CREATING THE LIST IN A TABULATED FORM FOR LATER DRAFTING

Here is an example of how you put together a table of parts, reference numbers, connections and functions as a preliminary step in drafting the specification. The first step was to draft the schematic shown on page 5.

This is then followed by creating a table with columns 1-4 as in the table below. Go to the TABLE function in your word processor such as found in Microsoft Word to create an empty table.

Note, I may not fully explain the function or put in every connection when I first form the table. My advice is to start simple to establish the thread of ideas (in the FUNCTION) column that will later on be put into a preliminary draft of the specification, such as is illustrate on pages 2 through 4, below. A full copy of the patent pertaining to the example is found the Library of Patents: US Patent 4,684,855 Kallos, August 4, 1987.

PART	**REFERENCE NUMBER**	**CONNECTION**	**FUNCTION**
motor	10	Circuit 100	invention
rotor	12	Motor 10 axis	Rotate
electrically conductive coils/ also designated as S2, S4, S6, and S8	24	Induce electric field Into motor armature magnets	d.c. is switched between two sets of electrically conductive coils 24 during rotation of the rotor 12
electronic control device	100	To control motor rotation	Connects to motor stator
switching module	102	output terminal 175	Controls S2, S4, S6, S8
switching modules	104	Complement to 175	Controls S3, S5, S7, S9
direct current voltage supply	110	Connects to bypass 112 and sw2	Supplies bias voltage

a conductor	112	Sw2 and 6 volt supply	Bypass power supply
silicon control rectifiers	116, 117, 118, and 119.	117 anode to 116 anode 118 anode to 119 anode	SCR 116 conducts current a capacitor 152 (C1) charges to the value of the voltage that is present at the SCR 116 cathode 160
SCR 116 gate	124.	Stator connection 140	Turn SCR off
SCR 116	cathode 160	C3 and C1 and conductive coils S2	Conductive path for coils
a capacitor	152 (C1)	R1	Hold charge
resistor 164 (R1)		SCR 117 cathode	

THE ELECTRONIC CONTROL DEVICE OF THE PREFERRED EMBODIMENT

Basically, the operation of the electronic control device 100 can be described in the following manner. The direct current (d.c.) entering the system is constant. The d.c. is switched between two sets of electrically conductive coils 24 during rotation of the rotor 12.

In this manner intermittent discrete square wave current pulses flow to the electrically conductive coils. The switching of d.c. is accomplished by alternately turning on and turning off the silicon control rectifiers (SCRS) designated in FIG. 4 as items 116 and 118.

The electrically conductive coils also designated as S2, S4, S6, and S8 in FIG. 4 are switched on by SCR 116 during alternate 45 degree rotation of the rotor 12.

A conductive coil current conductor connects the conductive coils to an output terminal 175 on a switching module 102 in which the SCR 116 is contained.

The electrically conductive coils also designated as S1, S3, S5 and S7 in FIG. 4 are switched on by SCR 118 during the subsequent 45 degree rotation of the rotor 12. The average d.c. flowing through each set of the electrically conductive coils in FIG. 4, of S2, S4, S6 and S8, or S1, S3, S5 and S7 depends on the length of time the SCRS 116 and 118 are on, respectively. The SCRS 116 and 118 are turned on and off by periodic timing pulses that are

generated by the timing device 80 mounted to the rotor shaft 70. A periodic timing pulse is generated at the point the rotor 12 passes through an integral rotation of 45 degrees i.e., 0, 45, 90, 135, 180, 225, 270, 315 degrees.

Because the electromotive force produced by the electrically conductive coils 24 causes rotation of the rotor 12 of the motor 10, and the timing device 80 integrally sensing rotation on the rotor shaft 70, any differential change in the speed of the rotor 12, that may be caused by a load on the output side of the rotor 12, will cause a change in the time interval between periodic timing pulses.

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and the timing device 80, will suffice to explain the switching module 104 and its associated electrically conductive coils 24, S1, S3, S5, and S7 as they relate to the timing device 80. The preferred embodiment discloses eight sets of radially disposed electrically conductive rows of coils, 24 as shown radially separated by 45 degrees FIG. 2 and is variously referred to as an eight pole motor. The invention contemplates that more or less than eight poles will work with commensurate gains and losses of horsepower efficiency. However, as is evident any increase or decrease in the number of poles must be made in multiples of four for the sake of electromagnetic symmetry. Regardless of the number of sets of four poles incorporated the electrical control device requires two switching modules.

The electronic control device 100 of FIG. 4 includes a basic voltage supply 106 provided across d.c. supply conductors 101 attached to two opposing end terminals to power the switching modules 102 and 104. The illustrative circuit voltage as shown in FIG. 4 is 12 volts direct current (d.c.), but the circuit can operate equally well with different supply voltages as long as the values of the various circuit components are adjusted accordingly.

The electronic control device 100 also includes a second direct current voltage supply 110 provided across a conductor 112 to transfer voltage through the fixed contact 90a and the radially disposed electrical contacts 86 and ultimately the silicon control rectifier gates 124, 125, 126, 127 of a group of the silicon control rectifier's (SCRS) 116, 117, 118, and 119. The illustrative second direct current voltage supply 110 is 6 volts, but the circuit can operate

equally well with a different voltage provided the SCRS actually used can accommodate a different gate voltage.

When electrical contact between the disk 84 contact 87 and the rotary contact 99 is made an electrical potential is established between fixed contact 90a and either SCR gate 124 or SCR gate 126 of FIG. 4 causing current conduction through the respective SCR. The conduction of current through either SCR then flows to the respective set of stators causing the rotor to turn.

FIG. 4 illustrates the electrically conductive coils 24 connected in electrically parallel to each other. Each electrically conductive coil, e.g. S2, is understood to represent either the single stator configuration viz. alternate embodiment illustrated in FIG. 5, as item 184 or the row of stators configured in FIG. 2, as item 24. Although, FIG. 4 shows the electrically conductive coils 24 connected in electrical parallel to each other, the same basic operation of the motor 10 is achieved if the electrically conductive coils 24, S2 through S8 and S1 through S7 are connected in electrical series (unshown).

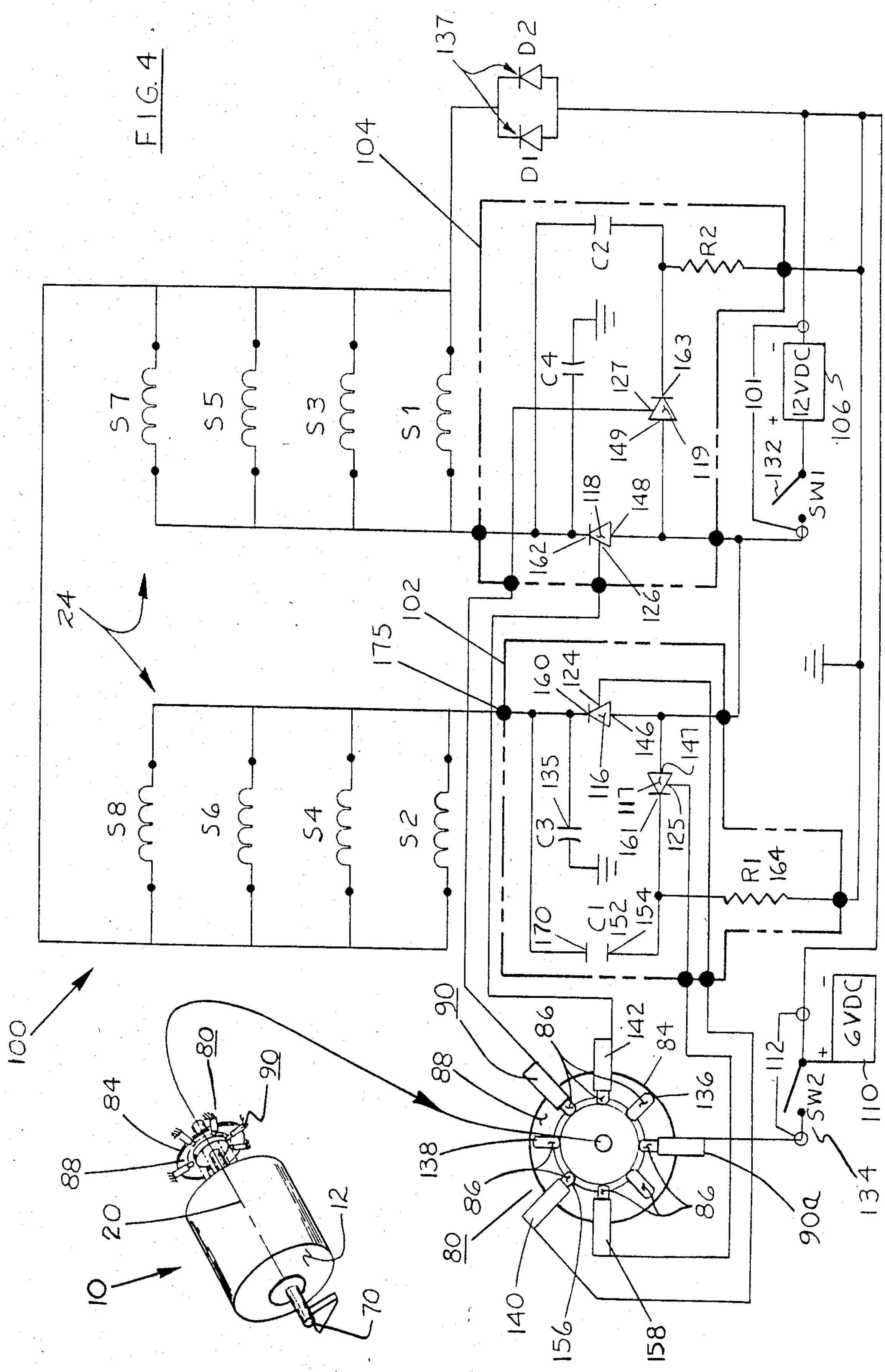
FIG. 4
12VDC
6VDC
SW1
SW2
S1
S2
S3
S4
S5
S6
S7
S8
D1
D2
C1
C2
C3
C4
R1
R2
10
12
20
24
70
80
84
86
88
90
90a
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