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Declarations under Rule 4.17:

[Continued on next page]

(54) Title: PATIO HEATER SIDE HEAT DIRECTOR

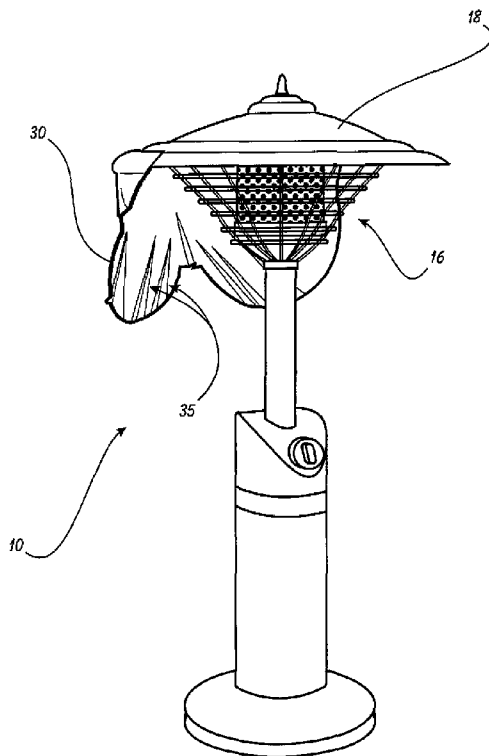


FIGURE 2

(57) Abstract: A Patio Heater Side Heat Director is disclosed. The patio heater side heat director attachment is attachable to a conventional patio heater so that the dome attachment hangs down from the heater's heat shield on one side. The side heat director is designed to reflect incident heat/energy on one side of the heater towards the opposing side of the heater. The side heat director defines two or more lobes that assist in focusing the energy reflected by the director. The side heat director is easily attached to a conventional patio heater, by clipping or crimping the heat director to the edge of the patio heater heat shield. Finally, the side heat director attachment has a very low thermal mass so that very little heat energy is retained by the side heat director attachment, such that the largest possible percentage of the heater energy is reflected towards the seating area.



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- as to the identity of the inventor (Rule 4.17(i))
  - as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
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## PATIO HEATER SIDE HEAT DIRECTOR

This application is filed within one year of, and claims priority to Provisional Application Serial Number 61/131,939, filed 6/12/2008.

### BACKGROUND OF THE INVENTION

#### 1. Field of the Invention

This invention relates generally to outdoor heating devices and, more specifically, to a Patio Heater Side Heat Director.

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#### 2. Description of Related Art

Propane-fueled heaters are prevalent for heating outdoor spaces. Many restaurants and taverns provide the heaters to heat outdoor serving areas in the evenings. The heaters typically used in such hospitality environments are large units that utilize a five gallon propane cylinder for fuel. Residential use of these "patio" heaters has grown over the years, with a smaller, tabletop version being created that is ideal for the home application. Except for scale/size, the elements of the tabletop unit are essentially comparable to the full-size models. Figure 1 is a perspective view of a conventional (tabletop) patio heater 10.

The patio heater 10 has a base 12, within which the propane cylinder is contained. A stem 14 extends upwardly from the base 12 to the burner 16. The propane flow

15

passes through the stem 14 to supply the burner 16 with fuel. Presumably for safety reasons, the burner 16 is topped by a heat shield 18, and surrounded by a guard 20. The heat shield 24 is defined by a circular (typically) perimeter edge 24, and is removably attached to the burner 16 by a securing nut 22 (or by some other fastening system).

5           While the conventional patio heater 10 is very handy to increase personal comfort while entertaining or otherwise spending time outdoors, it does suffer from a problem related to its limited fuel source. While there are heaters available that use a fixed fuel source (such as natural gas), rather than a self-contained propane tank, most heaters 10 employ a portable source. Table-top units are generally too small to have a piped-in fuel source, and the  
10 piping would harm the utility of even having a table-top unit. With large models, the portability of the heater is lost if a permanent piped fuel source is used.

          For these reasons, an integrated tank is by far the most useful version of the patio heater 10. The drawback of the tank version is that there is a finite amount of available fuel. As a result, any way to increase efficiency of the heater 10 and/or burner 16 will extend  
15 the lifespan of the fuel tank, and therefore reduce the number of tank exchanges. Furthermore, by increasing efficiency and reducing fuel consumption, it is expected that the environmental concerns associated with the increasing numbers of active propane-fueled heaters would be lessened.

SUMMARY OF THE INVENTION

In light of the aforementioned problems associated with the prior devices and attachments, it is an object of the present invention to provide a Patio Heater Side Heat Director. The patio heater side heat director attachment should be attachable to a conventional patio heater so that the dome attachment hangs down from the heater's heat shield on one side. The side heat director should reflect incident heat/energy on one side of the heater towards the opposing side of the heater. The side heat director should define two or more lobes that assist in focusing the energy reflected by the director. The side heat director should be easily attachable to a conventional patio heater, such as by clipping or crimping the heat director to the edge of the patio heater heat shield. The side heat director attachment should embody a very low thermal mass so that very little energy is retained by the side heat director attachment, such that the greatest amount of heater energy possible is reflected towards the seating area.

BRIEF DESCRIPTION OF THE DRAWINGS

The objects and features of the present invention, which are believed to be novel, are set forth with particularity in the appended claims. The present invention, both as to its organization and manner of operation, together with further objects and advantages, may best be understood by reference to the following description, taken in connection with the accompanying drawings, of which:

Figure 1 is a perspective view of a conventional tabletop patio heater;

Figure 2 is a side perspective view of the heater of Figure 1, having a preferred embodiment of the side heat director of the present invention attached thereto;

Figures 3A and 3B are partial cutaway views of the attachment section of the side heat director of Figure 2 attached to the heater heat shield of Figure 1;

Figure 4 is a front perspective view of the heater and side heat director attachment of Figure 2;

Figure 5 is a front view of the side heat director attachment of Figures 2 and 3; and

Figure 6 is a top view of the heater of Figure 1 having the side heat director attachment of the present invention attached thereto.

DETAILED DESCRIPTION  
OF THE PREFERRED EMBODIMENTS

The following description is provided to enable any person skilled in the art to make and use the invention and sets forth the best modes contemplated by the inventor of carrying out his invention. Various modifications, however, will remain readily apparent to those skilled in the art, since the generic principles of the present invention have been defined herein specifically to provide a Patio Heater Side Heat Director.

The present invention can best be understood by initial consideration of Figure 2. Figure 2 is a side perspective view of the heater 10 of Figure 1, having a preferred embodiment of the side heat director 30 of the present invention attached thereto. The side heat director 30 is a lightweight, easily-attachable metallic reflector that reflects infrared energy emitted from a side (presumably a backside) of the burner 16, so that that energy is directed towards a seating area. Figure 4 provides additional detail regarding the attachment 30.

The isolation views provided in Figures 3A and 3B depict that the attachment 30 has a ridge 31 that forms either a narrow pocket 33A or an offset pocket 33B around its upper perimeter. A plurality of the pockets 33A and 33B make up the preferred way for the side heat director 30 to attach to the heat shield (see Figure 1), as is discussed in more detail below in connection with Figure 6. To attach the attachment 30 to the heat shield 18, you simply position the attachment 30 so that the outer edge of the heat shield 18 is inside the pockets 33A or 33B, and then hand-crimp the pocket onto the heat shield 18. Due to the

lightweight and malleable properties of the attachment 30, this crimping will provide adequate strength to hold the attachment 30 to the heat shield 18.

In certain designs (and as shown), several pleats 35, or partial crimps, may be formed in various portions of the attachment 30. These pleats 35 (where included) are  
5 configured and located to create generally spherical “lobes” in the attachment 30, without the need for sophisticated metal forming procedures in manufacturing of the attachment 30. The pleats 35 are optional where a lower-cost manufacturing process is desirable. In other versions, for aesthetic or efficiency reasons (or others), the pleats 35 could be eliminated by molding or pressing the curved shape into the attachment 30.

10 Figure 4 is a front perspective view of the heater and side heat director attachment 30 of Figure 2. The attachment 30 is designed to provide the maximum heat reflection while also taking care to not damage the structure of the patio heater 10. The preferred design shape, therefore, is the dual-lobed shaped shown here in Figure 3.

The left lobe 32 and right lobe 34 extend from the left and right side of the  
15 shield 18. The lobes 32, 34 meet at a central section of the attachment 30 (behind the burner 16), that has a bottom edge that is slightly raised (approximately 15 angular degrees) so that heat will not be reflected onto the stem 14. The result is to reflect the maximum energy into and around the sides of the burner 16, towards the seating area adjacent to the heater 10. It is a simple matter of rotating the heater 10 so that the heat is directed towards the desired user  
20 location.



Figure 5 shows the attachment 30 detached from the heater. As discussed above, the left lobe 32 and right lobe 34 meet in the central portion of the attachment 30 at the central ridge 38. The ridge 38 functions to protect the stem (see Figure 4) from exposure to excess reflected heat, and further directs most of the reflected energy out through one of the  
5 two lobes 32, 34.

The upper edge 36 of the attachment 30 is configured so that it will cooperate with the perimeter edge of the patio heater heat shield (see Figure 1). The attachment 30 is designed to be clipped or crimped to the heat shield (see Figure 1) so that it will be securely attached without too much added thermal mass (i.e. without large metallic devices). Figure 6  
10 depicts how the arrangement appears from another angle.

As depicted, the lower edges (31A and 31B, respectively) of the left lobe 32 and right lobe 34 are curved in such a way as to each create a generally spherical reflective surface facing the patio burner (see Figure 1).

The optional seam 27 shown here is intended to depict the potential that the  
15 attachment 30 be composed of two individual halves. Making it two-piece may facilitate the packaging and shipping of the attachment 30. The two halves would be interconnected at the seam 27 and central ridge 38.

Figure 6 is a top view of the heater 10 of Figure 1 having the side heat director attachment 30 of the present invention attached thereto. The upper edge 36 of the heat  
20 director attachment 30 actually folds up over the perimeter edge 24 of the heat shield 18 until it is atop the shield 18 as shown here. Simply crimping the attachment 30 to the heat shield

18 will usually be sufficient to hold the attachment 30 in place, but simple all-metal clips (even paper clips) could be added to hold the attachment 30 in place even more securely.

Since the perimeter edge is circular in profile, a series of notches alternate with tabs that form either narrow pockets 33A or offset pockets 33B. The tabs do not have to  
5 form either one or the either type of pocket 33A and 33B, as depicted above, but rather could be variations of both. That is to say that the pockets 33A, 33B could begin at the center of the heat shield 18 (top of the page here) as strictly narrow pockets 33A, and then proceed to transition to a more and more offset until reaching the configuration shown above in Figure 3B. The purpose of the offset is to cause the attachment 30 to have more curvature at its outer  
10 edges than at its center by causing the upper edge 36 of the attachment 30 to be more “pulled up” at its outer edges.

In its simplest form, the attachment 30 is made from a very thin sheet of aluminum material (e.g. between approximately 0.006 and 0.050 inches in thickness – or heavy gauge foil). The purpose of using very thin material is to minimize the thermal mass of  
15 the attachment 30. If the thermal mass is very low, then the attachment 30 will reflect radiated energy without retaining heat, thereby creating another radiant heat source and increasing the heat radiating from the element as well.

Durability or aesthetic qualities can also be enhanced by utilizing a multi-layered material for the attachment 30. A multiple layered material will tend to be more rigid  
20 than a single thin layer of material, and will provide decorative options, such as the ability to emboss logos and other designs into the attachment 30. While such options are available in a

limited fashion in the single-layer version of attachment 30, there would be additional options for the multi-layered construction.

Tests of example arrangements such as the attachment 30 shown in Figures 2-5 were conducted, with the results displayed below in Table I:

Table I: Test Results on Tabletop Patio Heater (10,000 BTU Capacity)

	Patio Heater Alone	Patio Heater with Side Heat Director Attachment
Element Temperature (degrees F)	674	782
Radiant Temperature (degrees F)	165	190

10 Virtually all models of heaters demonstrate consistent results. The heater 10 clearly produced a significantly higher temperature after installation of the side heat director attachment 30. As a result, the user can choose to throttle back the fuel flow to the heater 10 by twenty-five to thirty percent, and still enjoy the same radiant heat output to the area of use as an unmodified heater 10 that is at full flow. Consequently, the fuel tank will be expected to  
 15 last twenty-five to thirty percent longer than the prior standard heater 10, and will provide the environmental benefits of less fuel consumed and less carbon emissions.

Those skilled in the art will appreciate that various adaptations and modifications of the just-described preferred embodiment can be configured without departing from the scope and spirit of the invention. Therefore, it is to be understood that, within the scope of the appended claims, the invention may be practiced other than as specifically described herein.

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CLAIMSWhat Is Claimed Is:

1. An attachment for patio heaters, said patio heaters comprising a central burner and having a heat shield thereover, said heat shield defining a perimeter edge, the attachment comprising:
  - a first lobe;
  - a second lobe;
  - a center ridge bisecting said first and second lobes; and
  - an upper edge extending between said first and second lobes, said upper edge configured to be attachable to a section of said perimeter edge.
2. The attachment of Claim 1, wherein the inner face defined by said first lobe and said second lobe are generally concave shapes intersecting at said center ridge.
3. The attachment of Claim 2, further defined by a lower edge, said lower edge being generally curved at said first and second lobes, and defined by a notch where said center ridge intersects said lower edge.
4. The attachment of Claim 3, wherein said upper edge is defined by one or more pockets formed therein to capture the perimeter edge of the heat shield.
5. The attachment of Claim 4, wherein said pockets are defined by a circumferential curl formed in said upper edge extending from a ridge formed circumferentially adjacent to said upper edge.
6. The attachment of Claim 5, wherein said pockets comprise a plurality of attachment tabs having gaps formed between each, said tabs forming said pockets.

7. The attachment of Claim 6, wherein said pockets are selected from a group of pockets including narrow pockets and offset pockets, said offset pockets defined by a greater separation between said curl and said ridge than said narrow pockets.
8. The attachment of Claim 7, wherein said first and second lobes are defined by pleats formed therein.
9. The attachment of Claim 8, wherein said first and second lobe are separate members interconnected at a seam formed therebetween.
10. A patio heater, comprising:
  - a central burner and having a heat shield thereover, said heat shield defining a perimeter edge; and
  - a heat redirector attachment extending from said perimeter edge, comprising:
    - a first lobe having a concave shape facing said central burner;
    - a second lobe having a concave shape facing said central burner;
    - a center ridge bisecting said first and second lobes; and
    - an upper edge extending between said first and second lobes, said upper edge configured to be attachable to a section of said perimeter edge.
11. The patio heater of Claim 10, wherein said upper edge of said attachment is defined by one or more pockets formed therein to capture the perimeter edge of the heat shield.
12. The patio heater of Claim 11, wherein said pockets are selected from a group of pockets including narrow pockets and offset pockets, said offset pockets defined by a greater separation between said curl and said ridge than said narrow pockets.
13. The patio heater of Claim 12, wherein said first and second lobes are defined by pleats formed therein.

14. The patio heater of Claim 13, wherein said pockets are defined by a circumferential curl formed in said upper edge extending from a ridge formed circumferentially adjacent to said upper edge.

15. The patio heater of Claim 14, wherein said first and second lobe are separate members interconnected at a seam formed therebetween.

16. A combination patio heater and heat redirection device, comprising:

a central burner and having a heat shield thereover, said heat shield defining a perimeter edge; and

heat redirection device attached to said perimeter edge of said heat shield, the redirection device comprising:

a first lobe having a concave shape facing said central burner;

a second lobe having a concave shape facing said central burner;

a center ridge bisecting said first and second lobes; and

an upper edge extending between said first and second lobes, said upper edge being attachable to said perimeter edge.

17. The combination of Claim 16, wherein said first and second lobe are separate members interconnected at a seam formed therebetween.

18. The combination of Claim 17, wherein said upper edge of said redirection device is defined by one or more pockets formed therein to capture the perimeter edge of the heat shield.

19. The combination of Claim 18, wherein said pockets are selected from a group of pockets including narrow pockets and offset pockets, said offset pockets defined by a greater separation between said curl and said ridge than said narrow pockets.

20. The combination of Claim 19, wherein said pockets are defined by a circumferential curl formed in said upper edge extending from a ridge formed circumferentially adjacent to said upper edge.



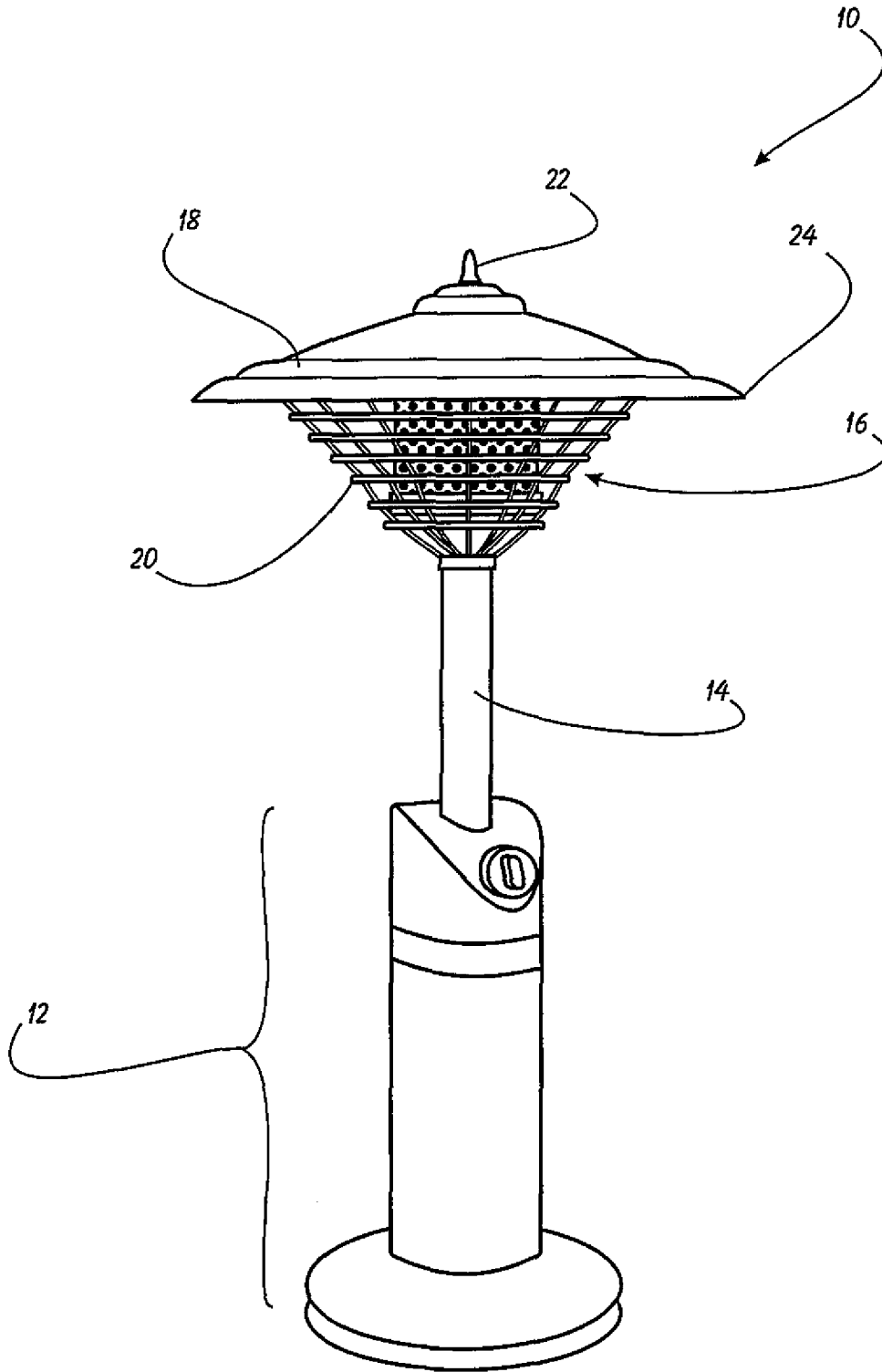


FIGURE 1  
PRIOR ART

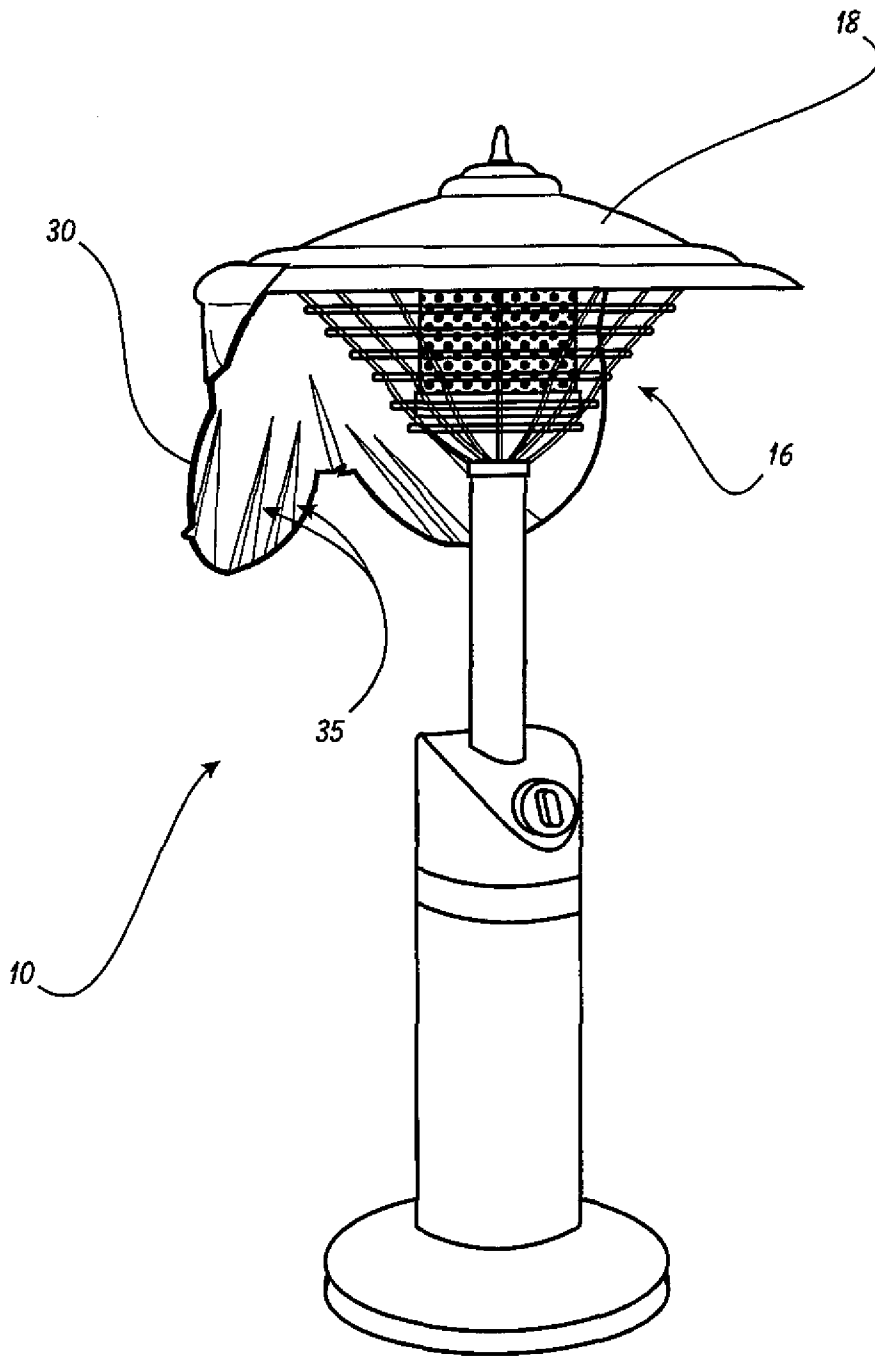


FIGURE 2

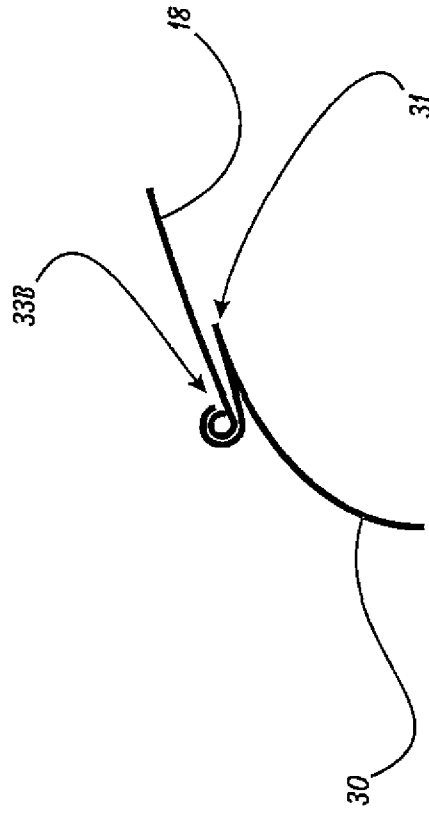


FIGURE 3B

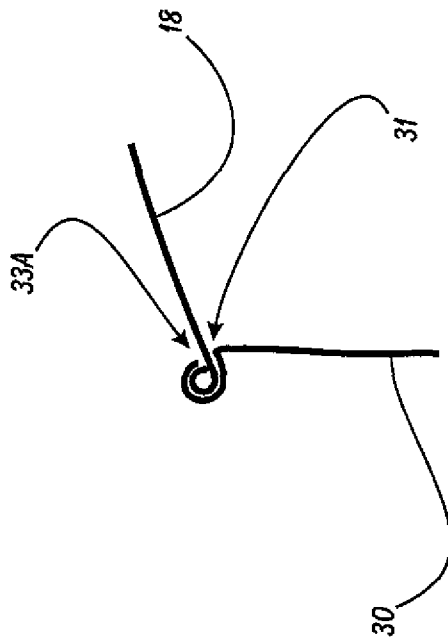


FIGURE 3A

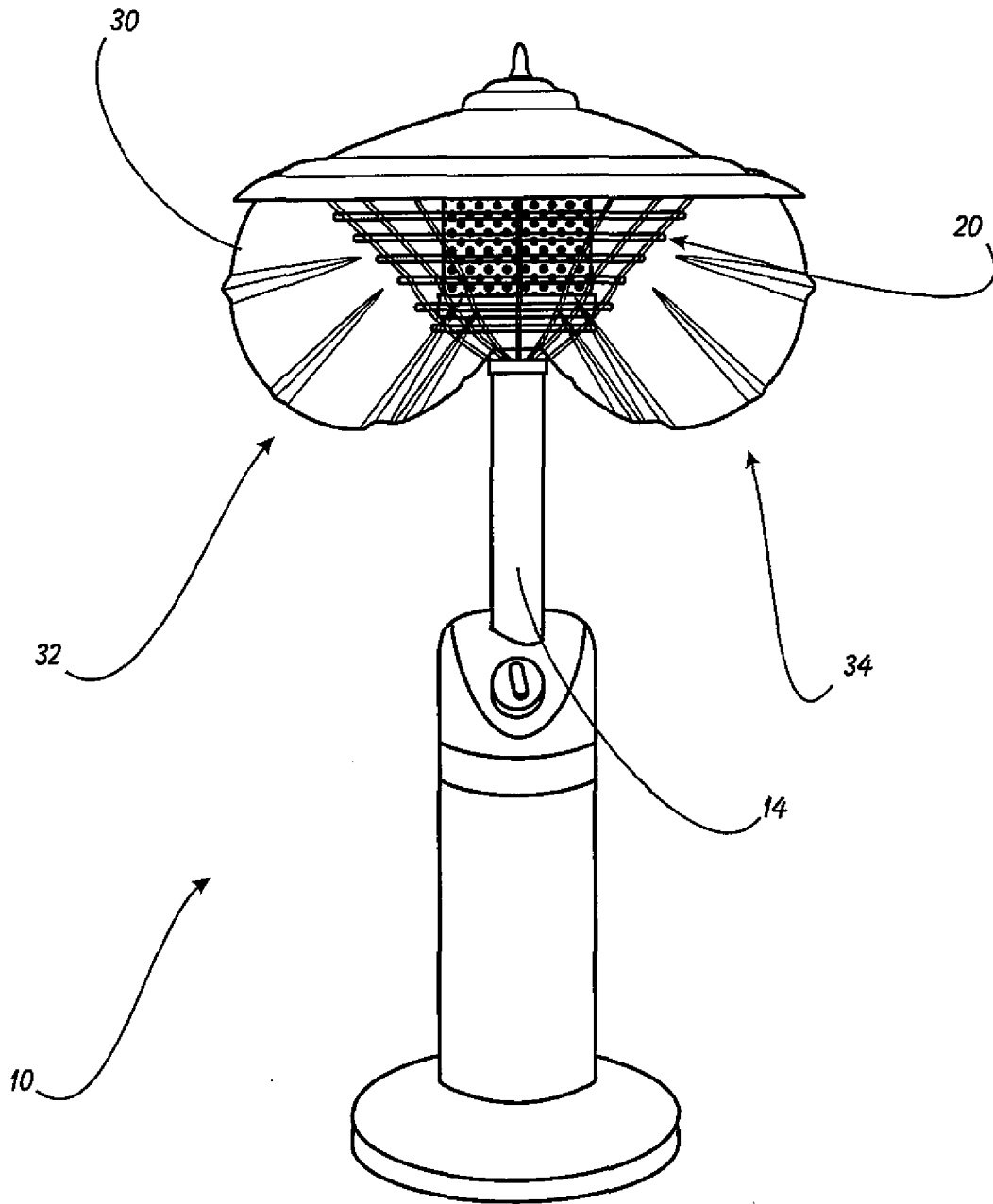


FIGURE 4

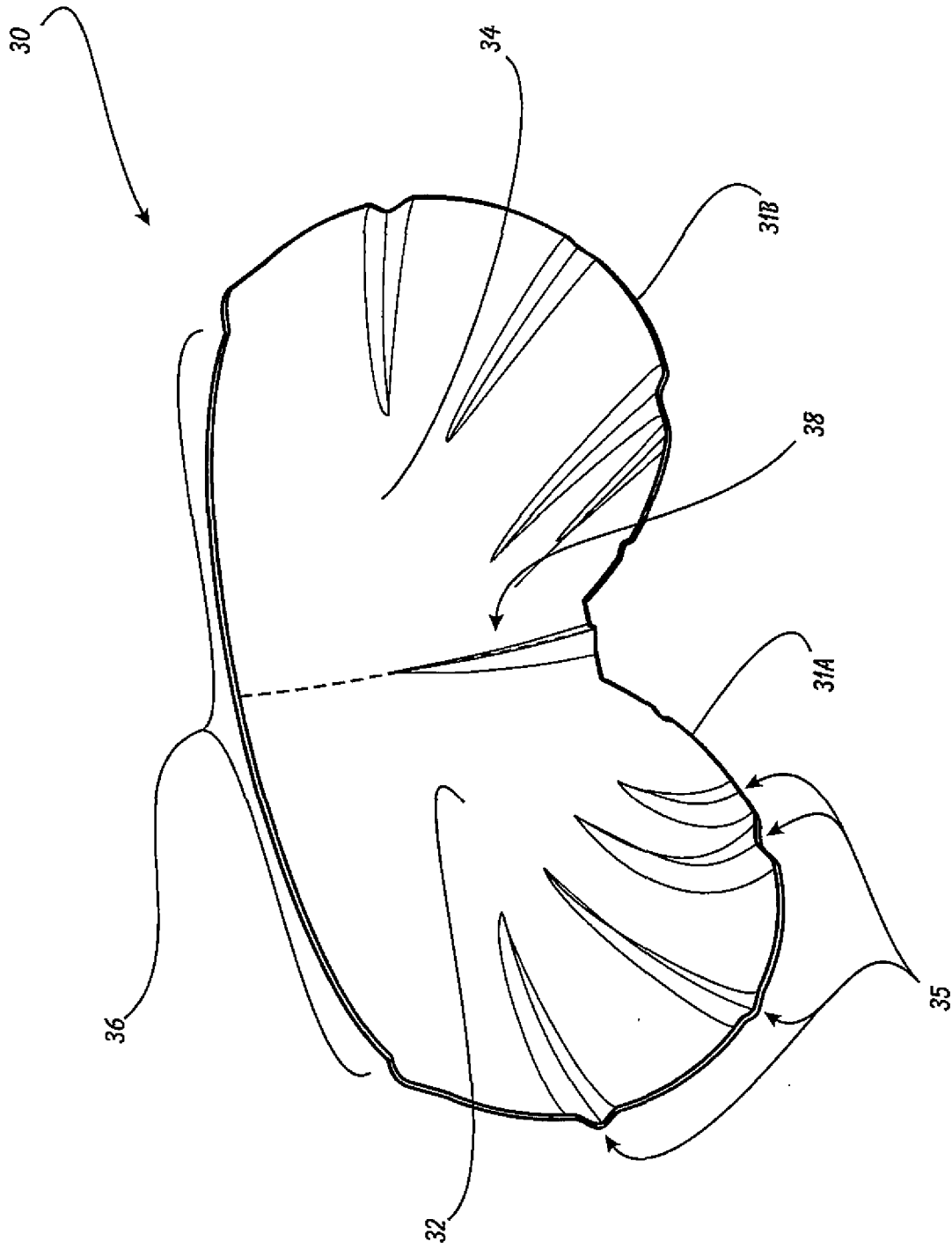


FIGURE 5

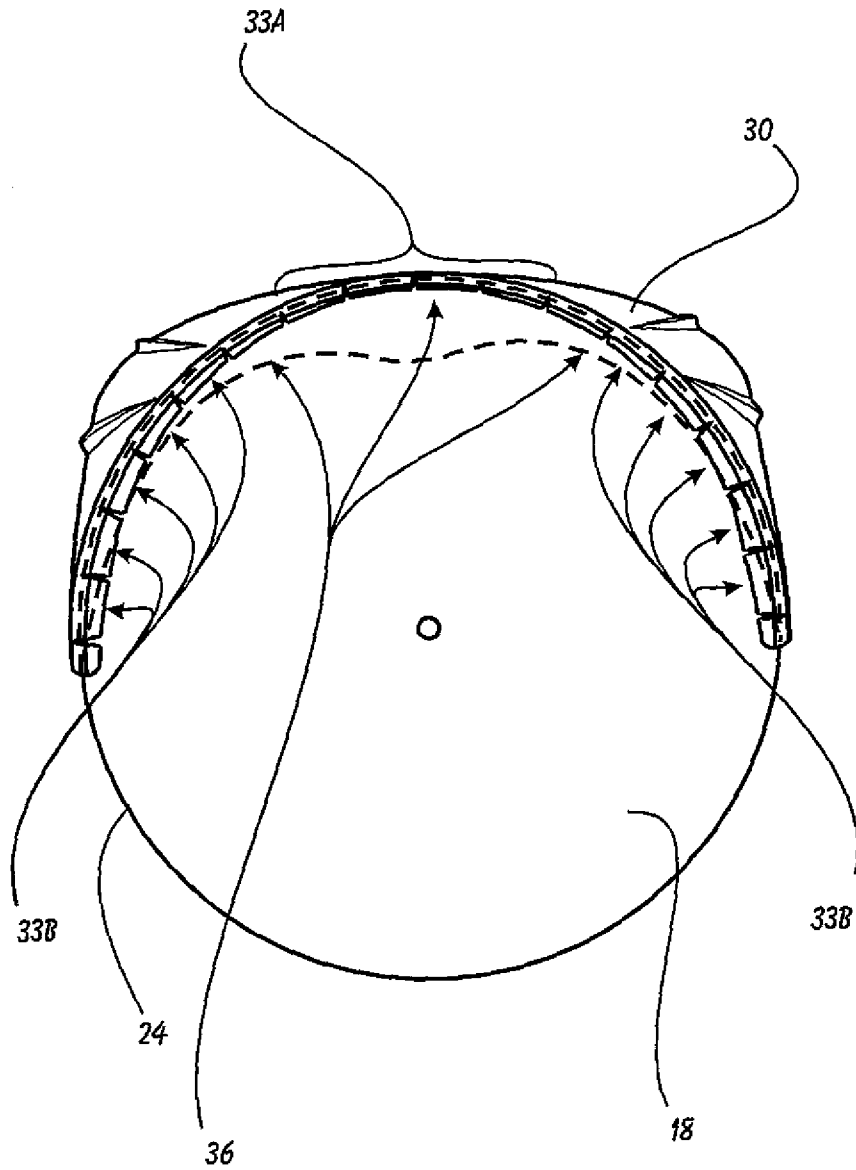


FIGURE 6

**INTERNATIONAL SEARCH REPORT**

International application No  
PCT/US2009/046844

**A. CLASSIFICATION OF SUBJECT MATTER**  
INV. F24C1/10 F24C1/12

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)  
F24C

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	GB 2 425 826 A (O'CONNELL JOSEPH [IE]; O'CONNELL JAMES [IE]) 8 November 2006 (2006-11-08)	1, 10, 16
Y	figure 5	4-9, 11-15, 18-20
X	CH 139 119 A (SCHWANDER MAX [CH]) 15 April 1930 (1930-04-15)	1, 3
X	WO 2007/016928 A (FRISGAARD WENG APS [DK]; FRISGAARD PEDERSEN CARSTEN [DK]; WENG CHRISTI) 15 February 2007 (2007-02-15)	1
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Further documents are listed in the continuation of Box C.  See patent family annex.

\* Special categories of cited documents :

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed
- \*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- \*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- \*&\* document member of the same patent family

Date of the actual completion of the international search  14 September 2009	Date of mailing of the international search report  25/09/2009
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Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040; Fax: (+31-70) 340-3016	Authorized officer  Rodriguez, Alexander
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## INTERNATIONAL SEARCH REPORT

International application No  
PCT/US2009/046844

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DK 2005 01121 L (FRISAARD C [DK]) 9 February 2007 (2007-02-09) figure 1	1
Y	DE 10 2006 026984 A1 (JAERISCH VIVIANE [DE]) 13 December 2007 (2007-12-13)  paragraphs [0013] - [0016]; figure 2	4-9, 11-15, 18-20



**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No

PCT/US2009/046844

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
GB 2425826	A	08-11-2006	IE	20050200 A2	03-05-2006
CH 139119	A	15-04-1930	NONE		
WO 2007016928	A	15-02-2007	DK	176070 B1	20-03-2006
			EP	1926939 A2	04-06-2008
DK 200501121	L		NONE		
DE 102006026984	A1	13-12-2007	NONE		