United States Patent [19]

Voland et al.

[11] **3,732,383**

[45] **May 8, 1973**

[54] **MULTIPLE INTEGRAL TIMERS WITH IMPROVED HOUSING SUPPORT PLATE**

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[22] Filed: **Sept. 28, 1970**

[21] Appl. No.: **75,854**

[52] **U.S. Cl.** .....**200/38 R,** 200/168 R

[51] **Int. Cl.**.....**H01h 43/10**

[58] **Field of Search** .....200/38 R, 38 B, 38 BA, 200/38 C, 38 CA, 168

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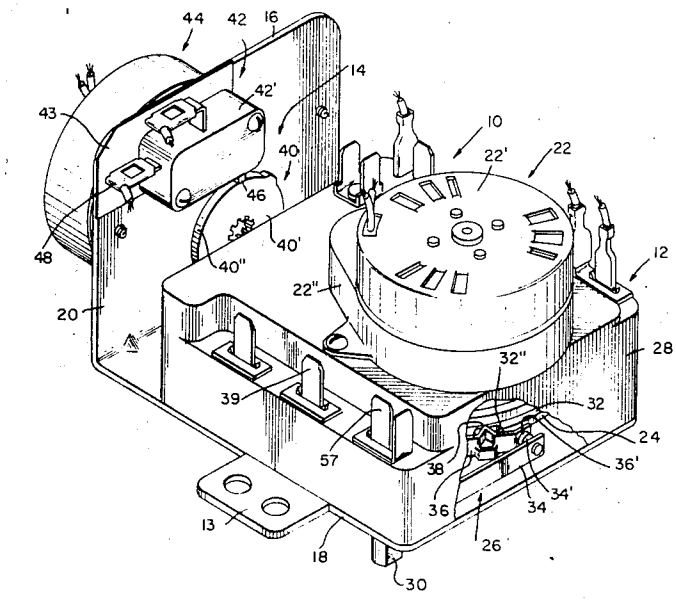
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[57] **ABSTRACT**

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



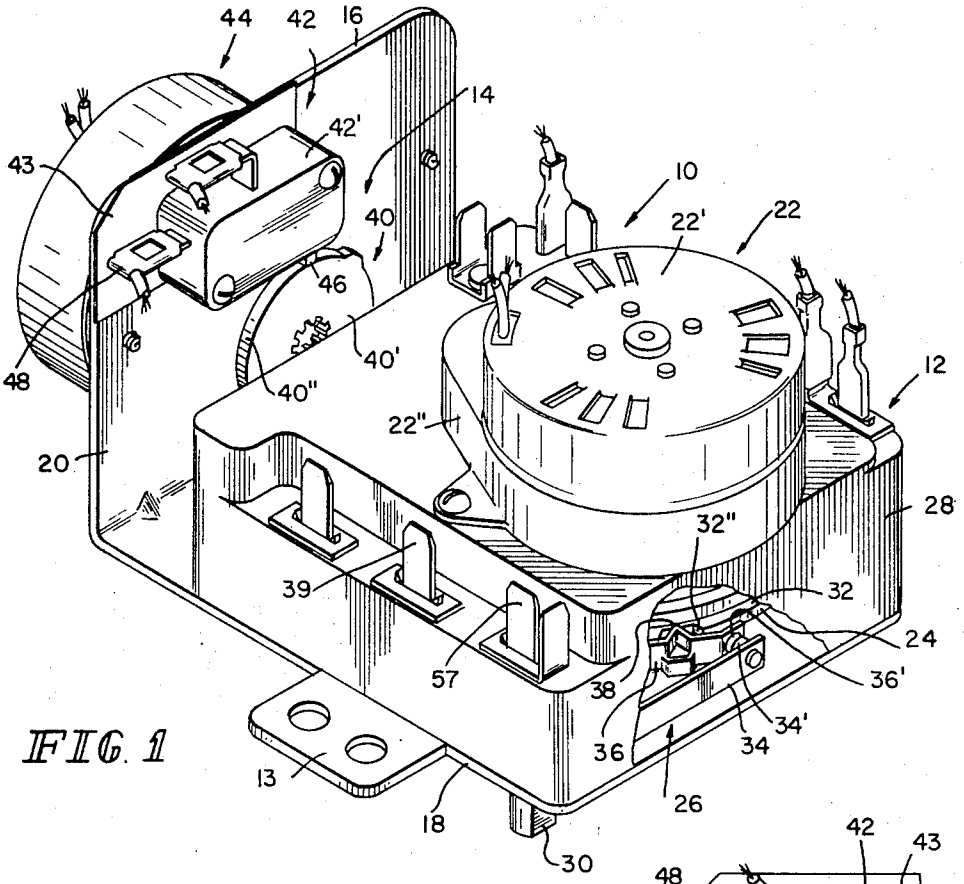


FIG. 1

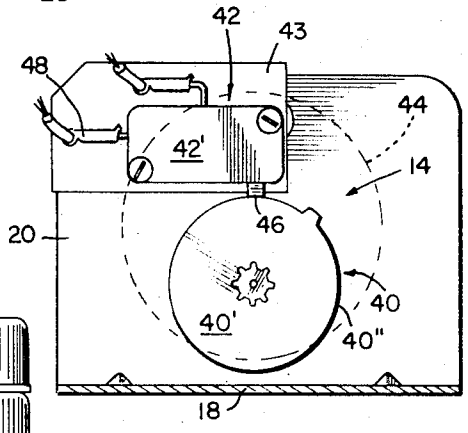


FIG. 3

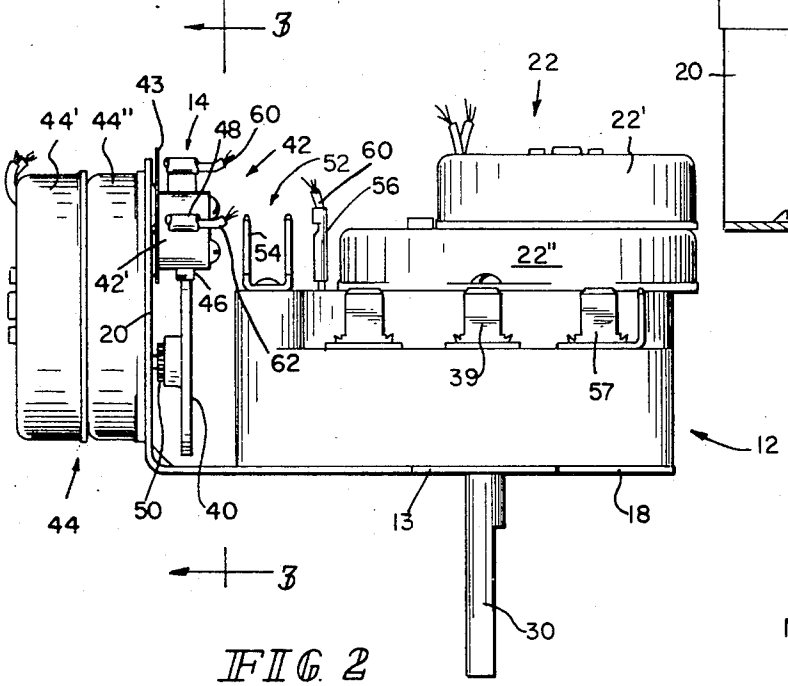


FIG. 2

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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 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.

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 fixed 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.

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