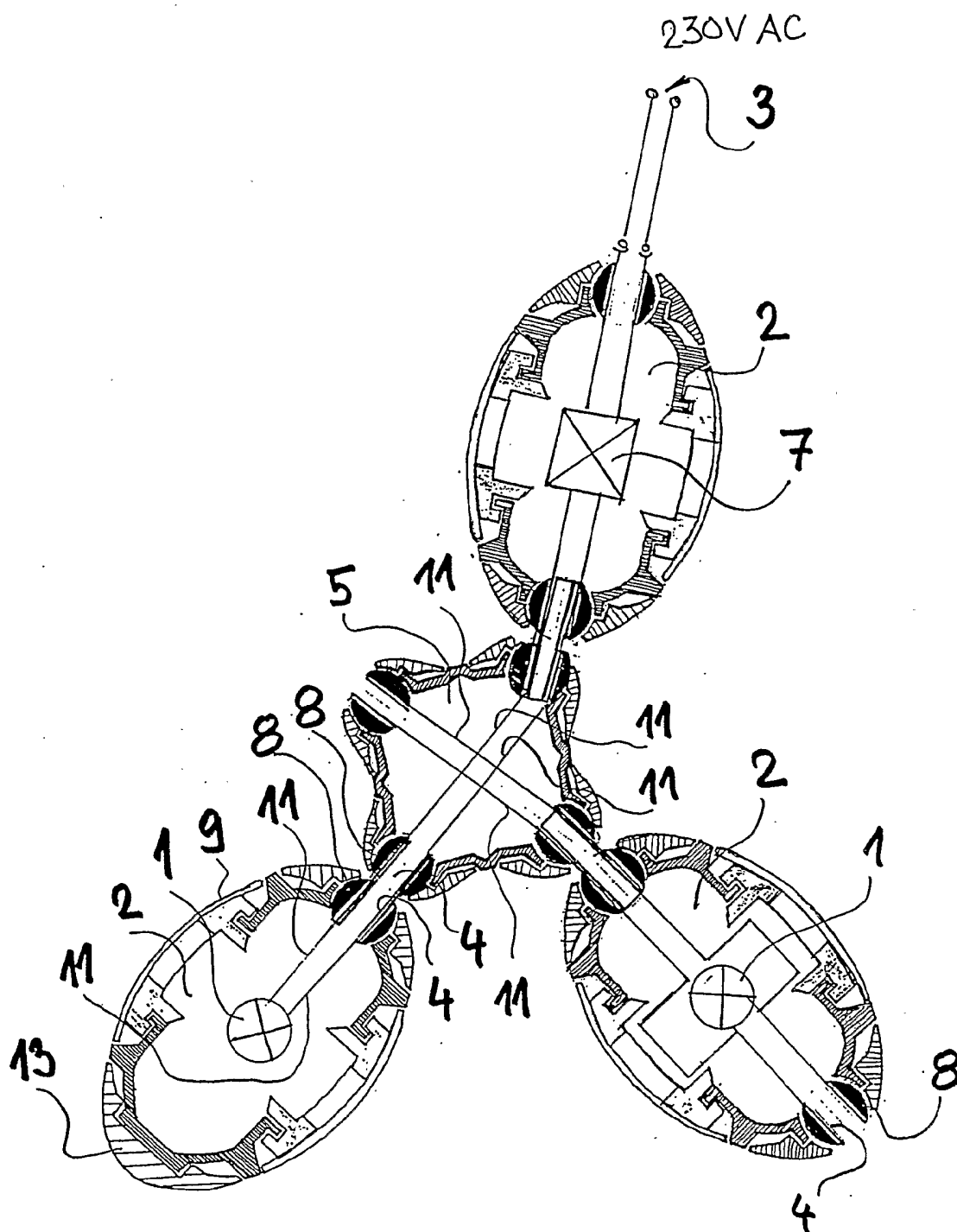


Fig. 5

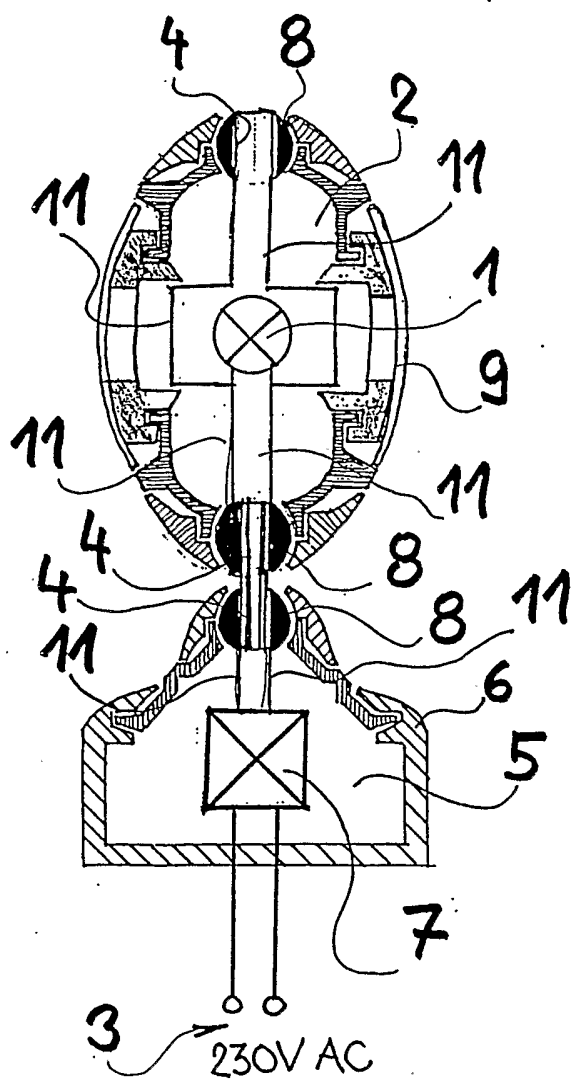


Fig. 6

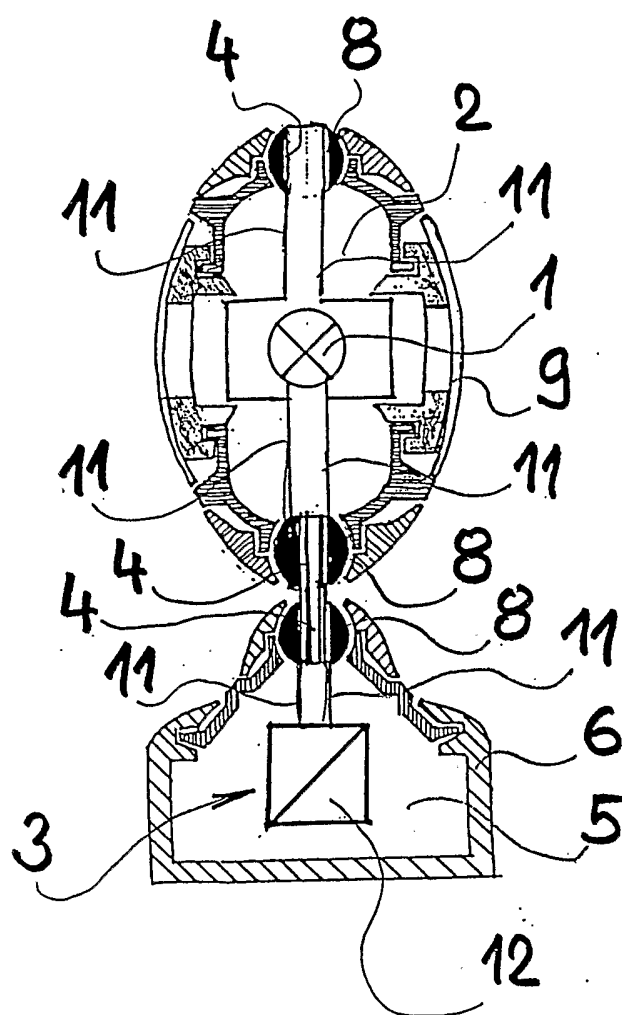


Fig. 7



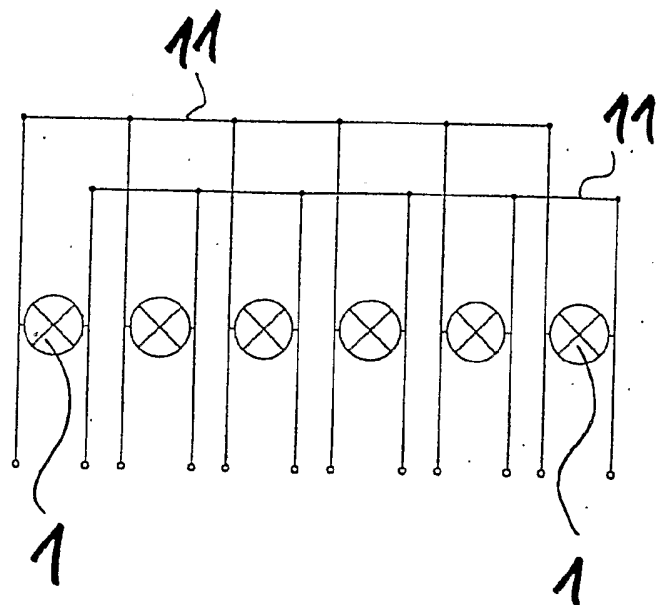


Fig. 8

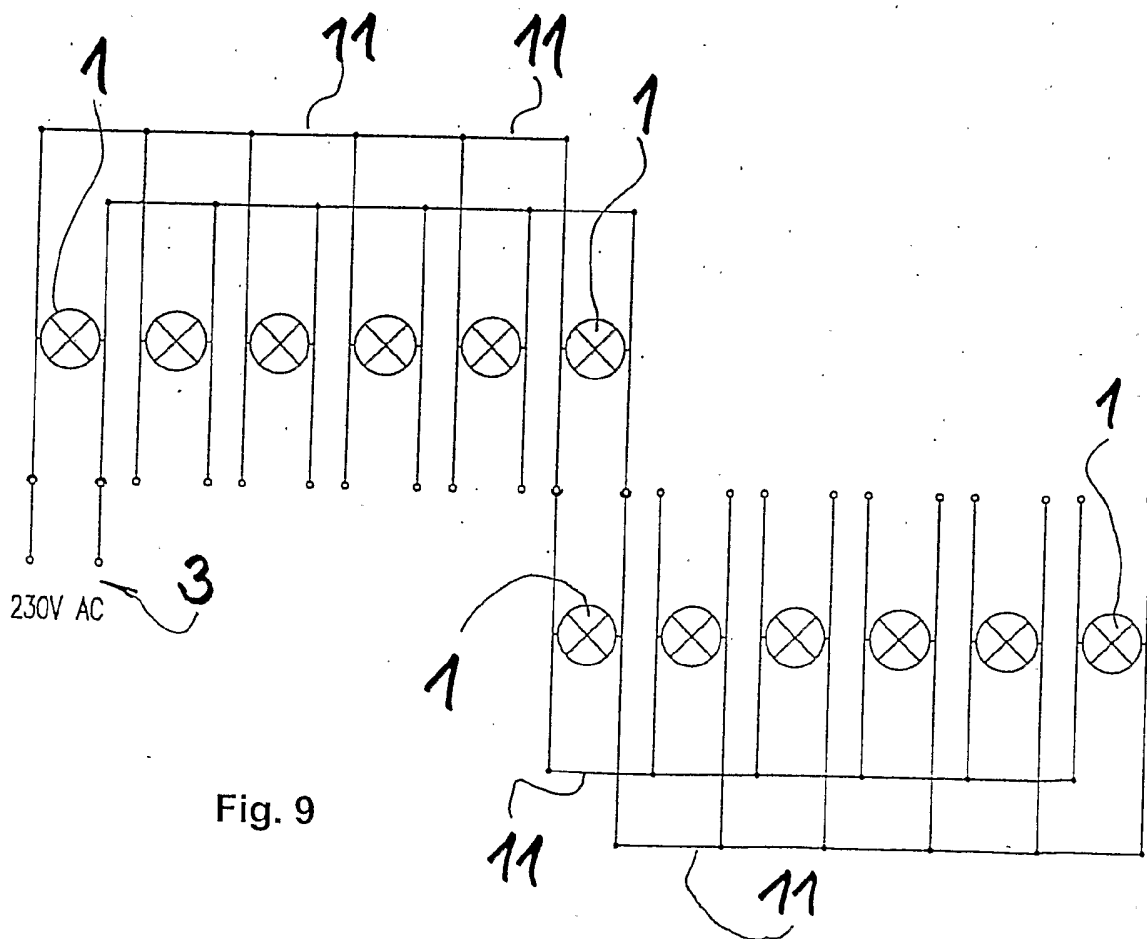


Fig. 9

## INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER  
IPC 7 F21S8/00 F21V23/06

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 F21S F21V

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 3 061 715 A (THOMAS THOMAS J) 30 October 1962 (1962-10-30) column 1, line 8 - line 17 column 1, line 59 - line 69 column 2, line 47 - line 72 column 3, line 48 - column 4, line 14 figures 1A,1B	1-4,7,10
A	---	5,6
X	US 3 188 794 A (JOHNSON RAYMOND D) 15 June 1965 (1965-06-15) column 5, line 8 - line 69 column 2, line 44 - line 69 column 2, line 10 - line 35 figures --- -/--	1,4,7

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

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## INTERNATIONAL SEARCH REPORT

International Application No

PCT/CZ 02/00066

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 488 082 A (CUMMINS MILLARD) 11 December 1984 (1984-12-11) column 3, line 16 - line 29 claim 6 figures 1,2,4 -----	1,8,9

# INTERNATIONAL SEARCH REPORT

Information on patent family members

Int: Application No

PCT/CZ 02/00066

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 3061715	A	30-10-1962	NONE	
US 3188794	A	15-06-1965	NONE	
US 4488082	A	11-12-1984	NONE	