7A 63/1346

PATENT SPECIFICATION

Inventor: THOMAS JOSEPH CURTIS

743,638

Date of Application and filing Complete Specification: Dec. 17, 1953.
No. 35181/53.
(Patent of Addition to No. 693,920 dated June 13, 1951).
Complete Specification Published: Jan. 18, 1956.

Index at acceptance:—Class 110(1), D2J1

COMPLETE SPECIFICATION

Improvements in and relating to Electric Fans

We, THE GENERAL ELECTRIC COMPANY LIMITED, of Magnet House, Kingsway, London, W.C.2, a British Company, do hereby declare the invention for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to electric fans having mechanism for causing the fan to oscillate during rotation so that the effect of the fan is felt over a wider area than would be possible if the axis of the fan were fixed.

The present invention is an improvement in or modification of the invention disclosed in patent specification No. 693,920 which claims an electric fan having mechanism for causing the axis of rotation of the fan blades to oscillate relatively to the base of the fan, said mechanism for oscillating the fan including a member which when the fan is arranged for oscillation, is normally restrained from movement relatively to another member by frictional engagement therebetween, wherein said frictional restraint is applied between a member secured to the base of the fan and a member which forms an abutment for the oscillating mechanism, the strength of such frictional engagement being sufficient to permit oscillation under normal operating conditions, but being insufficient to allow the oscillating mechanism to exert a force sufficient to overturn the fan if it meets an obstruction during operation, said oscillatory mechanism being arranged to allow oscillation to continue, after angular displacement of the arc of oscillation by relative movement of the members subjected to the frictional restraint, in the event of the original arc of oscillation being obstructed.

According to the present invention, the frictional restraint applied between the member secured to the base of the fan and the member which forms an abutment for the oscillating mechanism is assisted during oscillatory operation by providing said member which forms the abutment for the oscillating mechanism with one or more projections or depressions adapted to engage one or more depressions or projections respectively provided on a member secured to the base of the fan.

The force required to overcome the frictional engagement combined with the resistance offered by the inter-engagement of the projection or projections and the depressions can be determined by selection of the strength of spring or other means urging said members into engagement and can also be controlled by selection of the depth of inter-engagement of the projection or projections and the depressions. The depressions may conveniently take the form of circular holes or recesses which can be engaged by co-operating spherical projections. Where two or more projections are provided, these are arranged simultaneously to engage depressions. Any convenient number of depressions can be provided so that it is not necessary to move the two members relatively to one another through an excessively large angle against the frictional restraint from a position in which the projections engage in depressions to a position in which said projections next engage in depressions.

One form of construction in accordance with the present invention will now be described by way of example with reference to the accompanying drawing which is an exploded perspective view corresponding to Figure 3 of the drawings accompanying the Complete Specification of Patent No. 693,920.

In the drawings the various parts are given the same reference numbers as the corresponding parts in Figure 3 of the above mentioned Complete Specification, even though they may differ in detail of shape from the corresponding parts in said Complete Specification. With the exception of the parts shown in the accompanying drawings, the arrangement of the electric fan is the same as that shown in Figures 1 and 2 of the drawings accompanying said Complete Specification.

The housing of the fan is arranged to be

[*Price 3s. 0d.*]

rotatable for oscillatory movement about the axis of a spigot 44, a combined journal and thrust ball bearing race 50 being provided between the lower end of a casing part of the fan and a knuckle joint member 43 which is attached to the base of the fan. The ball bearing race 50 is secured in position by a retaining clip 101 which engages a recess 102 in the spigot 44 and a plain washer 103, a spring washer 104 and a washer 105 having keys to engage lengthwise slots in the spigot 44 are assembled above the retaining clip 101 and are surmounted by a friction member 57. Above the friction member 57 is a movable sleeve 51 which is interposed between the lower casing part of the fan and the spigot 44 and is slidable vertically under the control of a bolt 52 having an eccentric pin 53 extending from its end and engaging a recess in the sleeve 51. The bolt 52 has an operating knob 54 by means of which it can be turned so as to raise or lower the sleeve 51. The upper surface of the sleeve 51 has three bores 110 each housing a small helical compression spring 111, the lower end of which engages the bottom of its bore, while the upper end exerts an upward thrust on a thrust bearing 60 above which is mounted a hardened steel washer 112 having inwardly projecting lugs to engage the slots in the spigot 44 and having on its upper surface a number of circular recesses on a circular path surrounding the axis. Above the washer 112 is a plate 62 carrying a pin 63 to which one end of an oscillating link 31 is attached. The plate 62 is held in position by a bearing member 65 and the various parts are assembled together by a bolt 64 which is screw threaded at its lower end to engage a screw thread in the spigot 44. The lower surface of the plate 62 has a number of projections 113 which can conveniently be formed by peening hardened steel balls into recesses in the plate so that they each exhibit a spehrical projection 113 which can engage one of the recesses in the upper surface of the washer 112. In the arrangement shown there are three balls forming projections 113 symmetrically arranged around the plate 62 and there are twelve co-operating recesses in the upper surface of the washer 112 so that relative rotation between the plate 62 and the washer 112 through an angle of 30° allows each of the projections 113 to move from one recess to the next. When the sleeve 51 is raised by means of the bolt 52 an upward pressure is exerted on the washer 112 by the springs 111 acting through the thrust bearing 60 causing the projections 113 to engage three of the recesses in the washer 112 and thereby to hold the plate 62 against rotation relatively to the spigot 44. The upward pressure exerted by the springs 111 also causes the plate 62 frictionally to engage the bearing member 65 so as to assist in holding the plate 62 against rotation about the axis of the spigot 44. If, due to the fan meeting an obstruction, an excessive thrust is applied through the oscillating link 31 to the plate 62, the projections 113 can be forced out of their recesses against the action of the spring 111. The pressure exerted by the springs 111 continues to exert frictional restraint upon movement of the plate 62 relatively to the bearing member 65 and additional restraint is exerted when the projections 113 have engaged the next recesses in the upper surface of the washer 112. By the provision of a considerable number of recesses, say, nine or more, in the upper surface of the washer 112, there are provided a multiplicity of positions in which the engagement of the projections and recesses provide restraint in addition to that provided by the frictional engagement between the washer 112 and the plate 62. It will be noted that relative movement between the plate 62 and the washer 112 prevents damage to the fan and that the plate 62 moves relatively to the base of the fan to which is secured the spigot 44 until the end of the oscillatory movement is reached. The plate 62 is then held by the frictional engagement assisted by the engagement of the projections with the recesses so that the pin 63 can again constitute an abutment for the end of the oscillating link 31. This feature prevents damage to the fan in the event of its meeting an obstruction when arranged for oscillatory movement and the strength of the combined frictional engagement and the restraint provided by the engagement of the projections and recesses or depressions can be arranged to be such that the fan cannot over-turn itself if it meets such an obstruction.

Oscillatory movement of the fan can be prevented by moving the sleeve 51 downwardly by means of the bolt 52 to a position in which it rests on the friction member 57 and the pressure exerted by the springs 111 on the washer 112 is relieved. The plate 62 is then comparatively free to revolve about the spigot 44 so that the pin 63 no longer constitutes an abutment for the oscillating link 31 so that the casing of the fan does not oscillate.

What we claim is:—

1. An improvement in or modification of the electric fan claimed in any of the claims of Patent No. 693,920, wherein the frictional restraint applied between the member secured to the base of the fan and the member which forms an abutment for the oscillating mechanism is assisted during oscillatory operation by providing said member which forms the abutment for the oscillating mechanism with one or more projections or depressions adapted to engage one or more depressions or projections respectively provided on a member secured to the base of the fan.

2. An electric fan having an oscillating mechanism constructed and arranged to operate substantially as hereinbefore described with reference to and as shown in the accompanying drawing.

rotatable for oscillatory movement about the axis of a spigot 44, a combined journal and thrust ball bearing race 50 being provided between the lower end of a casing part of the fan and a knuckle joint member 43 which is attached to the base of the fan. The ball bearing race 50 is secured in position by a retaining clip 101 which engages a recess 102 in the spigot 44 and a plain washer 103, a spring washer 104 and a washer 105 having keys to engage lengthwise slots in the spigot 44 are assembled above the retaining clip 101 and are surmounted by a friction member 57. Above the friction member 57 is a movable sleeve 51 which is interposed between the lower casing part of the fan and the spigot 44 and is slidable vertically under the control of a bolt 52 having an eccentric pin 53 extending from its end and engaging a recess in the sleeve 51. The bolt 52 has an operating knob 54 by means of which it can be turned so as to raise or lower the sleeve 51. The upper surface of the sleeve 51 has three bores 110 each housing a small helical compression spring 111, the lower end of which engages the bottom of its bore, while the upper end exerts an upward thrust on a thrust bearing 60 above which is mounted a hardened steel washer 112 having inwardly projecting lugs to engage the slots in the spigot 44 and having on its upper surface a number of circular recesses on a circular path surrounding the axis. Above the washer 112 is a plate 62 carrying a pin 63 to which one end of an oscillating link 31 is attached. The plate 62 is held in position by a bearing member 65 and the various parts are assembled together by a bolt 64 which is screw threaded at its lower end to engage a screw thread in the spigot 44. The lower surface of the plate 62 has a number of projections 113 which can conveniently be formed by peening hardened steel balls into recesses in the plate so that they each exhibit a spehrical projection 113 which can engage one of the recesses in the upper surface of the washer 112. In the arrangement shown there are three balls forming projections 113 symmetrically arranged around the plate 62 and there are twelve co-operating recesses in the upper surface of the washer 112 so that relative rotation between the plate 62 and the washer 112 through an angle of 30° allows each of the projections 113 to move from one recess to the next. When the sleeve 51 is raised by means of the bolt 52 an upward pressure is exerted on the washer 112 by the springs 111 acting through the thrust bearing 60 causing the projections 113 to engage three of the recesses in the washer 112 and thereby to hold the plate 62 against rotation relatively to the spigot 44. The upward pressure exerted by the springs 111 also causes the plate 62 frictionally to engage the bearing member 65 so as to assist in holding the plate 62 against rotation about the axis of the spigot 44. If, due to the fan meeting an obstruction, an excessive thrust is applied through the oscillating link 31 to the plate 62, the projections 113 can be forced out of their recesses against the action of the spring 111. The pressure exerted by the springs 111 continues to exert frictional restraint upon movement of the plate 62 relatively to the bearing member 65 and additional restraint is exerted when the projections 113 have engaged the next recesses in the upper surface of the washer 112. By the provision of a considerable number of recesses, say, nine or more, in the upper surface of the washer 112, there are provided a multiplicity of positions in which the engagement of the projections and recesses provide restraint in addition to that provided by the frictional engagement between the washer 112 and the plate 62. It will be noted that relative movement between the plate 62 and the washer 112 prevents damage to the fan and that the plate 62 moves relatively to the base of the fan to which is secured the spigot 44 until the end of the oscillatory movement is reached. The plate 62 is then held by the frictional engagement assisted by the engagement of the projections with the recesses so that the pin 63 can again constitute an abutment for the end of the oscillating link 31. This feature prevents damage to the fan in the event of its meeting an obstruction when arranged for oscillatory movement and the strength of the combined frictional engagement and the restraint provided by the engagement of the projections and recesses or depressions can be arranged to be such that the fan cannot over-turn itself if it meets such an obstruction.

Oscillatory movement of the fan can be prevented by moving the sleeve 51 downwardly by means of the bolt 52 to a position in which it rests on the friction member 57 and the pressure exerted by the springs 111 on the washer 112 is relieved. The plate 62 is then comparatively free to revolve about the spigot 44 so that the pin 63 no longer constitutes an abutment for the oscillating link 31 so that the casing of the fan does not oscillate.

What we claim is:—

1. An improvement in or modification of the electric fan claimed in any of the claims of Patent No. 693,920, wherein the frictional restraint applied between the member secured to the base of the fan and the member which forms an abutment for the oscillating mechanism is assisted during oscillatory operation by providing said member which forms the abutment for the oscillating mechanism with one or more projections or depressions adapted to engage one or more depressions or projections respectively provided on a member secured to the base of the fan.

2. An electric fan having an oscillating mechanism constructed and arranged to operate substantially as hereinbefore described with reference to and as shown in the accompanying drawing.



For the Applicants:
F. S. PEACHEY,
Chartered Patent Agent.

Leamington Spa: Printed for Her Majesty's Stationery Office, by the Courier Press.—1956.
Published at The Patent Office, 25, Southampton Buildings, London, W.C.2, from which copies may be obtained.

