

## IN THE UNITED STATES PATENT OFFICE

In re application of  
 William F. Friedman, et al.,  
 Serial No. 36,869,  
 Filed Aug. 19, 1935,  
 Electrical Switching Mechanism

Div. 37, Room 5886-B  
 October 15, 1938.

Hon. Commissioner of Patents,

Sir:

Responsive to Patent Office Action dated April 18, 1938,  
 it is desired to amend as follows:

In the specification, page 3, last line, after " 9. " insert the following : - - Inherent in the mechanism here disclosed and as the result of such a friction drive a slipping action is produced, which action is aided by the sliding movement of disks 13 and 13' on the face of wheels 16 and 16' , respectively. The cams 9 and 9' as well as the system of gearing previously described, contribute an important part to this slipping action and consequent lost motion whereby the switching operation is performed in an irregular, aperiodic or fortuitous manner. This constitutes an important object of the invention all as fully set forth in the specification and shown in the drawing.: - - Same page, next to the last line, cancel "constantly" and substitute - - continuously - -

Claim 6, line 3, after "drives " insert - - having a slipping action and - - Same claim, line 5, after " individually" insert - - to aid the slipping action and - -

Claim 15 is withdrawn without prejudice.

Claim 17, lines 5 and 6, cancel " for randomizing" and substitute - - to assist in randomizing - -

## REMARKS

As to the expression "constantly varying speeds" it may be said that the word "constantly" is here employed in the sense of continuously and in order to clarify the phrase on page 3, line 2, amendment has been directed accordingly. It will be noted that the word "continuously" appears in a number of claims and it is believed that with this amendment in the specification, the intended meaning when considered in the light of the actual operation will now be clear. However, the word "constantly" has been employed in another part of the specification, for example, in the middle paragraph on page 4 and it should be understood that the words in question have substantially the same general significance as will be supported by dictionary definitions.

As to the phrase "connected in a random manner to the commutator rings", page 4, line 2, the idea which should be perfectly plain when read in the light of the disclosure is that the contacts are not in any particular order. The arrangement may be said to be irregular and, therefore, random, that is to say, without reference to any given sequence.

Regarding the criticism of the term "commutator", the Examiner will note that the specification very plainly states that the numeral 18 is intended generally to designate the commutator, which here comprises the rings 21 to 25 which are insulated one from the other and held between the end rings, ~~one of which is 18~~. It should be understood that the numeral 18 is not intended to apply merely to the one element, i.e., the end ring, but as the description plainly states that it generally designates the complete assembly. This assembly in structure and function substantially performs

the office in the present mechanism of a commutator and it is contended that the term is aptly used. It is fundamental that the specification in any given case may be properly regarded as a dictionary for the terms employed consistently throughout the description and as a dictionary for the terms as used in the claims.

The suggestion that the "conventional means or instrumentalities" which term is used on page 4, line 5, <sup>is not identified</sup> is not understood. It is clear from the context that a switching mechanism as here disclosed may be used to operate various instrumentalities. The idea here is clear enough from the specification that the blocks schematically employed and designated clearly by the numeral 33 with lead lines to each one may be any one of a number of instrumentalities such, for example, as relays. It is believed that the specification is quite clear in this regard.

With reference to the slipping action inherent in the friction drives, which action is relied upon in the present case to produce the aperiodic result, it should be noted that the slipping is necessarily an incident to the sliding movement of the disks 14 and 14' which slide up and down against the face of wheels 16 and 16' respectively. A considerable amount of lost motion must necessarily follow this sliding movement, which is aided by the cam action which causes the disks to rapidly move up and down when driven in opposite senses by the differential and intermediate gearing. This action follows naturally from the whole theory of operation of this mechanism and is perfectly clear from the drawing itself. In order to more clearly emphasize the said function and operation, it is desired to amplify the description at this point and an amendment has been directed accordingly. Care has been observed to avoid anything in the nature of new matter. It is urged that the slipping feature

is a natural consequence of the peculiar operation of the present mechanism and the specification as now amplified supports the aperiodic result and the objection to the claims on the ground of insufficient description should be withdrawn.

Replying to the query as to what is meant by "a slot and bar arrangement", page 3, line 8 from the bottom, a sketch which shows in detail and on a larger scale the slot and bar arrangement is submitted herewith for the Examiner's information. In the light of the description queried by the Examiner, it will be seen by reference to the sketch that the arm or bar 11 which responds to cam movements works with the collar 13. A pin 12 permits the bar 11 in its range of movement in response to the cam action to carry the collar 13 up and down, the disk 14 being keyed to the shaft 3 in such a manner as to permit its movement against the tension of spring 15. A similar operation should be understood in connection with the opposite component all designated by the numerals primed to those employed in the structure just described. If officially required or permitted, a figure will be added in accordance with the attached sketch in order that the slotted arrangement may be clear.

The Examiner's criticisms in respect to the claims are now considered in detail as follows:

As to claim 6, line 2, it is noted that the Examiner objects to the term "associated" and also objects to the phrase "operative movement relative to one another". It should be noted in the first place that in this claim the introductory portion defines the word "bodies" as "rotating bodies", which is regarded as sufficiently definite when read together with the phrase questioned by the Examiner. Applicants are seeking to avoid restrictive words in the introductory part of the claim. It

will be noted that claim 6 has now been amended both in line 3 and in line 5 to bring out the slipping action of the friction drives which now fully supports in the first insertion the functional term in a discrete time relation. Here the word "discrete" is used in the sense of separate and connotes separate units. It is considered that the phrase correctly expresses the operation, i.e., the friction drives do actuate the bodies as separate units and, therefore, in a discrete time relationship.

In this same claim, lines 4 and 5, the term "operatively coordinated" is intended to be broad. The means clause brings in enough structure in combination to define the cooperative relationship of all the elements to support the functional statement. Moreover, it is urged that the differential gearing and the cams do contribute to the slipping action and do aid the aperiodic function. Referring now to claims 7, 10, and 11 and noting again the Examiner's objection to the word "commutator" the assembly of rings 21 and 25 insulated from one another and tied together by the end rings are considered to be a commutator. The rings function as collector rings just like in a commutator and the collectors designated by the numeral 26 do act in a manner analogous to brushes, so that the action is clearly a commutating action and, once again, it is pointed out the applicants are entitled to make the specification as a dictionary for the terms of the claims and where the terminology is consistent throughout and the meaning is clear, the use of the word "commutator" should be considered as apt and correct. As here employed, it assists in defining the structural elements of the claim.

Referring to claims 8 and 9, it is noted that the Examiner challenges the use of the word "cams" as part of the "means for differentially

controlling the operation of the units ". It should be kept in mind that both claims 8 and 9 are dependent upon claim 7 and the comments above with respect to claim 7 are repeated and confirmed.

It is noted that a similar objection is made with respect to claim 10. In this claim the last means clause should be read in its entirety with the understanding that the differential gearing and the cams do mutually contribute to accentuate the aperiodic action.

As to the criticism of claim 11, it is contended that the phrasing in the first part of the claim is correct as it stands. It is entirely clear from the drawings that the rotatable commutator is provided with a plurality of contact elements and it is correct to say that a rotatable conductor is operable with said elements for establishing a plurality of current connections. The conductor is not here defined as a part of the commutator at all. The Examiner's criticisms in this respect are not understood.

As respects the criticism applied to claim 12, it is contended that the expression " comprising relatively rotatable switching devices " is not inconsistent with the idea that the rotatable elements are a part of one switching mechanism. The meaning is clear enough when read in the light of the disclosure and it is thought to be correct when broadly referring to a switching relationship like, in this instance, to use the word "devices" in the plural; Applicants are seeking to adequately cover their invention and should not be required to use restrictive expressions, or to define structure in great detail in the introductory portion of a claim where the intended meaning is clear and where the context of the claim when read in its entirety brings in all necessary elements of the combination.

1th reference to the criticism of the word "components" as used in claims 14, 15, 16, 17, 19, 20, 21 and 22, what is said generally in the preceding paragraph is also pertinent here. The commutator assembly on the one hand, and the rotating arm on the other, are certainly components of a switching mechanism and the use of the word throughout this group of claims is considered to be entirely correct. Applicant is not willing to unnecessarily restrict himself in the introductory paragraph of these claims.

It should be noted at this point claim 15 has been withdrawn in view of the ground of rejection found in next to the last paragraph on page 4.

The rejection of claims 13 and 18, also claims 19 to 23 on Boardman of record has been noted. Fig. 4 of Boardman to which the Examiner specifically refers is described on page 9, lines 82 to 93 as showing a structure which is merely a duplication of the arrangement of discs previously shown and described; also the same manual adjustment is used. In said patent the friction discs do not have a continuously slipping action as called for by the claims of applicants; nor is there any idea of continuously and irregularly varying the rate of movement or time relationship of the rotatable switching components. In Boardman the adjusting screws are employed to make fixed adjustments to change the speed of rotation in accordance with a scale as at 13. These are manual adjustments and when any given adjustment is made, no further change is made. A continuously varying relationship is not consistent with the theory of operation in said patent, but is vital to the present invention and is defined in these claims. Please again refer to the last page of paper dated December 1, 1937, for previous remarks on Boardman.

The criticism applied to claims 13 through 23 which goes to the use of the term contacts has been considered. No reason is seen why these claims should be worded in precise terms to define in so many words that the element 19 is provided with a plurality of contacts while the arm 30 is provided with a single contact. This word occurs in all these claims in the introductory part where it is the intent merely to recite that the switching components taken together are provided with contacts. It is not desired to limit the claims in this respect. The criticism of claim 17 has been noted. This claim has now been amended and is thought to be clear of objection in this respect.

Referring to claim 25, line 3, in reply to the objection that no disclosure is found for the limitation that the contacts are "spaced at irregular intervals", it has been previously explained in connection with the first three lines, page 4 of the specification that the contacts 20 are spaced irregularly or, in other words, that the arrangement is without any given sequence. This is what is meant by the expression "in a random manner" found in this portion of the description.

Reference is now made to the rejection of claims 7 and 13 to 23 as not defining invention over either Seeley or the German patent to Fohn. The Examiner's rejection is apparently based on the consideration that the two contact carrying disks having independent driving means for each disk are equivalents of the corresponding features as found in the citations and in the present invention. This rejection, however, does not take into consideration (1) that the means shown in the citations does not provide an arrangement for continuously varying the speed of the rotating contact members; (2) moreover in the disclosures of each of



these patents the speed of rotation of these contact members is so controlled that once they rotate at the same speed that speed is maintained ; and (3) in each of the reference patents means is provided for the control of a single circuit only as opposed to a plurality of circuits as in the present invention. It should be kept in mind that in the prior art as exemplified by the patents in question, the object is to synchronize circuits, that is to say, to bring about a definite time relationship or synchronization which is just the opposite of the purpose of applicants' invention. As repeatedly emphasized in connection with the present invention, the object is to continuously and irregularly vary the timing relationship. Referring to the German patent to Vohn, it should be kept in mind that the object here is to produce and maintain synchronism between the alternators A and A' .

With reference to the rejection of the claims on the ground of multiplicity, it is applicants' position that the Examiner has not yet made any definite ruling as to the character or scope of protection to which they may be entitled over the art and, therefore, applicants have no adequate yard stick to guide them in determining what, if any, claims might be safely relinquished at this time. With the same consideration in mind, it will be difficult to point out in detail why the claims are patentably different from each other. The effort has been throughout to maintain a patentable distinction between the claims in the case. Applicants are entitled to restate their invention a reasonable number of times and there is no desire to multiply the claims unreasonably ; but it is vitally important that the invention shall be adequately claimed and until applicants have some definite indication of what the Examiner considers to be patentable,

it is thought that the cancellation of claims at this time cannot be attempted without danger of prejudicing the applicants' rights. An earnest effort has been made to deal with every ground of objection and favorable reconsideration is courteously solicited in the light of the foregoing.

Respectfully submitted,

William F. Friedman, et al.,

By:

Attorneys