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(54) **Apparatus for simulating a fire**

(57) The invention relates to an apparatus for simulating a fire, in particular for use in a fireplace and the like, comprising a housing, in which at least one light source is fitted for lighting at least one first element provided with flame and/or fire simulation patterns, which first element can be moved by means of a driving element, and also comprising a window at the front side of the housing, onto which the created flame and/or fire

simulation light patterns can be projected in use.

The object of the invention is to provide an apparatus for simulating a fire by means of which a varied, less often recurring and true-to-nature flame and fire image can be created, and according to the invention the apparatus is characterized in that at least one further movable element provided with flame and/or fire simulation patterns is fitted in the housing.

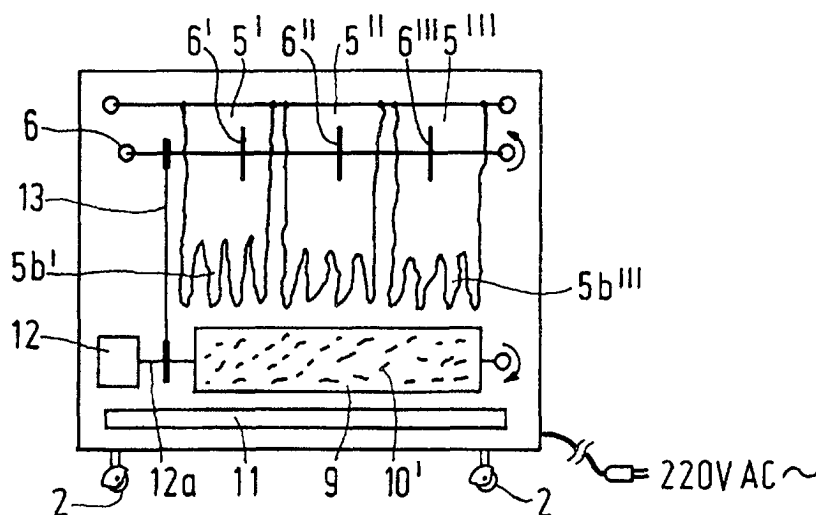


FIG. 1c

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Description

[0001] The invention relates to an apparatus for simulating a fire, in particular for use in a fireplace and the like, comprising a housing, in which at least one light source is fitted for lighting at least one first element provided with flame and/or fire simulation patterns, which first element can be moved by means of a driving element, and also comprising a window at the front side of the housing, onto which the created flame and/or fire simulation light patterns can be projected in use.

[0002] Such a fire simulation apparatus is known, for example from International patent application no. PCT/DE99/03935 (WO 00/34717). The moving element creates all kind of alternating flame and/or fire simulation light patterns with the aid of the light source, which light patterns are projected onto the window via a number of mirrors.

[0003] One drawback of such an apparatus is the fact that the created flame and/or fire simulation light patterns are of a recurring nature, so that the obtained flame and fire image does not look very true to nature to the user.

[0004] The object of the invention is to overcome the above drawback and to provide a fire simulation apparatus by means of which it is possible to create a varied, true-to-nature flame and fire image which recurs less often.

[0005] According to the invention, the apparatus is characterized in that at least one further movable element provided with flame and/or fire simulation patterns is fitted in the housing.

[0006] At least one element can be built up of at least one flexible foil, which foil is fixed to the upper side of the housing with one edge, wherein the downwardly extending free edge is provided with cuts in the shape of flame patterns and wherein the foil abuts against a driving element having an irregular contact surface.

[0007] In one embodiment of the apparatus according to the invention, the provision of at least one projecting part on the driving element makes it possible to impart movement to the flexible foil, so that a constantly varying flame and/or fire image is obtained through interaction with the light from the light source.

[0008] In another embodiment of the apparatus, a more varied pattern of movement of the flexible foil can be obtained in that the driving element comprises at least one gear having irregular teeth.

[0009] In another embodiment, by means of which a more varied and less often recurring flame and fire image can be obtained, the apparatus is characterized in that the element is built up of several flexible foils arranged one beside another, which foils each abut against a driving element.

[0010] According to another embodiment, it is possible to create a greatly varied flame and fire image through interaction between the two elements, so that the user will experience the fire image as very true to

nature, by designing the other element as a hollow, transparent cylinder which is filled with a large number of reflective segments.

[0011] In another embodiment of a fire simulation apparatus according to the invention, in which the first element is an endless carrier arranged over at least two drivable rollers, the other element is likewise configured as an endless carrier arranged over at least two drivable rollers so as to obtain a more varied and true-to-nature flame and fire image.

[0012] At least one endless carrier of said embodiment may consist of a foil provided with a reflective or a non-reflective flame and/or fire simulation pattern. In order to achieve a satisfactory interaction of light between the two elements, the other endless carrier consists of a non-transparent foil provided with transparent flame and/or fire simulation patterns.

[0013] According to the invention, a greatly varied, non-recurring and true-to-nature flame and fire image can in particular be obtained in that one endless carrier can be driven in vertical direction and another endless carrier can be driven in horizontal direction within the housing.

[0014] The invention will now be explained in more detail with reference to a drawing, in which:

Fig. 1a is a side elevation of one embodiment of an apparatus for simulating a fire according to the invention;

Fig. 1b is a front view of the embodiment as shown in Fig. 1a;

Fig. 1c shows another embodiment of a fire simulation apparatus according to the invention;

Fig. 1d shows various partial views of a specific part of an apparatus according to the invention.

Fig. 2a and Fig. 2b schematically show another embodiment of a fire simulation apparatus according to the invention.

[0015] In Figs. 1a - 1c, like parts are numbered alike. In these figures, numeral 1 indicates a housing of an apparatus for simulating a fire, which housing is movable on wheels 2 in this embodiment. Thus, the user can easily move and position the fire simulating apparatus. Accommodated in housing 1 is a light source 4 as well as a generally transparent window 3, which also forms the front side of the apparatus. In accordance with the invention, two elements 5 and 9 are fitted in the housing, which elements are each provided with flame and/or fire simulation patterns.

[0016] In this embodiment, the first element 5 is made up of a flexible foil 5, for example a textile fabric or a plastic foil, which is fixed in the housing 1 with its upper edge 5a. As is shown in Fig. 1b, cuts in the shape of flame patterns 5b are formed in the bottom free edge of the foil 5. The foil 5 abuts against a driving element 6, which includes several projecting parts 6a, 6b and 6c in this embodiment. The textile fabric may be reinforced in

those places where it makes contact with the projecting parts.

[0017] The other element 9 is a transparent hollow cylinder (see Figs. 1b and 1c), which hollow cylinder is filled with a large number of reflective segments 10, which can have different colours. The colour composition that is used determines the simulated heat of the fire. As Fig. 1b shows, said reflective segments 10 may be either elongated or ribbon-shaped segments, or consist of reflective particles as shown in Fig. 1c.

[0018] Both the element 5 and the element 9 are movably accommodated in the housing. To this end, an electric motor 12 is mounted in the housing, which rotates the cylinder 9 about its longitudinal axis, thus moving segments 10 that are present in the hollow cylinder 9. The driving element 6 for the first element 5 can be likewise be moved, via a driving belt 13 that is passed over the motor shaft 12, with the projecting parts 6a, 6b, 6c touching the freely suspended foil, so that a flickering effect is obtained. The hollow cylinder 9 and the driving element 6 can either be rotated in the same direction of rotation or in opposite directions of rotation by the motor 12.

[0019] Since the light emitted by the light source 4 falls on both elements 5 and 9, a greatly varied, that is, non-recurring and consequently very true-to-nature flame and fire pattern is created by the combination of the "fluttering" foil 5 and the hollow cylinder 9 filled with reflective segments 10. This light pattern is projected onto the transparent window 3. A mirror 11 is disposed under the housing so as to obtain an additional diffused lighting effect.

[0020] As a result of the rotation of the hollow cylinder 9, a greatly varied, i.e. "at random" reflection pattern of the incident light from the light source 4 through the hollow cylinder is obtained already by the use of the freely moving segments 10. A likewise very irregular and varied and thus true-to-nature flame pattern can be obtained by providing the driving element that abuts against the foil 5 with an irregular contact surface. Such an effect can be obtained, for example, by designing the projecting parts 6a, 6b with different lengths or by providing the driving element with an irregular cam pattern 7 or with irregular teeth 8. These embodiments are shown in Fig. 1d.

[0021] Another embodiment of an apparatus for simulating a fire according to the invention is shown in Figs. 2a and 2b. The two elements 5 and 9 that are shown therein are endless carriers 5, 9 arranged over at least two drivable rollers 15a, 15b and 19a, 19b, respectively, which endless carriers 5, 9 can be driven by a motor in an analogous manner as in Figs. 1a - 1c.

[0022] As is shown in the exploded view of Fig. 2b, the endless carrier 5 is made of a transparent foil provided with flame and/or fire simulation patterns 16, which may or may not be reflective. In this embodiment, the endless carrier is made of a non-transparent foil provided with transparent flame and/or fire simulation pat-

terns 20. The endless carrier 5 can be driven in the vertical plane and the endless carrier 9 can be driven in the horizontal plane by suitably driving the motor 12. It is possible to project a greatly varied, non-recurring and consequently very true-to-nature flame and fire pattern onto the window 3 by driving the two endless carriers 5 and 9, preferably at different speeds.

10 Claims

1. Apparatus for simulating a fire, in particular for use in a fireplace and the like, comprising a housing, in which at least one light source is fitted for lighting at least one first element provided with flame and/or fire simulation patterns, which first element can be moved by means of a driving element, and also comprising a window at the front side of the housing, onto which the created flame and/or fire simulation light patterns can be projected in use, **characterized in that** at least one further movable element provided with flame and/or fire simulation patterns is fitted in the housing.
2. An apparatus for simulating a fire according to claim 1, **characterized in that** at least one element is built up of at least one flexible foil, which foil is fixed to the upper side of the housing with one edge, wherein the downwardly extending free edge is provided with cuts in the shape of flame patterns and wherein the foil abuts against a driving element having an irregular contact surface.
3. An apparatus for simulating a fire according to claim 1 or 2, **characterized in that** said driving element comprises at least one projecting part.
4. An apparatus for simulating a fire according to claim 2 or 3, **characterized in that** said driving element comprises at least one gear having irregular teeth.
5. An apparatus for simulating a fire according to any one or more of the claims 2 - 4, **characterized in that** said element is built up of several flexible foils arranged one beside another, which foils each abut against a driving element.
6. An apparatus for simulating a fire according to any one or more of the claims 2 - 5, **characterized in that** the other element consists of a hollow, transparent cylinder which is filled with a large number of reflective segments.
7. An apparatus for simulating a fire according to claim 1, wherein the first element is an endless carrier which is arranged over at least two drivable rollers, **characterized in that** the other element is likewise configured as an endless carrier arranged over at

least two drivable rollers.

8. An apparatus for simulating a fire according to claim 7, **characterized in that** at least one endless carrier consists of a foil provided with a reflective or a non-reflective flame and/or fire simulation pattern. 5
9. An apparatus for simulating a fire according to claim 7, **characterized in that** the other endless carrier consists of a non-transparent foil provided with transparent flame and/or fire simulation patterns. 10
10. An apparatus for simulating a fire according to any one or more of the claims 7 - 9, **characterized in that** one endless carrier can be driven in vertical direction and another endless carrier can be driven in horizontal direction within the housing. 15

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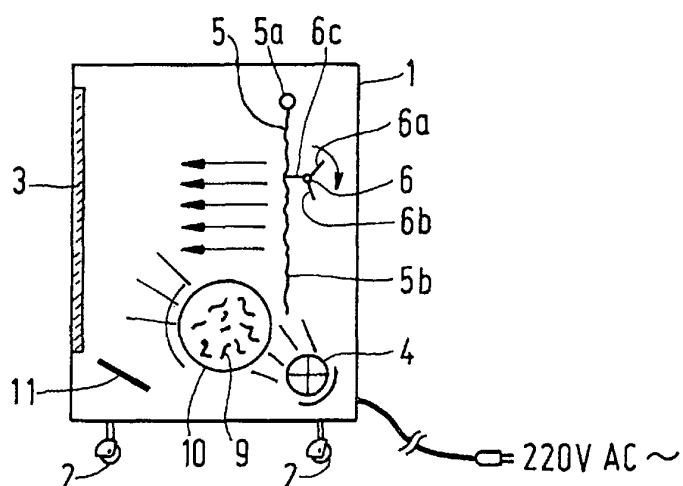


FIG. 1a

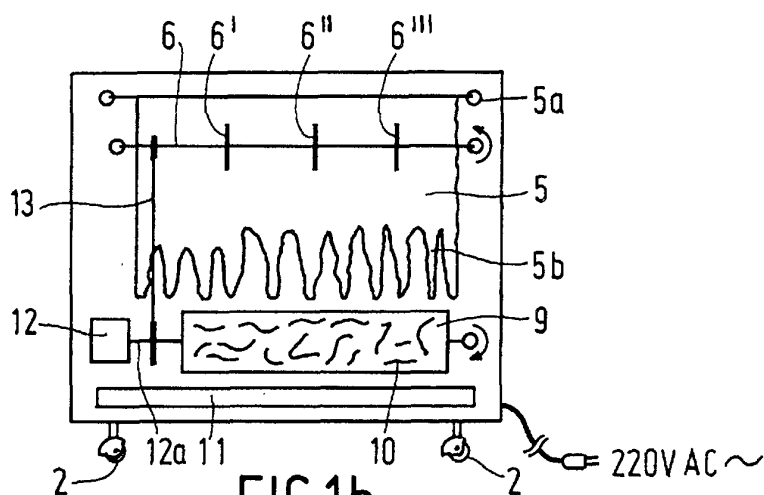


FIG.1b

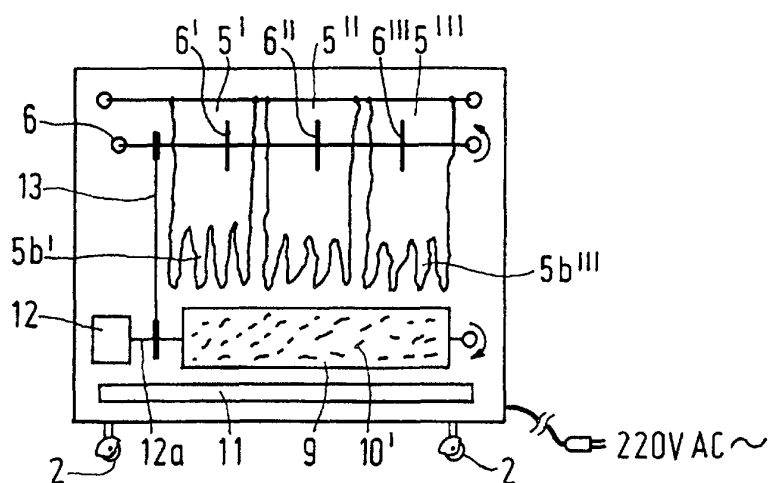


FIG. 1c

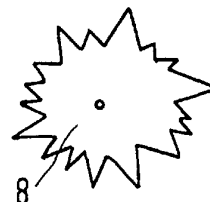
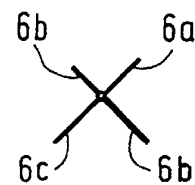


FIG.1d

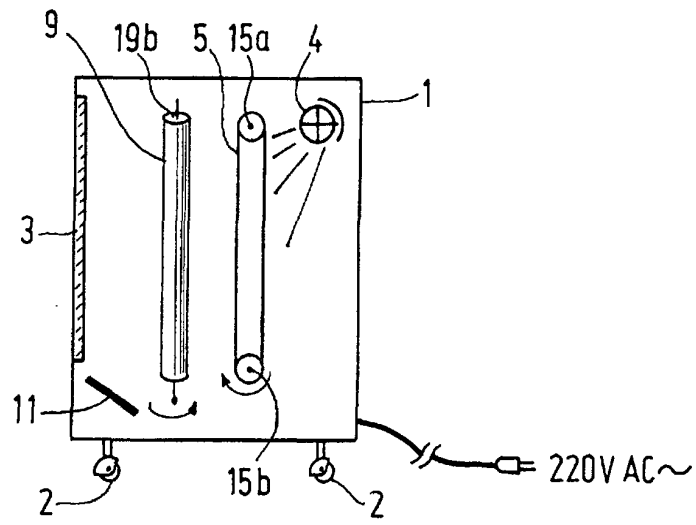


FIG. 2a

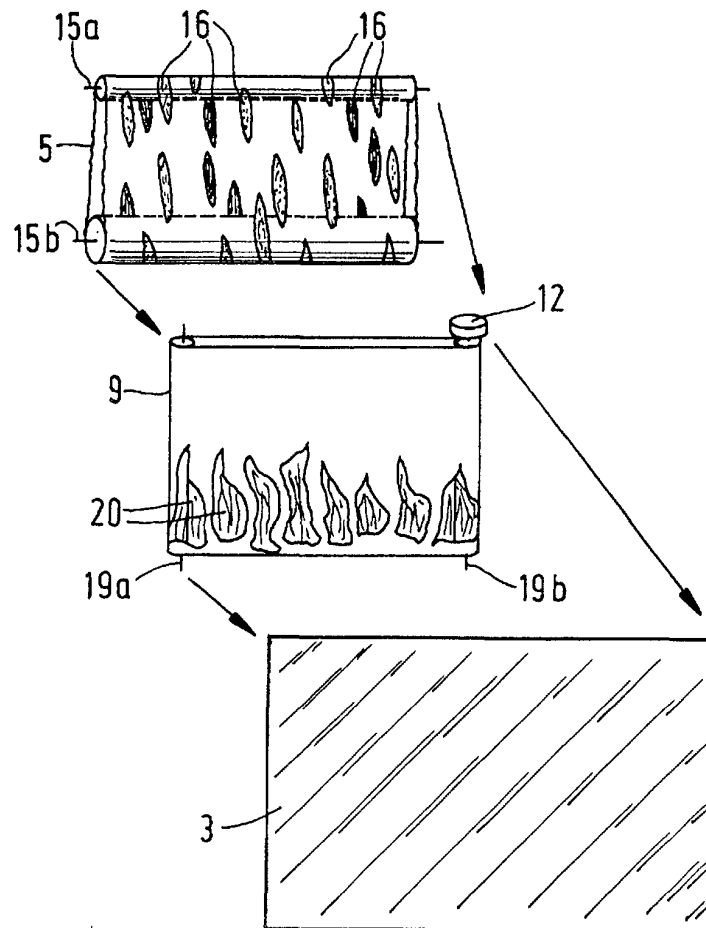


FIG. 2b



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EUROPEAN SEARCH REPORT

Application Number
EP 02 07 5069

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.7)
X	GB 2 337 582 A (GAZCO LTD) 24 November 1999 (1999-11-24) * claims; figures *	1,2,6	F24C7/00
X	GB 2 230 335 A (BASIC ENGINEERING LTD) 17 October 1990 (1990-10-17) * page 9, line 2 - line 20; figure 7 *	1,2,5	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			F24C
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 14 May 2002	Examiner Vanheusden, J
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03/92 (P/4201)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 02 07 5069

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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14-05-2002

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
GB 2337582	A	24-11-1999	NONE	
GB 2230335	A	17-10-1990	AU 621713 B2	19-03-1992
			AU 4931390 A	16-08-1990
			IE 63651 B1	31-05-1995
			NZ 232435 A	25-06-1991
			US 4965707 A	23-10-1990