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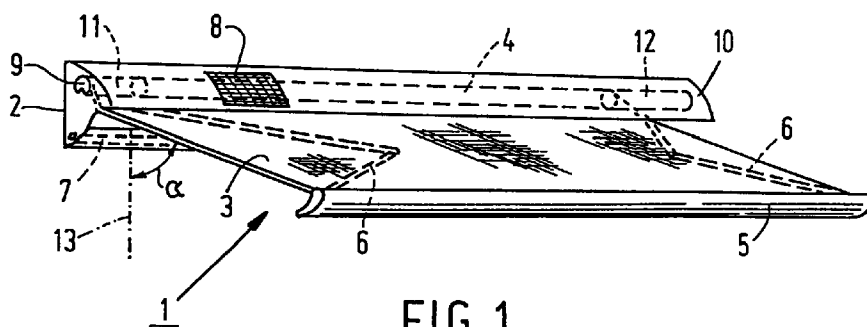
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(54) **A sun-blind comprising lighting means**

(57) A sun-blind (1), in particular of the type which is to be mounted on an outside wall of a building (13), having an elongated frame or housing (2) and shading means (3-6) comprising a movable screen (3). The screen (3) can extend over a specified distance with respect to the frame or housing (2) and, in its mounted state, may include an angle ( $\alpha$ ) with the outside wall (13) to which the frame or housing (2) is mounted. The frame or housing (2) is provided with lighting means (7) disposed for lighting the space under the frame or hous-

ing (2) and the screen (3), irrespective of the position of the screen (3). Electric power supply means (11) in the form of a battery may be accommodated in the frame or housing (2) for the purpose of supplying the lighting means (7) with electric energy. Preferably, the frame or housing (2) comprises solar cell means (8), which are operatively connected to the power supply means (11). The sun-blind (1) may be a compact, integral, single unit, which can be mounted in one operation.



**FIG. 1**

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## Description

[0001] The invention relates to a sun-blind, in particular a sun-blind of the type which is to be mounted on an outside wall of a building, having an elongated frame or housing and shading means comprising a movable screen which can extend over a specified distance with respect to said frame or said housing and, in its mounted state, may include an angle with an outside wall or side to which said frame or said housing is mounted, said frame or housing comprising lighting means.

[0002] A sun-blind of this type is known from German Patent Application 40 31 471.

[0003] With such sun-blinds of the elbow or extension type, the shading means consist of a cloth or screen which can be moved a specified distance with respect to the outside wall on which the sun-blind is mounted. With some types of sun-blinds, the acute angle which the cloth or the screen includes with the outside wall can also be varied. Sun-blinds of the elbow or extension type are generally mounted above a window on an outside wall of a building.

[0004] With the known sun-blind, the lighting means are mounted at the frame or housing such that a flounce of the screen is illuminated, provided the screen does not extend from the frame or housing, that is in its closed or folded state. By moving the screen with regard to the housing, i.e. folding out the screen, the lighting means are at the upper side of the screen, when viewed in its mounted state, which screen of course has the property of blocking incident light.

[0005] In particular in the case of houses, where a sun-blind is mounted on the terrace side of the house, for example, it is often desirable to have lighting available at the terrace as well. In such a case, with the known sun-blind, separate lighting means have to be mounted on the outside wall in addition to the sun-blind.

[0006] In practice, the sun-blind and the lighting means both have to be installed separately, whereby frequently insufficient space is available for the sun-blind and the lighting means in the case of installation under a ceiling or under a projecting wall part, so that a compromise is necessary, which, from an aesthetic point of view, often is detrimental to the design and the form of the sun-blind or of the lighting means, or of both.

[0007] Accordingly, the invention provides a sun-blind which is characterized in that said lighting means are disposed for lighting the space under said frame or housing, irrespective of the position of said screen.

[0008] Different from the known sun-blind, the sun-blind according to the invention provides for an effective illumination or lighting of the space beneath the frame or the housing also if the screen extends outwardly, i.e. is folded out. The intensity of the light can be adjusted for reading a book, but also for the purpose of safety light in order to prevent as much as possible injuries due to darkness. This also, if a user has forgotten to fold up the

screen at night, or if the screen stays folded out due to failure or the like.

[0009] With the sun-blind according to the invention, the total costs for mounting the sun-blind and the lighting means are considerably reduced because both the sun-blind and the lighting means can be mounted simultaneously in one operation. The whole may be given a desired aesthetic appearance and/or a desired form, and be adapted to particular standardised dimensions of windows and the like, if desired.

[0010] In an embodiment of the sun-blind according to the invention, in particular for use above a window on the terrace side of a house, the shading means comprise a screen which can be wound onto a rotatably arranged roller, in such a manner that the screen can be moved with respect to said frame or said housing by rotating the roller and wherein said lighting means are disposed opposite the roller in such a manner that the lighting means are beneath the frame or the housing in its mounted state.

[0011] In a preferred embodiment of the invention the lighting means are incorporated in the frame or housing.

[0012] In yet another embodiment, the lighting means are arranged in such a manner that light is emitted in a specified direction. In the mounted state of the sun-blind, light may be emitted in the direction of the ceiling or a projecting wall part for decorative purposes, for example, and functionally in the direction of a terrace or the like present under the sun-blind.

[0013] With sun-blinds which are used in practice, the shading means can be moved manually or automatically, for example electrically. It will be appreciated that a separate electric connection for the lighting means is not necessary in the case of electrically operated shading means. The lighting means can be directly connected to the electrical connection of the operating means in that case.

[0014] In a preferred embodiment, electric power supply means in the form of a battery are accommodated in the housing of the sun-blind for the purpose of supplying the lighting means with electric energy. In yet another embodiment, said battery may be advantageously accommodated in the roller of a sun-blind of the type described above.

[0015] The battery may be removably arranged, so as to be replaced in case of exhaustion. In another preferred embodiment of the invention, the housing of the sun-blind comprises solar cell means, operatively connected to the power supply means. The battery may be charged during daytime, for example, via the solar cell means which are capable of generating electric energy from the light that incidences thereon, such that sufficient energy is stored in the battery for supplying the lighting means with energy during the evening and the night.

[0016] The solar cell means are preferably attached to the housing in such a manner that they will not be screened to any significant extent when the shading

means are moved with respect to the housing.

**[0017]** In yet another embodiment of the invention the solar cell means extend along the length of the housing in order to have sufficient energy available for charging the battery quickly.

**[0018]** In a yet another embodiment of the sun-blind according to the invention, driving means which are connected to the power supply means, in particular an electrically controlled motor, are provided for moving the shading means with respect to the housing.

**[0019]** In yet another preferred embodiment of the invention, in particular in the case of a sun-blind comprising a roller, the driving means comprise a tubular motor, which is received in the roller from one end thereof, whereby the power supply means in the form of a battery are received in the roller from the other end.

**[0020]** By furthermore accommodating control means for remote control of the lighting means and/or the driving means in the housing, which control means may be connected to sensor means in an embodiment of the invention for controlling the lighting means and/or the driving means under the influence of ambient conditions and/or time, a compact sun-blind in the form of an integral, single unit to be mounted on an outside wall of a building can be provided.

**[0021]** The invention will be explained in more detail hereafter with reference to the accompanying figures, which illustrate an embodiment of a sun-blind in the form of an awning or sunshade of the extension type.

Figure 1 is a schematic, perspective view of a preferred embodiment of a sun-blind according to the invention in the form of an awning, wherein a few parts which are not visible from the outside are illustrated in dashed lines.

Figure 2 is a schematic, perspective, larger-scale view of a part of the sun-blind according to Figure 1, showing parts in exploded view.

Figure 3 is a schematic, perspective, larger-scale cross-sectional view of a closed sun-blind according to Figure 1, seen from line III - III.

Figure 4 is a block diagram of an embodiment of an electric wiring diagram for use with the sun-blind according to Figure 1.

**[0022]** The sun-blind according to the invention which is shown in Figure 1 is of the so-called elbow or extension type, which is to be mounted on the outside wall of a building.

**[0023]** The sun-blind or awning 1 comprises an elongated frame or housing 2, from where shading means in the form of an opaque screen or cloth 3 can extend over a specified distance.

**[0024]** The screen or cloth 3 winds onto a so-called winding roller 4 within the frame or housing 2. The screen or cloth is attached with its outwardly extending end to an end strip or end tube 5, which is supported by the frame or the housing 2 via pivoting arms 6. In the

illustrated embodiment, the pivoting arms 6 are illustrated in dashed lines, because they extend under the cloth or screen 3, seen in the plane of the drawing.

**[0025]** In accordance with the invention, lighting means 7 are provided beneath the frame or housing 2, likewise seen in the plane of the drawing.

**[0026]** As clearly shown in Figure 1, the lighting means 7 can effectively illuminate the space beneath the frame or housing 2, i.e. the cloth or screen 3, irrespective of the position of the cloth or screen 3, that is folded up or folded out. The type and power of the lighting means may be selected in dependence on the purpose for which the lighting means are intended, for example working purposes, safety purposes or decorative purposes.

**[0027]** Solar cell means 8 comprised of several solar panels extending in the longitudinal direction of the frame or housing 2 are mounted on the upper side of the frame or housing 2, seen in the plane of the drawing. For illustrative reasons, only part of the solar cell means 8 are shown.

**[0028]** In the illustrated embodiment of the invention, power supply means comprising one or more batteries 11 are accommodated in the roller 4 at one end 9 of the roller, as is illustrated in dashed lines. An electric driving motor 12, which is likewise illustrated in dashed lines, is accommodated, partially or completely, in the roller 4 at the other end 10 thereof. The cloth or screen 3 can be moved into or out of the frame or housing 2 by means of the motor 12. Depending on the construction, it is also possible to vary the acute angle  $\alpha$  which the cloth or screen 3 includes with the outside wall or side 13 of a building in its mounted state.

**[0029]** Figure 2 is a larger-scale, exploded view of a number of the main components of the awning 1 shown in Figure 1.

**[0030]** The frame or housing 2 consists of a first frame part 14, which has an essentially V-shaped cross-section, a first leg 15 being a substantially flat plate, which is to be mounted against an outside wall of a building, and the other leg 16 having the shape of a curved cover.

**[0031]** A second frame part 17, having an essentially L-shaped cross-section, the long leg 18 of which is likewise a substantially flat plate, which is to be mounted against an outside wall, and the short leg 19 of which defines a chamber 20.

**[0032]** The first frame part 14 and the second frame part 17 are provided at their free ends with coupling means 21 and 22, respectively, for coupling the frame parts together. The frame parts 14, 17 may be made of sheet steel or for example of aluminium.

**[0033]** The lighting means 7 according to the invention, in the form of so-called TL (Tube Light) lighting means in this embodiment, are shown in the chamber 20. Also other suitable lamp types and fixtures may be used, of course, as is known per se in the art.

**[0034]** At its lower side, seen in the figure, the chamber 20 is closed by a plate 23 of a light-transmissive

material. This plate may be a transparent or semi-transparent plate of plastic material, or a plate 23 of a perforated, nontransparent material, inter alia a metal. The frame or housing 2 may also be made in one piece, for example of aluminium.

[0035] For the sake of clarity, the electric connections of the lighting means 7 are not shown. Sockets and connectors suitable for mounting lamps are likewise known per se in practice.

[0036] As is clearly shown in Figure 2, the power supply means 11 take the form of a cylindrical battery, which is received in the roller 4 from the end 9 thereof. At the other end 10 of the roller 4, a tubular motor 12 is placed therein, in such a manner that rotation of the motor 12 will cause the roller 4 to rotate in either one direction so as to move the cloth or screen (not shown) inwards or outwards with respect to the frame or housing 2.

[0037] In the illustrated embodiment, the solar cell means 8 consist of solar cell panels 24, which are mounted at the upper side, seen in the plane of the drawing, of leg 16 of the first part 14 of the frame or housing 2. As shown, leg 16 is provided with a recess 25 for slidably receiving the solar cell panels 24 therein.

[0038] For the sake of clarity a pivoting arm 6 is shown, which is provided at one end with fixing means 26 for fixing the end strip 5 thereto, and which is provided at the other end with fixing means 27 for being fixed to end cap 28, which is mounted on either end of the elongated frame or housing 2 in its mounted state. The end caps 28 are provided with mounting holes 29 for mounting the awning 1 to an outside wall.

[0039] For the sake of clarity, the bearing support of the roller 4 and for example the tubular motor 12 are not shown in detail. For those skilled in the art, it will be clear, however.

[0040] Figure 3 is a larger-scale, cross-sectional view from line III - III of Figure 1, wherein the cloth or screen 3 is completely present within the frame or housing 2. As is indicated by dashed lines, a supporting tube 30 may be disposed in the longitudinal direction of the frame or housing 2 for stiffening purposes. This is in particular the case with sunshades having a length of more than 5 m, for example.

[0041] Figure 4 shows, in the form of a block diagram, an embodiment of an electric wiring diagram for use with the awning 1 according to the invention.

[0042] Solar cell means 8 in the form of one or more solar cell panels 24 are connected to an input 32 of a charging circuit 31. Power supply means in the form of a battery 11 are connected to the output 33 of the charging circuit 31. The charging circuit 31 is designed in such a manner that the battery 11 can be charged by electric energy generated by the solar cell means 8. The lighting means 7 and driving means, in the form of an electric DC motor 12, are connected to the battery 11.

[0043] A motor control circuit 34 is provided for controlling the motor 12. Electric DC voltage energy is sup-

plied from the battery 11 to input 35 of the motor control circuit via a polarity inverter 37. The motor 12 is connected to output 36 of the motor control circuit 34.

[0044] The polarity of the DC voltage on the input 35 of the motor control circuit 34 can be inverted by the controlling inverter 37, which results in rotation of the motor 12 in either one direction. The motor control circuit 34 is designed such that the drive will be turned off when the motor 12 is stationary, which is for example the case when the cloth or screen 3 is completely accommodated within the frame or housing 2, or when it has reached its extreme outward position. Also when the screen movement is obstructed, the drive will be turned off.

[0045] As an alternative for such a motor control circuit 34, so-called limit switches may be incorporated in wiring portions 38, 39 of inverter 37, which limit switches interrupt the wiring portions in question when the cloth or screen 3 has reached its respective end position (not shown).

[0046] The lighting means 7 can be turned on or off via a single-pole control switch 40. If desired, the converter means 41 may be provided in the supply line to the lighting means 7 and the switch 40 for converting DC voltage into AC voltage, for example if the lighting means 7 which are used require alternating voltage or if they require a higher operating voltage than the voltage which is available on the terminals of the battery 11.

[0047] In this embodiment, the inverter 37 and the single-pole switch 40 may be operated manually, indicated at 42, or automatically, via a control circuit 43.

[0048] The control circuit 43 may be provided with remote control means 44, such as a remote control circuit (radiographic, infrared, ultrasonic, etc.), in such a manner that the movement of the cloth or screen 3 and the turning on and off or the dimming of the lighting means 7 can be carried out via the remote control means 44.

[0049] In a preferred embodiment, sensor means 45 are connected to the control circuit 43, which sensor means may comprise photosensitive sensors, for example, for automatically moving the cloth or screen 3 in dependence on the light conditions (sun condition), and moisture sensors, for example, for automatically moving the cloth or screen 3 to within the frame or housing 2. The sensor means 45 may be adjusted in such a manner that the lighting means 7 will automatically be turned on when darkness falls. The sensor means 45 may furthermore comprise timer means for having the lighting means 7 burn for a predetermined period of time or for automatically turning the lighting means 7 on and/or moving the cloth or screen 3 at predetermined points in time.

[0050] A very compact construction can be obtained by accommodating the respective electric connections and the associated control circuits in the roller 4 as well, between the battery 11 and the motor 12. Suitable flexible or other electric connectors for connecting fixed and

rotatable electric components, which are known per se, may be used for connecting the electric components which are present in the roller to the other components, such as the solar cell panels and the lighting means 7.

[0051] The solar cell panels 24, the charging circuit 31, the motor 12 and the motor control circuit 34, the control circuit 43, the remote control circuit 44, the sensor means 45 and the converter means 41 are commercially available components, which need not be explained to a person skilled in the art. Batteries 11 of, for example, 12 or 24 V DC which are suitable for the purpose of the invention are likewise components which are well-known to a person skilled in the art.

[0052] Although the lighting means 7 are present beneath the cloth or screen 3 in the illustrated embodiment, they may also be present at the ends of the frame or housing 2 or on or in the end caps 28, of course, or be placed to additionally radiate light for lighting a cove or an outside wall, or may include further lighting means to that purpose, mounted at the upper side of the frame or housing 2 (not shown). The lighting means 7 and/or the plate 23 may furthermore be suitably selected for emitting light at a desired angle or in a desired direction.

[0053] The type and power of the lighting means may be selected in dependence on the purpose for which the lighting means are intended, for example working purposes, safety purposes or decorative purposes.

[0054] Furthermore, the invention is not limited to a sun-blind in the form of an awning, for outdoor use.

[0055] Although the invention has been discussed by means of a compact, independent, integrated embodiment of a sunshade, which can be installed in one mounting operation, without further external connections, it will be apparent that the invention is not limited to sun-blinds which are fitted with their own power supply means. The lighting means may be connected for their electric energy supply to the electric installation of a building on which the sun-blind is mounted, if desired.

## Claims

1. A sun-blind, in particular a sun-blind of the type which is to be mounted on an outside wall of a building, having an elongated frame or housing and shading means comprising a movable screen which can extend over a specified distance with respect to said frame or said housing and, in its mounted state, may include an angle with an outside wall or side to which said frame or said housing is mounted, said frame or housing comprising lighting means, characterized in that said lighting means are disposed for lighting the space under said frame or housing, irrespective of the position of said screen.
2. A sun-blind according to claim 1, wherein said shading means comprise a screen which can be wound onto a rotatably arranged roller, in such a manner that said screen can be moved with respect to said frame or said housing by rotating said roller and wherein said lighting means are disposed opposite said roller in such a manner that said lighting means are beneath said frame or said housing in its mounted state.
3. A sun-blind according to claim 1 or 2, wherein said lighting means are accommodated within said frame or housing.
4. A sun-blind according to claim 1, 2 or 3, wherein said lighting means are disposed so as to emit light in a specified direction.
5. A sun-blind according to claim 1, 2, 3 or 4, wherein electric power supply means in the form of a battery are accommodated in said frame or housing for the purpose of supplying said lighting means with electric energy.
6. A sun-blind according to claim 5, in dependence on claim 2, wherein said power supply means are accommodated in said roller.
7. A sun-blind according to claim 5 or 6, wherein said housing comprises solar cell means, which are operatively connected to said power supply means.
8. A sun-blind according to claim 7, wherein said solar cell means are attached to said frame or housing in such a manner that they will not be screened to any significant extent when said shading means are moved with respect to said frame or housing.
9. A sun-blind according to claim 7 or 8, wherein said solar cell means extend along the length of said frame or housing.
10. A sun-blind according to claim 5, 6, 7, 8 or 9, comprising driving means connected to said power supply means, in particular an electrically controlled motor, for moving said shading means with respect to said frame or housing.
11. A sun-blind according to any one of the claims 5 - 10, comprising control means for remote control of said lighting means and/or said driving means.
12. A sun-blind according to claim 11, comprising sensor means connected to said control means for controlling said lighting means and/or said driving means dependent on ambient conditions.
13. A sun-blind according to claim 10, 11 or 12, in dependence on claim 6, wherein said power supply means are received in said roller from one end thereof and in that said driving means in the form of

a tubular electric motor are received in said roller  
from another end thereof.

14. A sun-blind according to claim 13, wherein said  
control means and/or said sensor means are 5  
accommodated in said roller.
15. A sun-blind according to claim 14, wherein said  
sun-blind is an integral unit to be mounted on an  
outside wall of a building. 10

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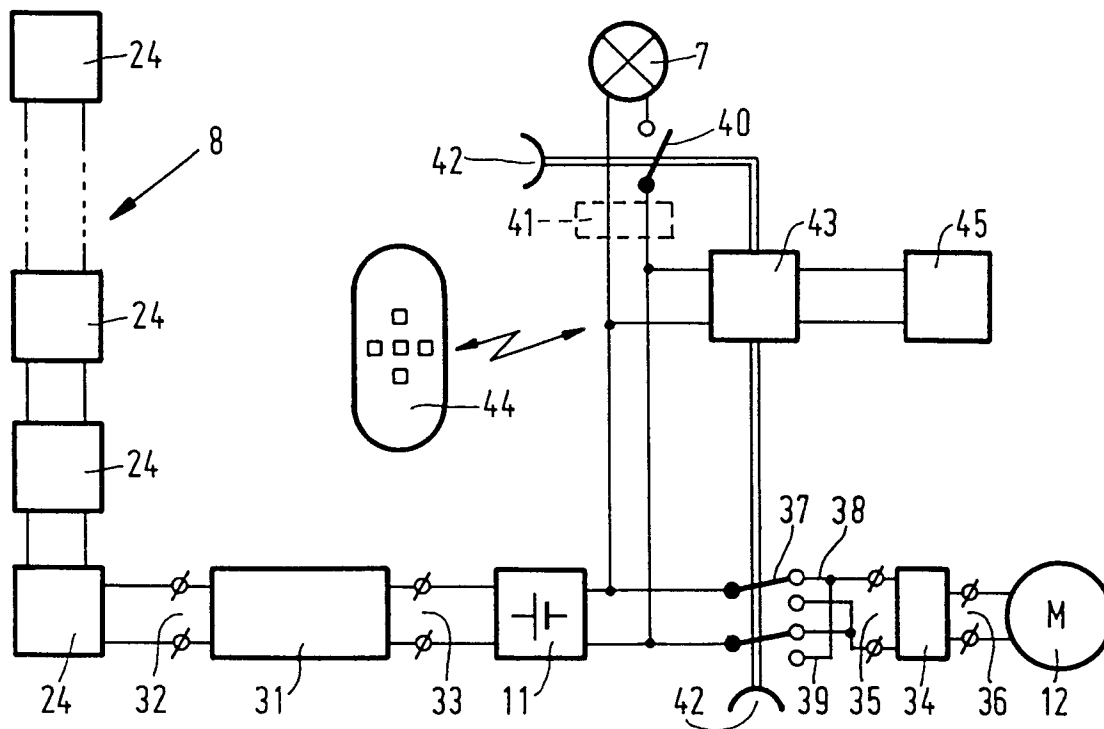
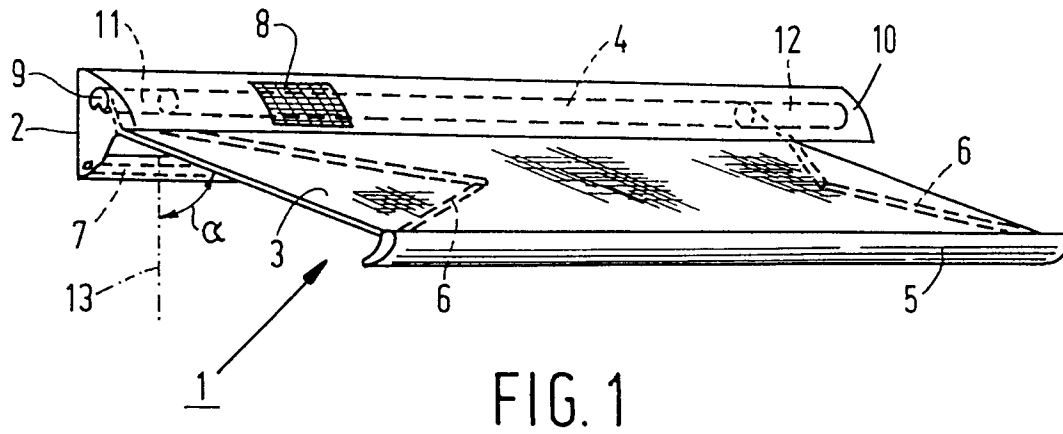
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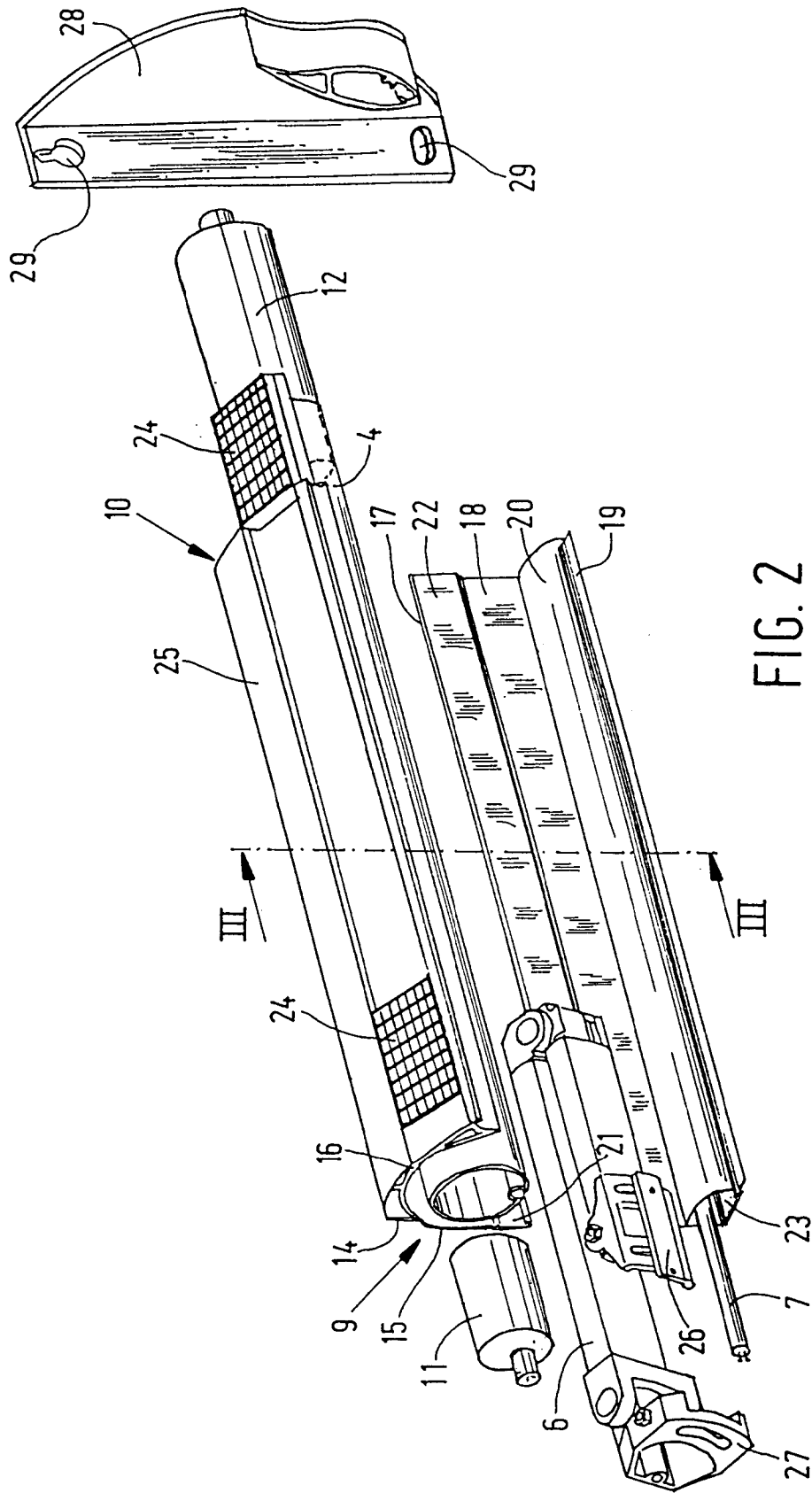
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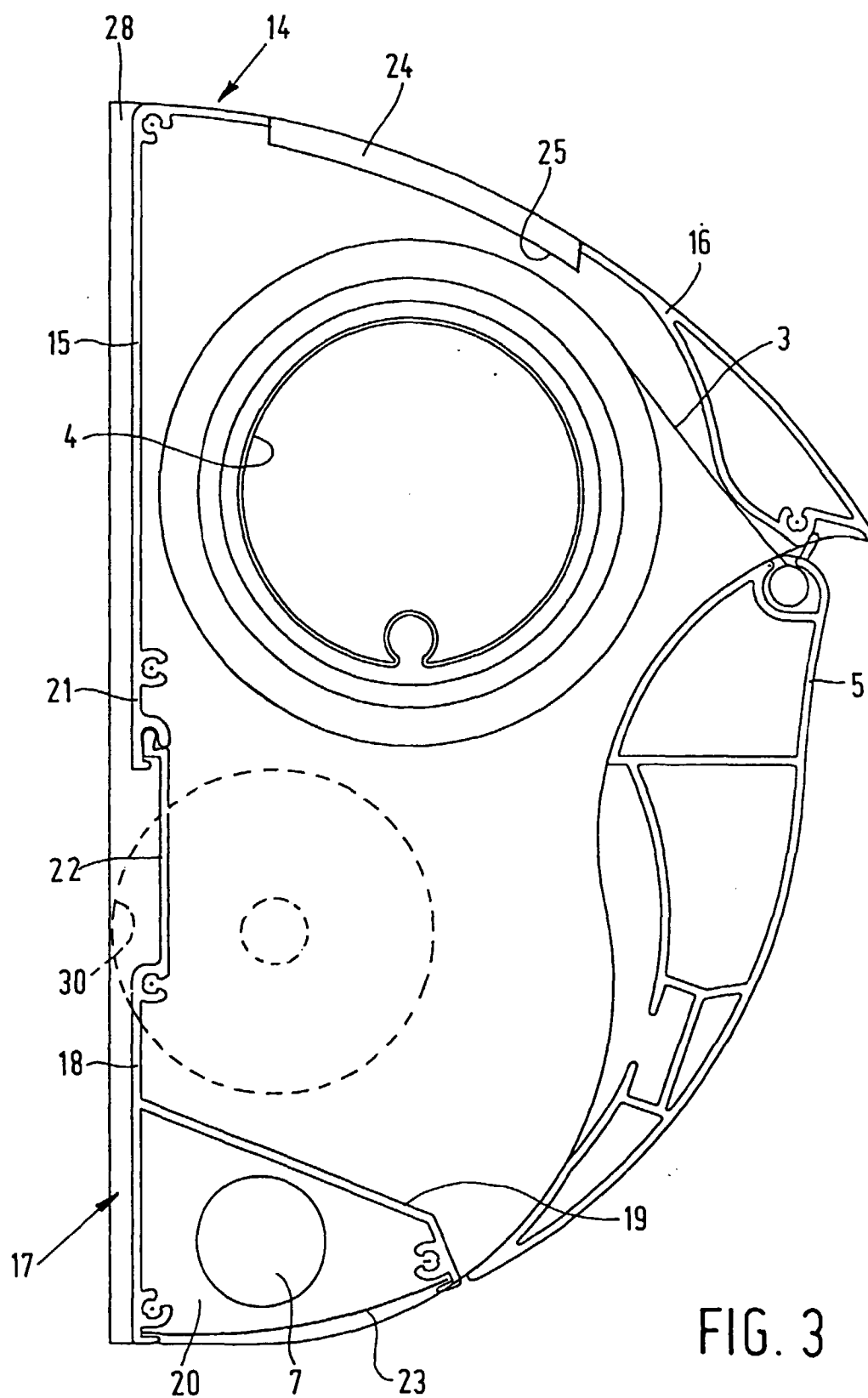


FIG. 3



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# EUROPEAN SEARCH REPORT

Application Number  
EP 98 20 3828

| 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.6) |
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| The present search report has been drawn up for all claims                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                        |                                  |                                              |
| Place of search                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                        | Date of completion of the search | Examiner                                     |
| THE HAGUE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                        | 17 February 1999                 | Ayiter, J                                    |
| <p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone<br/> Y : particularly relevant if combined with another document of the same category<br/> A : technological background<br/> O : non-written disclosure<br/> P : intermediate document</p> <p>T : theory or principle underlying the invention<br/> E : earlier patent document, but published on, or after the filing date<br/> D : document cited in the application<br/> L : document cited for other reasons<br/> &amp; : member of the same patent family, corresponding document</p> |                                                                                                                        |                                  |                                              |

EPO FORM 1503 03 82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT  
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EP 98 20 3828

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
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