MULTIPLE INTEGRAL TIMERS WITH IMPROVED HOUSING SUPPORT PLATE

Inventors: Elmo W. Voland, Indianapolis; Noel C. Mullikin, Beech Groove, both of Ind. 46107

Assignee: P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed: Sept. 28, 1970

Appl. No.: 75,854

U.S. Cl. 200/38 R, 200/168 R
Int. Cl. H01h 43/10
Field of Search 200/38 R, 38 B, 38 BA, 200/38 C, 38 CA, 168

References Cited

UNITED STATES PATENTS
3,291,922 12/1966 Hauser 200/38 C X

2,820,859 1/1958 Davies et al. 200/38 B X
3,109,073 10/1963 Lewis et al. 200/38 C
2,897,299 7/1959 Colby et al. 200/38 B X
3,271,541 9/1966 Dotto et al. 200/38 B X
3,373,253 3/1968 Davin 200/38

Primary Examiner—J. R. Scott
Attorney—Richard H. Childress, Robert F. Meyer and Henry W. Cummings

ABSTRACT

At least two timing mechanisms are carried by a single base member. Each of the timing mechanisms include program means responsive to constant speed drive means, switch means responsive to the program means, electrical terminals electrically connected to the switch means, and electrical leads electrically connecting the timing mechanisms together.

2 Claims, 3 Drawing Figures
MULTIPLE INTEGRAL TIMERS WITH IMPROVED HOUSING SUPPORT PLATE

The present invention relates to timing mechanisms, and more particularly, to at least two timing mechanisms unitarily constructed as a single unit.

Timing mechanisms are generally used in the appliance industry to operate the appliances in accordance with a programmed sequence. For example, timers are used to operate washers and dryers to wash, rinse and dry clothes in accordance with a programmed sequence. Some appliances use two such timers. For example, a washer and dryer may have a timer having predetermined program cycles and an interrupter circuit timer to interrupt or disconnect the power to the circuits of the main timer as occasion demands.

In such applications, separate timers have generally been used. The use of two separate timers requires separate handling during appliance production and service, and separate mounting means. All of this will add to the ultimate cost of the appliance.

The present invention is concerned with a timing mechanism and has as one of its objects the provision of a timing mechanism which is simple and economical to produce.

Another object of the invention is to provide a timer having a combination of two timing units fabricated as a single unit.

Still another object of the invention is to provide a timing mechanism having at least two timing mechanisms carried by a single base member.

Yet another object of the invention is to provide a timer wherein at least two timing mechanisms are carried by a single base member each of the timing mechanisms having a program means responsive to a constant speed drive means, switch means responsive to the program means, and electrical leads connecting the two timers together.

Still another object of the invention is to provide a timer having at least two timing mechanisms carried by a single base member wherein the base member is divided into two sections each of the sections being substantially normal to each other.

These and other objects of the invention will become apparent from the following description taken in conjunction with the accompanying drawings wherein:

FIG. 1 is an isometric view of the timing mechanism of the present invention;

FIG. 2 is a side elevation of the timing mechanism; and

FIG. 3 is a view taken along line 3—3 of FIG. 2.

Generally speaking, the objects of the invention are accomplished by providing in combination at least two timing mechanisms carried by a single base member, each of the timing mechanisms including a program means responsive to a constant speed drive means, switch means responsive to the program means, electrical terminals electrically connected to the switch means, and electrical leads electrically connecting the timing mechanisms together.

Referring now to the drawings, there is shown a timer 10 which includes at least two timing mechanisms 12 and 14 carried by a single base member 16. Base member 16 includes two sections 18 and 20 which are substantially normal to each other. Ears 13 serve as a mounting means for mounting the timer to a structural member of an appliance. Thus since timing mechanism 14 is carried by section 20 and timing mechanism 12 is carried by section 18, the two timing mechanisms are substantially normal to each other. This provides for a more compact unit.

Timing mechanism 12 includes a constant speed drive means 22, a program means 24 and switch means 26. The program means and switch means are substantially enclosed in a housing 28 which is carried by section 18 of base member 16, the housing carrying the constant speed drive means 22. Cam means 24 includes a cam stack 32 having individual cams 32' carried by shaft 30, each of the cams having coded indicia on its outer periphery or cam surface 32'. The constant speed drive means 22 includes a suitable motor 22' such as a synchronous motor to which is coupled a speed reduction means such as a gear train (not shown) enclosed in gear box 22''. The speed reduction means is coupled to the shaft 30 to provide rotational motion to the cam stack 32. Switch means 26 includes a plurality of electrical contact means 34 having a fixed electrical contact 34' adapted to be engaged by an electrical contact 36' carried by movable contact blade 36. The movable contact blade 36 includes a cam follower 38 adapted to ride over the coded indicia of the individual cams. Electrical terminals 39 are electrically coupled to the switching means.

Timing mechanism 14 includes program means 40, switch means 42 and constant speed drive means 44. Program means 40 includes a single cam 40' having coded indicia on its outer periphery or cam surface 40'. Switch means 42 includes a suitable switch such as a snap-action switch 42' of the type well known in the art which includes a plunger 46 adapted to ride over the cam surface 40' on the cam 40' to be biased thereby. Electrical terminals 48 are electrically coupled to the switches of the snap-action switch 42'. A sheet 43 made of a suitable electrically insulative material serves to electrically isolate the terminals and the switch from base member 16. Constant speed drive means 44 includes a suitable motor 44' such as a synchronous motor coupled to a speed reduction means (not shown) such as a gear train disposed in gear box 44''. Cam 40' is coupled to constant speed drive means 44 through pinion 50.

There is a bussing means 52 which permits the electrical terminals for switch means 42 and the constant speed drive means 22 to be selectively electrically coupled together in accordance with a programmed sequence. Bussing means 52 includes electrical terminals 54 and 56 and electrical lead 60 and 62 connecting terminals 48 of switch means 42.

In operation, shaft 30 may be manually rotated to set the program means 24 at a predetermined starting position. Constant speed drive means 22 may then rotate cam stack 32 so as to actuate switch means 26 and thus selectively open and close electrical circuits through terminals 39 and 57. Constant speed drive means 44 may, if desired, be continuously rotating cam 40' so as to actuate snap-action switch 42' while constant speed drive means 22 is driving program means 24 of timing mechanism 12. By proper wiring connections to the constant speed drive means 22, activation of snap-action switch 42' selective energizing and de-energizing of constant speed drive means 22 can be achieved. Al-
ternately, constant speed drive means 44 could, by proper wiring connections, be controlled by the cam stack 32.

What is claimed is:
1. A timing device comprising:
a. a single base member, said base member including first and second sections, disposed substantially normal to each other,
b. a rotatable shaft extending through said first section,
c. a cam stack having individual cams carried by said shaft,
d. a housing carried by said first section and substantially surrounding said cam stack,
e. a first constant speed drive means coupled to said shaft and carried by said housing,
f. a cooperating fixed and movable electrical contact means carried by said housing, said movable electrical contact means responsive to said cam stack,
g. a second constant speed drive means carried by said second section,
h. a single cam carried by said second section and coupled to said second constant speed drive means,
i. a snap-action switch means responsive to said single cam,
j. electrical terminals electrically coupled to said fixed electrical contact means and said snap-action switch means, and
k. bussing means providing a means to selectively electrically couple said electrical terminals of said snap-action switch means and said constant speed drive means together.
2. The combination according to claim 1 wherein said constant speed drive means includes synchronous motors and speed reduction means coupling said synchronous motors to said program means.