INTISARI

Pencampur komposisi bola secara otomatis adalah sebuah peralatan mekanis yang terprogram secara *software* untuk mencampur kombinasi dua warna bola hitam dan putih dengan jumlah seperti yang dikehendaki. Jumlah pilihan bola dibatasi sampai 10 bola.

Sebuah masukan pilihan jumlah bola melalui saklar rotari akan disandikan dalam bentuk biner 4-bit dengan rangkaian gerbang OR. Keluaran 4-bit ini diberi simbol seperti pada bilangan BCD(4-bit) yakni DCBA dengan D sebagai MSB(*Most Significant Bit*)-nya. Keluaran DCBA(4bit) ini sebelum diinputkan akan dilewatkan sebuah pensaklaran transistor untuk menggerakkan *relay*. Pensaklaran menggunakan transistor dengan tipe BC 547. Ketika masukan jumlah pilihan bola diinputkan dengan menekan tombol *Check*, sistem akan menyimpan sinyal input dalam memori dan akan ditampilkan dalam 2-digit peraga 7-segmen. Setelah ditekan tombol *Start*, program akan dijalankan dan output berupa solenoid akan *Flicker* ON-OFF sebanyak jumlah pilihan bola yang dimasukkan. Sistem akan bekerja secara otomatis, bergantian setelah siklus bola hitam selesai dilanjutkan bola putih demikian seterusnya sampai bola habis atau sistem dihentikan.

Dalam perancangan ini pengendali yang digunakan adalah sebuah PLC (*Programmable Logic Controller*) Omron tipe CPM1. Sistem dilengkapi dengan sensor untuk mendeteksi keadaan bak penampung bola. Saat bola habis maka sistem akan berhenti, setelah diisi maka siklus akan dilanjutkan lagi.

ABSTRACT

Automatically ball mixing was mechanic tool that programmed accordance with software to mix a combine of two colour of black ball and white ball by means of number desired. A number of the ball selection limited up to 10 balls.

One input from the selection of a number of balls through rotary electric switch will be coded on shape binary 4-bit by means series of OR gate. This 4-bit output was given a symbol like at BCD (4-bit) digit i.e. DCBA with D as its MSB (Most Significant Bit). Before this DCBA (4-bit) output was entered, its will be past trough a transistor electric switch to relay activation. An Electric switch using BC 547 transistor. When input of a number of ball selection was entered by pressing Check knob, system will store input signal in explanatory statement and will be displayed in 2-digit 7-segment visual aid. After Start knob was pressured, program will be done and output like solenoid will Flicker ON-OFF as much as a number of the selection ball that be entered. System will work automatically, changed after black ball cycle was finished, followed by white ball continuously up to ball were used up or a system was stopped.

In this planning, manage used was a PLC (Programmable Logic Controller) Omron whose type was CPMI. A system was completed by sensor to detect condition of ball large container. When balls were used up then a system will be stopped, after its be filled then cycle will be continued again.

This paper discuss about designing of PLC based automatic combining and mixing of collared balls machine. Combining of two different things can be found in industrial, example in sorting table machines.

This apparatus consist of combining machine method controlled by PLC. Control panel consist of rotary switches as a selector of number of balls, bottoms as input devices and two seven segments to display number of ball passed. By using PLC, machine can be controlled more flexible changing the operation can be easily done using PLC.