



(12) **EUROPEAN PATENT APPLICATION**

(21) Application number : **92500004.4**

(51) Int. Cl.⁵ : **H01H 43/10**

(22) Date of filing : **14.01.92**

(30) Priority : **12.02.91 ES 9100369**

(43) Date of publication of application :
19.08.92 Bulletin 92/34

(84) Designated Contracting States :
DE FR GB IT

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(54) **Step-by-step timer switch activation system for program control devices.**

(57) The system, having the usual blocks of fast cams and program cams (6), activated step by step by means of a pawl (3) which is provided with a steady to-and-fro motion by an eccentric cam (2), incorporates a swinging detent (9) that can take up two positions, one standing in the way of the free end (7) of the actuation pawl (3), and a likewise swinging clearance lever (13) with three working positions, the detent (9) being inactive in two positions and active in the third.

This first part of the system is assisted by a selector lever, a timer lever and an anti-return ratchet, the said subsystem allowing the length of the timings deriving from the previous subsystem to be multiplied, thereby considerably enhancing the practical possibilities of the timer switch.

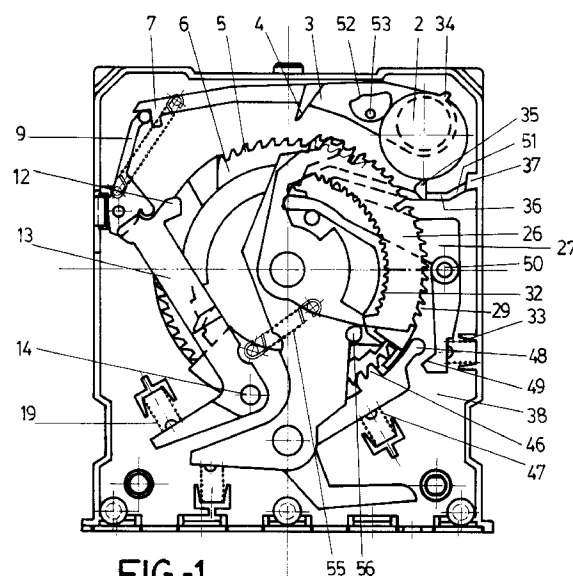


FIG.-1

OBJET OF THE INVENTION

The present invention relates to a step-by-step activation system, with a choice of stop intervals of variable lengths, applicable to program control devices, of the sort used in automatic washing machines, dishwashers and tumble driers, which devices comprise a block or set of fast cams which rotate continuously and assist contacts, where provided, which govern periodic functions in such machines, for instance reversing the direction of rotation of the washing drum, the said devices also having a block or set of main or program cams, the various working phases of the machines being governed through the said contacts, the block of fast cams being generally uniformly and steadily activated whereas the main block is driven step by step, with stop intervals every two step movements of variable lengths.

BACKGROUND OF THE INVENTION

It is a well-known fact that the larger the number of stop intervals obtainable, the bigger the capacity to program a control device, which is why the systems generating these are continually being improved, and a large number of varied solutions have been put forth in time.

Reference could for instance be made to French patent 1,595,564 where the block of program cams is designed with an integral ring gear activated by a pawl which makes it move one step forward each time it engages with the ring gear. Whenever the program so provides, a lock prevents the pawl from engaging with the ring gear integral with the block of cams, remaining thus until a timer element or wheel determines otherwise. The lock is part of a pivoting lever with a probe which works, assisted by the appropriate elastic means, with a selector cam that is also integral with the block of program cams. The timer element or wheel also has a surface that removes the lock from its active position when the pre-set time is over.

Italian patent 21,953 A/67 relates to a system similar to the above, singular in that the timer element or wheel is coaxial with the blocks of fast and program cams and also has means to reset the timer element to zero each time the block of program cams moves one or more steps forward, resetting being triggered by the element which accurately positions the block of main cams angularly.

Reference can also be made to German patent 1,193,008 in which the ratchet that prevents the timer wheel, which is continuously acted upon by elastic means, from returning toward it each time it moves forward, is rendered inactive when the preset time is over and held in such position until the pawl that makes it move forward step by step is also separated from the ring gear, both actions therefore allowing the timer wheel to be reset to zero, whereupon the anti-

return ratchet is immediately released, becoming active again.

The original arrangement and combination of the above and other known elements, such as ring gears with various levels of cogs, swinging or overlapping timer wheels and so on, have resulted in the aforesaid current choice of solutions.

Italian patent 1179717 thus relates to a device which yields two stop intervals for the block of program cams with one of its constituent parts, one of which lasts no more than the period of rotation of the block of fast cams, and the second one a fraction of this latter, whereas another part allows the previous and longer interval to be multiplied by whole multiples.

Operation relies upon an actuation pawl of periodic to-and-fro motion and means which prevent it from acting on the ring gear in the block of program cams for the time being. Such means in part comprise a timer element or wheel coaxial with the blocks of cams, provided with the appropriate holding and release means for the said timer wheel to be reset to zero, and a detent that, in co-ordination with the timer wheel and where appropriate, prevents the actuation pawl from engaging the block of program cams.

The disadvantage of the system is that the difference between both timings of length equal to or a fraction of the period of rotation of the block of fast cams, and the intervention or otherwise of the multiplier mechanism, depend, inter alia, on the active area within reach of the actuation pawl having the high or low level cogs of a two-level ring gear coupled to the block of program cams, wherefore the timing possibilities are limited to the said four.

DESCRIPTION OF THE INVENTION

The activation system subject hereof is designed to achieve step-by-step activation of a block of program cams with a choice of stop intervals of variable length, also partially relying on a timer wheel coaxial with the cam blocks and a detent which is particularly convenient and which on the one hand makes a timing of maximum length possible for the period of rotation of the fast cams, and two fractions thereof, and on the other, multiplication or otherwise of either of them by two multiplication factors, thereby simply and reliably to obtain nine stop intervals of different lengths, which means that use is very flexible, according to the needs that arise nowadays in machines for which such system is designed.

The system essentially comprises a motor and a transmission that provide a block of fast or reversing cams with motion, such cams rotating continuously at a steady speed, and a cam wheel which rotates to produce a steady to-and-fro motion in an advancing pawl. The system is also provided with a block of main or program cams, which moves forward step by step each time the actuation pawl acts upon a ring gear

with which it is integral, and a timer system which acts following a pre-set program, temporarily preventing the actuation pawl from moving the block of program cams forward each time it undergoes a to-and-fro motion, the timing system comprising two subsystems that may act separately or in combination, one such subsystem being designed to achieve stop intervals lasting the same as the period of rotation of the block of fast cams or fractions thereof, and the other subsystem being designed to multiply the length of any of the foregoing intervals by a factor whose magnitude is defined by a timer wheel or cam placed between the two blocks of cams, coaxially therewith, with freedom of rotation.

Such timer wheel or cam has the usual elements required for normal operation, such as activation and deactivation elements, elastic means urging it to start running, holding means preventing it from being reset to zero during the pre-set time, and means to position and keep such holding elements inactive to allow the timer wheel to return to the starting point each time the block of program cams moves one or more steps forward, and again position the same ready to act once reset to zero. It also has a detent or like element which works with the timer wheel and is designed to obtain a second factor multiplying the times from the first subsystem, on preventing the actuation pawl from penetrating a first deep space in the timer wheel's time counter ring gear, corresponding to the first multiplication factor, thereby preventing the actuation pawl from engaging the ring gear of the block of program cams, when the said deep space comes within reach of the pawl, the timer wheel having a surface which displaces the masking element at the end of its longer pre-set time, beyond its active position, leaving the system ready for the block of program cams to move one step forward.

Attached to the masking element are the means allowing the second multiplication subsystem to be activated and deactivated, and a probe which, with the assistance of elastic means, follows a three-level selector cam profile located inside the block of program cams, so that when the probe detects the level of greatest radius, the said subsystem is inactive, at the middle level the timer wheel is active and the lock inactive, which state corresponds to the first multiplication factor, whereas at the level of smallest radius, both the timer wheel and the lock are active, which state corresponds to the second multiplication factor.

The mechanisms of the activation, timing and positioning systems of the block of program cams are all assembled on a support plate located between the two blocks of cams.

In addition to this basic and conventional structure, the system subject hereof has, as a feature of the invention, an actuation pawl that is provided with to-and-fro motion by a cam wheel which rotates continuously, the said pawl being urged by suitable elastic

means towards the ring gears in the block of program cams and towards the counting ring gear in the timer wheel, the said pawl also having means which lift the same when it moves back, drawing it away from the aforesaid two ring gears.

With reference to another feature of the invention, the free end of the actuation pawl can work with the free end of a swinging detent that can take up two positions, one in which it stands in the way of the pawl, preventing it from engaging the aforesaid ring gears each time it undergoes a to-and-fro motion, whilst in the other position it remains at a distance, allowing the pawl to act freely.

The detent's position is in turn defined by a likewise swinging clearance lever with three working positions. At the two end positions, it holds the detent out of the reach of the actuation pawl, whereas in the middle position it stands in its way.

This clearance lever, located between both blocks of cams, has two probes which are assisted by appropriate elastic means to connect with the same number of internal cam profiles, both having three levels, one being a selector profile in the block of program cams, and the other an activation profile, located in the block of reversing cams.

With reference to another feature of the invention, each of the three levels of the selector cam of the block of program cams governs a time of inactivity of the actuation pawl of different length. Thus at the level of smaller radius, a length equal to the period of oscillation of the actuation pawl, for instance 7.5 seconds, is obtained, at the middle level the length can at most be equal to the period of rotation of the block of fast cams, for instance 4 minutes, the duration at the level of greatest radius being equal to a fraction of the latter, for instance $1/2$, $1/3$, $1/4$ and so on.

The profile located at the block of fast cams which rotates continuously with the same must cause the detent to swing, making it hold or release the actuation pawl at the appropriate times, as defined by the shape of the actual profile and by the level of the selector cam at which the relevant probe can be found. Save where the block of program cams is in a short timing position, in which case it is actually its own selector cam profile which acts through its level of lower radius on the clearance lever to cause direct release of the actuation pawl.

It is then possible for the actuation pawl to act, when the detent is released, on the block of program cams, making it move one step forward, or otherwise a second part of the system to intervene delaying such action. This second part or subsystem, which has already been generically described, has the following peculiarities.

When the element or timer wheel is at rest, it lies beyond the reach of the actuation pawl, in a stand-by position defined by a fixed abutment toward which it is urged permanently by suitable elastic means, acti-

vation coming about when the anti-return ratchet, in moving to engage the ring gear holding the timer wheel, acts on a surface arranged as a ramp on the said wheel, causing the same to move angularly beyond the reach of the actuation pawl, about to start its pre-set time.

A selector lever, whose probe is assisted by the relevant elastic means to follow a three-level cam profile in a second selector cam disposed inside the block of program cams, has a holding surface so that when the lever probe is at the level of greater radius, it keeps the anti-return ratchet at a distance from the relevant ring gear in the timer wheel, allowing it to reach the same once it is on either of the other two levels.

With reference to another feature of the invention, the anti-return ratchet in the timer wheel has an elastic arm whose free end works with a fixed abutment so that when the holding ratchet moves away from its corresponding ring gear on the timer wheel, each time the block of program cams moves one step forward, it holds the same in such position for the time required for the actuation pawl, which is lifted as it moves back, also to move away from its appropriate ring gear on the timer wheel, both actions together permitting its being reset to zero. A peripheral protuberance on the cam wheel acts shortly after on the elastic arm, moving it out of its holding position and hence leaving the holding ratchet in the timer wheel free to act again.

Finally, and with reference to another feature of the invention, in activating, timing and positioning, the block of program cams only has a single ring gear, all the cogs being at the same level. The timer wheel ring gear, working with the foregoing, is at a radially higher level and has, in specific positions, spaces of greater depth that enable the actuation pawl to engage the said ring gear in the block of program cams.

DESCRIPTION OF THE DRAWINGS

In order to provide a fuller description and contribute to the complete understanding of the characteristics of this invention, a set of drawings is attached to the specification which, while purely illustrative and not fully comprehensive, shows the following:

Figure 1.- Is a plan view of a timer switch provided with the activation system subject hereof, with the detent activated.

Figure 2.- Is a section of the said timer switch.

Figures 3, 4 and 5.- Respectively show details of the three positions of the clearance lever, duly connected to the detent with the actuation pawl, likewise showing the program and fast cam profiles.

Figure 6.- Is a plan view of the timer switch, as in figure 1, but without the timer cam in order for the mechanisms located under the same to be seen in greater detail.

Figures 7 to 13.- Finally show the various working positions of the timer cam together with the selection lever and the anti-return ratchet, and their connection to the actuation pawl catch and the ring gear in the block of program cams.

PREFERRED EMBODIMENT OF THE INVENTION

It can in light of these drawings be appreciated that a motor and a transmission that are not shown in such figures generate, in a manner that is known per se, a steady rotary movement supplied to a block of fast cams (1) and an eccentric cam (2). This eccentric cam (2) in turn provides a steady to-and-fro motion to an actuation pawl (3) having a catch (4), which engages, when the timing means so allow, a uniform ring gear and cogs (5) located on a single level, integral with the block of program cams (6), causing it to move forward step by step.

The actuation pawl has an extension whose end (7) can under certain operating circumstances engage the end (8) of a swinging detent (9), the cogs (5) thus remaining beyond the reach of the actuation pawl's catch (4), as may be observed in figures 1 and 5.

The detent (9) can in turn take up the positions shown in figures 3 and 4 and in figure 5, thereby allowing the catch (4) to engage the cogs (5) in one such position (figures 3 and 4) and preventing such engagement in the other position, shown in figure 5.

A spring (10) drives the actuation pawl (3) towards a position of engagement with the cogs (5), and the detent (9) towards a position of engagement with the end (7) of the actuation pawl.

The position of the detent (9) is defined by a spigot (11) thereof which feels a cam profile (12) located on the free end of a likewise swinging clearance lever (13), specifically swinging about the spin axis (14), the clearance lever being able to take up three working positions, respectively shown in figures 3, 4 and 5.

The clearance lever (13), located between the blocks of fast (1) and program (6) cams, as is clearly appreciated in figure 2, has two probes (15) and (16) with one of these, number (15), following an internal cam profile (17) along three levels, in the block of program cams (6), the other one, number (16) being related to an internal cam profile (18) also along three levels, integral with the block of fast cams (1). A spring (19) must keep the probes in touch with the respective aforesaid cam profiles.

The cam profiles are shown figuratively in figures (3), (4) and (5), for their movement is obviously circular.

As shown in figure 3, when the probe (15) rests at the level of greatest radius (20) on the cam profile (17) of the block of program cams, the clearance lever (14) will act upon the detent (9) causing the end (8)

thereof to move away from the actuating pawl end (7) whenever the probe (16) is in an area of the cam profile of greater radius (21) or smaller radius (22), such position corresponding to a timing equal to a fraction of the period of rotation of the block of reversing cams, the denominator of the fraction depending on the number of elevations and depressions present on the cam profile (18).

When the probe (15) is at the level of smaller radius (23) on the profile (17) in the block of program cams, as shown in figure 4, this same profile positions, without the assistance of the profile (18) in the block of fast cams, the system in the active state, corresponding to a short timing, of length equal to that of the period of to-and-fro motion of the forward pawl (3), for instance, and as aforesaid, 7.5 seconds.

In the working position shown in figure 5, the system will only be activated when a protuberance (24) on the cam profile (18) in the block of fast cams, moves the probe (16) carrying the clearance lever (13), and the latter the detent (9) to the position shown in figure 4. In such event, and in the event of the cam profile (18) having only one protuberance (24) on its periphery, the timing obtained will last as much as the period of rotation of the block of fast cams.

When the above-described timing system allows the actuating pawl (3) to go near the ring gear (5) in the block of program cams, it can either act on the same, causing a step or angular movement equivalent to that existing between two adjacent cogs to be advanced, or else a second part of the timing system function to multiply the length of the timings by one or two of the pre-set factors.

This second part of the system comprises a selector lever (25), a timer lever (26) and an anti-return ratchet (27) in the timer cam. The selector lever, shown in figures 1 and 6, is provided with a probe (28) to follow an internal cam profile (29) along three levels, integral with the block of program cams (6).

When the selector lever's probe (28) is at the cam (29) level of greater radius, the free end (30) of the selector lever, and the timer cam, is drawn away, as shown in figures 7 and 8, thus allowing the catch (4) in the actuating pawl (3) to act upon the cogs (5) in the block of program cams. In such position, a support surface (31) of the selector lever (25), as shown in figure (6), prevents the anti-return ratchet (27) from moving towards the holding cogs (32) in the timer cam (26), toward which it is urged by a spring (33).

When the probe (28) in the selector lever moves into any of the other two levels of smaller or medium radius on the cam profile (29), the support surface (31) is no longer flush with the anti-return ratchet (27) allowing the latter to engage the holding cogs of the timer cam. In order for this to take place it is also necessary for a salient (34) on the eccentric cam to push the probe (35) in the elastic arm (36) of the anti-return ratchet (27) in order to release the same from

an abutment (37) provided on the supporting plate (38), upon which they are assembled. When this happens, the catch (40) in the anti-return ratchet acts, on falling upon a ramp (41) of the timer cam (26), moving forward and carrying the system in the position shown in figure 9.

As shown in such figure 9, the first cog (39) in the timer cam is placed within reach of the catch (4) in the actuating pawl, preventing it from reaching the ring gear (5) in the block of program cams (6), since the ring gear (39) in the timer cam is located at a level above the ring gear (5) in the block of program cams. The end (30) of the selector lever (25) remains beyond the reach of the actuating cam (4). Under these circumstances, the timer cam (26) moves forward step by step until a deeper space (42) comes within its reach, as shown in figure 11, allowing the catch (4) to penetrate to reach the ring gear (5) in the block of program cams, causing the latter to move one step forward. Thus, operation corresponds to a position of the selection lever (25) where its probe (28) is located on the middle level of the cam profile (29) thereof, thereby to achieve a multiplication factor equal to the number of cogs provided between the first cog (39) in the timer cam and the first deep space (42).

When the probe (28) in the selector lever (25) is located at the level of smaller radius on the cam profile (29), the end (30) of the selector lever is positioned within the scope of the catch (4), as shown in figure 12. The catch (4) then causes the timer cam to move forward step by step, but the end (30) of the selector lever (25) prevents it from entering the first deep space. The timer cam continues to move forward until a drive surface (43) provided thereon acts on a spigot (44) integral with the selector lever (25), displacing the end (3) thereof to a position beyond the reach of the catch (4), as shown in figure 12. The catch (4) then enters the second deep space (45) in the ring gear of the timer cam, causing the block of program cams (6) to move one step forward. The second multiplying factor is thus obtained.

The timer cam (26) is provided with a spring (55) that tends to displace the same towards a fixed rest position defined by a spigot (56) located on the selector lever (25). The catch (40) of the anti-return ratchet (27) prevents the timer cam from moving back whenever it moves one step forward.

A ratchet (46) helps the ring gear (5) in the block of program cams so that with the assistance of a spring (47), the block of program cams is accurately in place for a step to be advanced, manually or automatically.

Whenever one or more steps are advanced in the block of program cams (6), the end (48) of the positioning ratchet (46) pushes a surface (49) of the anti-return ratchet (27), causing it to swing about an axis (50), and carrying the end (51) of its elastic arm (36) to the position relative to the abutment (37) shown in

figure 6, the cogs (32) of the timer cam hence being released from the holding action of the catch (40) in the ratchet (27). Shortly after this, the actuating pawl profile (52) will, with the assistance of a spigot (53) integral with the support (38), cause the catch (4) in the actuating pawl to rise, moving away from the ring gear (54) driving the timer cam, both actions allowing the timer cam to be free to return, by action of the spring (55) to its stand-by position as defined by the abutment (56).

We feel that the device has now been sufficiently described for any expert in the art to have grasped the full scope of the invention and the advantages it offers.

The materials, shape, size and layout of the elements may be altered provided that this entails no modification of the essential features of the invention.

The terms used to describe the invention herein should be taken to have a broad rather than a restrictive meaning.

Claims

1.- Step-by-step timer switch activation system for program control devices, of the sort comprising a block of fast cams (1), permanently turning at a steady speed, and a block of program cams (6) which are activated step by step by a pawl (3) which acts upon a ring gear (5) integral with the block of cams and which an eccentric cam (2) provides with a steady to-and-fro motion, the system having means to temporarily prevent the forward catch from reaching the ring gear in the block of program cams, the said timing means comprising two parts that can act together or on their own, one of them yielding stop intervals of length equal to the period of rotation of the block of fast cams and/or fractions thereof, and the other yielding one or more multiples of at least one of the foregoing and in which the multiplication system comprises a timer element or wheel and a detent or like element, both located between the two blocks of cams, and wherein with both the timer wheel being in turn disposed coaxially with both blocks of cams it is provided with elastic means that cause it to return to a fixed point, which is where the pre-set time starts, whenever the block of program cams moves one step forward once the pre-set time has begun, and means preventing it from returning during the said pre-set time and wherein for resetting the element holding the timing wheel to zero they are removed and held inactive until after resetting to zero as aforesaid, whereupon resetting elements again place them in a position to act, and wherein the detent is taken from its active position at the end of the pre-set time by means of a surface that is integral with the timer wheel, essentially characterised in that the same is also provided with a swinging detent (9) that can take

up two positions, in one such position standing in the way of the free end (7) of the actuating pawl (3) and in the other staying away from the same, the positions of the detent (9) being defined with the assistance of a likewise swinging clearance lever (13), with three working positions, so that at the two end positions the detent (9) is out of the way of the actuating pawl (3), and stands in its way when the former is in the middle position, the clearance lever (13) having two probes (15) and (16) related to the same number of internal cam profiles (17) and (18), both having three levels, one located in the block of program cams (6) and the other in the block of fast cams (1), activation of the timer wheel (26), which when at rest does in no case stand in the way of the actuating pawl (3), coming about upon angular displacement thereof caused by the respective displacement of the holding ratchet (27) to engage the relevant ring gear (32) in the timer wheel (26), whenever the selector lever (25) so allows, its probe (28) following an internal profile in a second selector cam (29) having three levels, in the block of program cams (6), such selector lever (25) having a surface (31) which, when the said lever (25) is at any of the three cam levels, prevents displacement of the holding ratchet (27) towards the relevant ring gear (32) in the timer wheel (26), allowing this when at either of the other two levels.

2.- Step-by-step timer switch activation system for program control devices, as in claim 1, characterised in that the detent (9) has an arm whose free end (8) is able to engage the free end (47) of the actuating catch (3) and a spigot (11) which is related to a profile (12) located on the free end of the clearance lever (13).

3.- Step-by-step timer switch activation system for program control devices, as in previous claims, characterised in that the free end (7) of the actuating catch (3) has a recess for coupling with the detent.

4.- Step-by-step timer switch activation system for program control devices, as in previous claims, characterised in that elastic means (10) permanently urge the actuating catch (3) and the detent (9) towards the position of engagement with each other.

5.- Step-by-step timer switch activation system for program control devices, as in previous claims, characterised in that the clearance lever (13) has its free end shaped as a cam profile (12) and has elastic means holding it in engagement with the cam profiles in the block of fast cams (1) and/or block of program cams (6).

6.- Step-by-step timer switch activation system for program control devices, as in claim 1, characterised in that the timer wheel (26) has an external ring gear (39) with spaces between cogs of two depths, the internal diameter of the shallower spaces being somewhat larger than the external diameter of the ring gear integral with the block of program cams and the internal diameter of the deeper spaces being equal to

the internal diameter of the latter's spaces, the said timer wheel also having an internal holding ring gear (32) which has a ramp-like surface (41) at its threshold, at an angle to the radius, and finally also having a surface (43) which acts when the pre-set time is over upon the salient (44) on the selector lever (25), pushing the same.

7.- Step-by-step timer switch activation system for program control devices, as in claims 1 and 6, characterised in that the anti-return ratchet (27) arranged as a sort of swinging lever and located on the side of the timer wheel (26) has a holding catch (40) on one of the swinging arms, working with the internal ring gear in the timer wheel (26), having an inclined surface (41) in the timer wheel (26), with a probe or abutment likewise located on its free end and able to work with a supporting surface (31) in the selector lever (25), with an elastic arm (36) which forms a single part with the ratchet and which has two working positions in one of which its free end abuts against a salient (37) in the supporting plate (38) upon which the ratchet is mounted to swing, holding the catch (4) away from the relevant ring gear (32), whereas in the other it rests upon a surface at a right or like angle to the foregoing, whereupon it may swing freely, the natural tendency of the elastic arm being to move toward the position at which it abuts, also having a probe (35) located on the elastic arm (36) close to its free end, upon which it acts, displacing the same to release the end of the arm from its abutting position, a salient (34) located on the periphery of a cylindrical portion, concentric with the spin axis and integral with the eccentric cam (2), while the second swinging arm has a surface (49) which works with the positioning ratchet (46) in the block of program cams (6) or else one or two cogs connecting directly with the ring gear (5) in the said block of cams, moreover applying elastic means (33) to the said arm, tending to displace the ratchet towards its position of engagement with the timer wheel (26).

8.- Step-by-step timer switch activation system for program control devices, as in claims 1, 6 and 7, characterised in that the selector lever (25) is provided with a probe (28) which follows an internal selector cam (29), having three levels, in the block of program cams (6), a supporting surface (31) which works with the anti-return ratchet (27) probe that, when the lever at the cam level of greater radius, prevents the anti-return ratchet from engaging the timer wheel, a lock that, when the lever (25) is at the cam level of smaller radius, prevents the actuating pawl (3) from engaging the ring gear that is integral with the block of program cams (6), an abutment (56) which works with a surface (43) in the timer wheel (26) and displaces the lever, when the pre-set time is over, beyond the position of the cam level of smaller radius, removing the lock from its active position, and elastic means tending to hold the lever with its probe against

the cam profile.

9.- Step-by-step timer switch activation system for program control devices, as in claims 1, 6, 7 and 8, characterised in that the actuation pawl (3) has, between its housing for the eccentric cam (2) and the drive catch (4), a hollow area (52) whose internal profile works with a spigot (53) on the plate (38) supporting mechanisms, so that when the pawl moves back, it draws the catch away from the ring gears upon which it is to act, again drawing near as soon as it begins to move forward.

10.- Step-by-step timer switch activation system for program control devices, as in previous claims, characterised in that the block of program cams (6) has two internal cam profiles (21) and (22), each having three levels, adjacent to one another, and a single ring gear (5) integral with the same, the cogs thereof all being flush with each other, and in that the block of fast cams (1) also has an internal cam profile (18) with three levels.

11.- Step-by-step timer switch activation system for program control devices, as in previous claims, characterised in that the activation and timer elements as a whole, saving the two blocks of cams, are mounted to form a stable assembly, upon a plastic supporting plate (38) provided with shafts and guides and housings therefor, and the necessary supports and points of attachment for the appropriate springs, such plate being located between the blocks of fast (1) and program (6) cams.

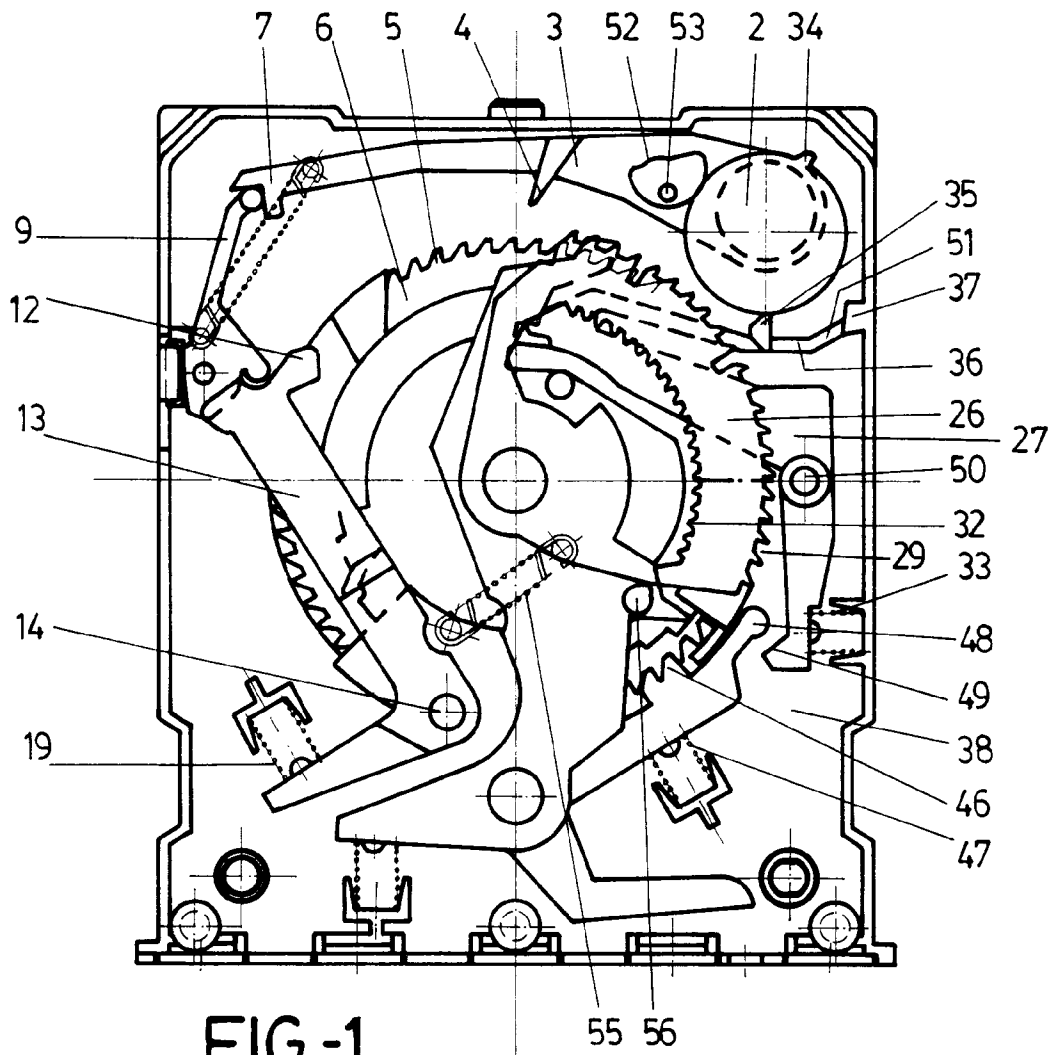


FIG.-1

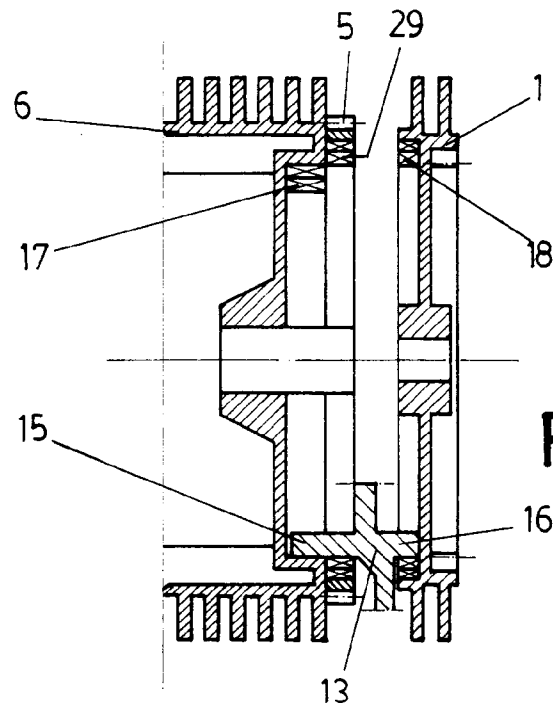


FIG.-2

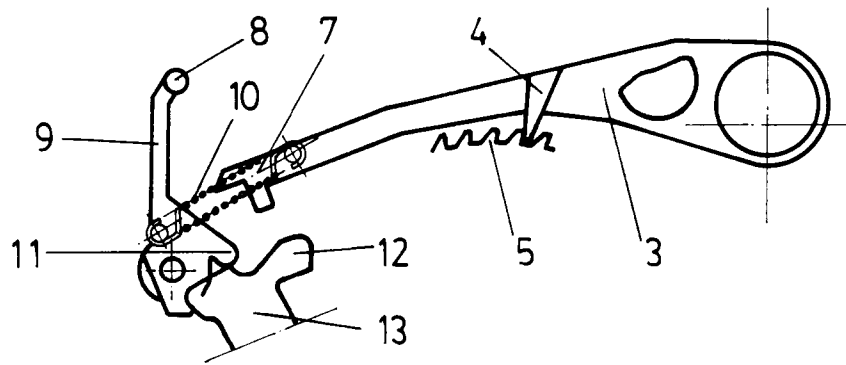


FIG.-3

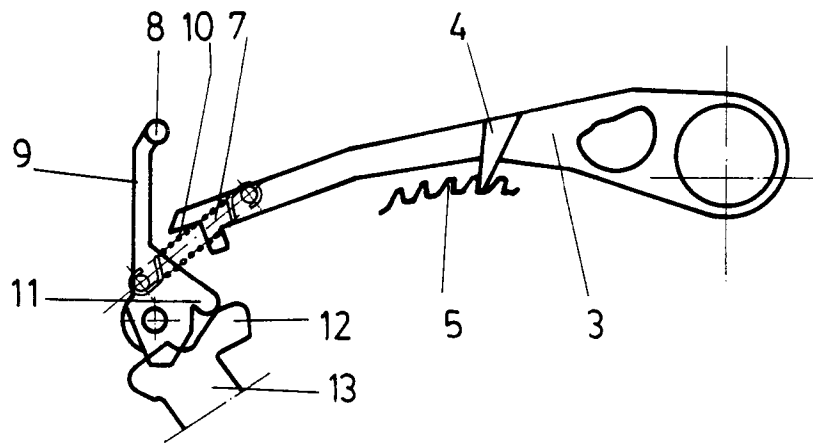
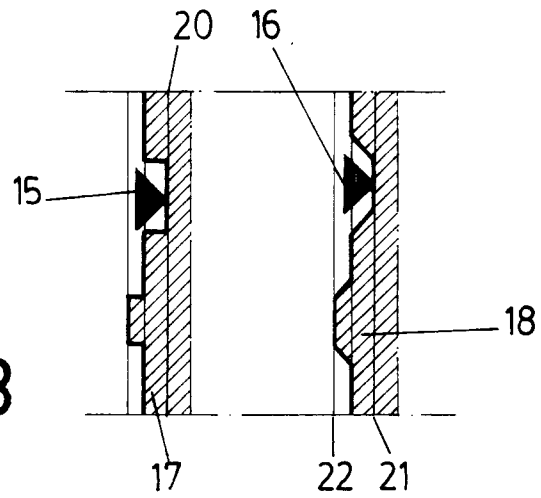
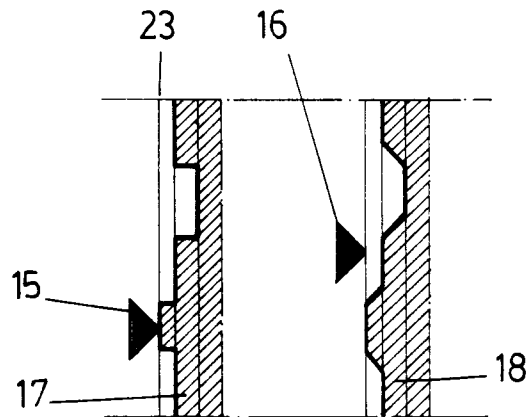
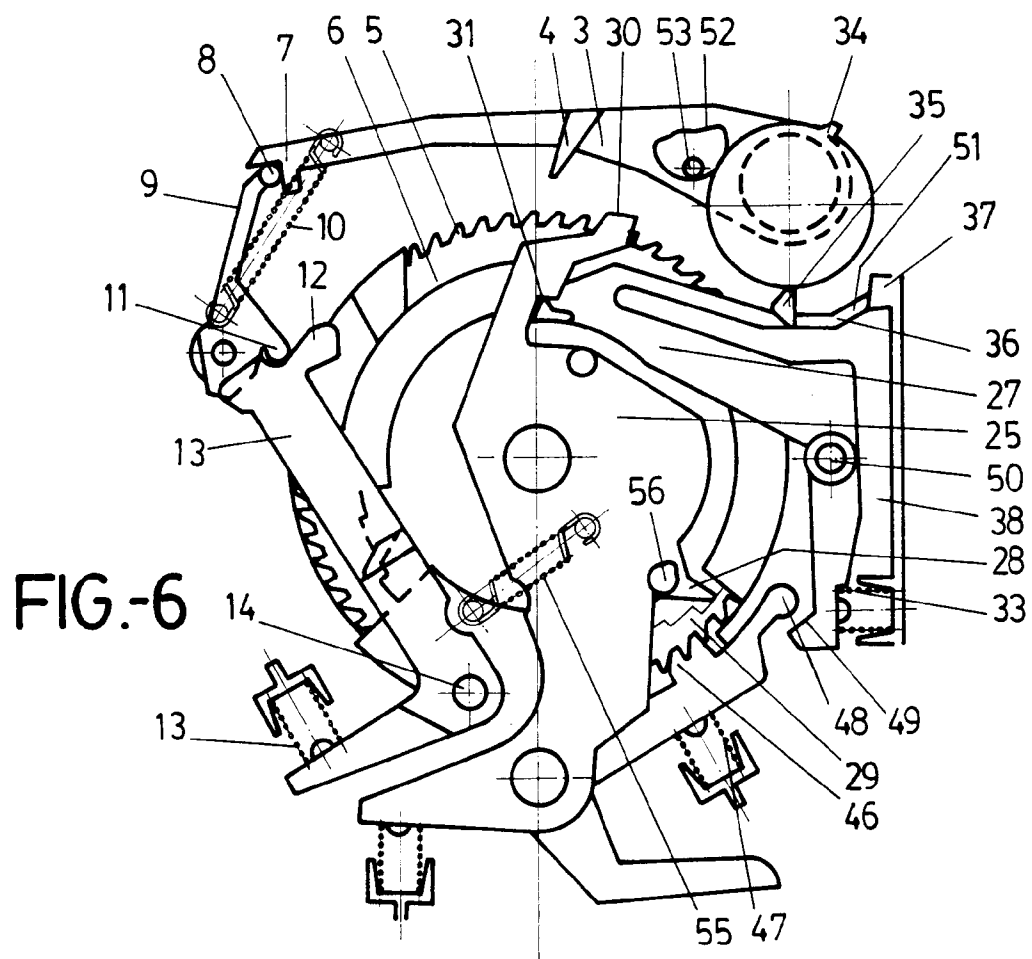
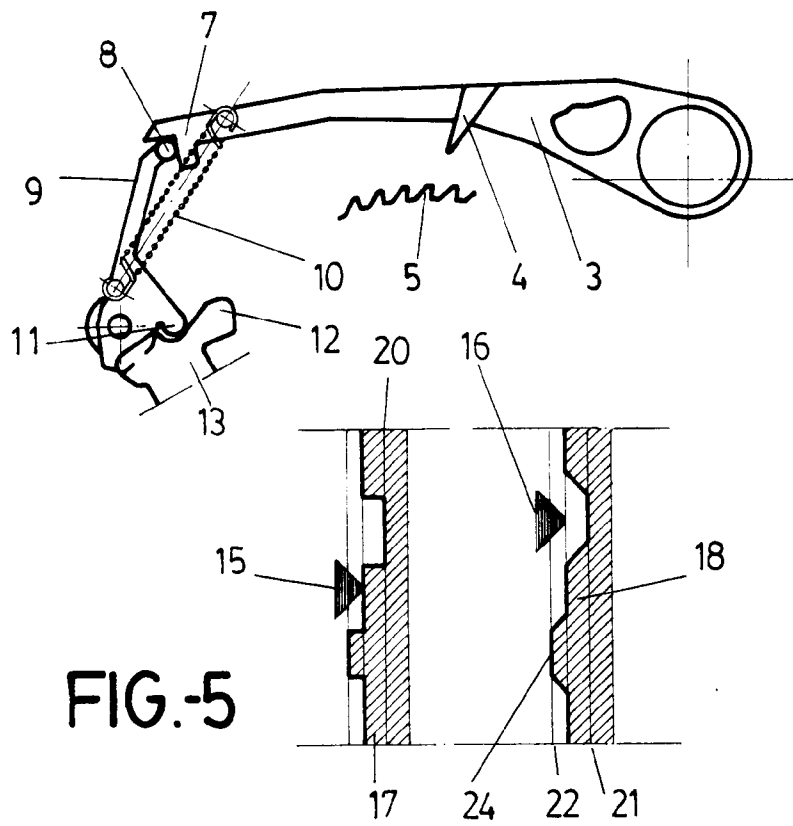


FIG.-4





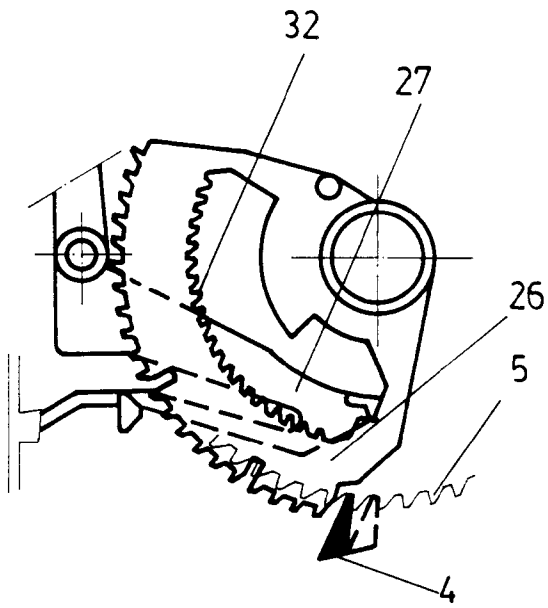


FIG.-7

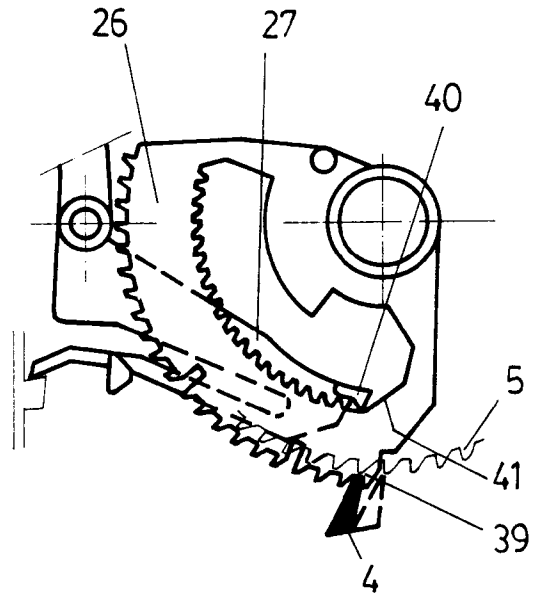


FIG.-9

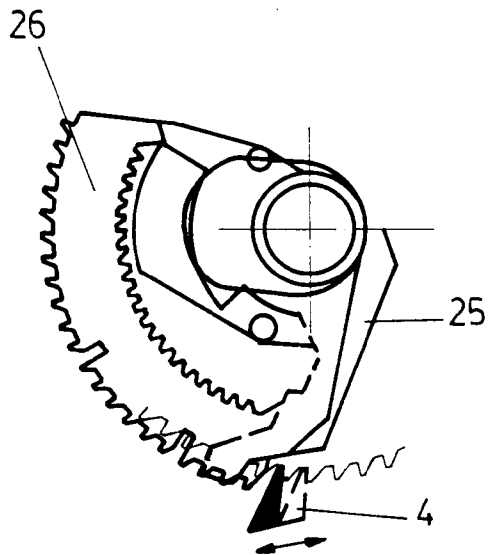


FIG.-8

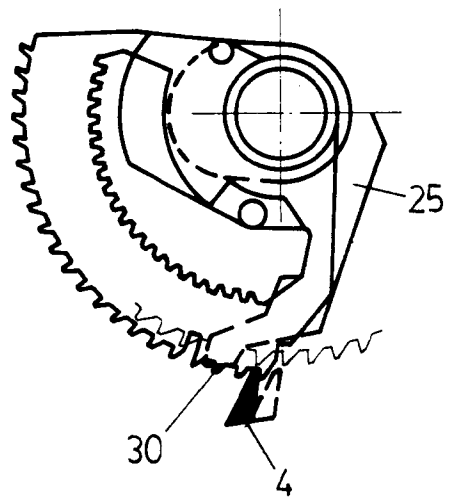


FIG.-10

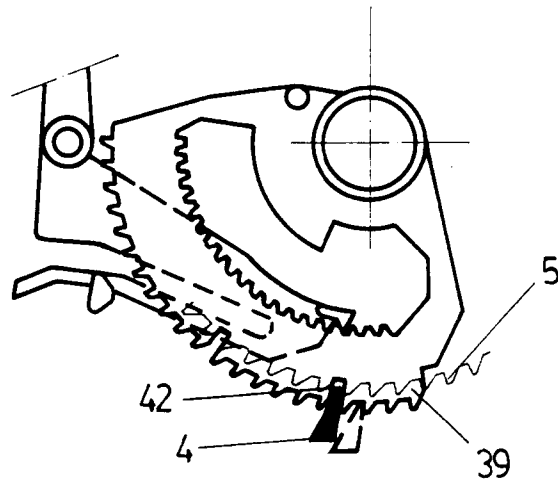


FIG.-11

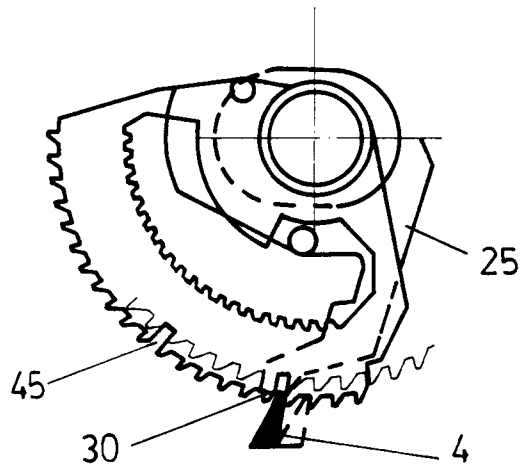


FIG.-12

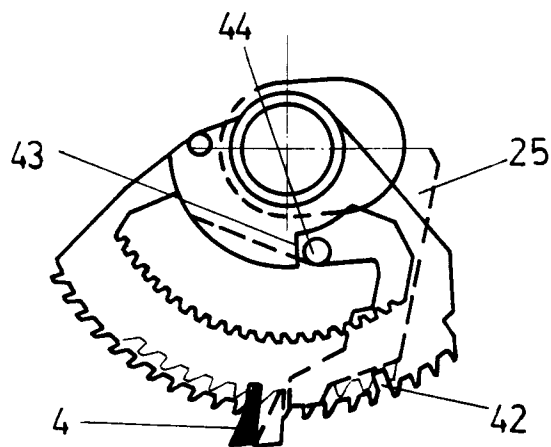


FIG.-13



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number

EP 92 50 0004

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.5)
A	EP-A-0 003 615 (EATON GMBH & CO. KG) * abstract; claim 1; figure 1 *	1	H01H43/10
A	DE-C-1 929 801 (CROUZET) * the whole document *	1	
D	& FR-A-1 595 564		
A	DE-A-1 805 594 (FA, CANDY S.P.A.) * page 1, paragraph 1 - page 3, paragraph 1 *	1	
D, A	DE-C-1 193 008 (SIEMENS-ELECTROGERATE AKTIENGESELLSCHAFT) * the whole document *	1	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			H01H
Place of search BERLIN		Date of completion of the search 20 MAY 1992	Examiner RUPPERT W.
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