

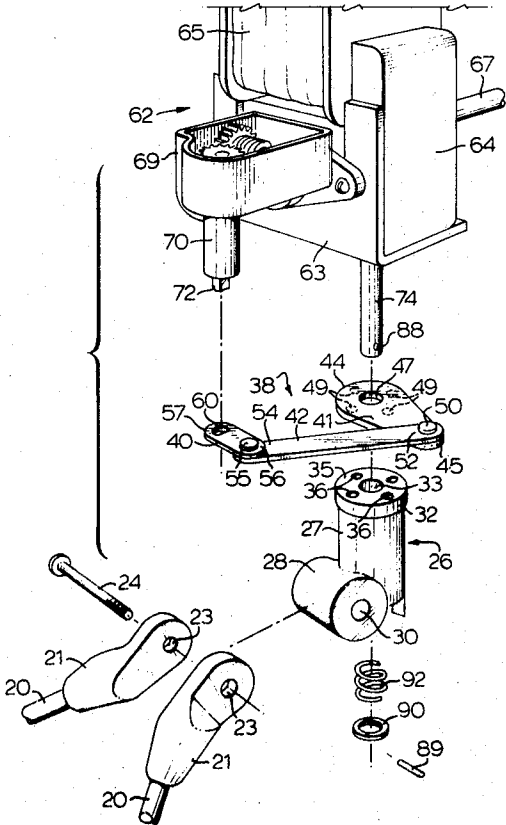
[54] **OSCILLATOR MECHANISM FOR FAN**
[75] Inventors: **James Chamberlain**, Willowdale, Ontario; **John Bradley**, Scarborough, Ontario, both of Canada
[73] Assignee: **Rotor Electric Company Limited**, Toronto, Ontario, Canada
[22] Filed: **Oct. 4, 1971**
[21] Appl. No.: **186,008**
[52] U.S. Cl. **74/42**
[51] Int. Cl. **F16h 21/18**
[58] Field of Search **74/42, 75; 416/246, 247**

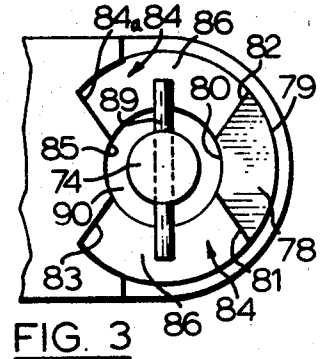
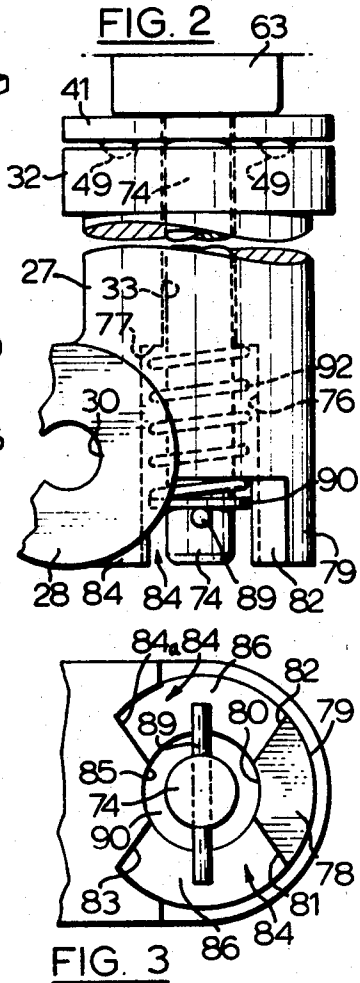
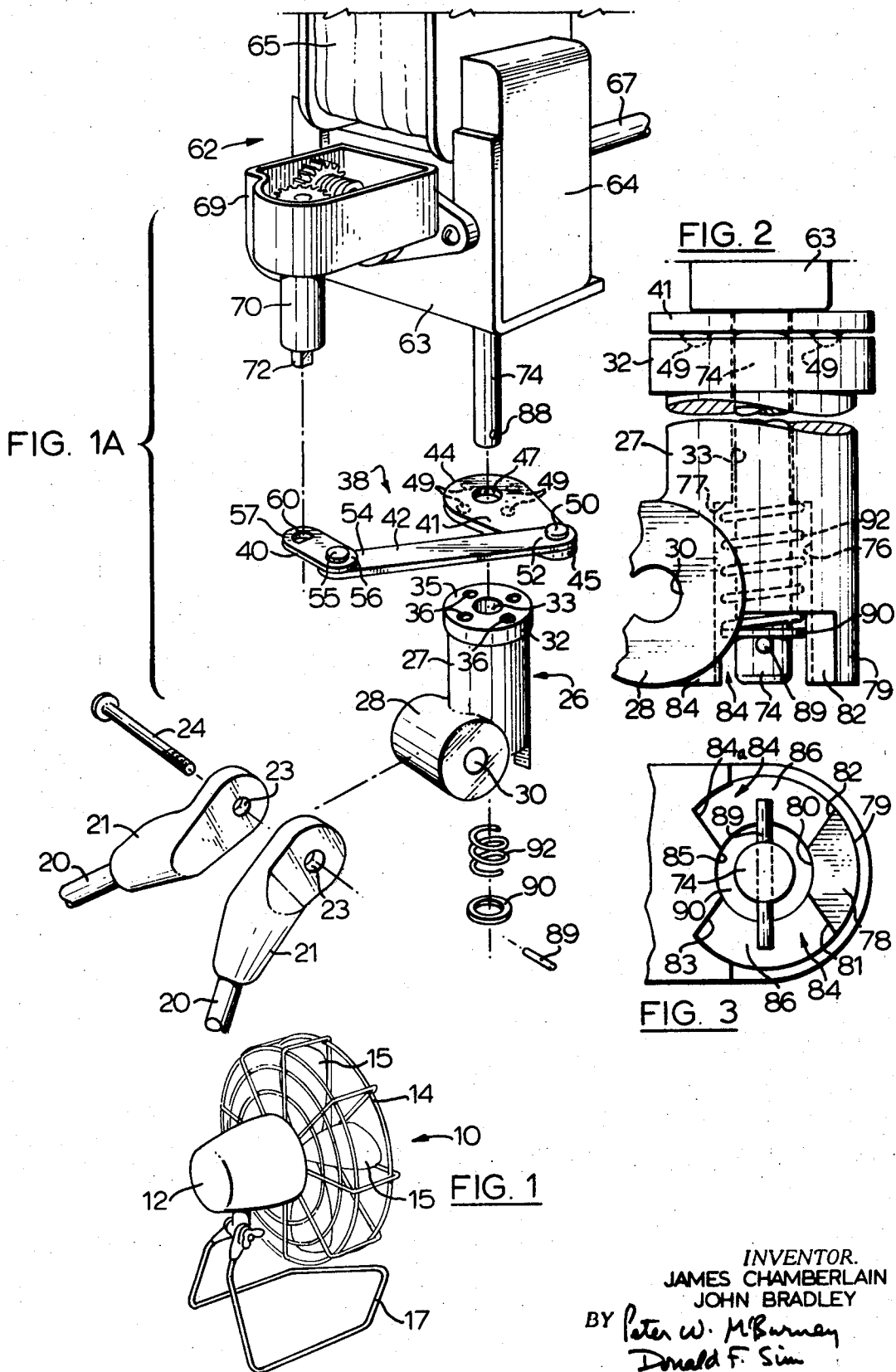
[56] **References Cited**

UNITED STATES PATENTS			
2,151,643	3/1939	Shu	74/42
2,921,474	1/1960	Ballard	74/42
3,073,532	1/1963	Rinkewich	74/42
3,354,730	11/1967	Thompson	74/42

FOREIGN PATENTS OR APPLICATIONS
582,204 10/1924 France 416/246
Primary Examiner—Charles J. Myhre
Assistant Examiner—Wesley S. Ratliff, Jr.
Attorney—Peter W. McBurney et al.

[57] **ABSTRACT**
An oscillating fan is disclosed in which a ratchet arm and a crank arm are joined by a connecting link, with the crank arm being driven by the fan motor through a reduction gear mechanism. The fan proper is attached to a vertical swivel shaft adapted to rotate in a bore in an oscillator member fixed to a stand. Normally the ratchet arm is fixed with respect to the oscillator member by registry means which can be forced out of registry. Detent means between the swivel shaft and the oscillator member limit the relative rotation of the former with respect to the latter to an arc the same as the arc through which the fan is adapted normally to turn.
9 Claims, 14 Drawing Figures





INVENTOR.
JAMES CHAMBERLAIN
JOHN BRADLEY
BY Peter W. McBurney
Donald F. Sim
Agents

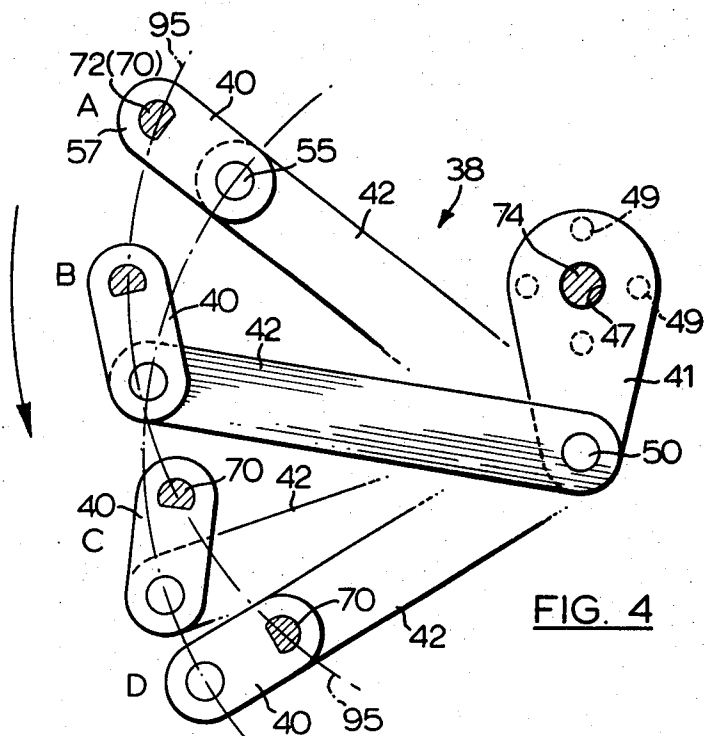


FIG. 4

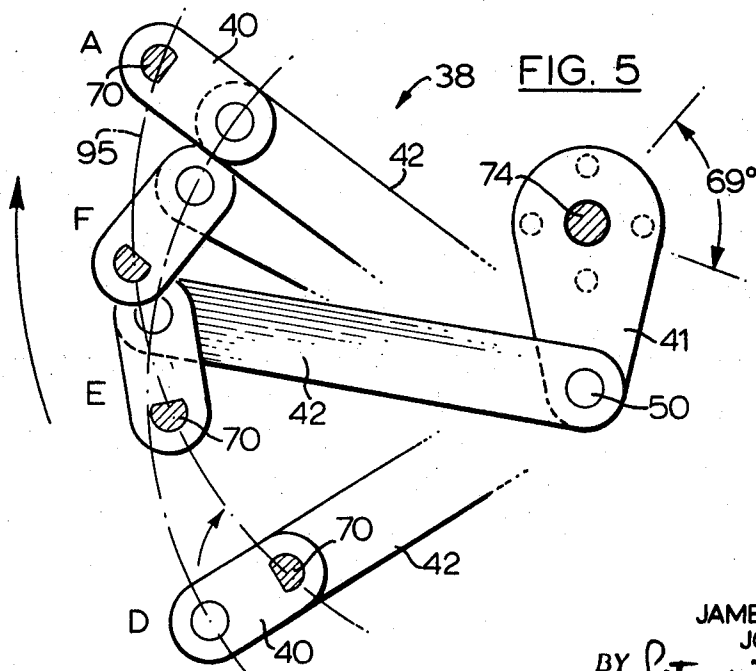
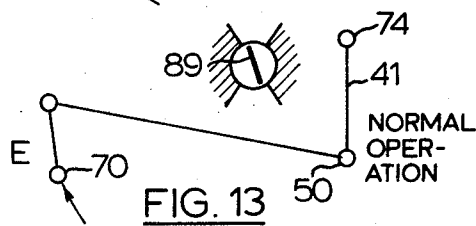
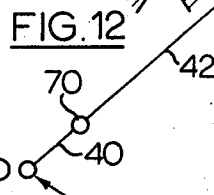
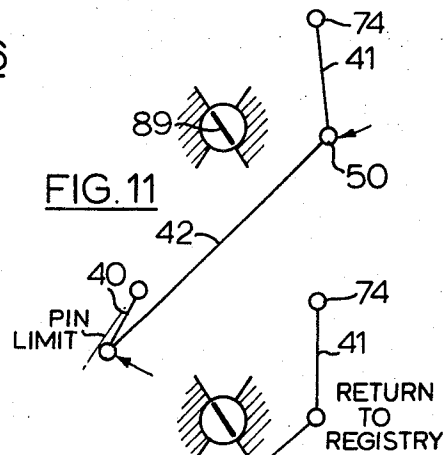
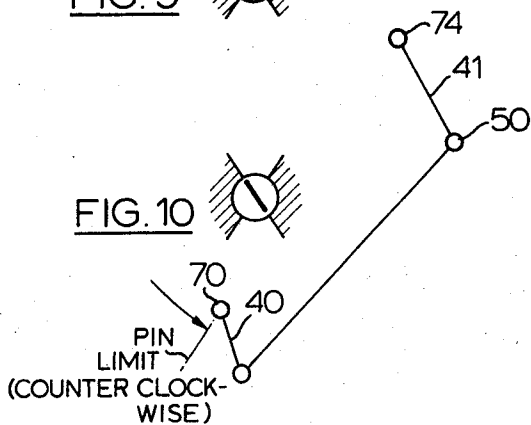
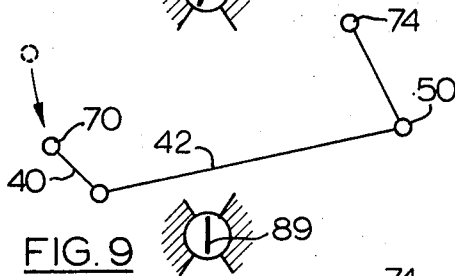
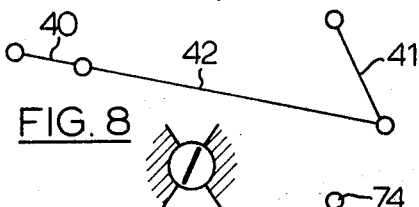
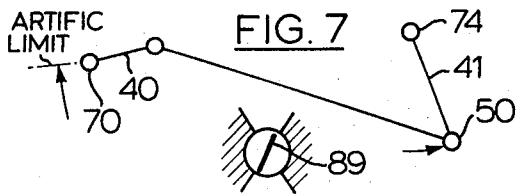
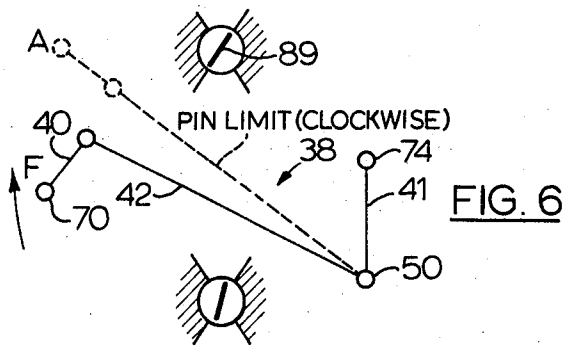


FIG. 5

INVENTOR.
JAMES CHAMBERLAIN
JOHN BRADLEY
BY *Peter W. McBurney*
Donald F. Sim
Agents



INVENTOR.
JAMES CHAMBERLAIN
JOHN BRADLEY
BY *Peter W. McBurney*
Donald F. Sim
Agents

OSCILLATOR MECHANISM FOR FAN

This invention relates to small electric fans of the oscillating type, in which the motor housing, fan blades and fan cage oscillate slowly back and forth through an arc generally in the range of 40° to 100°. More particularly, this invention has to do with the construction of the oscillator mechanism for such a fan.

BACKGROUND OF THE INVENTION

In conventional oscillating fan constructions, the oscillation is brought about by providing either an eccentric boss and follower ring arrangement or a rotating crank arm attached through a connector link to a longer oscillating ratchet arm, the crank arm undergoing complete rotation while the ratchet arm merely oscillates through the desired arc. In the eccentric construction, the ring is likewise caused to oscillate a ratchet arm. A housing to which the fan motor and fan blades are firmly attached is caused to oscillate by the ratchet arm. An example of the eccentric construction is U.S. Pat. No. 1,688,052, J.E. Marsden, issued Oct. 16, 1928, and entitled "Electric Heater Fan." In virtually every case, a reduction gear mechanism provides the oscillation of the fan motor, by driving the eccentric boss or the crank arm, as the case may be.

When the fan is in operation, slowly oscillating back and forth, it sometimes happens that the fan cage or the housing, both of which are oscillating, come into contact with a wall or other obstacle which halts the oscillation. If, in halting the oscillation, the fan motor itself is arrested through the action of the reduction gearing mechanism, then there is a serious danger that the fan motor will burn out. Should the fan motor be strong enough to resist arrest through the reduction gearing mechanism, then the risk arises that some part of the gear train or the oscillating linkage will be bent, broken, or otherwise damaged.

Some examples of the prior art have attempted to incorporate a "slippage" feature into the oscillating linkage, which will permit the oscillation to be arrested through contact with a wall, etc. without requiring the motor to be arrested or the linkage to be damaged. One such "slippage" construction is shown in the above-mentioned U.S. Pat. No. 1,688,052, in which the eccentric boss is held in the desired angular relation to the slowly rotating spindle by means of pins which enter depressions on the eccentric boss, the latter being held against the pins by means of a compression spring. When resistance is encountered due to the fan cage, etc. striking a wall, the pins jump out of the depressions and slippage takes place.

The slippage expedient is satisfactory as far as it goes. However, previous slippage constructions, such as that shown in U.S. Pat. No. 1,688,052, suffer from the disadvantage that, once the slippage has taken place due to the fan cage, etc. striking a wall or other impediment, the two portions which have "slipped" out of alignment will not automatically return themselves to the proper orientation. Once slippage has taken place, the two parts must be returned manually to the desired orientation, and this is both annoying and time-consuming.

OBJECTS OF THIS INVENTION

The primary object of this invention is to provide a slippage construction for an oscillating electric fan, so

designed that once slippage has taken place due to the fan cage, etc. striking an obstacle, the oscillating mechanism will automatically restore itself to proper alignment when the fan is removed from the vicinity of the obstacle.

A further object of this invention is to provide an oscillating fan construction which is inexpensive to manufacture due to the fact that certain parts are made to serve more than one purpose, thereby introducing an "economy of means" feature into the structure.

GENERAL DESCRIPTION OF THE INVENTION

Accordingly, this invention provides a fan, comprising a motor, fan blades adapted to be rotated by the motor, mounting means supporting said motor and said fan, a swivel shaft extending from said mounting means and fixed with respect thereto, an oscillator member having bore means for rotatably receiving said swivel shaft, support means for supporting the oscillator member and thus the swivel shaft and mounting means, a ratchet arm mounted about said swivel shaft in a plane normal thereto, and having registry means for maintaining the ratchet arm in a given position with respect to said oscillator member, said registry means being dislodgeable upon the application of sufficient torque, a crank arm adapted for rotation substantially in said plane about an axis fixed with respect to the mounting means and spaced from said swivel shaft, the crank arm being shorter than the ratchet arm, a connecting link joining a point on the crank arm remote from said axis to a point on the ratchet arm remote from said swivel shaft, reduction gear means through which the motor rotates said crank arm slowly about said axis, whereby said axis oscillates about said swivel shaft through a given arc, detent means between the swivel shaft and the oscillator member which limits the relative rotation of the swivel shaft with respect to the oscillator member to an arc substantially the same as said given arc, the detent means presenting no hindrance while the ratchet arm is in said given position with respect to the oscillator member.

GENERAL DESCRIPTION OF THE DRAWINGS

One embodiment of this invention is shown in the accompanying drawings, in which like numerals denote like parts throughout the several views, and in which:

FIG. 1 is a perspective view of an oscillating fan embodying this invention;

FIG. 1a is an exploded view of the oscillator mechanism of this invention;

FIG. 2 is a partial elevational view of some of the components of the oscillator mechanism, in assembled condition;

FIG. 3 is a view, from underneath, of the parts shown in assembled condition in FIG. 2;

FIGS. 4 and 5 are plan views of the oscillator linkage assembly, showing several different stages in the oscillation; and

FIGS. 6 through 13 are diagrammatic views of the oscillator linkage, illustrating the progressive stages occurring when an obstacle is encountered and then removed, and showing the way in which the linkage is caused to return to its normal registering position.

PARTICULAR DESCRIPTION OF THE DRAWINGS

Attention is first directed to FIG. 1, showing a fan 10 to consist generally of a motor housing 12, a fan cage 14 which encompasses and protects fan blades 15, and a stand 17 constituting support means for the fan. The stand 17 remains stationary while the housing 12, fan cage 14 and fan blades 15 oscillate with respect thereto.

Turning now to FIG. 1a, upper arms 20 of the stand 17 carry attachment portions 21 having apertures 23 through which a bolt 24 may pass. A suitable nut and washer (neither shown) are threaded onto the bolt 24 when in position. An oscillator member 26 has a cylindrical upright portion 27 and a generally cylindrical transverse portion 28. The two portions 27 and 28 are preferably integral with each other, and their axes are spaced from one another. The cylindrical transverse portion 28 has a central bore 30 adapted to receive bolt 24, once the attachment portions 21 have been located such that the apertures 23 are aligned with the central bore 30. Once the bolt 24 has been tightened into position, the oscillator member 26 is held relatively rigidly with respect to the stand 17. The frictional grip between the stand 17 and the oscillator member 26, however, can be overcome by exerting manual pressure to slightly change the attitude of the oscillating member 26 with respect to the horizontal. Generally, however, the oscillator member 26 will be oriented so that the cylindrical upright portion 27 is arranged with its axis substantially vertical. The upper end of the cylindrical upright portion 27 has an expanded part 32 with a diameter slightly greater than that of the cylindrical upright portion 27. The upright portion 27 has a central bore 33, and a flat upper face 35 forming the upper limit of the expanded part 32. In the upper face 35 are four pits or depressions 36, the purpose of which will be explained presently.

The oscillator linkage is shown generally at 38, and is seen in FIG. 1a to include a crank arm 40, a ratchet arm 41, and a connecting link 42. The ratchet arm 41 is somewhat pear-shaped, having one large end 44 and one small end 45. The large end 44 has an aperture 47 adapted for alignment with the central bore 33, and has, spaced about the aperture 47, four protuberances 49 which are adapted to register in the depressions 36 when the aperture 47 is aligned with the central bore 33 of the oscillating member 26. The small end 45 of the ratchet arm 41 carries a pin 50 by which one end 52 of the connecting link 42 is articulably connected. The other end 54 of the connecting link 42 is articulably connected through a pin 55 to one end 56 of the crank arm 40, while the other end 57 of the crank arm 40 has a non-circular aperture 60, the purpose of which will be explained presently.

Pictured above the oscillating linkage 38 in Figure 1a is a portion of the motor assembly 62. This latter is seen to include a motor bracket 63, a core 64 and winding 65, a motor shaft 67, and a reduction gear mechanism 69. The workings of the reduction gear mechanism 69 are entirely conventional, and need not be described or shown in detail. Extending downwardly from the reduction gear 69 is a crank shaft 70 having a reduced lower extension 72 of the same cross-section as the non-circular aperture 60. In the embodiment shown, the cross-

section of both the extension 72 and the non-circular aperture 60 is substantially a major segment of a circle, being that portion of a circle lying to one side of a cord and containing the center of the circle.

A swivel shaft 74 extends downwardly from the motor bracket 63, is rigid with respect thereto, and is dimensioned such that it can be rotatably received through the aperture 47 and in the central bore 33. The outside diameter of the swivel shaft 74 is slightly less than the inside diameter of the aperture 47 and the central bore 33. As particularly seen in FIG. 2, the central bore 33 has an enlarged portion 76 at its lower end, and includes a ledge 77 which defines the boundary between the central bore 33 and its enlarged portion 76. The lower end of the cylindrical upright portion 27 of the oscillating member 26 is constructed such that it exhibits a projecting portion 78 defined by an outer cylindrical surface 79, an inner cylindrical surface 80, a first buttress face 81, and a second buttress face 82. In essence, the cylindrical face 80 is simply an extension of the enlarged portion 76 of the central bore 33, while the outer cylindrical face 79 is simply an extension of the cylindrical surface of the upright portion 27.

As seen in FIGS. 2 and 3, a third buttress face 83 lies opposite the first buttress face 81, and a fourth buttress face 84 lies opposite the second buttress face 82. In the embodiment shown, the angle between buttress faces 81 and 83 (and also between buttress faces 82 and 84a) is 72°, although this is not to be considered a limitation. An inner cylindrical surface 85 spans between faces 83 and 84 and is concentric with the cylindrical surface 80.

There are thus defined two opposed recesses 84, each opening downwardly and each being defined between two of the above-mentioned buttress faces and a horizontal face 86. Preferably, during the manufacture of the upright portion 27, the recesses 84 are created by the removal of material after the central bore 33 and its enlarged portion 76 has been drilled. The swivel shaft 74 has a diametral cylindrical passageway 88 through which a pin 89, of greater length than the diameter of the swivel shaft 74, is received as shown in FIG. 3. The location of the passageway 88 in the swivel shaft 74 is such that, when the ratchet arm 41 is tightly sandwiched between the motor bracket 63 and the oscillator member 26, the pin 89 lies in a plane which cuts all of the buttress faces 81-84, and overlies the horizontal faces 86. A washer 90 is positioned about the swivel shaft 74 between the cylindrical faces 80 and 85, and immediately above and against the pin 89, as particularly seen in FIG. 2. A compression coil spring 92 bears with one end against the washer 90 and with the other end against the ledge 77, thereby urging the swivel shaft 74 downwardly, as seen in FIG. 2, and tending to compress the ratchet arm 41 between the motor bracket 63 and the oscillator member 26.

During normal operation, the protuberances 49 are lodged in the depressions 36, and the urging of the coil spring 92 tends to maintain these parts in registry, and tends to maintain the ratchet arm 41 in the orientation in which it has been shown in FIG. 1a. The protuberances 49 are, however, rounded as can be seen in FIG. 2, and this means that, upon the application of sufficient torque as between the ratchet arm 41 and the

oscillator member 26, the ratchet arm 41 can be rotated with respect to the oscillator member 26 because the protuberances 49 jump out of the depressions 36. When this dislodgement occurs, the spring 92 is slightly compressed.

Attention is now directed to FIGS. 4 and 5, showing the oscillating linkage 38 in plan view, each of these Figures showing four superimposed sequential stages in a single oscillating cycle of the fan of this invention. In FIG. 4, the ratchet arm 41 is aligned vertically with respect to the page, and this vertical alignment is taken to be the "normal" position of the ratchet arm 41 during the oscillation of the fan, with no obstructions being encountered. In this "normal" position, the protuberances 49 are lodged in the depressions 36 of the oscillator member 26. The swivel shaft 74 is shown in cross-section within the aperture 47 in the ratchet arm 41. As mentioned above, the application of a sufficient torque will cause the ratchet arm 41 to rotate about the center axis of the swivel shaft 74. During the normal oscillating operation of the fan, however, this level of torque is not applied to the ratchet arm 41, and the latter remains in the position shown in FIG. 4.

FIG. 4 also shows, in four different positions, the connecting link 42 and the crank arm 40. At the end 57 of the crank arm 40 is shown, in cross-section, the reduced lower extension 72 of the crank shaft 70 (see FIG. 1a). The pins 50 and 55 at either end of the connecting link 42 are also shown in FIG. 4.

In the discussion that follows, the different articulating axes of the oscillating linkage will be referred to by the names of the elements in the center of which the axes lie. Thus, reference to crank shaft 70, pin 55, etc. will be taken to refer to the central axes of these elements.

In FIG. 4 are shown four different sequential positions of the connecting link 42 and the crank arm 40, identified by the letters A, B, C and D. The position denoted A shows the crank arm 40 in its furthest clockwise position during oscillation. The crank shaft 70 is slowly rotating in the clockwise direction, and the position denoted B shows the crank arm 40 after it has rotated about 45° from the position denoted A. The crank shaft 70 and the swivel shaft 74 are separated by a distance which does not change, due to the construction described with respect to FIG. 1a. It is possible, however, for the crank shaft 70 to revolve around the swivel shaft 74, and the circular line 95 in FIG. 4 is the locus of the path which the crank shaft 70 may follow. As the crank shaft 40 rotates from the position A to the position B, the distance separating the crank shaft 70 from the pin 50 decreases. Because the circle 95 is eccentric with respect to the pin 50, the result is that the crank shaft 70 moves counter-clockwise along the circle 95. Further rotation of the crank shaft 40 to the position C further decreases the distance between the crank shaft 70 and the pin 50, and causes the crank shaft 70 to move further in the counter-clockwise direction along the circle 95. When the crank shaft 40 has reached position D, it has reached its closest approach to the pin 50, in which the crank shaft 40 is aligned with the connecting link 42.

The next sequence of events is pictured in FIG. 5, where the lowermost position of the crank shaft 40 is identified as position D and is the same as the position

D shown in FIG. 4. The crank shaft 40 continues to rotate from the position D, and as it does so it gradually increases the distance between the crank shaft 70 and the pin 50, thus forcing the crank shaft 70 to move in a clockwise direction along the circle 95 to the position E. Further rotation carries the crank shaft 70 to the position F, and finally the crank shaft returns to the position A when it has become aligned once more with the connecting link 42. FIGS. 4 and 5 thus represent one complete cycle of oscillation, which repeats itself endlessly as the crank shaft 70 slowly rotates.

FIGS. 4 and 5 illustrate the oscillatory motion of the oscillating linkage 38 under normal operation.

In order to understand the sequence of events taking place when the oscillation of the fan is artificially limited by some obstacle, etc. attention is directed to FIGS. 6 through 13. In these Figures, the crank arm 40, ratchet arm 41 and connecting link 42 are shown in the conventional schematic way common to the study of machine design. Each element is represented by a straight line between two circles, the centers of which circles represent the link axes between the elements.

In FIG. 6, the solid line representation corresponds exactly with the position F shown in FIG. 5, in which the crank shaft 70 is moving in the clockwise direction toward the position A shown in dotted lines in FIG. 6. Immediately adjacent the schematic representations are diagrams showing the orientation of the pin 89 corresponding to the positions of the linkage, the pin 89 being viewed from above looking downward. Naturally, it is not possible to view the pin looking from above, since it is located at the bottom of the oscillator member 26, but to view it from beneath would reverse the direction of rotation as between the schematic diagram of the linkage and the representation of the pin, and would only cause confusion. Thus, the pin 89 is seen from above, as is the linkage 38. The pin diagram adjacent the schematic position A shows the pin 89 to be in its clockwise limit position. This is the position that the linkage is approaching but, in FIG. 6, has not yet reached. The actual position of the linkage in FIG. 6 is that shown in solid lines, and the corresponding pin diagram shows the pin to be about 16° away from the clockwise limit position. 180°, 180°.

We now assume that, with the crank shaft 70 at the position F, an artificial limit is imposed on the oscillation of the fan, by way of the fan cage coming into contact with some obstacle. A line representing the artificial limit has been marked in FIG. 7, and the crank arm 40 has rotated somewhat further in the clockwise direction, with the crank shaft 70 remaining in the position F as shown in solid lines in FIG. 6. This further rotation of the crank arm 40 while the crank shaft 70 is prevented from moving toward the position A causes the ratchet arm 41 to be dislodged from its registry position with the oscillator member 26 and to rotate in the counter-clockwise direction about the swivel shaft 74. Upon dislodgement, the protuberances 49 jump out of the depressions 36, compressing the coil spring 92 (see FIGS. 1a and 2). In the pin diagram for FIG. 7, the angulation of the pin is the same as that for the solid line pin diagram of FIG. 6, representing position F in FIG. 5.

In FIG. 8, the crank arm 40 has moved around to a position in which it is aligned with the connecting link

32, and it is at this point that the ratchet arm 41 has been shoved the furthest away from its registry position with the oscillator member 26. It is now assumed that the friction between the ratchet arm 41 and the oscillator member 26, due to the fact that they are being pressed together by the action of the coil spring 92, is reasonably strong, and that as the crank arm 40 continues to rotate to the position shown in FIG. 9, the crank shaft 70 is drawn downwardly or counter-clockwise about the swivel shaft 74, so that it can approach more closely the pin 50 due to the enforced shortening of the "missing" side of the triangle defined by the connecting link 42 and the crank arm 40. In other words, the crank shaft 70 moves in a counter-clockwise direction around the swivel shaft 74 for the same reason that causes the counter-clockwise movement described with respect to FIG. 4. The pin diagram adjacent FIG. 9 shows that the pin has moved about 17° in the counter-clockwise direction.

Further clockwise rotation of the crank arm 40 about the crank shaft 70 eventually brings the latter to the counter-clockwise limit of pin movement and thus of crank shaft movement (since they are locked together), and the pin diagram of FIG. 10 shows that the pin 89 has reached alignment with the buttress faces defining the counter-clockwise limit. Referring to the schematic linkage diagram of FIG. 10, it will be appreciated that, since the swivel shaft 74 is fixed, and since the crank shaft 70 can move no further in the counter-clockwise direction about the swivel shaft 74, any further clockwise rotation of the crank arm 40 must begin to swing the ratchet arm 41 back (clockwise) toward its registry position, which is the vertical position in FIGS. 6 to 13.

Referring to FIG. 11, further rotation of the crank arm 40 has brought the ratchet arm 41 almost back to exact registry, and when the crank arm 40 has rotated around to alignment with the connecting link 42, as shown in FIG. 12, the ratchet arm 41 returns to exact registry with the oscillator member 26. At this point, the oscillator linkage has reverted to the normal operation shown in FIGS. 4 and 5, and in fact the FIG. 12 position corresponds to the position D in FIG. 5, which is the furthest counter-clockwise position of the crank shaft 70. FIG. 13 corresponds to position E in FIG. 5 and is a continuation of the normal operation from the position D shown in FIG. 12. In the pin diagram of FIG. 13, the pin 89 has begun to rotate clockwise from its counter-clockwise limit position, keeping exactly in phase with the rotation of the crank shaft 70 about the swivel shaft 74.

It will thus be seen that the pin and buttress face arrangement described above generally constitutes detent means adapted to limit the relative rotation of the swivel shaft with respect to the oscillator member to an arc substantially the same as the arc through which the crank shaft 70 naturally desires to move, as described with respect to FIGS. 4 and 5. Because the limits of the arc of pin movement and the limits of the arc of crank shaft movement coincide, the detent means presents no hindrance while the ratchet arm 41 is in its registry position with respect to the oscillator member 26.

While a total arc in the neighborhood of 69° has been illustrated and described with respect to the embodiment shown in the accompanying drawings, it will be

appreciated that this arc is by no means critical. With the detent means described in connection with the embodiment shown in the accompanying drawings, it will be appreciated that the construction of the buttress faces requires that the arc be less than 180°, although it is perfectly feasible to alter the detent means to achieve an arc greater than 180°, for example, by providing a pin which extends in only one direction from the swivel shaft.

What we claim as our invention is:

1. A fan, comprising:

a motor,

fan blades adapted to be rotated by the motor,

mounting means supporting said motor and said fan,

a swivel shaft extending from said mounting means and fixed with respect thereto,

an oscillator member having bore means for rotatably receiving said swivel shaft,

support means for supporting the oscillator member and thus the swivel shaft and mounting means,

a ratchet arm mounted about said swivel shaft in a plane normal thereto, and having registry means for maintaining the ratchet arm in a given position with respect to said oscillator member, said registry means being dislodgeable upon the application of sufficient torque,

a crank arm adapted for rotation substantially in said plane about an axis fixed with respect to the mounting means and spaced from said swivel shaft, the crank arm being shorter than the ratchet arm,

a connecting link joining a point on the crank arm remote from said axis to a point on the ratchet arm remote from said swivel shaft,

reduction gear means through which the motor rotates said crank arm slowly about said axis, whereby said axis oscillates about said swivel shaft through a given arc,

detent means between the swivel shaft and the oscillator member which limits the relative rotation of the swivel shaft with respect to the oscillator member to an arc substantially the same as said given arc, the detent means presenting no hindrance while the ratchet arm is in said given position with respect to the oscillator member.

2. A fan as claimed in claim 1, in which said detent means includes:

a pin positioned diametrically of said swivel shaft and extending beyond the swivel shaft,

at least two buttress faces on the oscillator member defining arc-end limits for the travel of said pin with respect to said oscillator member.

3. A fan as claimed in claim 2, in which the ratchet arm is located between the mounting means and said oscillator member, and in which said pin is located at the end of the oscillator member remote from said ratchet arm, the fan further including a compression spring between said pin and said oscillator member to urge the latter toward the mounting means, the registry means being activated by this urging.

4. A fan as claimed in claim 3, in which the registry means includes:

a flat surface on the oscillator member normal to the axis of the swivel shaft and having at least one depression, the ratchet arm having protuberance means adapted to lodge in said at least one depression.

9

10

5. A fan as claimed in claim 4, in which the said flat surface has four depressions arranged equidistantly from said swivel shaft and at 90° from each other.

6. A fan as claimed in claim 1, in which said given arc is less than 180°.

7. A fan as claimed in claim 1, in which said given arc is substantially 70°. 70°,

8. A fan as claimed in claim 2, in which the pin extends in both directions beyond the swivel shaft, there

being a pair of buttress faces for each end of the pin, said given arc being substantially 70° , there being further a washer between the compression spring and the pin.

5 9. A fan as claimed in claim 2, in which the oscillator member is a centrally bored cylinder, and in which said support means is a stand connected to said cylinder.

* * * * *

10

15

20

25

30

35

40

45

50

55

60

65