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(71) Applicant: **Wu, San-Chi**
Pei-Tun Dist., Taichung City (TW)

(72) Inventor: **Wu, San-Chi**
Pei-Tun Dist., Taichung City (TW)

(74) Representative:
Smaggasgale, Gillian Helen et al
Mathys & Squire,
100 Gray's Inn Road
London WC1X 8AL (GB)

(54) Fan blade assembly of a ceiling fan

(57) A fan blade assembly is to be secured to a rotor of a ceiling fan, and includes a mounting member (35,35',35") of a single-piece construction with an annular mounting plate (351) to be secured on the rotor, and a plurality of mounting arms (353), each of which extends radially and outwardly from the annular mounting plate (351) to form a free mounting end (355,355'355"). A plurality of blade members (37,37') are mounted fixedly on the free mounting ends (355,355',355") by a plurality of fasteners (36,36',39), such as screws.

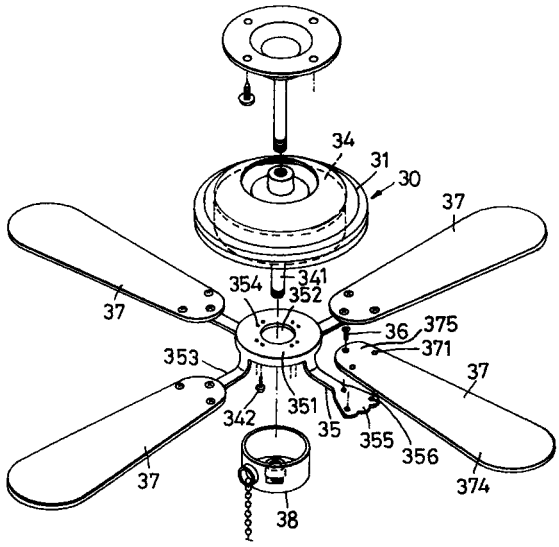

FIG.2

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Description

[0001] This invention relates to a fan blade assembly for mounting on a rotor of a ceiling fan, more particularly to a fan blade assembly with a mounting member of a single-piece construction for mounting blade members thereon.

[0002] Referring to Fig. 1, a conventional ceiling fan 10 is shown to include a support rod 11, a ceiling fan body 12 which is connected to one end of the support rod 11 to enclose a motor 13 therein, a plurality of fan blades 16, a plurality of U-shaped mounting plates 14, each of which has two ends secured respectively to the rotor 131 and the one of fan blades 16 by means of screws, and a control box 15 which is coupled to the motor 13. The mounting plates 14 and the fan blades 16 are usually assembled on the ceiling fan body 12 by the consumer, thereby resulting in inconvenience and unsteady assembling for a consumer. In addition, the mounting plates 14 and the fan blades 16 are liable to break and loosen from the ceiling fan body 12 after long-term use, thus resulting in danger when the ceiling fan 10 operates.

[0003] The object of the present invention is to provide a fan blade assembly which can be easily assembled on a ceiling fan body and which has a durable construction.

[0004] According to this invention, a fan blade assembly includes a mounting member of a single-piece construction with an annular mounting plate to be secured on a rotor of a ceiling fan, and a plurality of mounting arms, each of which extends radially and outwardly from the annular mounting plate to form a free mounting end. A plurality of blade members are anchored fixedly on the free mounting ends by a plurality of fasteners, such as screws.

[0005] The mounting member can be secured on the rotor in a manufacturing plant in advance. The consumer merely mounts the blade members on the free mounting ends of the mounting member with the use of the fasteners. Thus, it is convenient for the consumer to assemble the fan blade assembly on the ceiling fan. In addition, owing to the single-piece construction, the mounting member processes increased strength.

[0006] Moreover, each of the fasteners further has an elastomeric coupling member to be snugly fitted in a hole of the corresponding blade member to reduce noise due to vibrations when the ceiling fan rotates.

[0007] Other features and advantages of the present invention will become apparent in the following detailed description of the preferred embodiments of the invention, with reference to the accompanying drawings, in which:

Fig. 1 is a sectional view of a conventional ceiling fan;

Fig. 2 is an exploded view of a first preferred embodiment of a fan blade assembly according to this invention for mounting on a ceiling fan;

Fig. 3 is a sectional view showing how the fan blade assembly of the first preferred embodiment is assembled to a ceiling fan;

Fig. 4 is an exploded view of a second preferred embodiment of a fan blade assembly according to this invention;

Fig. 5 is a sectional view showing how the fan blade assembly of Fig. 4 is fixed on a ceiling fan;

Fig. 6 is an exploded view of a third preferred embodiment of a fan blade assembly according to this invention; and

Fig, 7 is a sectional view showing how the fan blade assembly of Fig. 6 is fixed on a ceiling fan.

[0008] Before the present invention is described in greater detail, it should be noted that same reference numerals have been used to denote like elements throughout the specification

PREFERRED EMBODIMENT OF THE PRESENT INVENTION

[0009] Referring to Figs. 2 and 3, the first preferred embodiment of a fan blade assembly according to the present invention is shown to be adapted to be mounted on a rotor (not shown) of a motor 34 which is received in a ceiling fan body 31 of a ceiling fan 30, and comprises a mounting member 35 and a plurality of blade members 37.

[0010] The mounting member 35 is made integrally of steel or iron by a punching process to form a single-piece construction, and includes an annular mounting plate 351 and a plurality of mounting arms 353 which extend radially and outwardly from the mounting plate 351 to form free mounting ends 355, respectively. The mounting plate 351 is formed with a central hole 352 for passage of a shaft 341 of the motor 34 to couple with a control box 38. A plurality of first screw holes 354 are formed in the mounting plate 351 around the central hole 352 such that a plurality of first screws 342 extend through the screw holes 354 to engage the rotor of the motor 34, thereby retaining the mounting plate 351 on the rotor. In addition, a plurality of second screw holes 356 are formed in each of the free mounting ends 355 of the mounting arm 35.

[0011] Each blade member 37 has a distal end 374 and a proximate end 375 formed with a plurality of mounting holes 371 therein to correspond to the second screw holes 356. A plurality of screw fasteners 36 pass through the mounting holes 371 and are threaded in the corresponding second screw hole 356 so as to mount the proximate ends 375 of the blade members 37 fixedly on the free mounting ends 355 of the mounting member 35.

[0012] As such, the mounting member 35 can be secured on the rotor of the motor 34 in a manufacturing plant in advance. The consumer merely mounts the blade members 37 on the free mounting ends 355 of the

mounting member 35 with the use of the second screw fasteners 36, respectively. Thus, it is convenient for the consumer to assemble the fan blade assembly on the ceiling fan 30. In addition, owing to the single-piece construction, the mounting member 35 processes increased strength as compared to the prior art.

[0013] Referring to Figs. 4 and 5, the second preferred embodiment of the fan blade assembly according to this invention is shown to have a construction similar to that of the first preferred embodiment, except that a plurality of elastomeric coupling members 39 are mounted to the proximate ends of the blade members 37'. Each mounting hole 371' is confined by an inner peripheral wall which has a constricted portion 376 to divide the mounting hole 371' into a smaller notch portion 372 and a bore portion 377 of a dimension larger than that of the notch portion 372. Each coupling member 39 has an enlarged head portion 392, a shank 391 which extends upwardly from the head portion 392, and an insert hole 393 which extends through the head portion 392 and the shank 391. The shank 391 is flared upwardly and outwardly so as to be fitted snugly in the notch portion 372 by pressing the shank 391 thereinto after the head portion 392 has been brought to pass through the bore portion 377.

[0014] Each of the second screws 36' is inserted into and is retainingly engaged in the insert hole 393, and extends outwardly of the head portion 392 so as to be threaded into the corresponding second screw hole 356. In addition, each mounting end 355' has a recess portion 357 in which the second screw holes 356 are formed for receiving the head portions 392 of the coupling members 39.

[0015] As illustrated, by virtue of the coupling members 39, the proximate ends of the blade members 37' are fastened tightly to the free mounting end 355' of the mounting member 35', and the noise due to vibration when the ceiling fan rotates can be eliminated.

[0016] In order to enhance the aesthetic appeal of the ceiling fan, a plurality of decorative members 40 are mounted on the proximate ends of the blade members 37', respectively. Each decorative member 40 has a plurality of resilient engaging plugs 41 with radial outward peripheral flanges 43 to be fittingly retained in the bore portions 377 of the mounting holes 371' in such a manner that the flanges 43 extend downwardly of the bore portions 377 to rest on a bottom side of the blade member 37' for retaining the decorative member 40 on the blade members 37'. Moreover, the decorative members 40 cover the second screws 36' and fall off the ceiling fan before the second screws 36' are loosened, thereby giving a warning of impending danger.

[0017] Referring to Figs. 6 and 7, as compared to the second preferred embodiment, the proximate ends of the blade members 37' according to the third preferred embodiment of this invention are secured on the bottom sides of the free mounting ends 355'' of the mounting member 35''. Likewise, the decorative members 40' are retained on the bottom sides of the proximate ends of the blade members 37', respectively. In addition, each decorative member 40' has a resilient plug plate 44 to replace one of the engaging plugs 41'. The plug plate 44 has a length longer than that of the engaging plug 41', and a hook end portion 441 so as to hook on the respective top side of the free mounting end 355'' immediately after the plug plate 44 passes snugly through the mounting hole 371' of the blade member 37' and a through hole 358 of the mounting end 355'' against a biasing action of the hook end portion 441. Thus, the blade members 37' are firmly retained on the mounting member 35''.

Claims

1. A fan blade assembly adapted to be secured to a rotor of a ceiling fan, said fan blade assembly including a mounting member (35,35',35''), and a plurality of blade members (37,37'), each having a distal end (374), and a proximate end (375) anchored fixedly on said mounting member (35,35',35''), further characterized in that:

   said mounting member (35,35',35'') is of a single-piece construction including an annular mounting plate (351) adapted to be secured on the rotor, and a plurality of mounting arms (353) each extending radially and outwardly from said annular mounting plate (351) to form a free mounting end (355,355',355'');
   said proximate end (375) of each of said blade members (37,37') being anchored fixedly on said free mounting end (355,355',355'').

2. The fan blade assembly as claimed in Claim 1, characterized in that said free mounting end (355,355',355'') has a plurality of screw holes (356) formed therein, said proximate end (375) of each of said blade members (37,37') having a plurality of mounting holes (371,371') formed therein to correspond with said screw holes (356), said assembly further comprising a plurality of fasteners (36,36',39), each of which extends into one of said mounting holes (371,371') and a corresponding one of said screw holes (356) so as to mount said proximate end (375) fixedly on said free mounting end (355,355',355'').

3. The fan blade assembly as claimed in Claim 1 or 2, characterized in that said proximate end (375) has a plurality of inner peripheral walls confining said mounting holes (371'), each of said inner peripheral walls having a constricted portion (376) to divide a corresponding one of said mounting holes (371') into a smaller notch portion (372) and a bore portion (377) of a dimension larger than that of said notch portion (372);

each of said fasteners including:

an elastomeric coupling member (39) having an enlarged head portion (392), a shank (391) extending upwardly from said enlarged head portion (392) and fitted snugly in said notch portion (372) by pressing said shank (391) thereinto after said enlarged head portion (392) has been brought to pass through said bore portion (377), and an insert hole (393) extending through said head portion (392) and said shank (391); and

a screw (36') inserted into and retainingly engaged in said insert hole (393) , and extending outwardly of said head portion (392) so as to be threaded into a corresponding one of said screw holes (356) to tighten said proximate end (375) to said free mounting end (355',355'').

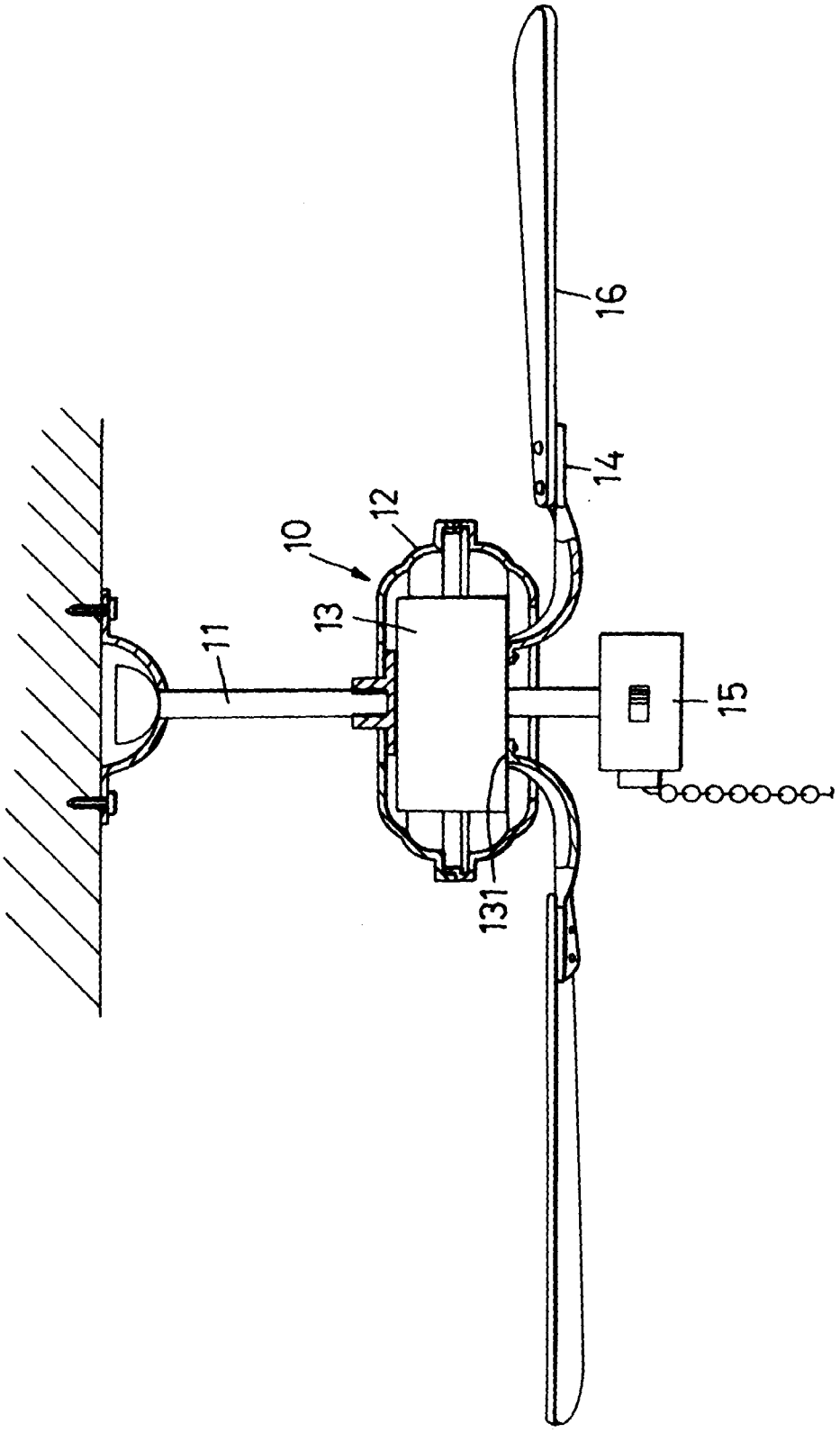

FIG.1

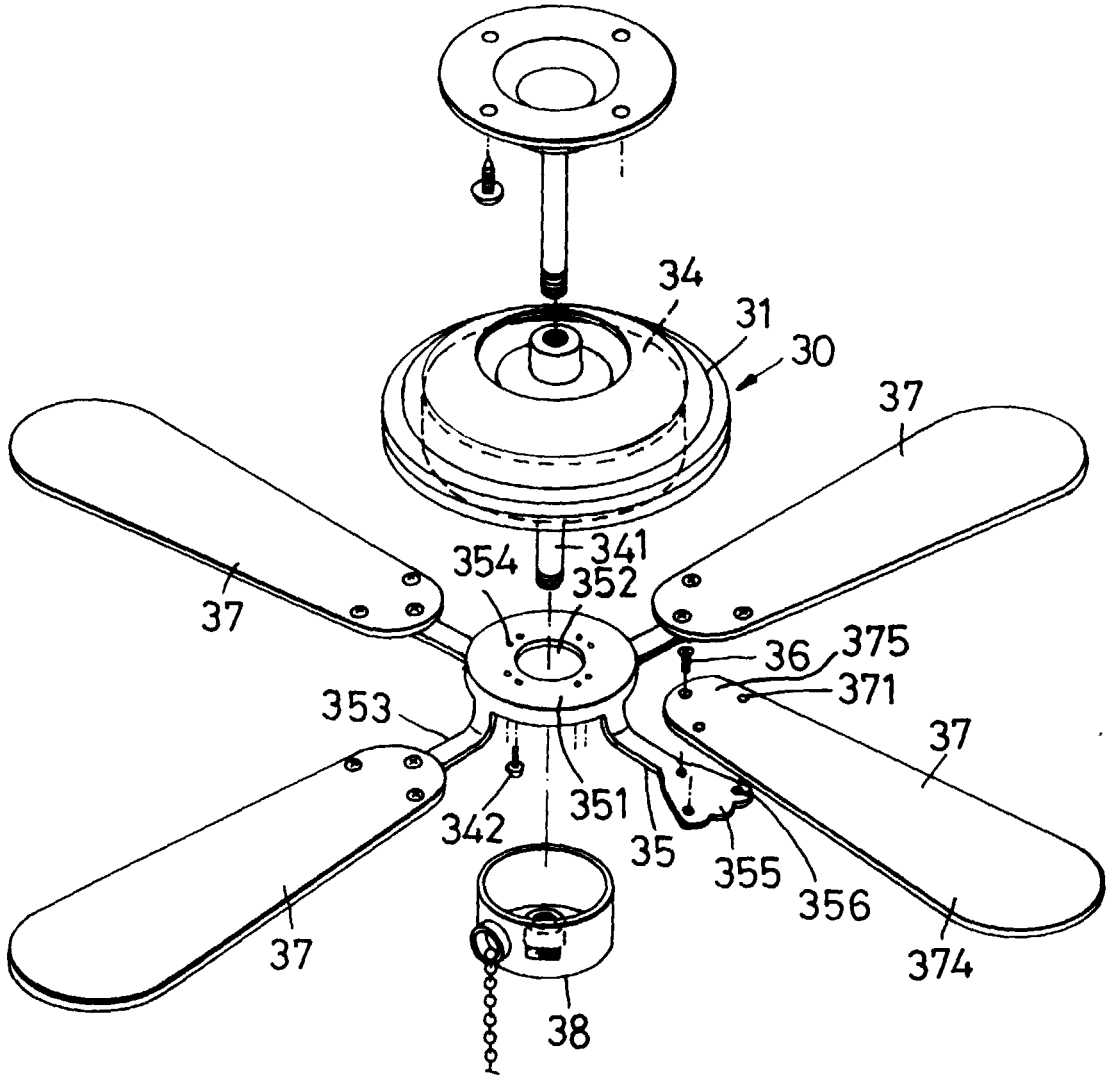
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FIG.2

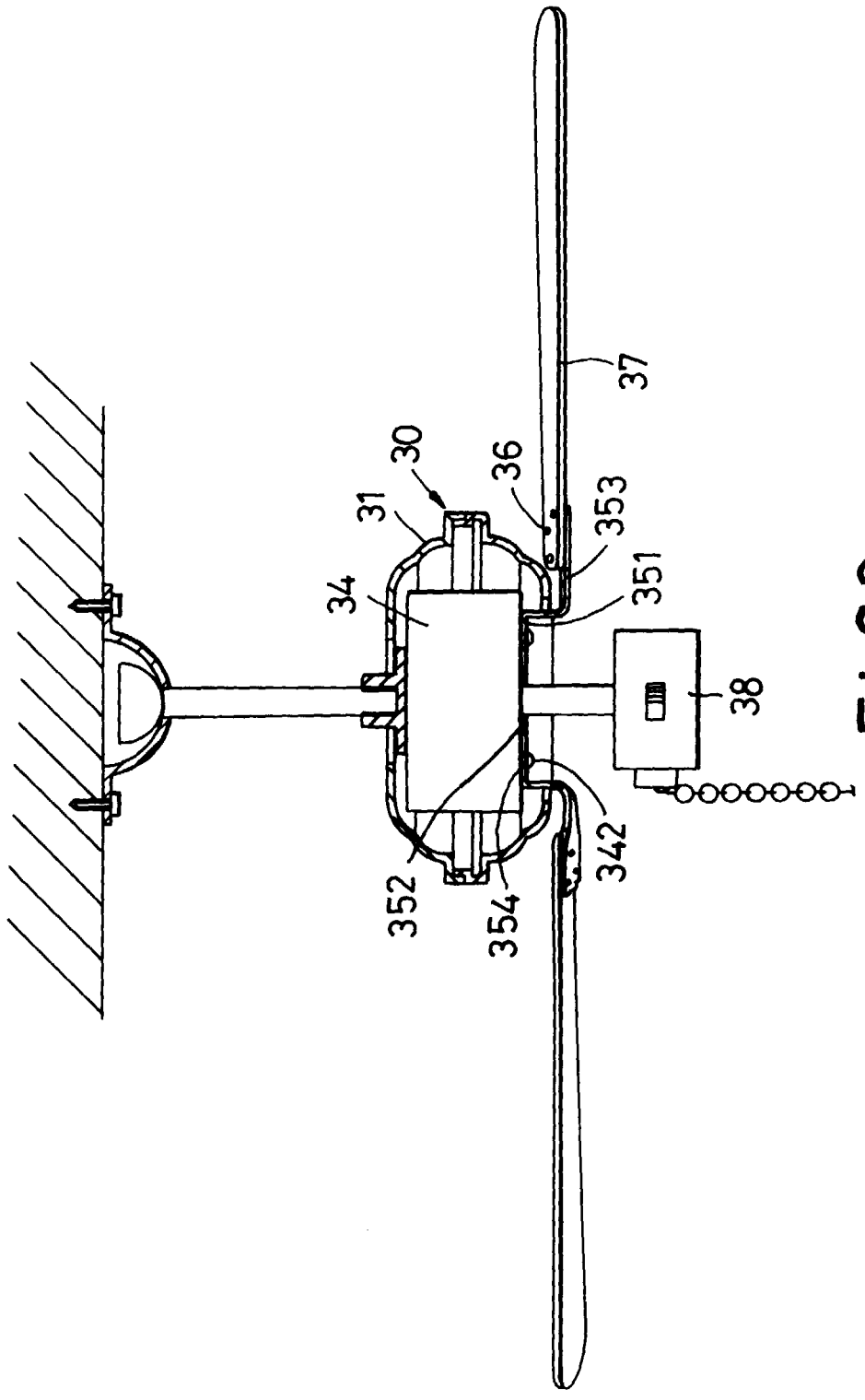

FIG.3

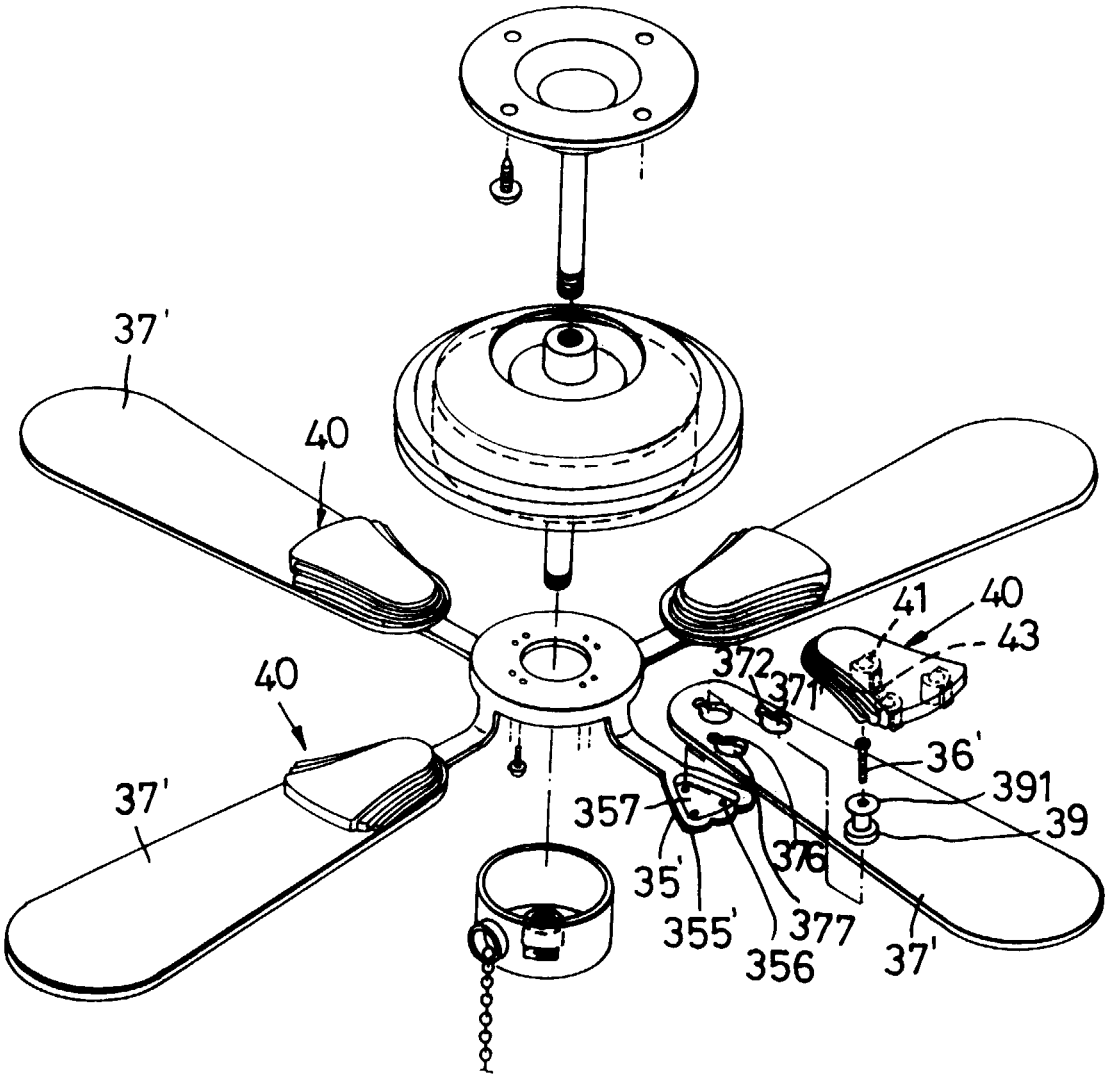

FIG.4

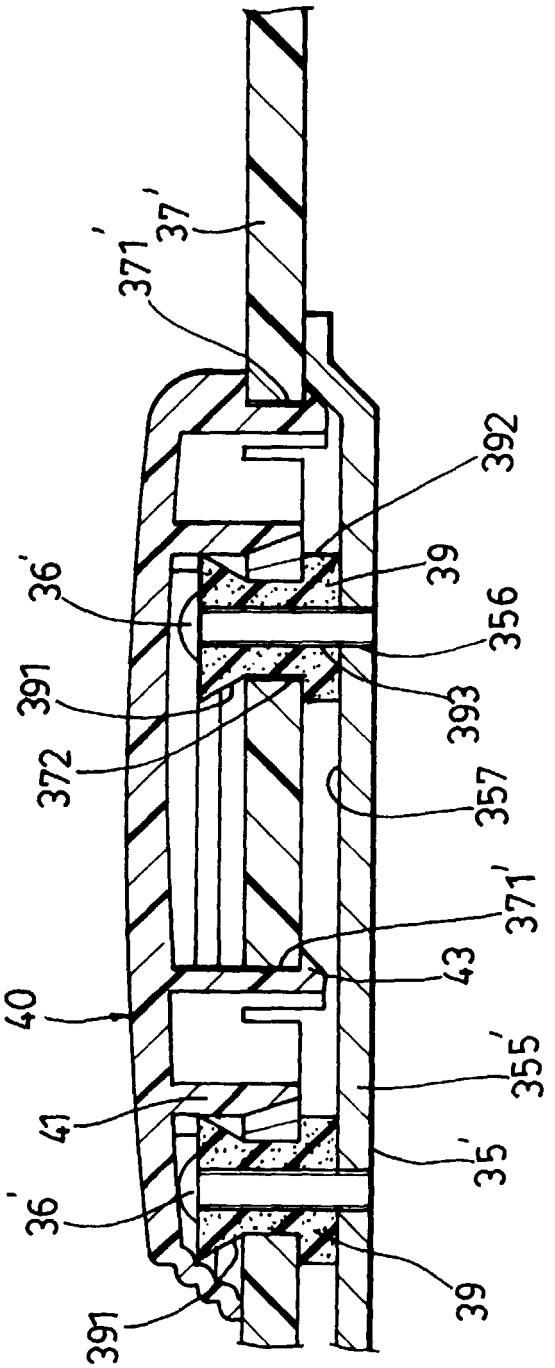

FIG.5

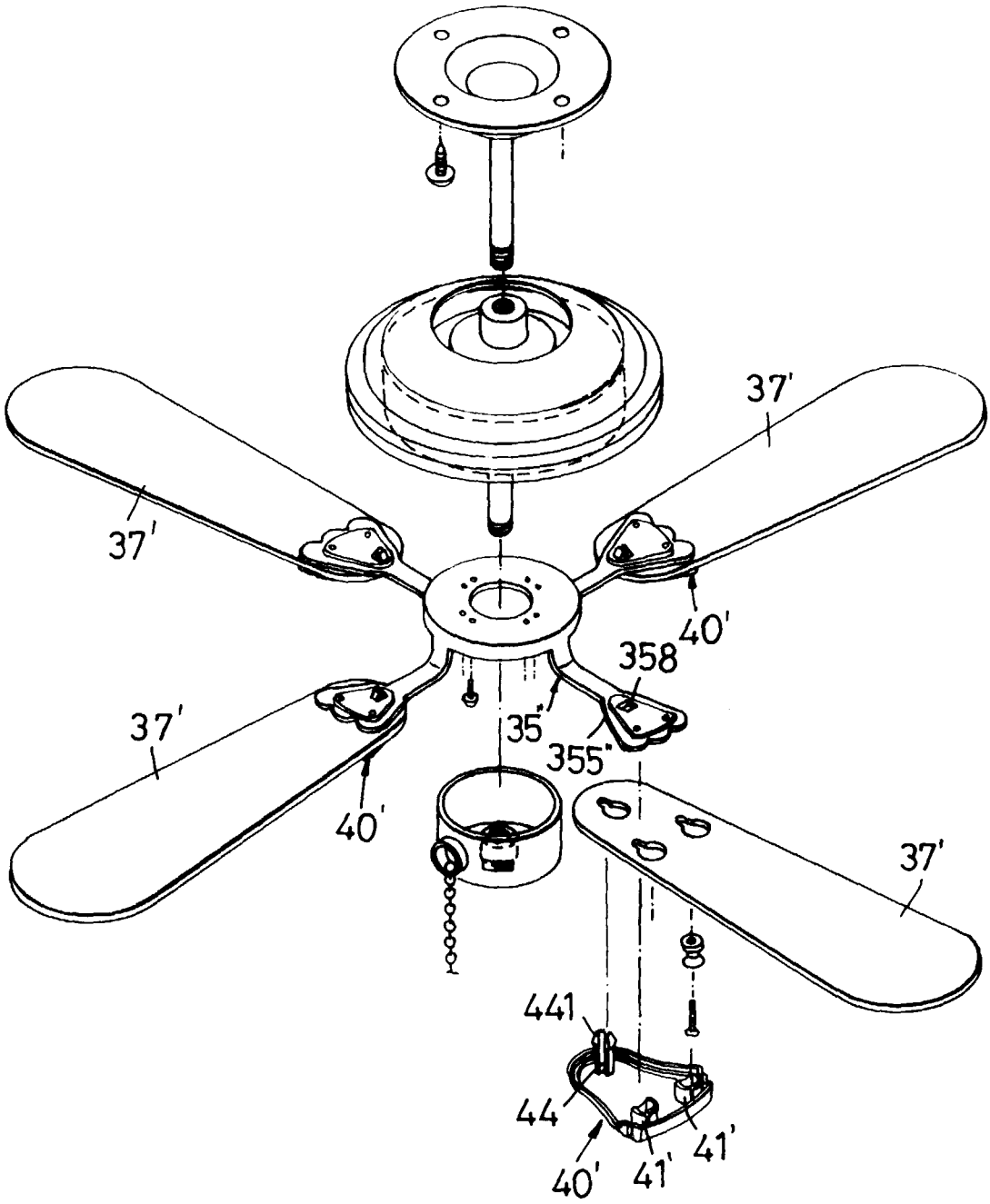

FIG.6

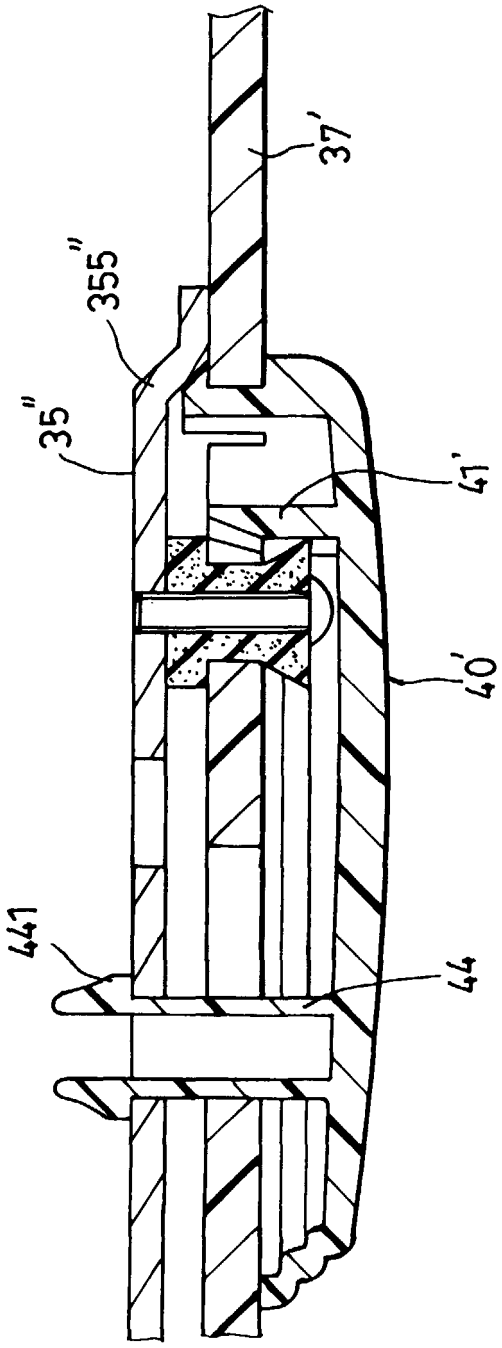

FIG.7

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EUROPEAN SEARCH REPORT

Application Number
EP 98 30 6362

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)
X A	EP 0 840 015 A (HUNTER FAN CO) 6 May 1998 * column 8, line 38 - column 9, line 23; figures 1-3 *	1 2,3	F04D29/34 F04D25/08
A	GB 2 288 853 A (HUNTER FAN CO) 1 November 1995 * page 3, line 31 - page 4, line 25; figures 1-3 *	1-3	
A	US 5 304 037 A (SCOFIELD ROBERT L) 19 April 1994 * the whole document *	1-3	
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TECHNICAL FIELDS SEARCHED (Int.Cl.6)

F04D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	8 January 1999	Teerling, J

CATEGORY OF CITED DOCUMENTS

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82