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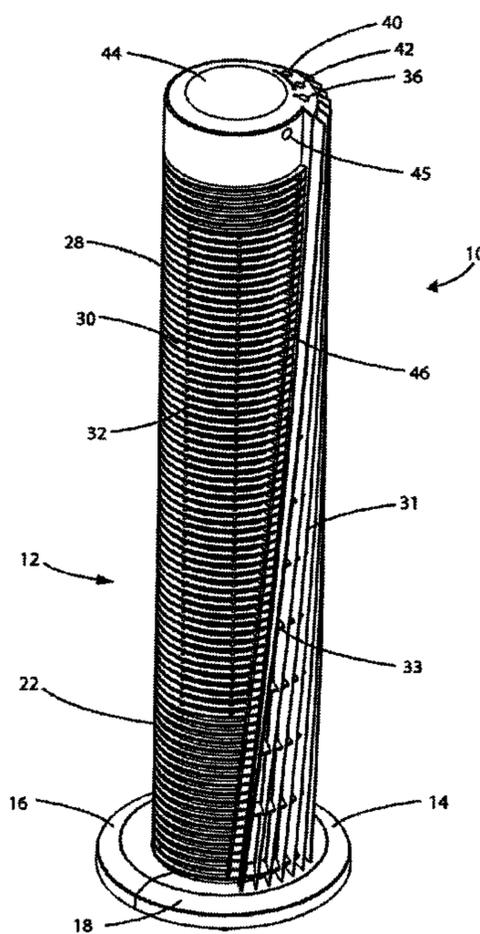


FIG. 1

(57) **Abrégé/Abstract:**

The present disclosure relates to a tower fan having a base and a column coupled to the base. A blower is positioned within the column. The blower has an inlet and an outlet, and the outlet twists about an exterior of the column along a longitudinal axis of the column.



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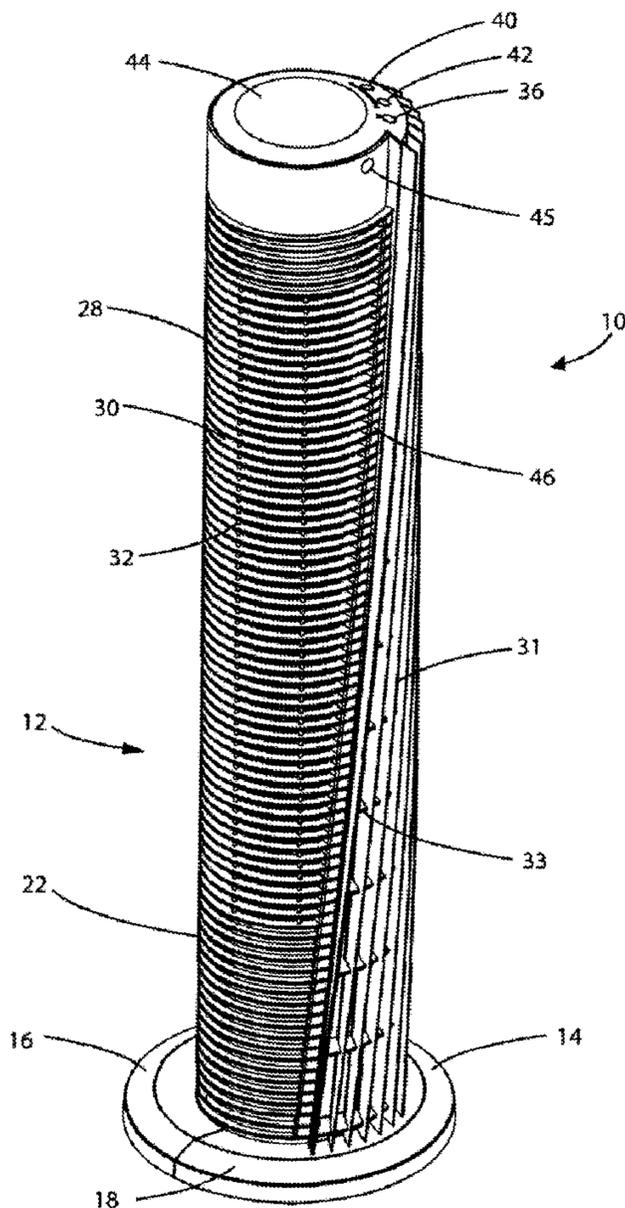


FIG. 1

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## **SPIRAL TOWER FAN**

### **Related Applications**

[0001] The present application claims the benefit under 35 U.S.C. § 119(e) of U.S. Provisional Application Serial No. 61/313,277 filed March 12, 2010, and titled SPIRAL TOWER FAN. The above mentioned provisional application is incorporated herein in its entirety.

### **Background**

[0002] Tower fans are preferred in a variety of situations because of the relatively small amount of floor space that needs to be dedicated to the fan. Unfortunately, typical tower fans blow air in a narrow blower range along the height of the blower. Air circulation over a larger range has been achieved in the past by providing oscillating tower fans. Such oscillating tower fans require a second motor to allow for oscillation of the tower column. Further, oscillating fans provide an inconsistent air circulation pattern as the fan oscillates, effectively preventing whole room circulation. Accordingly, it is desirable to provide a tower fan capable of circulating air through a wider horizontal blower range while not requiring the added expense of an oscillation motor. Further, it is desirable to provide a tower fan capable of circulating air through a wider horizontal blower range while maintaining a constant air circulation pattern without adversely affecting whole room circulation.

### **Summary**

[0003] A tower fan includes a base and a column coupled to the base. A blower is positioned within the column. The blower has an inlet and an outlet, and the outlet twists about an exterior of the column along a longitudinal axis of the column.

### Brief Description of the Drawings

[0004] FIG. 1 is a perspective view of a spiral tower fan.

[0005] FIG. 2 is an elevation view of the spiral tower fan of FIG. 1.

[0006] FIG. 3 is another perspective view of the spiral tower fan of FIG. 1.

[0007] FIG. 4 is a cross-sectional view of the spiral tower fan of FIG. 1, taken along line B—B.

[0008] FIG. 5 is an overlay of two cross-sectional views of the spiral tower fan of FIG. 1 taken along lines A—A and B—B, respectively.

[0009] FIG. 6 is a perspective view of a spiral blower suitable for use in the tower fan of FIG. 1.

### Detailed Description

[0010] Referring to FIGS. 1-3, a tower fan 10 includes a column 12 mounted to a base 14. Column 12 extends generally vertically about a longitudinal axis. The column 12 may be a distinct component or, alternatively, column 12 and base 14 may be formed as a single unitary body by molding or other manufacturing process. The base may include, as shown, two halves 16 and 18 to facilitate manufacturing and assembly. Feet 20 may be coupled to base 14 to allow for tower fan to be placed level on a surface such as a floor. A handle 19 may be disposed or coupled to column 12 to facilitate selective positioning of tower fan 10 by a user. A variable speed blower is disposed within region 22 of column 12 is coupled to cross flow blower blades 24 (shown in FIG. 4) and extend vertically through a blower height 26. A blower inlet 28 is covered by cross guards shown as slats 30 that may be horizontal. In some embodiments, the slats may be louvered to obscure view of the interior of the column 12. Cross guards 30 may be coupled to vertical supports 32. Cross guards 30 and vertical

supports 32 may be configured to restrict access to the blower fan blades 24. An outlet is provided and shown as having generally vertical slats 31 for directing the air flow out of the blower and away from the column 12. Vertical slats 31 may be coupled to cross ribs 33. Vertical slats 31 and cross ribs 33 may be configured to limit access to the blower fan blades 24. Controls may be provided on a control panel 34. On a tower fan 10, the controls may be positioned on a top surface of the column 12. In other embodiments, the controls may be disposed on a side of the column 12, or on the base 14. Indicator lights may also be provided that visually indicate the blower speed or other parameter. Exemplary controls and indicators may include a power button 36, speed selector 38, timer 40, and indicator lights 42 for visually displaying the operating status of tower fan 10.

**[0011]** A recessed area 44 may be disposed on a top surface of tower fan 10 and be configured to receive and retain a remote control (not shown) for operating tower fan 10. The remote may be an infrared type remote, in which case, remote sensor window 45 may be positioned near the top of tower fan 10 on its side. In other embodiments, the remote may be an ultrasonic, radio frequency, or other alternative, suitable type of remote.

**[0012]** In some embodiments tower fan 10 is envisioned to be positioned with the base 14 on the floor and the column 12 extending upward therefrom. The blower height 26 may extend along about half to two thirds, or up to three fourths or more of the overall height of column 12. In some such embodiments the blower height 26 may extend along a greater or lesser portion of the overall column height. The inlet 28 and outlet of the blower are twisted about a longitudinal (vertical) axis of the tower fan 10. This allows for the blower to direct air over a wider blower range along the height of the tower fan 10 / column 12. This provides for greater air circulation without the use of an oscillating design.

**[0013]** A power supply for the motor may be supplied by a cord and be disposed in base 14 and/or region 22. Wire route 46 provides a conduit for wiring to connect control panel 34 to

the motor and power supply.

[0014] Referring to FIG. 4, a cross-section of tower fan 10 along line B—B of FIG. 2 shows certain aspects of tower fan 10 in more detail. Tower fan 10 is shown as further including column 12 which is shown as being formed of two pieces, back portion 13 and inlet portion 48. This construction may be selected for ease of manufacture, or another suitable configuration may be selected. As blower or fan blades 24 rotate, air is drawn in along the path generally indicated by the arrows. The air passes through the inlet 28 by way of the space interstitial to cross guards 30 and vertical supports 32. The air flows past inlet air cut-off 50 and is directed around the interior of column 12. The airflow exits between vertical slats 31, which are generally shown as having an air-foil shape. The air flow is partially restricted from passing back to inlet 28 by the outlet air cut-off 52. Outlet air cut-off 52 is shown as being molded with wire route 46, however, these components could alternatively be formed separately. The leading edge of vertical slats 31 may be provided with a blunt portion 54 to create appropriate back pressure to reduce noise and/or vibration.

[0015] Referring to FIG. 5, two cross-sectional views of tower fan 10 taken along lines A—A and B—B are shown. Cross-section B—B is shown in relief. As can be seen, the air inlet cut-off 50 is provided in the same relative position in both cross-sections, while the outlet air cut-off 52 is moved radially about column 12 with the outlet. Lines C and D show the extreme tangents from the outlet by which a lateral distribution of air over about 75° without the need for oscillation. Other degrees of lateral distribution can be achieved by varying the degree of sweep of the outlet, or the overall height of the tower. Vertical slats 31 are shown as being arranged in a roughly parallel arrangement, but the slats may be arranged radially to provide a more extreme spread of the outlet air at a given cross-section.

[0016] In other embodiments, the blower range may traverse 90° which may be preferred if the fan is to be placed in the corner of a room or work area that has a generally rectangular

shape. In yet other embodiments, the blower range may traverse over 60°, 180°, 360°, or any other desired angle. In some embodiments, a smaller version of the tower fan 10 may be used as a desktop fan and be placed on a desk or other piece of furniture to circulate air in an area proximate to a user. In some alternative embodiments, the tower fan may be coupled with a heating method, such as a heating element disposed within the column to provide a heating function.

[0017] Referring to FIG. 6, blower 24 may be a spiral blower having blades 60 that are helically arranged in a similar manner to vertical slats 31 shown in the previous figures. Blower 24 may further include a plurality of support members 62 that are fixedly coupled to blades 60. In some embodiments, a plurality of sub-units comprised of blades 60 bounded by two support members 62 may be joined end-to-end to form the bulk of blower 24. Two end caps 64 and 66 are also provided. End cap 66 is shown as positioned at the top of blower 24 and may be coupled to an interior structure within column 12 to align blower 24. End plate 64 may be positioned at the base of blower 24, proximate to the drive motor. End plate 64 includes fins 68, apertures 70, and center opening 72. Center opening 72 may be configured to receive a collar or other device to couple blower 24 to a drive shaft. Fins 68 are provided to dissipate heat from the drive motor during use. Apertures 70 are placed between fins 68 and allow for warm air above the motor housing to be drawn into blower 24. This further aids in motor cooling and allows for the use of smaller and less expensive motors to drive blower 24.

[0018] Although a few exemplary embodiments of the present invention have been shown and described, the present invention is not limited to the described exemplary embodiments. Instead, it would be appreciated by those skilled in the art that changes may be made to these exemplary embodiments without departing from the principles and spirit of the invention, the scope of which is defined by the claims and their equivalents.

[0019] The terminology used in the description of the invention herein is for the purpose of describing particular embodiments only and is not intended to be limiting of the invention. As used in the description of the embodiments of the invention and the appended claims, the singular forms "a", "an" and "the" are intended to include the plural forms as well, unless the context clearly indicates otherwise.

[0020] Unless otherwise defined, all technical and scientific terms used herein have the same meaning as commonly understood by one of ordinary skill in the art to which this invention belongs. All publications, patent applications, patents, and other references mentioned herein are incorporated by reference in their entirety.

[0021] It will be further understood that the terms "comprises" and/or "comprising," when used in this specification, specify the presence of stated features, integers, steps, operations, elements, and/or components, but do not preclude the presence or addition of one or more other features, integers, steps, operations, elements, components, and/or groups thereof. It will be understood that relative terms are intended to encompass different orientations of the device in addition to the orientation depicted in the Figures.

[0022] Moreover, it will be understood that although the terms first and second are used herein to describe various features, elements, regions, layers and/or sections, these features, elements, regions, layers and/or sections should not be limited by these terms. These terms are only used to distinguish one feature, element, region, layer or section from another feature, element, region, layer or section. Thus, a first feature, element, region, layer or section discussed below could be termed a second feature, element, region, layer or section, and similarly, a second without departing from the teachings of the present invention.

[0023] It will also be understood that when an element is referred to as being "connected" or "coupled" to another element, it can be directly connected or coupled to the other element or

intervening elements may be present. In contrast, when an element is referred to as being "directly connected" or "directly coupled" to another element, there are no intervening elements present. Further, as used herein the term "plurality" refers to at least two elements. Additionally, like numbers refer to like elements throughout.

[0024] Thus, there has been shown and described several embodiments of a novel invention. As is evident from the foregoing description, certain aspects of the present invention are not limited by the particular details of the examples illustrated herein, and it is therefore contemplated that other modifications and applications, or equivalents thereof, will occur to those skilled in the art. The terms "having" and "including" and similar terms as used in the foregoing specification are used in the sense of "optional" or "may include" and not as "required". Many changes, modifications, variations and other uses and applications of the present construction will, however, become apparent to those skilled in the art after considering the specification and the accompanying drawings. All such changes, modifications, variations and other uses and applications which do not depart from the spirit and scope of the invention are deemed to be covered by the invention which is limited only by the claims which follow. The scope of the disclosure is not intended to be limited to the embodiments shown herein, but is to be accorded the full scope consistent with the claims, wherein reference to an element in the singular is not intended to mean "one and only one" unless specifically so stated, but rather "one or more." All structural and functional equivalents to the elements of the various embodiments described throughout this disclosure that are known or later come to be known to those of ordinary skill in the art are expressly incorporated herein by reference and are intended to be encompassed by the claims.

What is claimed is:

1. A tower fan comprising  
a base;  
a column coupled to the base, and;  
a blower positioned within the column, the blower having an inlet and an outlet; wherein the outlet twists about an exterior of the column along a longitudinal axis of the column.
2. The tower fan of claim 1, wherein the blower is an axial blower and extends along a portion of the column.
3. The tower fan of claim 2, wherein the outlet comprises a plurality of slats having a cross-sectional shape of an air foil.
4. The tower fan of claim 3, wherein at least a portion of the slats have a leading edge that is blunt.

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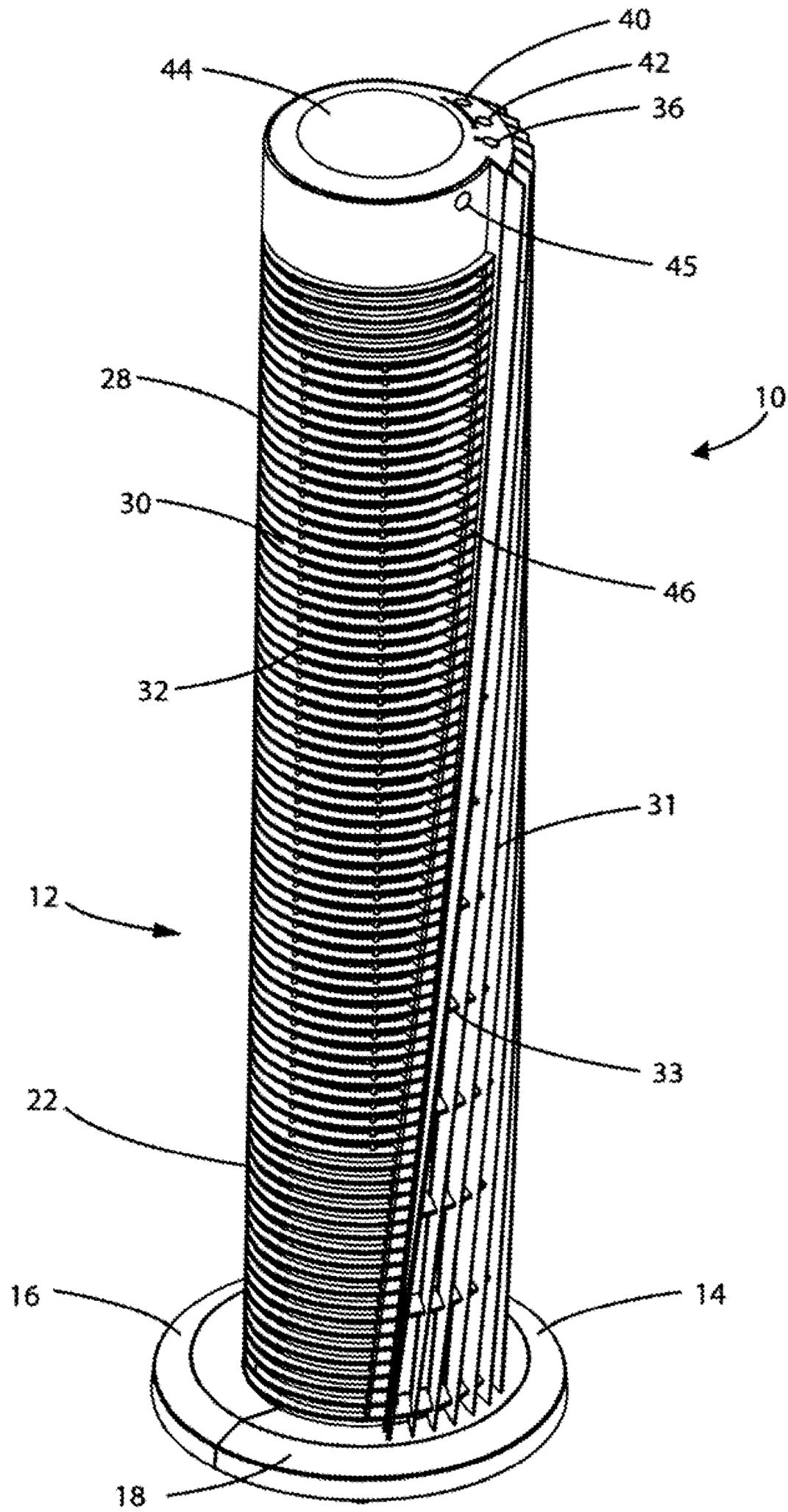


FIG. 1

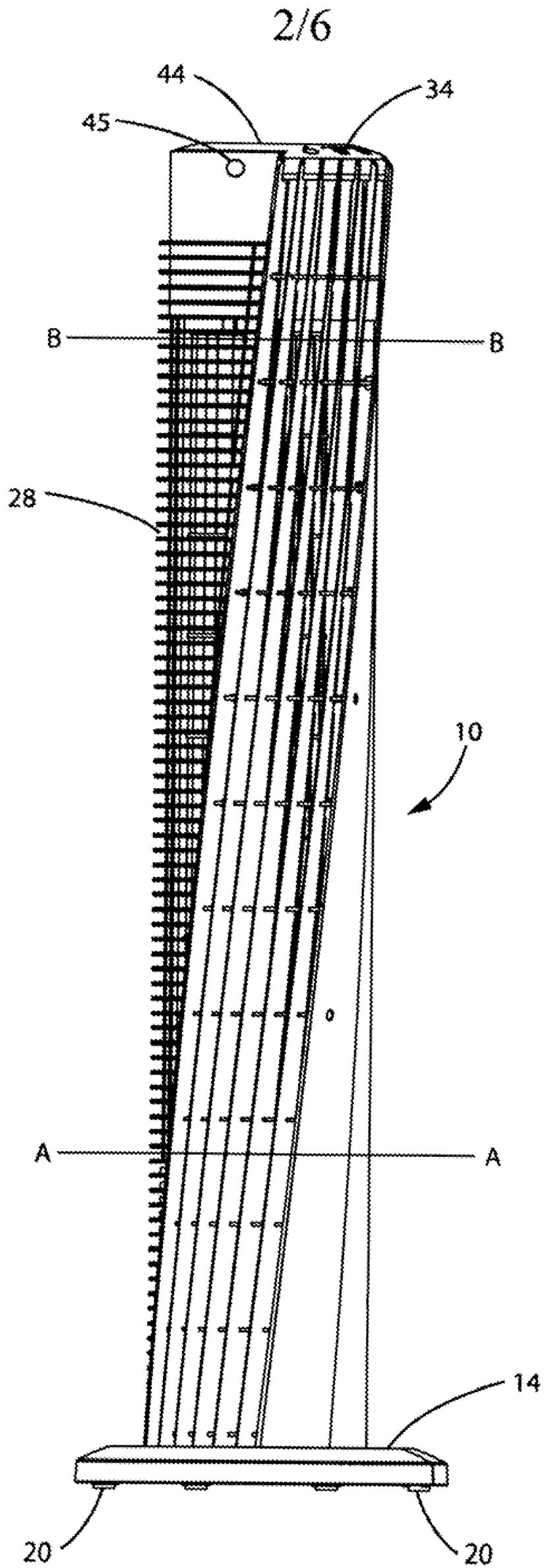


FIG. 2

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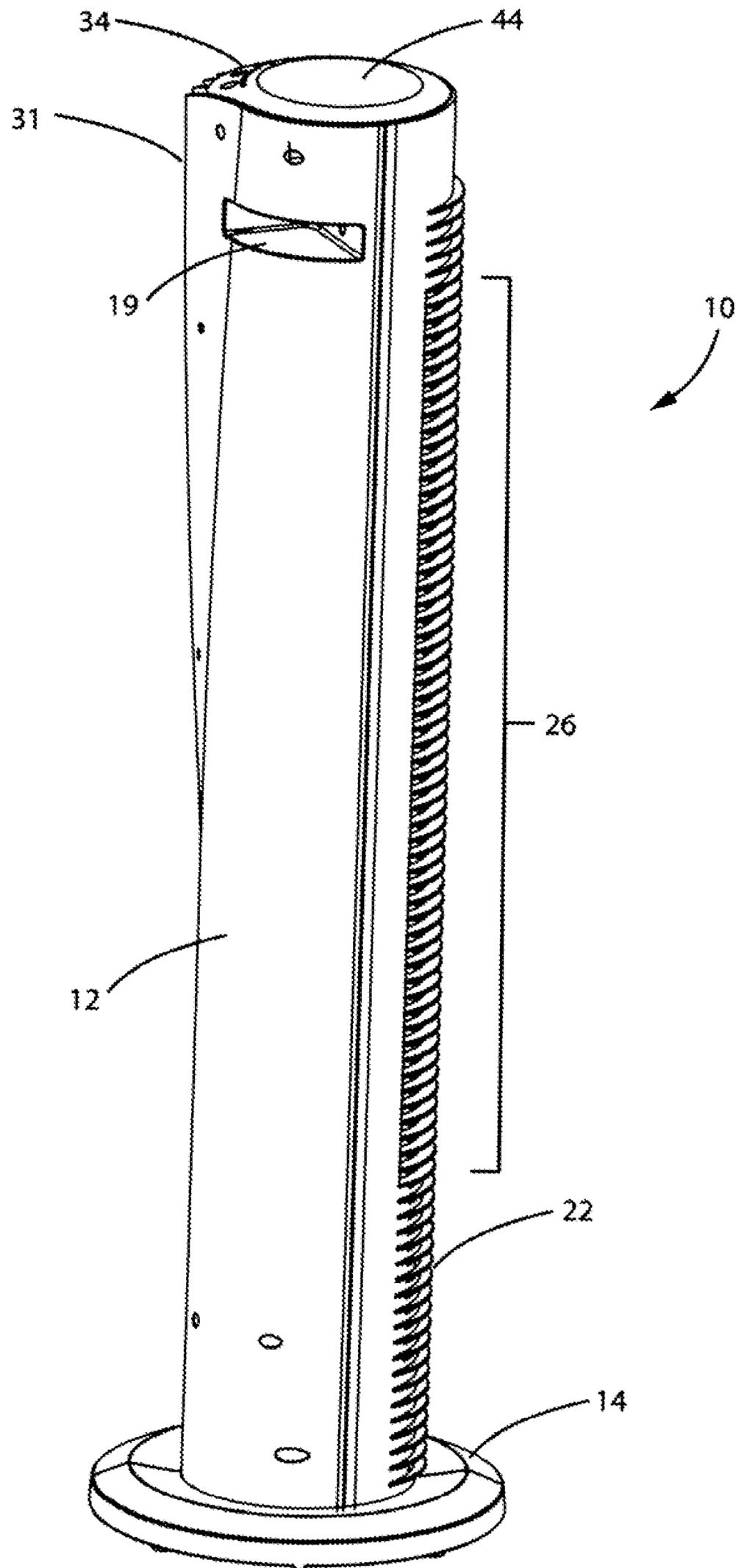


FIG. 3

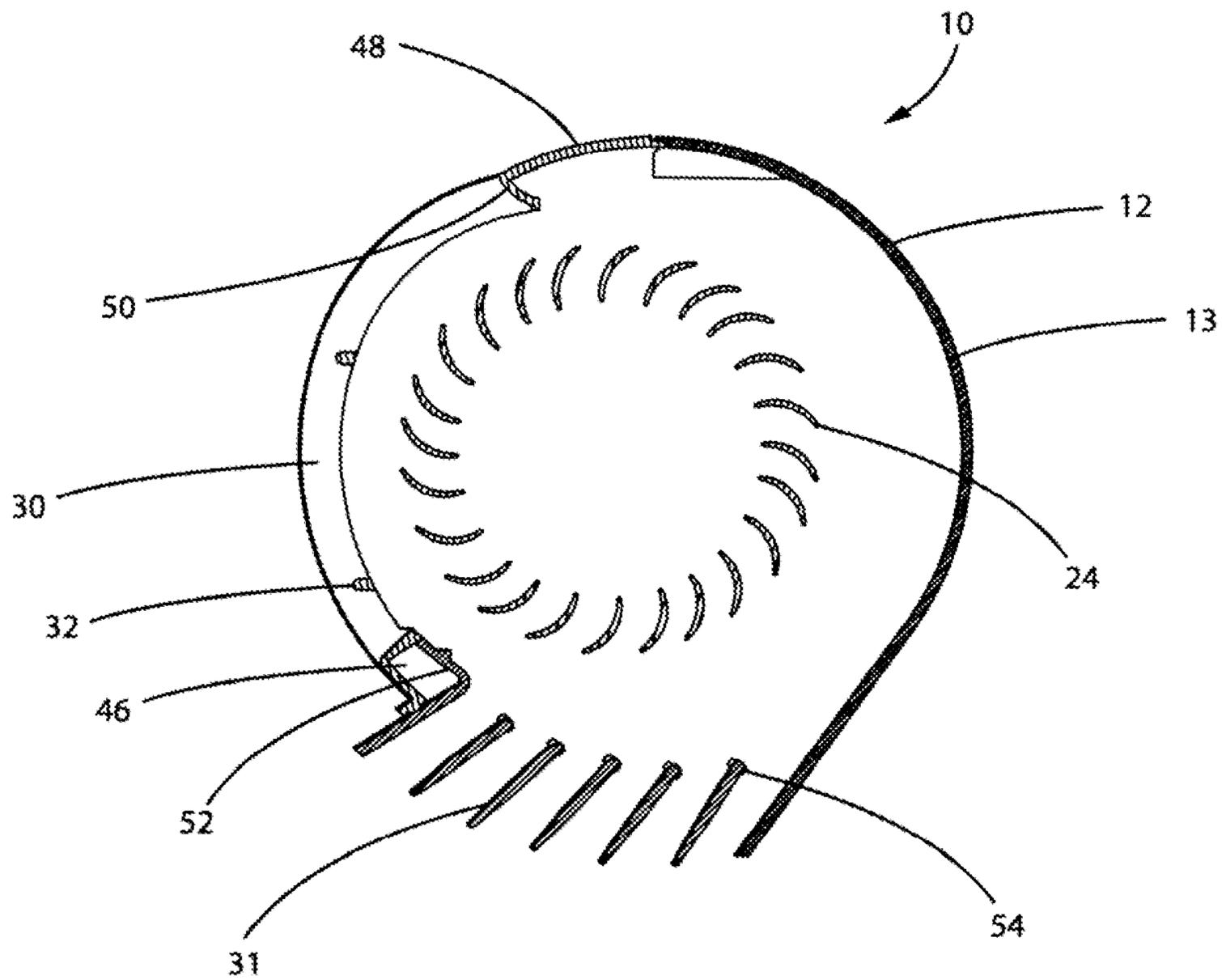


FIG. 4

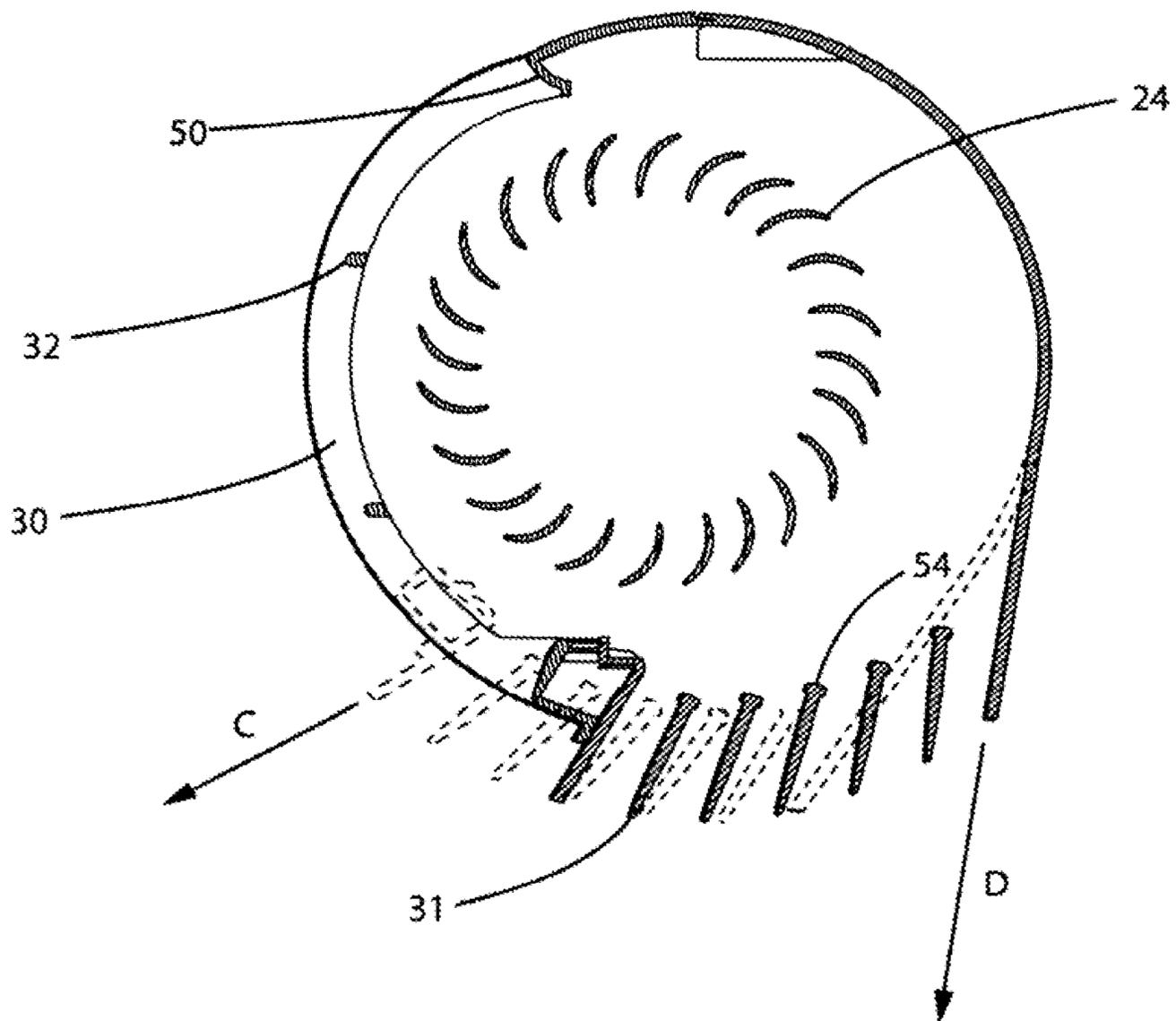


FIG. 5

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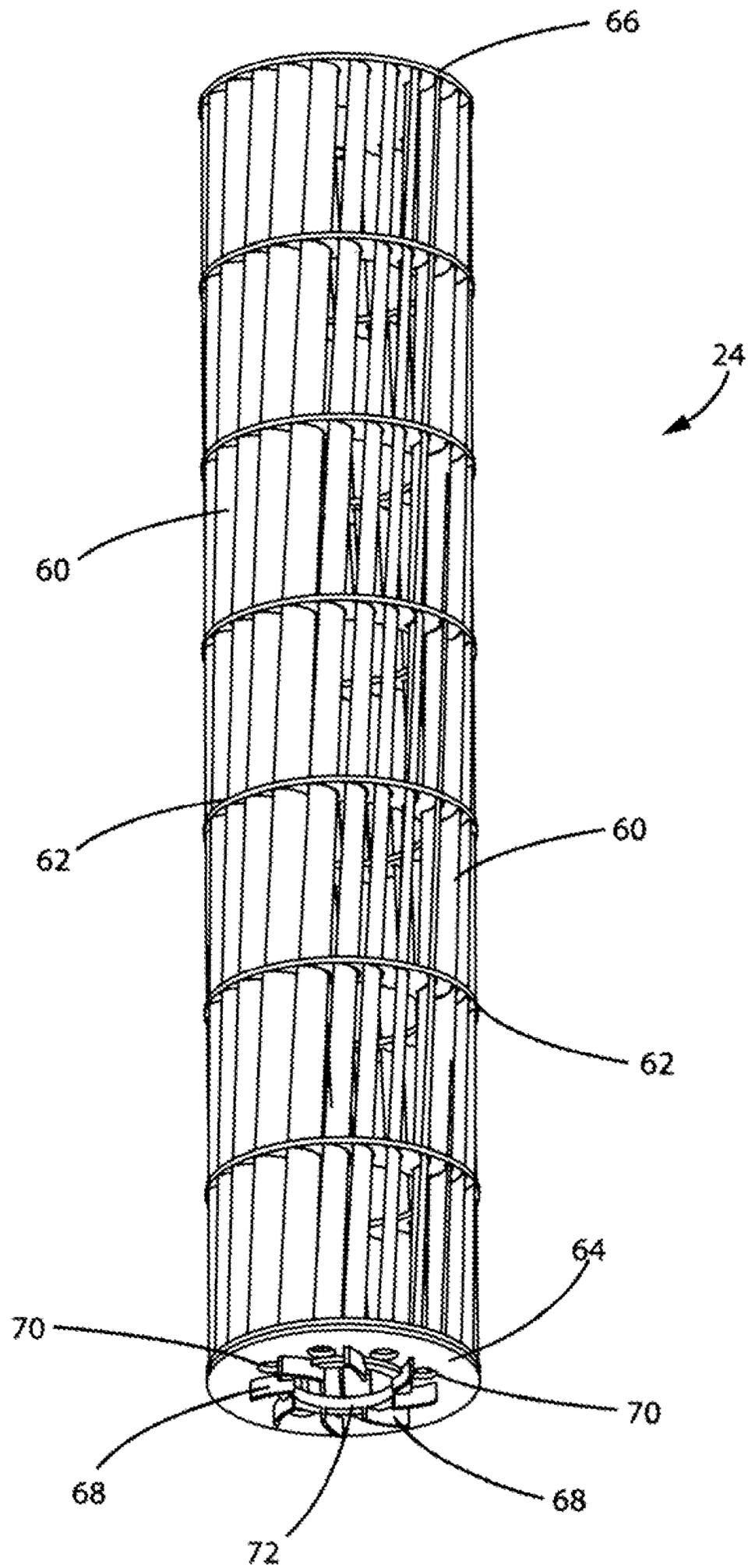


FIG. 6

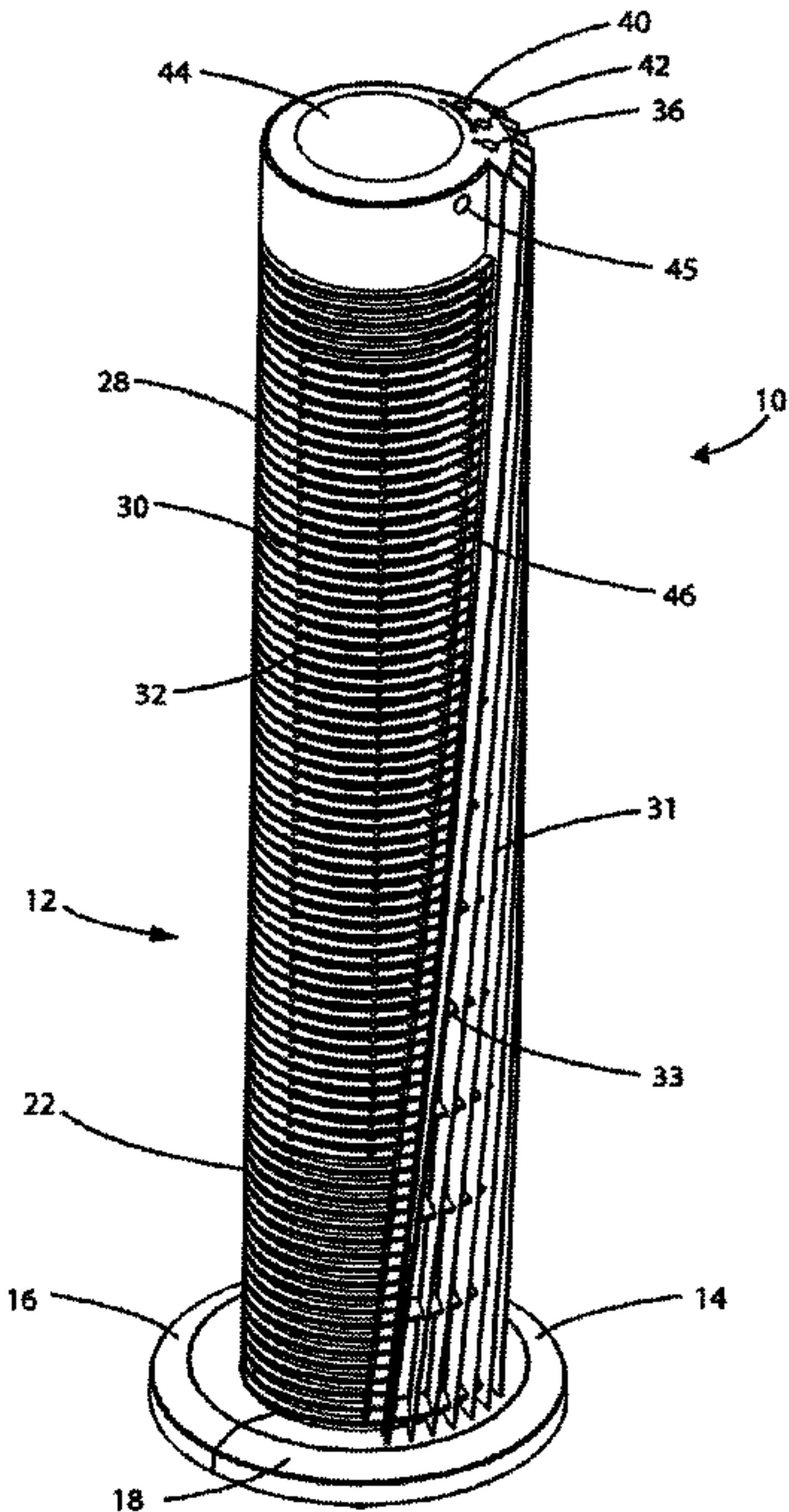


FIG. 1