

## Microcontroller Based Food-Mixing Machine

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**Abstract-**In this project, a smart machine for food mixing is proposed. This machine will be specifically designed to prepare *bhel*. To prepare *bhel* puffed rice, *farsana*, chilli powder, some spices, tamarind liquid, onion has to be mixed with proper proportion. In the proposed design, user can select taste (sweet, medium spicy, spicy) and quantity (no. of plates).

Upon the inputs given by user smart machine will mix the required items in proper quantity. automated microcontroller-based *bhel* mixer that can provide mixed *bhel* with the push of a single button.

**Key words** - Motor, Mixer.

### Introduction-

In our day to day life food mixing, the process where two or more food items are mixed

together is carried out manually. To make a good mixture (good taste) one requires good knowledge of foods to be mixed. Sometimes it is very critical to handle appropriate quantity of particular food items. Spices, salt, chillies, oil,

As of 2013 the ATmega 328 is commonly used in many projects and autonomous systems where a simple, low speed, low cost, micro-controller is needed. perhaps the most common implementation of this chip is on the popular Arduino development platform, namely the Arduino Uno and Arduino nano models

This project is mainly based on to reduce or decrease man power using natural as well as technical ideas. It is an innovative technique which is totally hygienic. It can help to reduce time. As the popularity in tea will

increase This technique is very easy to do more work in short time period

The provision of the world population with food represent one of the most important future challenges for science and technology in this context of many different objectives arise. In many countries of the world the most urgent task is to satisfy the original nutritive minimum requirement on other hand food has further function in the industrialized nations as the settlement of the special enjoyment or the promotion of health.

Thus, the food is produced or processed under very different conditions. A considerable share of the population consumes products directly out of nature or out of the characteristic agriculture. In the industrialized nation people meanwhile eat up predominantly such food which stems out of a far mechanized agriculture and are prepared in large industrial plants.

### Keypad-

Keypad allows users to input data while a program is running. This tutorial shows you how to connect a 6 button keypad to an Arduino and how to use library keypad. A keypad is often needed to provide input to an Arduino system and membrane type keypads are an economical solution for many applications

Atmega are popular for :

- low cost
- wide availability
- large user base

free development tools and serial programming (and reprogramming with flash memory)

#### D). HARDWARE DESCRIPTION

##### Microcontroller ATmega328

The microcontroller is the heart of the proposed embedded system. The ATmega328 is a low-power CMOS 8-bit microcontroller based on the AVR enhanced RISC architecture. By executing powerful instructions in a single clock cycle, the ATmega328 achieves throughputs approaching 1 MIPS per MHz allowing the system designed to optimize power consumption versus processing speed.

##### Function block-

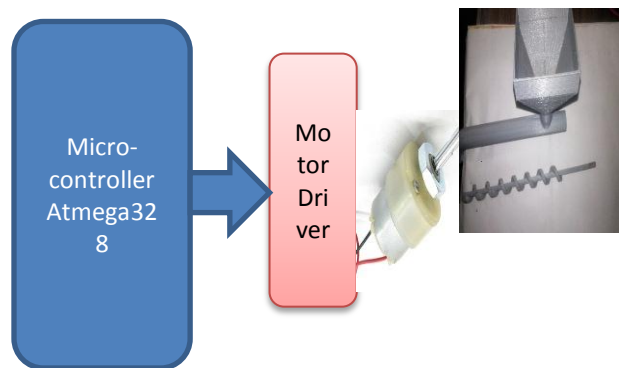


Fig.2 function block diagram

#### Block Diagram

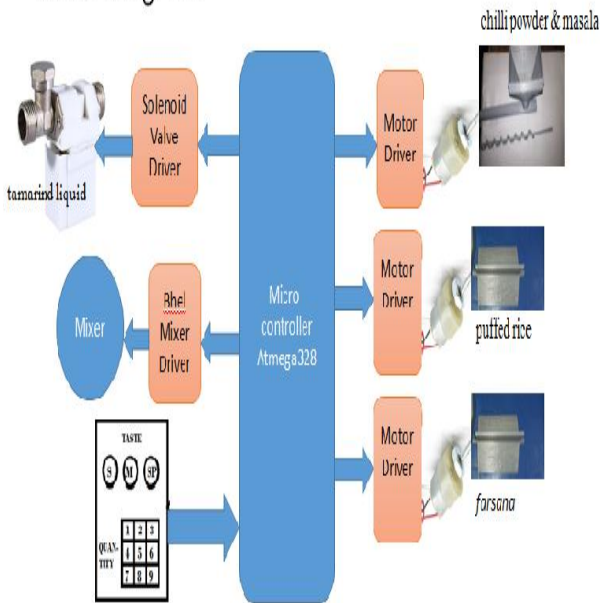


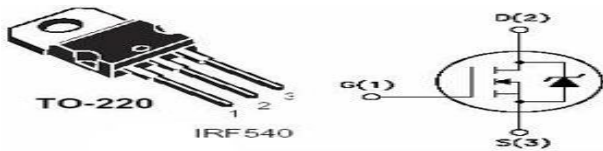
Fig.1 block diagram

#### B) Parts of system-

- 1) Dc motors
- 2) Device control
- 3) Analog to digital convertor
- 4) Microcontroller ATmega328
- 5) Motor driver circuit
- 6) Keypad
- 7) Relay circuit

#### C) Flow of working-

- i. Microcontroller ATmega328 is used as it contains inbuilt ADC and this project contains many sensors which need to be given to ADCs. The ATmega328 is a low-power CMOS 8-bit microcontroller based on the AVR enhanced RISC architecture.



- Motor driver plays important role to drive chilli powder & masala block of project
- Motor driver is designed by using component MOSFET irf540

### Features (IRF540)

- Drain-Source Volt (Vds): 100V
- Drain-Gate Volt (Vdg): 100V
- Gate-Source Volt (Vgs): 20V
- Drain Current (Id): 30A
- Power Dissipation (Ptot): 150W
- Type: N-Channel

### Motor Driver Circuit

A "freewheeling diode" is put into a circuit to protect the switching device from being damaged by the reverse current of an inductive load. It is normally placed in a circuit so that it does not conduct when the current is being supplied to the inductive load.

When the current flow to an inductor is suddenly interrupted, the inductor tries to maintain the current by reversing polarity and increasing the voltage.

Without the "freewheeling diode" the voltage can go high enough to damage the switching.

With it, the reverse current is allowed to flow through the diode and dissipate.

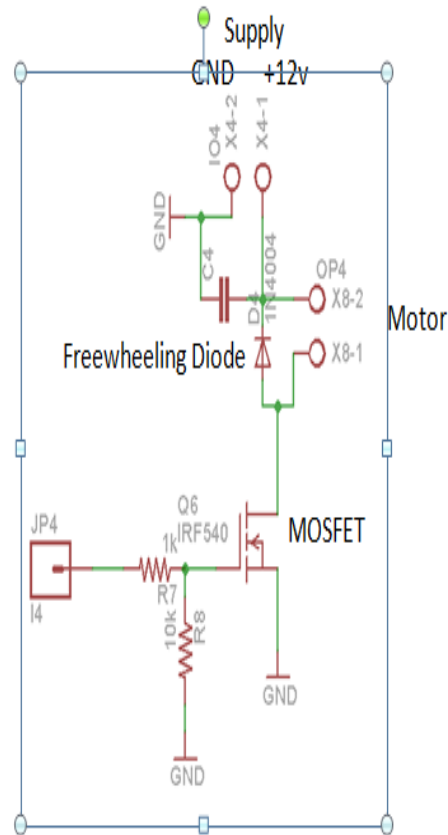


Fig.3 freewheeling diode circuit diagram

### LCD (Liquid Crystal Display)-

LCD (Liquid Crystal Display) screen is an electronic display module and find a wide range of applications. A 16x2 LCD display is very basic module and is very commonly used in various devices and circuits. These modules are preferred over seven segments and other multi segment LEDs.

LCD(liquide crystal display)screen is an electronic display module and find a wide range of application .A 16\*2 LCD displayd is very basic module and is very commonly used in various devices and circuits .These modules are preferred over seven segments and other multi segment LEDs are economical ;easily programmable

; have no limitation of displaying special & even custom character 'animation and so on.

A 16\*2 LCD means it can display 16 characters per line and there are 2 such line ,In this LCD each character is displayed in 5\*7 pixel matrix . This LCD has two register s ,namely ,command and Data

The command register stores the command instruction given to the LCD



Fig.4 Liquid Crystal display(LCD)



Fig.5 Hardware mounting diagram

## Advantages-

- Total hygienic.
- NO manual error of mixing in proper proportional.
- Due to proper mixing bhel is very testy.

- This project helps to reduces the man power
- There is increased efficiency and safety regarding systems ,facilities products.
- Automatically controlled machines guarantee constant Quality with minimized energy waste functioning at the a optimum level requiredin this specific time period .
- Limiting the no of production stop and restart of the machine for inspection .

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