

INDUSTRIAL SOLUTION



PUBLIC PRIVATE RESEARCH NETWORK (PPRN)

JABATAN PENDIDIKAN POLITEKNIK DAN KOLEJ KOMUNITI

2015-2018



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Galeria PjH, Aras 5-7, Jalan P4W, Persiaran Perdana, Presint 4, 62100 Putrajaya



Penaung

Prof. Dato' Ts. Dr. Mohd Ismail Bin Abd Aziz

Penasihat

Ts. Dr. Mohammad Naim Bin Yaakub

Penyelaras

Dr. Ishak Bin Mohamad

Cr. Dr. Saifuddin Kumar Bin Abdullah

Ts. Dr. Mohd Norhadi Bin Muda

Ketua Pengarang

Ts. Dr. Choong Chee Guan

Sidang Redaksi

Pn. Azua Hanim Binti Mohd Said

Pn. Nadzirah Binti Muhammad Merejok

Pn. Rozanna Binti Sa'ari

Cik Siti Zubaidah Binti Ibrahim

Grafik

Pn. Elmiza Binti Roslan

**ISI KANDUNGAN INDUSTRIAL SOLUTION
PUBLIC PRIVATE RESEARCH NETWORK (PPRN)**

Politeknik dan Kolej Komuniti Malaysia

2015-2018

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PROJEK



2015

PROJEK PUBLIC PRIVATE RESEARCH NETWORK (PPRN) 2015

Politeknik dan Kolej Komuniti Malaysia

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HALAGEL RAIL-LIFTER MACHINE

WAN MOHD NAGUIB WAN ABD. RAHMAN, MOHD FAIZAL REZA YAACOB,
MOHD NASAEI SHAHID OTHMAN, MUHAMMAD KHOIRUDIN ZAKARIA,
MOHD KHAIRUL ANUAR SHAH HASSAN, MOHD BUKHARI MD JAHI & NORHASLINA ASRI
POLITEKNIK SULTAN AZLAN SHAH
wmnaguib_warahman@yahoo.com

HALAGEL PRODUCTS SDN. BHD. is currently facing ergonomic problem specifically at Rock Salt Unloading Section. Presently, three (3) workers are responsible in operating the Rock Salt Unloading Section. Their tasks are being divided into two part which are: (1) transporting of Rock Salt Pallet containing 60 bags of 25-kilogram Rock Salt sack each from storage area to unloading section and (2) carrying Rock Salt sack, open-up the sack and unloading raw rock salt into hopper of Rock Salt Mixing Machine manually. Currently, the task of unloading 25 kilograms of Rock Salt each, into hopper is done manually by two workers. Due to high speed of production, the task to unload more than 60 bags of 25-kilogram Rock Salt for each bag to the hopper has caused the workers to experience back pain and exhaustion. The ergonomic issue has resulted workers to left the company. A solution has been proposed to replace or minimize the use of human strength to lift up the Rock Salt bag and unload it into the hopper. The solution called HALAGEL-RAIL LIFTER SYSTEM for Ergonomically Efficient Rock Salt Unloading System (RL System). The RL System consists of lifting machine with free-railing type wheels. The HALAGEL RL System helps to lift the Rock Salt pallet to the entrance of hopper upon receiving from forklift. The height of RL System can be adjusted manually to match the height of hopper resulting Rock Salt bag to be easily fed into the hopper. This approach has tremendously reduced the issue of back pain and exhaustion of the workers. Indirectly, the number of workers needed to operate the unloading section is being reduced to one worker from two workers, previously.



Halagel rail-lifter machine

PPRN
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Z-CHANNEL ROLLER BENDING MACHINE

PUTRI IRDA AB RAHMAN, ALAWIAH ABDULLAH,
MOHD FIRDAUS MOHD BANDONG & MOHD HELMI ABD HALIM
POLITEKNIK SULTAN AZLAN SHAH
putri_irda@psas.edu.my

The objective of this project is to produce a mechanical design and develop a Z-Channel Roller Bending Machine. Z-Channel Roller Bending Machine is an innovation to fabricate top and bottom flange to main elbow body component. The elbow components were used to assemble side rail as a cable support in LRT/MRT as well as construction industries. The machine is to be used to eliminate assembling elbow parts by welding joint processing and is also can helps to improve the quality of elbow component. The designing process for this machine was using CATIA V5R21 software and it is 3D model design. The machine is to be used to bend straight Z-Channel plate into curved shape. During the process, the Z-channel plate will pass through 3 special rollers to ensure the desired outputs are well shaped. The plate is rolled between two roller drivers until the preferred bend radius profile is obtained. The shape will be represented by the roller corresponded to the profile's cross section. Within two minutes a completed curvature elbow components were produced. The machine is capable to produce more than 10 times finished goods output as compared to the welding joining process method. The handling of this machine can be also operated by unskilled worker and it will contribute to better economic scale of labour.



Z-Channel Roller Bending Machine

AUTOMATIC MEAT SLICING (AMS) MACHINE FOR BABARITTOS DELIGHT

NOR'AIN SENIN & NOORHIDAYAH RAMLI
POLITEKNIK SULTAN AZLAN SHAH
nor'ain@psas.edu.my

The purpose of this project is to modernize the old-style method in slicing the chicken meat, purposely for Babaritos Delight Food Truck. The main ingredient of Burritos is slices of boneless chicken meat, where each slice has to be thick. Due to high demand of Burritos, the old-fashioned method; which is using knife is no longer practical. The machine consists of several moving circular blades, which each gaped. The meat chicken will be placed on the moving conveyor, and moves through the blades and will be dispensed into a detachable hygienic tray. Food Grade Hygienic Conveyor Belt is used for hygienic purpose. A motor will control the speed of the blades and the conveyor. The additional feature is the existence of the wheels at the base of the machine to make it transportable. The AMS machine is predominantly to help the company to increase the output of sliced meat and can reduce the number of workers. The AMS machine is only requires one worker for the operation and the output can be up to 30 kilograms in 30 minutes, meanwhile the quality of the sliced meat is more superior as most of the slices meat are precisely 5mm thick.



Automatic Meat Slicing (Ams) Machine for Babarittos Delight

PPRN
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DEVELOPMENT OF ONION PEELING MACHINE TO ASSIST SMALL MEDIUM ENTERPRISES (SME) INDUSTRY

HALIMAH AB RAHIM, MUHAMAD HISSAMMUDDIN SHAH ZAINAL ABIDIN & MOHD HARIZ IBRAHIM
POLITEKNIK SULTAN HAJI AHMAD SHAH & KOLEJ KOMUNITI PAYA BESAR
halimah@polisas.edu.my

Onion peeling machine is developed for a Small and Medium Industry (SME). The machine is equipped with horizontal rotating tromp peeler and aided with compressed air to remove the outer layers of the onion skin. In Food Industry, a conventional method for peeling onion is still applied and it leads to the lack of productivity, efficiency and time consuming. This project will focus on development of onion peeling machine including determination of machine peeling capacity and the percentage of removed shallots skin towards three different types of shallots namely Siam, India and Rose India. Results shows that the peeling capacity for India and Siam shallots skins have no significant difference compare with India Rose. The percentage of removed shallots skins were higher for Siam (84%) and India (80%) shallots due to the very thin membrane of the skins compared to India Rose (76%) that have strong roots and thick membrane layers. As a conclusion, this onion peeling machine is developed successively for different types of shallots and capable to peel other onion skin in order to produce higher output. Therefore, this project will aid the development of SME industries especially in a services sector that contributed the highest percentage to Gross Domestic Product (GDP).



Automatic Meat Slicing (Ams) Machine for Babarittos Delight

AUTOMATIC SATAY SLICING MACHINE

AMEERUZ KAMAL AB WAHID, MUHAMMAD IZAD YUSOFF,
ABDUL HAFIZ ABDUL HAMID & MAI NOOR ASIAH TAN ZALILAH
POLITEKNIK SULTAN AZLAN SHAH
ameeruz@psas.edu.my

Currently, the process of producing satay required meat to be sliced and skewed manually. Generally, one worker can slice up to 10 skew per minute. Due to high demand in satay industries, the industry is facing pressure to produce more skew of chicken satay. The manual method to skew chicken meat is no longer practical, tedious, not economical and ergonomical which is also not feasible to workers. Furthermore, it is not financially sustainable and the company need to expand in term of production, space, and marketing. Due to the growing demand for satay product in the market, the effectiveness of the satay processing machine must be improved. Many of existing machines for skewering are not automatic where the skewering process is done manually. This research is focused on overcoming the time difference between manual and automation skewering process. Getting the same size of the meat is the main concern in producing chicken satay skew. Automatic Satay Slicing Machine (ASSM) will help the food industry in terms of saving time and thus will increase product sales.



Automatic Satay Slicing Machine

PTSB GO GREEN BOAT

FIRDAUS MOHAMED SAHID, KOH FOO HIN & SYUKRUL HASSANI JAMALUDIN
POLITEKNIK TUANKU SULTANAH BAHYAH
firdaus@ptsb.edu.my

Pencemaran kawasan berair perlu ditangani bagi memastikan generasi akan datang dapat menikmati kelestarian alam semulajadi dengan lebih baik. Bagi mengurangkan masalah pencemaran air, sebuah produk inovasi mengutip sampah terapung dibangunkan untuk diaplikasi secara optimum. Produk inovasi ini boleh diaplikasi di kolam, tasik, sungai, laut dan empangan. Komponen yang digunakan dalam proses pembangunan produk ini adalah gentian kaca, pelampung, gam panas, pam vakum, sumber kuasa bateri, enjin kuasa bot, pemacu dan jaring. Dua pendekatan yang boleh diaplikasikan iaitu menggunakan pam vakum bagi kelompok sampah yang kecil dan jaring digunakan bagi kelompok sampah yang besar. Selain daripada itu, produk ini dikendalikan sepenuhnya oleh pekerja terlatih dan mampu mengutip sampah di kawasan yang luas. Produk ini juga memudahkan pengumpulan sampah secara teratur dan sistematik berbanding dengan kaedah manual yang menggunakan perahu dan penyekat jaring. Dengan terhasilnya produk inovasi ini, masalah mengutip sampah terapung di kawasan berair dapat diatasi dengan lebih cepat dan berkesan.



PTSB Go Green Boat

INKUBATOR PENETASAN TELUR

IZHAR AHMAD, FAIZAL AHMAD & HANIZAM IBRAHIM
POLITEKNIK TUANKU SULTANAH BAHYAH
izhar@ptsb.edu.my

Inkubator penetasan telur yang sedia ada di dalam pasaran pada masa kini menghasilkan jumlah penetasan telur yang rendah. Fenomena ini disebabkan kesukaran dalam mengawal kelembapan dan suhu udara di dalam inkubator. Inkubator sedia ada menggunakan kaedah dengan meletakkan bekas air di bahagian atas atau bawah dalam mengawal kelembapan. Kaedah tersebut di dapati sukar untuk mengekalkan kelembapan dan suhu yang bersesuaian dengan jenis telur terutamanya pada musim panas atau kemarau. Keadaan ini boleh menjejaskan proses perkembangan embrio. Projek pembangunan Inkubator penetasan telur ini direkacipta yang mempunyai satu ruang pemanasan udara terdiri dari pemanas (*heater*) dan kipas untuk menyalur keluar udara melalui salur pemanas. Produk ini juga dilengkapi dengan pelembab udara (*humidifier*) yang boleh menghasilkan wap air yang berzarah halus supaya mudah bercampur dengan udara panas dan seterusnya menghasilkan kelembapan udara mengikut peratusan yang ditetapkan. Dengan terhasilnya produk inkubator ini pelbagai pihak dapat menerima faedah dan meningkatkan penetasan telur lebih efektif.



Inkubator Penetasan Telur

PPRN

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CRISP PROCESSOR (AGV-01)

AIZZI SHAKIR ABDUL KADIR, MAHANOM ISMAIL, RAHMAT OMAR & KASLIA KASIRAN
KOLEJ KOMUNITI KUALA LANGAT
aizzishakir85@gmail.com

Crisps Processor atau AGV-01 ini merupakan sebuah mesin separa automatik yang berfungsi sebagai mesin pemprosesan kerepek khusus bagi Industri Kecil dan sederhana (IKS) yang mengusahakan penghasilan kerepek secara manual. Proses penghasilan kerepek secara manual adalah perlahan dan memenatkan terutamanya dalam proses menyagat, menggoreng dan mengangkat. Oleh yang demikian, AGV-01 dibangunkan bagi mempercepatkan proses penghasilan kerepek serta meningkatkan produktiviti industri dengan menggabungkan kesemua proses utama penghasilan kerepek tersebut. Penggabungan proses tersebut bukan sahaja menjimatkan masa penghasilan malah ianya meningkatkan kuantiti pengeluaran kerepek sehingga 5 kali ganda berbanding kaedah manual yang diamalkan sedia ada. Metodologi pembangunan produk AGV-01 ini menggunakan pendekatan kaedah R&D iaitu pembangunan produk baharu oleh Ulrich dan Eppinger, 2012. AGV-01 ini tidak mengubah rasa asli kerepek sedia ada yang diusahakan, malah ianya menambahbaik dan meningkatkan lagi kualiti dan tekstur kerepek tersebut. AGV-01 ini bukan sahaja menjimatkan masa dan peningkatan kualiti serta kuantiti pengeluaran sahaja, malah pihak industri juga dapat menghasilkan sehingga 5 jenis kerepek berasingan iaitu kerepek berasaskan pisang, ubi kentang, ubi kayu, keladi dan keledak.



Crisp Processor (Agv-01)

REDESIGN AND DEVELOPMENT OF PROTOTYPING CAPPING FOR BOTTLE DRIP

RAMLI BESAR, AHMAD ROSDI ABDUL RAHIM & SAIFUL BAHRI MOHAMED
POLITEKNIK KUALA TERENGGANU
ramli@kkktu.edu.my

Based on the market trend analysis, the demand for plastic product especially bottle capping will be increased rapidly thus the company has to increase the production rate to meet the future demand. The company currently experiencing high rejection rate of bottle capping due to inconsistency of product quality produced. Injection moulding is the most common plastic processing technique used to produce hollow and thin wall object from thermoplastic materials. The quality of the bottle cap depends on various processing parameters. The major parameters affecting the performance of injection moulding are melting temperature, pressure and ambient temperature. Systematic experimental work is employed to find the best factor setting for on-target responses and minimized variability. A two level full factorial design is used to plan systematic experiment. Getting the right combination and optimizing the processing conditions / parameters will increase moulding process efficiency and productivity. Design of Experiment (DoE) methodology is used to solve the quality issues of product manufactured. The measured response is analyzed mathematically and statistically for generating the best fit of mathematical model representing the system behaviour. This model is then used to find the best factors setting for on target responses and minimized variability of product produced. This is to redesign the bottle cap by considering all constraints available and aiming for the long term investment. Designing of new bottle cap that focused on the following criteria reduced or eliminated the two tests conducted previously. The used of Failure Mode and Effects Analysis (FMEA) for identifying all possible failures in designing and assembly process of a new design bottle cap were applied. The detailed design of bottle cap which comprises of three elements as follows: 1. Twin Port Design Bottle Cap that have been redesigned with specific shape characteristics to cater for automatic assembly processes; 2. Rubber Disc is redesigned by having two port instead of previously one; and 3. Aluminium Seal by replacing the “ring puller” that has a perforated line which provides protection from getting contaminated.



Redesign and Development of Prototyping Capping for Bottle Drip

PROJEK



2016

PROJEK PUBLIC PRIVATE RESEARCH NETWORK (PPRN) 2016

Politeknik dan Kolej Komuniti Malaysia

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PPRN

1

MESIN PENGADUN SOS CHAR KUEY TEAW

MOHD ELIAS DAUD & ZULKARNAIN HAMID
POLITEKNIK SULTAN SALAHUDDIN ABDUL AZIZ SHAH
mdeliaspku@yahoo.com

Industri Kecil dan Sederhana (IKS) kini sentiasa bersaing dalam perniagaan bagi memastikan teknologi pembuatan yang merangkumi sistem automatik dan separa automatik berkembang dan berubah dari semasa ke semasa. Tujuan projek ini dibangunkan adalah bagi menghasilkan satu mesin pemprosesan sos separa automatik untuk membuat sos char kuey teow. Konsep mesin pengadun ini adalah berdasarkan prinsip mekanikal dan kawalan elektrik. Mesin ini dikawal oleh PID (*Proportional-Integral-Derivative*) bagi mengawal suhu dan masa pada plat pemanas. Manakala, media pemanasan menggunakan minyak silikon. Sebagai tambahan, mesin ini juga menggunakan kaedah atau cara pengisian yang mampu mengekalkan nilai pH yang sesuai iaitu antara 4 hingga 5. Projek ini boleh memberi manfaat kepada pengguna melalui kecekapan penggunaan peralatan khusus untuk mesin pengadun. Hasilnya, ia dapat meningkatkan pengeluaran kuantiti dan kualiti produk.



Mesin Pengadun Sos Char Kuey Teaw

FOOD TRUCK – IMPROVING POWER SUPPLY (SOLAR POWER)

AZHAR ABDULLAH, IBRAHIM ABDULLAH, ZULKIFLI MOHD YUSOFF & NOOR HISHAM KOYA
POLITEKNIK KOTA BHARU
azhar@pkb.edu.my

Restaurants normally have fixed connections to the grid for the electricity need. This is also apply to the food truck entrepreneurs where they also need the electrical power supply that can be used to operate electrical equipment. This makes mobile generators as an important tool for food trucks. However, the use of fuel-generating generators is not only noisy, it also pricy since the price of fuel is quite expensive and it is also not good for environment. FIC KITCHEN TECHNOLOGY SDN. BHD through PPRN program have offered researchers from Public Institutions to submit their proposals to improve existing methods for generating electricity in Food Trucks and to identify ways to improve ventilation in Food Trucks. Solar energy is one of renewable energy and will not be exhausted. The use of solar energy is soundless and environmental friendly. The power supply will not only able to generate lights but also bigger machine such as food warmer heater, coffee make, sink water pump, blender and 1HP aircond. The result of the study showed the effectiveness of solar systems in food truck in terms of fuel cost savings as well as the system power supply energies for electrical equipments. This project has opened another era of advancement in the production of food trucks using an eco-friendly supply system.



Food Truck – Improving Power Supply (Solar Power)

ONION PEELER MACHINE

SITI NORAZMA MUHAMOOD, NOR AZURA OSMAN & AZHAR RAMLI
POLITEKNIK SULTAN AZLAN SHAH
zurapsas@gmail.com.my

This paper presents the design and fabrication of onion peeler machine that can produce peeled onions at large quantity in a short time. A machine is designed by using drum application with AC motor control system and microcontroller. The drum speed is controlled through the use of a variable frequency drive (VFD) at a maximum speed of 50 rpm. Meanwhile, the microcontroller is used to control the motor rotation at the specified time. The drum will rotate the onions in one direction at maintain speed without damaging the onion structure. When it rotates, there will be friction between the onions and the wall of the drum. This machine allows the onions to be peeled within 3 to 5 minutes with an ideal speed of 35 rpm. It also can peel 2 to 3 kg onions and save up to 3 times from manual peeling method. The minimal usage of electricity, low maintenance and can be operated by only one employee are the added benefits to the industry. With the innovation of this onions peeler machine, it is expected to meet the demands of Small and Medium Enterprises (SME) industries in producing low cost machines with high productivity products.



Onion Peeler Machine

LEMON GRASS BLENDER MACHINE

SYAHRUNIZAM BUYAMIN, MOHD FAUZI OTHMAN & ZAINORA KAMAL LUDIN
POLITEKNIK SULTAN AZLAN SHAH & POLITEKNIK SULTAN IDRIS SHAH
syahrnizam@psas.edu.my

This paper presents the design, fabrication, installation and testing of lemon grass blender machine to enhance productivity and efficiency of the lemon grass blender production. Currently, the blending process of lemon grass using smaller size of blender machine required a long process due to the number of sessions needed as compared to bigger blending machine. This is a very tedious work in order to achieve the targeted amount of fine blended lemon grass output. This situation contributes to a longer process of time. The quality of blended lemon grass is also need to be improved hence the quality of fine blend lemon grass can be produced. This machine is designed by using stainless steel blender jar with AC motor and Programmable Logic Controller (PLC) panel system. The process of blending the lemon grass can be controlled according to the desired time. The selections of 5 minutes, 10 minutes or 15 minutes time can produce 3 different types of fine blended lemon grass. The lemon grass blender machine helps to increase the productivity of fine blended lemon grass four times higher which approximately 20 kg per day compared to the use of previous type of machine. Workers turnover can be decreased with the use of Lemon Grass Blender Machine which can reduce the exhaustive of the workers.



Lemon Grass Blender Machine

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VENDING MACHINE MONITORING SYSTEM

FAIZAL AHMAD & WAN NOR HARMAN WAN YAHAYA
POLITEKNIK SULTAN ABDUL HALIM MUADZAM SHAH
faizal_polimas78@yahoo.com

Pada masa kini perniagaan berkonsepkan Vending Machine memainkan peranan penting dalam perniagaan jualan runcit secara automatik untuk produk minuman dan makanan ringan. Sistem urusniaga yang mudah dengan kos tenaga kerja yang minima dan keuntungan yang tinggi menyebabkan pengusaha berminat menceburi bidang perniagaan layan diri ini. Perniagaan berkonsepkan Vending machine sediaa mempunyai beberapa kelemahan antaranya kegagalan fungsi mesin berpunca dari kegagalan teknikal dan vandalism. Berdasarkan kelemahan tersebut Vending Machine Monitoring System dibangunkan bertujuan memantau operasi semasa mesin secara telemetri menggunakan rangkaian GSM. Sistem ini merupakan sistem komunikasi antara mesin dan pengusaha yang membolehkan sebarang kerosakan atau ralat pada mesin dipantau secara terus setiap masa untuk makluman dan tindakan pengusaha. Sistem ini dilengkapi litar kawalan, Sensor dan MDB Reader yang berfungsi mentafsir sebarang data ralat dan menghantar data tersebut melalui rangkaian GSM ke sistem penerima pengkalan data dan telefon bimbit pengusaha atau juruteknik bertugas. Melalui maklumat yang diperolehi, tindakan baik pulih mesin dapat dilaksanakan segera dan meminimakan kerugian hasil jualan oleh mesin.



Vending Machine Monitoring System

DESIGN OF 500L HEATED JACKETED TANK

MOHAMAD ADHAR MOHAMAD NARSARDIN & RAZAIDAH RAZALI
POLITEKNIK SULTAN AZLAN SHAH
mohamadadhar@gmail.com

This project is created to increase the production productivity of company up to three times and improve the company's product quality. The Jacketed Tank is able to cook up to 500 liters of lime juice in 20 minutes. The inside of the tank is developed using SS316 stainless steel material whereas SS304 is used for the outside and is developed using double layered concept. It is also coated using rock wall fiber glass for insulation material to withstand hot temperatures in cooking process. The tank is also equipped with a 0.75KW rated three-phased induction motor with a fixed speed of 36 rpm using direct on line control. As an added value, two sensor units are used to display the degree of temperature during cooking process. A sensor is placed in the tank to display a thin lemonade temperature and a unit of sensor is placed between two layers of the tank to indicate the degree of oil temperature. Furthermore, on the side of the tank is added with a thin lime display level using a glass tube that measures the amount of lime juice from 100 liters to 400 liters. The tank is modified by adding stove at the bottom of the tank that use gas to generate fire that cook the lime juice.



500L Heated Jacketed Tank

SABAK SALAI OVEN MACHINE

MOHD KHAIRUL ANUAR SHAH HASSAN, MOHD FIRDAUS MOHD BANDONG &
AMEERUZ KAMAL AB WAHID
POLITEKNIK SULTAN AZLAN SHAH
khairul_anuar@psas.edu.my

Sabak Salai Oven (SSO) is a machine that use to smoke foods from varied products such as meat, fish, chicken and duck. This smoked food is famous in Southern Malaysia. Food such as smoked meat is from animals that are hunted in the forest and then smoked to preserve the meat from getting smelly or spoilt. The purpose is to preserve the meat before getting out of the forest. SSO replaced the traditional way to smoke the food, from open system smoke to close system smoke. In addition, this SSO is automatic system to help produce good quality smoked food. This SSO will helps the smoked food industry to go further and expand their business. Furthermore, this SSO will ensure the process of smoking the food to be more hygenic because the use of food grade material. Stainless steel 304 type is used because it is easy to be cleaned. Other than that, this SSO also ensure the time process of smoking will be reduced and it will increase the production number for one cycle. This SSO will definitely helps the owner of this smoked food industry to improve their business.



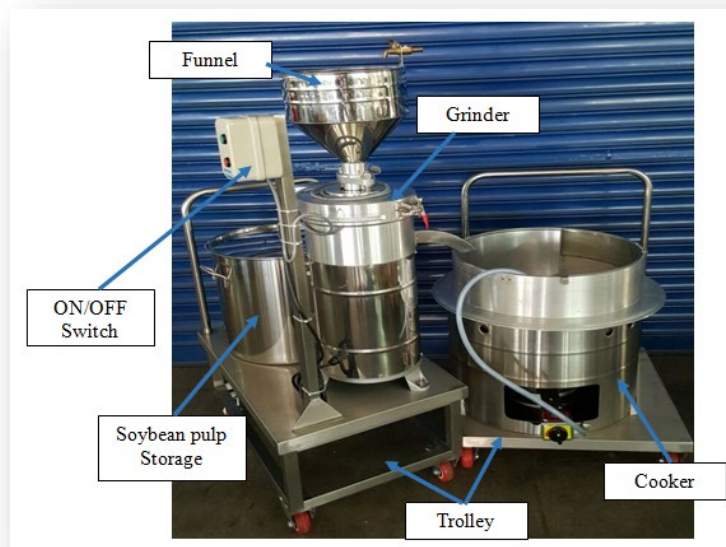
Sabak Salai Oven Machine

PPRN
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SOYBEAN MILK GRINDING AND FILTRATION MACHINE

SAW CHUN LIN, MOHD NAZRIN NAHAR, CHOONG CHEE GUAN, AZMI NAROH
POLITEKNIK UNGKU OMAR & POLITEKNIK TUANKU SYED SIRAJUDDIN
sawchunlin@puo.edu.my

Fresh soybean milk grinding and filtration machine is aimed to design and develop a machine that will minimize the production time and human effort during the extraction of soymilk by combining the grinding and filtration process into a single machine. The production process started by soaking the dry soybeans in water for 8-10 hours. After soaking, the soybeans were fed into the machine and the machine will start to grind the soybean with the aid of water. After that, the soymilk is separated from the pulp through a rotating conical filter medium. The size of the grinding stone will determine the amount of soy milk produced. The aim of this research is to design and develop a suitable size of grinding stone to be rotated by the electric motor of 1.5 horsepower that is used in fresh soybean milk grinding and filtration machine.



Soybean Milk Grinding and Filtration Machine

VADEI GRINDING MACHINE

YAAKUB OMAR & WAN MOHD ZAMRI WAN AB. RAHMAN
POLITEKNIK SULTAN SALAHUDDIN ABDUL AZIZ SHAH
yaakub2499@yahoo.com.my

Kuih vadei merupakan sejenis makanan dari India selatan yang menggunakan kacang dal serta beberapa campuran rempah sebagai bahan utama. Dalam industri pembuatan kuih vadei, mesin pengisar yang digunakan oleh pihak industri sekarang hanya boleh mengisar dalam kuantiti yang sedikit iaitu 1 kg dalam masa 2 jam. Namun, bagi memenuhi permintaan pelanggan, sesebuah perusahaan perlu mengisar 15 hingga 30 kg kacang dal sehari. Justeru, Vadei Grinding Machine direka bentuk untuk menyelesaikan permasalahan dalam membuat kuih vadei. Mesin ini dapat mengisar kacang dal dalam kuantiti yang banyak iaitu 10 kg dalam masa 15 minit dengan menggunakan motor elektrik 1 fasa dan hanya boleh melakukan kerja-kerja ringan mengikut kuasanya iaitu 5 hp ke bawah. Selain itu, batuan beku atau batuan igneus digunakan dalam reka bentuk mesin pengisar ini. Pembangunan Vadei Grinding Machine bukan sahaja boleh mengisar kacang dal malah boleh digunakan untuk mengisar cili kering, beras, masala dan penghasilan rempah ratus masakan India.



Vadei Grinding Machine

TRADITIONAL SALAD (ULAM) SLICING MACHINE FOR NASI KERABU

MOHD ASMADI IDRIS, YUSUF ISMAIL, SAIFFUL BAHARI OMAR & FIZATUL AINI PATAKOR
POLITEKNIK MERLIMAU MELAKA
asmadi@pmm.edu.my

Pokku Enterprise merupakan sebuah syarikat Bumiputera yang menjual nasi kerabu ayam dan daging. Bagi menyediakan ulaman untuk nasi kerabu, syarikat ini terpaksa memotong sayuran ulam dalam skala yang besar untuk memenuhi dua buah kedai miliknya di Kuala Lipis. Sumber manusia yang ramai dan masa yang lama diperlukan untuk memotong ulaman ini. Justeru melalui PPRN, kumpulan penyelidik menyelesaikan permasalahan syarikat ini dengan mereka bentuk sebuah mesin pemotong ulam yang bersesuaian untuk kegunaan syarikat. Ia direka agar memenuhi keperluan syarikat yang mahu kepantasan dalam pemotongan sayur dan pada masa yang sama mengekalkan kesegaran sayur tersebut. Ianya merupakan sebuah mesin yang mesra pengguna yang hanya menggunakan seorang pengendali mesin pada satu-satu masa.



Traditional Salad (Ulam) Slicing Machine for Nasi Kerabu

LAKSA MACHINE

YUSOF ISMAIL, MOHD ASMADI IDRIS, SAIFFUL BAHARI OMAR & FIZATUL AINI PATAKOR
POLITEKNIK MERLIMAU MELAKA
yusof@pmm.edu.my

Norasmani Mohammad Enterprise merupakan sebuah syarikat Bumiputera yang menghasilkan mee laksa. Pihak syarikat memerlukan bantuan dari segi proses menguli doh tepung laksa. Sebelum ini, proses menguli dilakukan secara manual dan ia mengambil masa yang panjang untuk disediakan. Selain itu, syarikat juga memerlukan bantuan bagi membantu proses pengukusan laksa konvensional yang mengambil masa 2 hingga 3 jam untuk menghasilkan 4kg laksa. Justeru, sebuah mesin pemprosesan laksa dibangunkan mengikut spesifikasi yang dikehendaki syarikat. Mesin yang dibangunkan ini dapat membuat doh laksa yang boleh mengadun sehingga 20kg doh laksa dalam sekali proses mengadun. Selain itu, mesin ini juga mampu untuk menukarkan doh laksa yang telah di adun ke dalam bentuk laksa untuk direbus. Mesin ini juga mampu mengeluarkan dan merebus laksa pada kuantiti 20kg laksa pada setiap jam (20kg/jam). Sebagai tambahan penyelidik juga merekabentuk Heavy Duty Blender bagi memudahkan proses membuat perencah laksa.



Laksa Machine

CURRY PUFF MACHINE

YAAKUB OMAR, WAN MOHD ZAMRI WAN AB. RAHMAN
POLITEKNIK SULTAN SALAHUDDIN ABDUL AZIZ SHAH
yaakub2499@yahoo.com.my

Karipap merupakan sejenis makanan yang popular di Malaysia di mana ia menggunakan bahan seperti daging dan kentang sebagai inti utama. Permasalahan yang sering dihadapi oleh industri dalam penghasilan karipap ialah kaedah pembuatannya masih secara konvensional. Ini menyebabkan kuantiti keluaran pastri yang boleh dihasilkan dalam masa sehari amat sedikit dan memakan masa yang lama. Untuk menyelesaikan permasalahan ini, sebuah mesin pengadun, peleper dan alat pencetak karipap direka untuk memudahkan proses pembuatan karipap seterusnya meningkatkan kuantiti penghasilan karipap. Justeru, Curry Puff Machine direkabentuk untuk menyelesaikan permasalahan dalam pembuatan kuih karipap. Cadangan penyelesaian yang dilakukan adalah untuk menggantikan atau meminimumkan penggunaan tenaga manusia untuk menghasilkan adunan doh karipap. Melalui Curry Puff Machine ianya dapat menghasilkan lebih daripada 3600 keping karipap bergantung kepada kecekapan pekerja. Dengan penciptaan alat pencetak karipap, penguli dan peleper doh dapat meningkatkan produktiviti syarikat.



Curry Puff Machine

ELECTRONIC QUAIL EGG INCUBATOR WITH AUTOMATIC HUMIDIFIER CONTROL

IZHAR AHMAD, FAIZAL AHMAD & HANIZAM IBRAHIM
POLITEKNIK TUANKU SULTANAH BAHİYAH
izhar@ptsb.edu.my

Poultry farm is a place where hen and female quails lay eggs to breed its population. Incubation is a technique of egg hatching either in a natural or artificial method. In a modern world today, an egg incubator is designed as a replacement for the hen or female quail's role in nature in order to incubate and hatch their eggs successfully. To fulfill the needs and demands of growing poultry facilities and farming industry, artificial incubators are designed to monitor temperature, ventilation and humidity with accuracy and so that it will be more reliable and feasible to hatch a large number of eggs at one time. However, some limitations to industrialized incubator include low hatching rates with around 50% of affected quail quality. The microcontroller PLC Omron 60 I/O is used to control the tray movement while the temperature is controlled by Omron temperature controller. To control a perfect humidity level, an innovation of hot air mixtures and water mist produced by the air humidifier is utilized in this product. This method has shown that humidity level is well stabilized and is not affected by environmental conditions. Within two months, our test results indicated an increase of efficiency with 80% of successful hatching rates. The percentage of hatching is also influenced by egg storage periods before being put into the incubator.



Electronic Quail Egg Incubator with Automatic Humidifier Control

SEMI-AUTO CHEESE CAKE FILLING MACHINE

ROHANIZA M. ZALI, ROHANA SAHAK & SALIZAHANIM LEMAN
POLITEKNIK SULTAN SALAHUDDIN ABDUL AZIZ SHAH
rohaniza@psa.edu.my

The real challenges faced by Small and Medium Enterprise (SME) in Malaysia which specialized in food productions is the technology used to support the production scale. In addition, work controlled by human has been replaced by the auto-cycle control equipment to meet the target market. As this trend continues, this project which is funded by Public-Private Research Network (PPRN) managed to develop a semi-auto cheese cake filling machine to support the related industries. This machine uses a pneumatic system with pneumatic piston filler that can control the flow of an output liquid. The full process of this machine starts with the insertion of the raw material into the tank. The cheese cake filler is then being injected into the container through the adjustable nozzle layer by layer based on the required quantity. The timer is also used in order to set the frequency of filler injection. This machine is able to increase the quantity of production from 500 packets to 2000 packets per day, and will also reduce the processing time up to 76% as well as gaining the profit margin up to 300%. This machine also can be used for other related food processing industries.



Semi-Auto Cheese Cake Filling Machine

AUTOMATION OF COFFEE BEAN CHILLER MACHINE

MUHAMMAD MUSTAPHA, ZAILANI AB GHANI, FIRDAUS ALI, SALIM BACHOK
SITI RAHAIDA ABDULLAH & JAUHARI HADI @ HATI
POLITEKNIK IBRAHIM SULTAN
muhammad@pis.edu.my

The preparation of coffee powder includes roasting, cooking, cooling, and grinding of the coffee beans. The cooling of caramelization of roasted coffee beans requires certain duration of time to reach a room temperature and turn to solid phase. The aim of this project is to decrease the cooling time and the development of this Automation Cooling Machine and is set as the objective. Designing machine is introduced as an important step prior to decrease the time of the cooling process. The parameter of heat transfer involves during cooling process. It was identified to complete the designed machine and development in order to ensure the objective can be achieved. Constant of thickness is a parameter for the heat transfer by conduction and it is needed as the equipment in design due to caramelization coffee beans, the thickness was crucial to ensure the consistency of cooling. The design was included a pneumatic equipment to complete an automation system and it was carried out by human factor production and produce the consistencies output. Motor and gear system are involved in the design to produce the consistent of thickness. The fan was assembled to the machine to produce the high speed air flow for the heat transfer to the environment through force convection and reduce the temperature of caramelization of roasted coffee beans.



Caramelization of Roasted Coffee Beans Automation Cooling Machine

STABILITY AND SHELF LIFE STUDIES OF CINNAMON COFFEE BODY SCRUB

AINA FATHIAH ZUHAIDI, RUSYIDAH MAT ZIN BOESTAMI & NOR AZIYAN MOHD NASIR
POLITEKNIK TUN SYED NASIR SYED ISMAIL
a.fathiah@ptsn.edu.my

Body scrub is a popular treatment that is basically a facial for the body. It is also an exfoliating cosmetic preparation and applied to the body to cleanse the skin. It exfoliates and hydrates your skin, leaving it smooth and soft. A body scrub is done with an abrasive material, usually coffee or sugar mixed with some kind of massage oil and an aromatic like essential oils. In this research, a preliminary on the formulation of cinnamon coffee body scrub have been conducted. In this work, the active ingredient from the coffee and cinnamon are used and formulated into scrub base and cream base. The coffee and cinnamon are added into the base with two different percentages which is coffee (18% w/w and 12.5% w/w), cinnamon (7% w/w and 12.5% w/w) and stored at two different storage temperatures (27°C and 45°C). To evaluate the stability of the cinnamon coffee body scrub formulated, the physical analysis was conducted in terms of stability, colour, and spread ability. The sensory analysis also had been conducted to identify the texture, odour, and colour to be more preferable. From the observation, the results show that the coffee body scrub formulation of 18% w/w and 12.5% w/w exhibit better stability compared to the 7% w/w and 12.5% w/w cinnamon coffee body scrub formulation.



Stability and Shelf Life
Studies of Cinnamon Coffee
Body Scrub

INNOVATION OF WATER PURIFIER TECHNOLOGY FOR GIANT PRAWNS SEEDLINGS

MOHD NAIM FIRDAUS, NURAINI KHALIL & AZMIE GHAZALI
POLITEKNIK JELI & UNIVERSITI MALAYSIA TERENGGANU
naim@pjk.edu.my

The aquaculture industry especially prawns culturing have been shifted from the conventional method to the new high technology to make sure the sustainable of production can be achieved. There are several problems have been identified to produce the good quality seed of giant fresh water prawns. Therefore this project is based on the innovation of giant prawn seed nursing system that combines the conventional nursing methods with the mechanical technology that facilitates rearing of giant prawns seedlings. The innovation system that has been introduced is a water purifier technology that can carry out three important functions in the raising of giant prawns seedlings which is (i) channeling water to the entire tank of nursery by dripping methods, (ii) to simplified the procedure of culturing and (iii) provide the suitable water filter throughout the nursing period. In order to ensure that the system is free from pathogens, the "SPF development manual" is intended as a complement to provide clear clarification of work rules, biological safety systems and pathogen screening for hatchery. The overall result, the production of giant prawn seedling through this innovation project increased the survival rate by 60-80% at the stage of Mysis to Post Larvae.



Water Purifier Technology for Giant Prawns Seedlings

MESIN PEMBUNGKUSAN DODOL

NURUL AKMAR, ROHANIZA M. ZALI, ANNAFAEDZATUL M. AMIN & NORLIA GHAZALI
POLITEKNIK SULTAN SALAHUDDIN ABDUL AZIZ SHAH
nakmar@psa.edu.my

Industri dodol mempunyai potensi dan daya saing untuk dikembangkan ke peringkat antarabangsa sekiranya jika kualiti dan aspek kebersihan dijaga. Kebanyakan masalah yang dihadapi oleh pihak industri pembuatan dodol adalah di peringkat proses pembungkusan yang mana buat masa ini dilaksanakan secara manual. Proses pemotongan yang dilakukan secara potongan tangan agak merumitkan dan memenatkan di samping ukuran pemotongan yang tidak tepat dan tidak sekata. Hal ini mendorong penghasilan mesin bersifat separa automatik dibangunkan bagi memudahkan proses pemotongan dan memberi hasil potongan yang sekata sekaligus memudahkan proses pembungkusan dodol oleh pihak industri. Oleh itu, mesin ini dihasilkan bagi membolehkan pemotongan dodol dilakukan secara separa automatik dan boleh dilaras serta dikawal oleh penjangka masa (timer). Proses keseluruhan pembinaan mesin adalah melibatkan tangki isian dodol berkapasiti 2 liter yang perlu diisi selepas dodol dimasak dan kemudian motor induksi AC berkuasa $\frac{1}{2}$ HP, 750 watt digunakan untuk memberi tekanan pada dodol secara kawalan oleh PLC dan seterusnya proses pemotongan menggunakan pemotong dua arah. Hasil potongan dilaras dengan menggunakan penjangka masa mengikut saiz yang dikehendaki oleh pihak industri. Secara keseluruhannya, mesin pemotongan dodol ini telah berjaya membantu pihak industri meningkatkan kualiti penghasilan produk mereka.



Mesin Pembungkusan Dodol

A NEW DESIGN OF MOLD FOR PALM SUGAR

ROHANIZA M.ZALI, NORLIA GHAZALI & ANNAFAEDZATUL
POLITEKNIK SULTAN SALAHUDDIN ABDUL AZIZ SHAH
rohaniza@psa.edu.my

As one of the Malaysian traditional delicacies, palm sugar or locally known as aren sugar has high demand in local market. However, this palm sugar has been traditionally formed by using screw-pine leaves that are going through very long processes with high-cost impact to the industries before the leaves are ready to be used as palm sugar mold. The uneven sizes of the mold are also one of the factors that encourage this project to design the new features of palm sugar mold with an even size and more hygiene by using the food grade material compared to the traditional method. The design of the mold is based on the industrial requirement and existing market needs. Therefore, in this project, the mold is designed with an array of 3 x 4 holes for each mold plate with two different sizes of holes which 100 mm and 80 mm diameter. The Perspex food grade has been used as a mold material for this project that can ensure the hygiene food processing for a better market prospect. The successfully run processing line shows that the processing time can be reduced by almost 33% compared to the existing processing technique.



A New Design of Mold for Palm Sugar

SMART EGG INCUBATOR

MOHD TAUFIK REZZA MOHD FOUZDI, AHMAD RAZIMI MAT LAZIM,
ALIF ABD TAHIR & MOHSEIN ABD MANAF
POLITEKNIK NILAI
taufik.f.poli@1gov.gov.my

The production capability of egg incubator is the main criteria for the achievement of chicken production. Most of chicken egg machine was only focus on the number of egg that can be fit in the incubator but not in the parameter control of egg in the incubator. The project of Chicken Egg Incubator is proposed to increase the growth of chicken with the development of chicken hatching machine using low capacity oven. The development of Chicken Egg Incubator is to increase hatching process and increase the quality of chicken hatched. The incubator can be operationalized automatic or semi-automatic. The control system which consists of micro-control (Arduino) will be used to control the movement of the egg in the incubator, to control the temperature and the humidity automatically. The information can be accessed online using raspberry pi where it will give the reading of the temperature and humidity in the incubator and the status of the eggs. The system is also able to send the command to the incubator control system.



Smart Egg Incubator

PPRN
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INNOVATION IN MYSTUS SPP (IKAN BAUNG) NURTURE SYSTEM

AMIRUL FARHAN OTHMAN @ MUSTAFFA, NURHAFIZAM SHAH HUSIN & NOOR AIN ABD HAMID
POLITEKNIK JELI
amirul@pjk.edu.my

Pembangunan produk Innovation In *Mystus Spp* (Ikan Baung) Nurture System bertujuan mengurangkan kadar kematian benih ikan baung yang masih dalam tempoh peralihan di dalam sangkar sungai. Produk ini juga boleh mengesan penggunaan probiotik terhadap penghadaman benih ikan baung serta kualiti air terhadap kadar hidup benih ikan baung dan penggunaan sangkar kanvas bagi mengawal kadar oksigen terlarut dalam air dalam sangkar. Sampel benih ikan baung diambil setiap minggu bagi menilai perkembangan pembesaran dan kadar hidup. Implikasi daripada penggunaan projek ini menunjukkan kadar oksigen lebih stabil dalam sangkar kanvas berbanding sangkar sungai. Manakala kadar hidup benih ikan baung dapat ditingkatkan sebanyak 10%. Penambahbaikan sistem kanvas hendaklah dilakukan bagi memudahkan kerja penyelenggaraan. Proses pemberian probiotik masih boleh dikaji dengan memberi kadar yang berbeza kepada benih ikan baung. Kesimpulannya produk ini telah berjaya diaplikasikan dengan baik dan kadar hidup benih ikan baung telah meningkat daripada sebelumnya.

Innovation in *Mystus spp* (ikan baung) nurture system



Innovation in *Mystus Spp* (Ikan Baung) Nurture System

FULLY AUTOMATED SYSTEM FOR PRODUCTION OF CHICKEN AND MEAT KEBAB

MOHD TAUFIK REZZA MOHD FOUZDI, AHMAD RAZIMI MAT LAZIM,
HAIRUL AZAM MOHD MOKHTAR & NURHIDAYAH MOHD TAHIR
POLITEKNIK NILAI
taufik.f.poli@1gov.gov.my

The efficiency capability of machines in the production line of the product is the key factor to the achievement of the industry. The current machines that are used to produce chicken and meat kebab are not ergonomic which causes difficulties, especially during the mixing, transferring and cleaning process. The company requires a modification to the existing machine/process which can optimize the overall capacity of the factory and the same time to reduce the production cost. Thus, this project provides a solution to the current proposal with introducing an integrated full automated system for the production of chicken and meat kebab. The system can be integrated with the existing machines to give a centralized control to the user. The system can be monitored and controlled directly via internet. The information regarding the production process such as temperature, weight, and sequence process can be monitored through Distribution Control System (DCS).



Fully Automated System for Production of Chicken And Meat Kebab

SYNCHRONIZED CONVEYOR SYSTEM FOR FLAT NOODLES (KUEY TEOW)

AZAHAR MOHD NOOR, MOHD ZAHRI JAAFAR & MUFFILI MAHADI
POLITEKNIK SULTAN ABDUL HALIM MUADZAM SHAH
azahar_mn@yahoo.com

Flat noodles or kuey teow is one of Malaysia favourite food. It is produced from rice flour mixture in thick liquid form. Then, it is poured on the flat conveyor bed and steamed to cook. Next, the process is a slitting process to slit kuey teow from one big sheet into a smaller size. The kuey teow is then cut into specific weight before the packaging process. This system involved in two areas of kuey teow production. The area involved in this project development is in between the cutting, the packaging process and after the packaging to collection bench. Ikhwan Food Industries faced critical manpower issues in these two areas, two men are needed to accomplish the kuey teow transfer from cutting station to packaging and one to transfer from packaging machine to the collection bench. The main objective of this system introduction is to minimized number of man power from three to only one. Based on the observation on all process involved in those areas and simulations, a suggestion is made. Next, discussion and redesign to meet the manufacturer inputs and engineering constraint had finally produced this system successfully. The system commenced in February 2017 with capability to sense existing machine activities and synchronized it operations accordingly. Built up on rugged aluminium frame, high endurance motor and bearing plus are controlled with a PLC. The future improvement is suggested to include kuey teow weighing capability on the conveyor and alter the production machine parameter to compensate cutting speed in order to achieve specific kuey teow weight.



Synchronized Conveyor System For Flat Noodles (Kuey Teow)

CURRY PUFF MACHINE

ZURENA LEMEN, JAMILAH ABBAS, SAIFULIZAM ABU BAKAR,
ZAKARIA AYOB @ IBRAHIM & AZIZI MURSIDY ZAINOL ABIDIN
POLITEKNIK SULTAN SALAHUDDIN ABDUL AZIZ SHAH
zurena@psa.edu.my

This project is to design a curry puff machine that helps local entrepreneurs to generate income. The whole process of curry puff making involves the use of human manpower. Therefore, the objective of developing this machine is to help industry players to start their business at low cost. This machine is designed, based on a systematic approach to ensure the proper design is accomplished. It covers the concept development, concept scoring, selection and preliminary final design. This machine has 6 units of mould that consist of 12 Teflon mould disks that are capable of producing 6 pieces of curry puff in each operation. It uses controlled mechanical power to ensure systematic operation is performed. At the same time, the materials that used for the machine are selected based on safety concern for food processing equipment. The completed machine is capable to produce approximately around 1000 to 3000 curry puffs per day. This machine is able to save manpower in curry puff processing. With this technology, local companies can increase their production of curry puffs in order to meet the market demand.

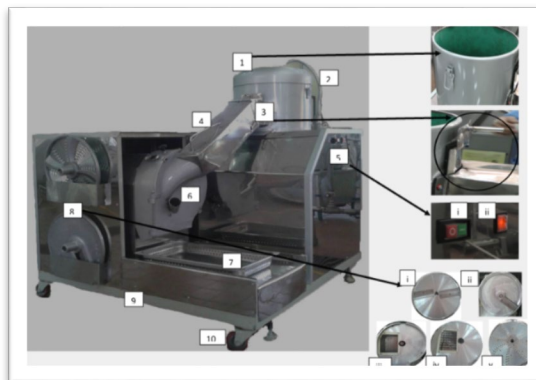


Curry Puff Machine

POTATO CUTTER & PEELER MACHINE IN IMPROVING REMPEYEK QUALITY

NORAIDA MOHAMAD ALI, SITI SHAFINI MUHAMAD, FATHMAH SALIM & AZHARI ABD. MAJID
POLITEKNIK SULTAN HAJI AHMAD SHAH
noraida@polisas.edu.my

Nowadays, the process of peeling and cutting potatoes usually made separately, either using manual method or machine where peeler machine is used to peel potatoes skin while cutter machine is used for cutting only. According to this invention, a potato processing machine consists of a framework, a peeler machine, a cutter machine and a controller mounted on the frame to control both peeler and cutter machine. To start the process, first, 15 kilograms of potatoes are put into peeler drum and then water faucet is switched on, and then water is poured into drum. The process of cleansing and peeling are done by the peeling machine when switch on the controller is pressed. This machine is convenient and fast which can peel 15 kilograms of potatoes in 1-2 minutes based on the size and shape of the potatoes. In this invention, a sliding divider door is installed vertically on peeler drum to prevent potatoes from entering the cutter machine during the peeling process so that potatoes skin can be peeled properly. A connector that has been installed in perpendicular from the peeler machine to cutter machine allows potatoes into space of cutter machine with appropriate feed rate for cutting process based on required shape. Cutter machine is equipped with perforated collectors to allow the cut potatoes to be soaked in the liquid for the purpose of cleaning and anti-browning treatment. With the aid of this equipment, it can minimize the time required to process potatoes during food processing. Processing time is an important element that will not only affect the production capacity but also the quality of end product.



Potato Cutter & Peeler Machine in Improving Rempeyek Quality

KEROPOK LEKOR ROLLER & CUTTER MACHINE

MOHAMAD HALIM IBRAHIM, ZULFADLI GHANI,
MOHAMAD SHAHRIL IBRAHIM & ISHAK MOHAMMED BASIR
POLITEKNIK MERLIMAU MELAKA
mhalim@pmm.edu.my

Rosfaniaga Service Sdn Bhd adalah syarikat yang mengeluarkan produk makanan iaitu keropok lekor. Syarikat yang berlokasi di Miri dan Kucing Sarawak ini masih menggunakan kaedah manual untuk memproses keropok lekor bermula dari penyediaan doh, menggulung, merebus dan memotong. Kaedah ini hanya mampu menghasilkan keropok lekor dengan anggaran 350 kg sehari (8 jam/hari). Bagi memenuhi kehendak syarikat dan pengeluaran yang berskala besar, penyelidik telah membuat kajian dan mengenalpasti beberapa proses yang boleh diinovasikan dengan menghasilkan mesin yang boleh menggulung dan memotong keropok lekor. Produk inovasi "Keropok Lekor Roller and Cutter Machine" dilengkapi dengan sistem "Conveyer", motor elektrik 3 fasa, sistem tali sawat (belting), "Emergency Stop Button" dan mata pemotong. Kelebihan produk ini boleh mempercepatkan dan memudahkan proses dalam penghasilan produk keropok lekor bagi meningkatkan kualiti dan kuantiti pengeluaran. Implikasi dari penggunaan produk inovasi ini jumlah pengeluaran keropok lekor meningkat sebanyak 700 kg dalam masa sehari.



Keropok Lekor Roller & Cutter Machine

MULTI-PURPOSE HIGH SPEED SPRAY PAINTING MACHINE

ZULKHAIRI KHAIRUDIN, NORHAYATI IBRAHIM & ZETTY ROHAIZA M. SAHAK
POLITEKNIK SULTAN SALAHUDDIN ABDUL AZIZ SHAH
zulkhairi6649@gmail.com

This study focuses on designing and developing a paint mixer that is suitable for small and medium industries. The paint mixer is designed to mix and blend the paint ingredient in an efficient way to improve the production rate as well as quality. The paint mixer is equipped with high shear blade powered by electric motor. It is able to mix the paint ingredient up to 200 liters for 4 hours. Therefore, the productivity increases from 30 liters a day up to 400 liters in 8 hours. The paint ingredient is fully dissolved in shorter time as compared to manually mixing process. The mixing process also reduces energy consumption by mixing a large quantity of paint ingredient.



Multi-Purpose High Speed Mixer

PPRN

28

DEVELOPMENT OF PEANUT CRISPS MACHINE

MUHAMMAD RIDZUAN IDRIS, MOHD KHAIRUL AKLI AB GHANI,
MOHD HUSHSHILA YUSOF & MOHD TAUFIK SYAZELI ZAID
POLITEKNIK SULTAN MIZAN ZAINAL ABIDIN
ridzuan@psmza.edu.my

Peanut Crips Machine (PCM) is aimed to design and develop a machine that will minimize the production time and human effort during the frying by combining the spice blender and flour mixer process into a single machine. The production started by putting the ingredients manufacturing Peanut Crips into place, such as powder, water, spices, anchovies and also nuts. Spices will go through the process to blend. Once done, this blend material will flow into the batter once the valve is opened. Blended ingredients are mixed together with flour batter in the mixer. After the process is finished, the solenoid switch blending will be opened to enable the mixture flows into the mould. The mould designed with the concept of conveyor will move simultaneously with openings solenoid continuously. The mould will go through two tanks filled with nuts and anchovies. The mould will pause when through this tank. This valve will open both tank so that nuts and anchovies will set on the mould. This mould will move to the frying oil container was boiling. As a whole, these machines are controlled using Raspberry Pi as Microcontroller.



Development of Peanut Crips Machine

EXTEND THE SHELF LIFE OF FROZEN POTATO PATTY

FATHMAH SALIM, NORAI DA MUHAMMAD ALI, SITI SHAFINI MOHAMAD & AZHARI AB MAJID
POLITEKNIK SULTAN HAJI AHMAD SHAH
fathma1@polisas.edu.my

As the demand for ready-to-eat food items arises, a variety of frozen foods is continually introduced in markets. One of the frozen foods that have becoming family favourite is potato patty. However, when potato patties are frozen, the formation of ice crystals within the food matrix may cause physical stress to food. Upon thawing, the melting of the ice crystals leads to moisture loss and the softening in food texture, which consequently affect the overall quality of the food and shorten its shelf life. To overcome these problems, several formulations have been developed using different types of binding agents. Aim of this study was to determine the effects of tapioca flour, corn flour and potato flour as binding agents in improving texture of frozen potato patty. Potato patty is produced by mixing mashed potato with other ingredients such as, meat, onion and colander leaves. Different types of binding agent is added at different percentage for each formulation and the mixer is then formed into round shape and stored at -40C. Each week, the frozen potato patty is fried and tested by thirty panelists randomly chosen among the students at Food Technology Department. Approximately 12 g of samples were placed on a plate and panelists rated firmness, meatiness and overall acceptance of the product based on 7-point hedonic and scoring scale. A Statistical Analysis System was used to conduct analysis of variance, to determine the effect of different binding agents on the texture, meatiness and overall acceptance characteristics of the product. Among the three binding agents tested, tapioca was most effective in improving texture of potato patty. Tapioca flour thickens at a lower temperature than corn starch and potato flour and remains stable when frozen. Potato patties that used tapioca flour as binding agents were still acceptable by panelist when tested via Sensory Evaluation Analysis. The products using tapioca flour as binding agents meet consumer expectation even when frozen for 3 months.



Extend the Shelflife of
Frozen Potato Patty

MULTI-SIZE FILLING ICE CREAM MACHINE

NORASIAH MUHAMMAD, ZULKARNAIN HAMID, SHARIZA AZWIN, YAHAYA HARTINY, ABD KAHAR
POLITEKNIK SULTAN SALAHUDDIN ABDUL AZIZ SHAH
norasiah.muhammad@gmail.com

Recently, filling hard ice cream has been done manually with limited human source, thus limiting the capability to fulfil the market demand. To automate the whole process of filling hard ice cream, the filling ice cream machine was designed. It will control the output of hard ice cream from the discharge nozzle to the filling nozzle. This new design will replace the manual filling of ice cream which will result the consistency quantity of ice cream. On the other hand, it will upgrade production efficiency as well as ultimate employee comfort. This innovation will also boost up the total production of company in order to meet the increasing demand in the market. The processes consist of five station positions which are cup holder, ice cream filling, chocolate/fruit syrup topping, lid placing and push out cup. These stations are held on the rotational plate which will rotate from one station to another station process. The process of filling hard ice cream using rotary concept was chosen to reduce space consumption in the production area. The processes are fully automatic using Programmable Logic Controller (PLC) system which is industrial digital computer that has been adapted for the control of manufacturing processes. The machine is designed for production of 2400 cups of 3.5 ounce ice cream in one hour as compared to the current production of 600 cups.



Multi-Size Filling Ice Cream Machine

PORTABLE SPRINKLER FOR PADDY PLANTATION

MOHAMAD SALAHUDIN MOHAMAD SAAD, MOHD FAHMI HAMID,
NURISAH WAHAB @ ABDUL WAHAB & SAHRIJAN AHMAD
POLITEKNIK TUANKU SYED SIRAJUDDIN
jauhdige@hotmail.com

Sektor pertanian merupakan salah satu sektor yang menyumbang kepada hasil pendapatan negara selain daripada sektor perindustrian. Antara aktiviti pertanian yang dijalankan adalah penanaman padi. Aktiviti tanaman padi merupakan satu inisiatif strategik yang boleh memenuhi keperluan padi negara. Bagi meningkatkan pengeluaran dan menjamin hasil tuaian padi yang berkualiti, satu produk inovasi yang mengambilkira pendekatan yang sistematik seperti penyemburan baja dan racun serangga. Produk inovasi 'portable sprinkler' satu mekanisma baru dalam menyelesaikan masalah berkaitan kerja pembajaan dan penyemburan racun serangga. Produk ini dibangunkan dengan tangki dan pam bertekanan tinggi yang disambung kepada hos bagi menyalurkan baja dan racun ke petak sawah dengan kendalian kenderaan beroda. Selain daripada itu, Produk 'portable sprinkler' ini mampu beroperasi pada permukaan tanah sawah yang mempunyai struktur yang tidak rata dan kerja pengendalian yang mudah serta kaedah penyemburan baja dan racun serangga yang tidak memberi kesan kepada kesihatan petani secara langsung. Penggunaan 'Portable Sprinkler' juga dapat mengatasi masalah pesawah dalam memastikan penyemburan baja dan racun serangga yang sekata ke atas setiap pokok padi. Implikasi hasil penggunaan produk ini, pengeluaran padi meningkat dan mengurangkan kos penyelenggaraan.

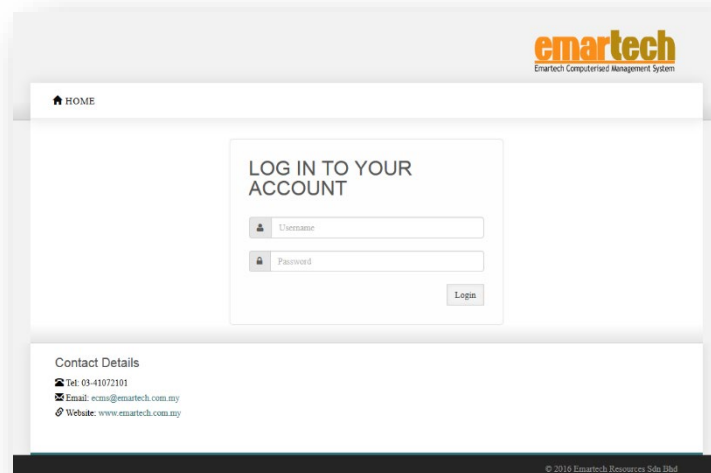


Portable Sprinkler for Paddy Plantation

EMARTECH COMPUTERIZED MANAGEMENT SYSTEM

RUZIANA MOHAMAD RASLI, MIME AZRINA JAAFAR, HAFIZAH ABDULLAH @ ALI,
HAWARIYAH RAHIM & SABRI SAEP
POLITEKNIK TUANKU SYED SIRAJUDDIN
adiana1984@yahoo.com

This project is intended mainly to Emartech Resources Sdn. Bhd. which is the company that requested a new upgraded management system to be used by their customer and staff. The main problem of existing system is that the company's existing website and management system is not integrated with each other. The database is unstable and the existing system cannot function properly. Not only that, the existing system cannot be used by mobile devices since the screen resolution will not fit properly and lastly, the company cannot manage the system and the data by their own since the system is being outsourced to other company. Based on these problems, it is proposed that a new upgraded system will be developed using PHP language, jQuery and MySQL as its database. The new system will be known as Emartech Computerized Management System, is a mobile web based system that can fit in mobile devices easily and efficiently. With the development cost of RM30,000.00, the company will be installed with a new server which will store the new system and its database. The project duration time is six months starting from 1st July until 31st December 2016 and the end product of this project will help the company to manage the data efficiently and securely, access the system anywhere and anytime and the system will be more stable than the older system.



Emartech Computerized Management System

MULTI-PURPOSE SMOKE MACHINE

ZULKARNAIN HAMID & ASMIRA ASHARI
POLITEKNIK SULTAN SALAHUDDIN ABDUL AZIZ SHAH
zulkarnain@psa.edu.my

Salai adalah salah satu cara memasak atau proses pengawetan makanan terutama ikan dan daging. Teknik tradisional yang digunakan di Malaysia pada zaman dahulu terutamanya di Kuala Pilah, Negeri Sembilan adalah dengan menyalai daging, ayam, itik atau ikan di atas kayu yang dibakar dibawahnya dan dibiarkan asap kayu menyalai selama 2 jam. Dalam usaha untuk meningkatkan industri salai, mesin berinovasi perlu dibangunkan supaya penghasilan makanan berasaskan salai lebih berkualiti. Mesin salai ini bertujuan untuk meningkatkan pengeluaran, mengurangkan masa salai dan mengurangkan pencemaran udara. Mesin salai pelbagai guna dihasilkan dengan mengambil kira beberapa faktor yang penting iaitu masa menyalai, pengawasan dan hasil bahan yang disalai. Kaedah menyalai mudah dan cepat telah digunakan dalam mesin salai ini. Bahan bakar seperti tempurung kelapa dan arang kayu digunakan dalam proses menyalai pada tempat pembakar berasingan. Mesin salai ini mempunyai ruang salai yang tidak terdedah kepada api pembakar. Di samping itu, mesin ini juga mempunyai kawalan suhu, set masa dan bacaan suhu untuk memudahkan pengguna mengawasi semasa proses salai. Penghasilan mesin salai pelbagai guna membantu pengusaha menghasilkan produk salai yang berkualiti dalam kuantiti yang tinggi serta menjimatkan masa tenaga kerja.

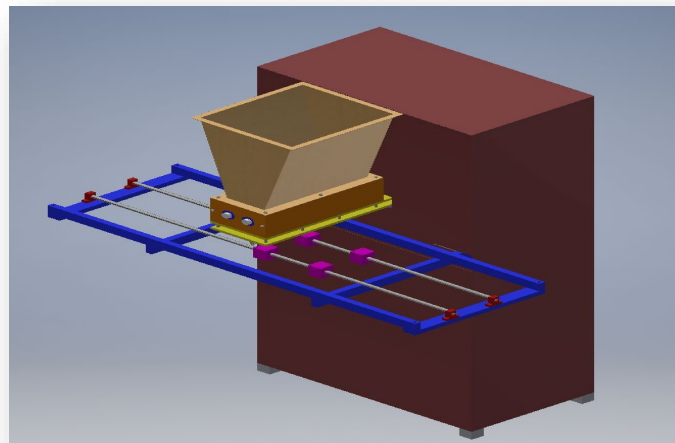


Multi-Purpose Smoke Machine

CREAM PUFF PROCESS MACHINE

ZULKARNAIN HAMID & MOHD ELIAS DAUD
POLITEKNIK SULTAN SALAHUDDIN ABDUL AZIZ SHAH
zulkarnain@psa.edu.my

Nowadays, technological innovation plays a major role for the entrepreneurs to move forward. Entrepreneurs are searching for easier method to aid the process short with large quantities of production. Manufacturing technology is constantly changing from time to time into automatic system, which is much needed by entrepreneurs from the Small and Medium Enterprise (SME) to compete in the market. This machine is developed with the purpose to integrate the conventional method with a semi-automatic machine as to enhance the production of cream puff. The machine is based on the principles of mechanical and electrical controls whereby the process is fully controlled by the Programmable Logic Controller (PLC), a system where industrial digital computer that has been adapted for the control of manufacturing processes. Materials suitable for use such as Teflon to 7 nozzles that move simultaneously and the bodywork are made of high quality stainless steel. The process of filling cream puff is by using the needles from stainless steel material. In addition, this method can help generate cream puff production.



Cream Puff Process Machine

REDESIGNING & MODIFICATION MURTABAK MACHINE

MD NAJIP TALIBIN , MOHD PAHMI SAIMAN,
KHAIRUL AZHAR AB. AZIZ & AHMAD SABRI BIN MOHAMED
POLITEKNIK SEBERANG PERAI
najip@psp.edu.my

At an early stage, the existing machine is used for moon cake shaping and is modified to form a mini murtabak. However, the machine faced many 'rejection' products during stamping which most of the "mini murtabak" will break at the outer skin and the contents stick inside of the mould and it causing difficulties to get the right shape and size. Modifications are performed by changing the entire operating system by using the programmable logic controller to have control many input and output. As a result, the dough is detected and it stops without interference accurately. A fixture device has been added to the stamper to ensure that the mini murtabak does not go out of the route and this part is connected to the sensor so that it works automatically. Replacement of some of the main components from driven system also improves the dough movement. Besides that, a new design of mould that has changing parameters helps to solve problems of size required by the company. The contents stick inside of the mould is based on series of tests. As a result of the modification and improvement of the machine, the company managed to reduce the percentage of defective murtabak.



Murtabak Machine

DOUGH MACHINE FOR BREAD BUN & CRIMPING TEMBOSA

MD NAJIP TALIBIN, MOHD PAHMI SAIMAN, MOHD FADLI ABDUL HAMID & ZULKIFLI BAKAR
POLITEKNIK SEBERANG PERAI
najip@psp.edu.my

In the past, pastry forming and crimping were done using mould and mounted on a holder which is always changed depending on the type of pastry. However, due to frequent assemble and dissemble of the mould, previous invention takes a lot of time in assembling and disassembling the moulds. In this research, the mechanism of the mould was designed and developed for the puff pastry device. It provides an easy handle during assembling and disassembling of the mould where mould changing occurred frequently. The design of the mould holder capable to lock and unlock the mould in a rapid time and ready to use without opening up any important parts. A semi-automatic control of the device was developed according to the desired size required by the company and it is controlled using a pneumatic system. The impacts of system to the industry are able to reduce time and do not need skilled workers to operate.



Dough Machine for Bread Bun & Crimping Tembosa

DESIGN AND PERFORMANCE EVALUATION OF DE-OILING MACHINE

ZULY ASHRAF ZULKIFLI, MOHD SYAFARIM MD ISHAK,
NOR AISHAH AKMAL A. RAHMAN & NOR AISHAH ISMAIL
POLITEKNIK SULTAN HAJI AHMAD SHAH
zuly@polisas.edu.my

Recently, Small Medium Enterprise (SME) becomes one of main contributor in food industry and growth rapidly. Moreover, the best traditional food which is Peneram is one of famous food that has been produces by SME industry. This paper presents the design and performance evaluation of peneram machine in order to minimize oil quantity within Peneram before packaging process. Design concept 3 was selected based on matrix evaluation processed. The full design was created using Inventor Software 2017 based on the design concept. The main body of Peneram machine is made from stainless steel food grade. The heat dissipates experiment which shows that there heats were reduced every minute using exhaust fan. The modified machine is successfully designed based on some conceptual design analysis. By taking into account the appearance, material, costs involved, the heat production process should be emphasized. Based on the simulation, the process of heat reduction is best based on the concept of 3. This is because the energy to remove heat from the machine is minimal as the heat produced process is not contrary to the nature of the heat itself. The cost of generating air flow to dissipate heat makes the exhaust fan cheaper than the use of vacuum and blower.



De-Oiling Machine

ANALYSIS QUALITY OF PENERAM DURING STORAGE

NOR AISHAH ISMAIL, NOR AISHAH AKMAL A.RAHMAN,
ZULY ASHRAF ZULKIFLI & MOHD SYAFARIM MD ISHAK
POLITEKNIK SULTAN HAJI AHMAD SHAH
aishahjtm@polisas.edu.my

Peneram is a traditional food which is sweet and comes in mini donut shape. The food is made from flour, palm sugar, water and oil. This traditional dish appeared to be too oily thus will lead to rancidity when storage. This research helps Warisan Jannah Sdn Bhd to overcome problem of Peneram becomes hard and too oily after fried. Three formulations are developed to determine the best formulation of peneram. The variables of the formulation are types and amount of flour. Research also determines the keeping quality of different formulation when keeping in room temperature. Sensory evaluation test is carried out by panelists using Hedonic and Scoring test. According to Scoring test, panelists rate Peneram as dark in colour. They also rate the aroma of sugar in all formulation are moderately strong. Panelists rated the texture of formulation 2 is soft, meanwhile formulation 1 and 3 as very hard texture. Referring to Hedonic Scale test, panelists prefer formulation 2 compared to other formulation. The manufacturer is adviced to quickly store the Peneram into air tight container after fried to prevent the oxidation that will cause changes in odour and flavour. Exposed to air will also lead to tough texture. Peneram's dough should not be left fermented more than 12 hours, as it will start gives changes of flavour and odour due to rancidity.



Analysis Quality of Peneram during Storage

MESIN PEMBUNGKUSAN ANGIN (ROTI)

SALHANA SAHIDIN @ SALEHUDIN, ROSIDI MUHAMAD NOR, ANI YAAKUB
POLITEKNIK SULTAN SALAHUDDIN ABDUL AZIZ SHAH
salhana@psa.edu.my

Produk bakeri mempunyai jangka hayat yang sangat pendek kerana sifatnya yang mudah rosak dan berkulat. Ruang pembungkusan yang diubah (Modified Atmosphaera Packaging) merupakan penyelesaian pembungkusan yang boleh diaplikasi secara optimum untuk meningkatkan jangka hayat produk. Usahawan bakeri hanya mampu menghasilkan roti kering dalam kuantiti yang kecil kerana sifat roti kering yang mudah rosak dan berbau. Objektif pembangunan produk mesin pembungkusan angin adalah untuk meningkatkan jangka hayat roti kering, menggunakan sumber gas yang paling sesuai untuk mengekalkan rasa dan kerangupan roti kering. Seterusnya, bahan pembungkusan dan teknologi pembungkusan yang sesuai bagi memanjangkan jangka hayat produk daripada mudah hancur. Pembangunan produk ini mengfokuskan kepada konsep ruang pembungkusan yang diubah (MAP) untuk mengekalkan bau dan rasa roti kering yang asli untuk tempoh masa yang optimum. Mesin pembungkusan ini mempunyai “vertical sealer” ditambah fungsi “air flushing” untuk proses pembungkusan dan pengeluaran roti kering yang di susun ke dalam pembungkus “nylon PA”. Udara daripada pemampat tanpa minyak dimasukkan untuk meningkatkan jangka hayat produk dan mengelakkan produk daripada pecah. Nylon PA dipilih kerana ciri-ciri teknikalnya yang baik terhadap penyerapan gas. Mesin ini mampu membungkus dengan pengisian produk sehingga mencapai pengeluaran 1000 pek sehari berbanding 600 pek sehari bagi operasi secara manual.



Mesin Pembungkusan Angin (Roti)

MESIN PES NASI GORENG

MOHD ELIAS DAUD, ZULKARNAIN HAMID & TENGKU MOHD. AIZAN BIN TENGKU MOHD
POLITEKNIK SULTAN SALAHUDDIN ABDUL AZIZ SHAH
mdeliaspku@yahoo.com

Mesin penggadun digunakan untuk menghasilkan produk makanan yang seperti pes nasi goreng yang dilakukan secara manual. Permasalahan yang timbul adalah dalam proses pengisian pes ke dalam bekas dengan mengekalkan suhu pada 800C. Proses ini dilakukan secara manual dan amat sukar untuk mengekalkan suhu yang tetap pada 800C. Oleh yang demikian, keperluan pembangunan produk inovasi mesin penggadun “semi-auto” untuk menghasilkan pes nasi goreng. Konsepnya menggabungkan prinsip kawalan secara mekanikal dan elektrik untuk memasak, manggadun dan mengawal suhu. Produk ini menggunakan kawalan PLC dan kawalan perkadaran untuk mengawal suhu, kelajuan motor dan kawalan suhu bagi mengekalkan pada 700C hingga 800C. Mangkuk sebagai bekas memasak diperbuat daripada keluli tahan karat. Dengan terhasilnya produk ini, dapat mengeluarkan kuantiti pes nasi goreng sebanyak sehingga 150 liter.



Mesin Pes Nasi Goreng

'SUJI' BISCUIT SEMI AUTOMATIC FORMING MACHINE

AIDA HARYATI MUDA, MASLIANA IDRIS, TENGKU BESARUDDIN SHAH TENGKU YAAKOB &
AHMAD ZAIFAZLIN ZAINORDIN
POLITEKNIK SULTAN HAJI AHMAD SHAH
aida@polisas.edu.my

The food industry has grown significantly over the years with new technology and innovation in line with global economic growth. The process traditionally takes a long time, limited production and costly. The quality of the biscuits depends on the skill of the worker who is doing the job. The objective is to design a user-friendly, semi-automatic operating machine. The machine has a flexible feature and operates using the concept of the extruder system. The pneumatic cutter system is able to cut various thicknesses of biscuits. In addition, the nozzle size and form can be changed according to user requirements. Using this machine the output has increased by 67 %. The production time of one piece of biscuit has decreased to 7 seconds compared to 20 seconds for the previous method. This machine also reduces the number of workers' by 85% compared to existing methods significantly will reduce operating costs and prevent the operator's direct contact with the dough and biscuit. In addition, the surface finish is smooth, uniform and improves hygiene practice in food handling.



'Suji' Biscuit Semi Automatic Forming Machine

DEVELOPMENT OF 3 IN 1 CHOCOLATE FILLING MACHINE WITH VARIABLE VOLUME USING SEMI OR FULL AUTOMATIC PROCESS

NORHAYATI IBRAHIM, ASNIZAH SAHEKHAINI, ZETTY ROHAIZA MOHD SAHAK @ ISHAK, MADYA MASTIKA AHMAD, NURUL HAYATI JAMIL & MOHD ZULKARNAEN IBRAHIM
POLITEKNIK SULTAN SALAHUDDIN ABDUL AZIZ SHAH, POLITEKNIK TUN SYED NASIR & JABATAN PENDIDIKAN POLITEKNIK DAN KOLEJ KOMUNITI
iyatipsa@gmail.com

The chocolate filling machine is designed to meet the demand of the small and medium homemade chocolate industry. The homemade chocolate is irregular in size and volume as well as susceptible to fungus and perishable. Extra work is also required to release an air bubble after the filling process into the chocolate mould. The development of the machine incorporated with three in one concept that combined three types of processes specifically chocolate melting, mixing and chocolate filling. The machine uses a volumetric piston filling principle and capable to dispense chocolate into different size of moulds. A safety measure, especially in material selection, has been considered to increase the productivity and quality of the chocolate bar produced. The machine can be operated semi- or fully- automatic. The machine is capable of filling the entire weight of 15 kg chocolate in less than 1 hour 30 minutes according to the size of the mould. Consequently, the air bubbles are also reduced with minimal effort during the filling process.



Development Of 3 in 1 Chocolate Filling Machine with Variable Volume Using Semi or Full Automatic Process

MESIN PEMBUATAN KACA MANIK

ONG TZE CHING, ANDY ANAK BUJA & HO RUI JIN
POLITEKNIK KUCHING SARAWAK
alex_ongtc@yahoo.com

Proses pembuatan manik merupakan satu proses yang sangat mencabar disebabkan tiada mesin khusus wujud untuk menghasilkannya. Penghasilan manik memerlukan kemahiran yang tinggi serta mesin yang diubahsuai untuk menjana punca api bagi tujuan pemanasan kaca. Mesin sedia ada yang digunakan di Victoria's Enterprise merupakan mesin yang digunapakai untuk tujuan kimpalan gas yang telah diubahsuai. Bagaimanapun, mesin tersebut sering rosak dan penyebaran haba tidak sekata. Mesin tersebut juga sangat besar dan sukar untuk dialihkan dari satu tempat ke tempat lain. Pembangunan Inovasi ini merupakan mesin penjana elektrik yang mudah alih dan mampu menjana haba yang tertumpu diperlukan untuk menyelesaikan masalah tersebut. Mesin yang dicipta adalah HHO Generator yang memisahkan molekul air ke dalam gas dan mempunyai campuran gas oksigen dan hidrogen yang dapat memberikan api yang kuat. Dengan muncung yang direka khas untuk memberikan haba yang tertumpu dan konsisten bagi menghasilkan kadar alir haba yang bersesuaian dengan proses penghasilan manik. Mesin ini boleh meningkatkan kualiti pengeluaran manik khususnya dalam industri kraftangan.



Mesin Pembuatan Kaca Manik

PPRN
44

TEMPAT PENYIMPANAN MAKANAN KERING BERPALET

HO RUI JIN, BLANGKAT AHMAD BASIMIN, ANDY ANAK BUJA & ONG TZE CHING
POLITEKNIK KUCHING SARAWAK
horuijin@poliku.edu.my

Kelembapan udara memainkan peranan yang penting dalam mengekalkan mutu makanan. Kelembapan relatif udara yang tinggi di iklim khatulistiwa akan menyebabkan pertumbuhan fungus dan kulat pada makanan berpalet arnab. Rentetan itu, kadar kematian arnab yang tinggi berlaku di Gold Rabbit Farm, Bintangor disebabkan kualiti pemakanan yang tercemar. Inovasi projek ini adalah berkaitan dengan keperluan tempat penyimpanan yang bersih dan alat pengawalan kelembapan relatif udara untuk mengekalkan kualiti makanan palet arnab. Maka, satu tempat penyimpanan makanan yang kering dihasilkan dengan pemasangan mesin pengawal kelembapan udara. Tempat penyimpanan adalah kedap udara serta bersaiz besar bagi menampung kuantiti stok makanan yang banyak serta mempunyai kemampuan mengekalkan kadar kelembapan relatif udara yang rendah. Kewujudan tempat penyimpanan ini membolehkan pengusaha untuk menyimpan lebih banyak makanan berpalet arnab dan mengurangkan kadar kematian ekoran dari keracunan makanan. Rentetan itu, kos pengeluaran menurun dan keuntungan meningkat.



Tempat Penyimpanan Kering untuk Makanan Berpalet

IMPROVEMENT OF SHELF LIFE FOR DADIH POWDER

YUSOF ISMAIL, MOHD ASMADI IDRIS, HAMIDAH NOOR MD YUSOF & WAN HAMIZAH WAN YUSOF
POLITEKNIK MERLIMAU MELAKA
yusof@pmm.edu.my

Azliz Enterprise merupakan sebuah syarikat Bumiputera yang membuat produk makanan seperti serbuk dadih dan dadih segar. Syarikat ini menghasilkan produk makanan mereka dengan skala yang banyak. Pihak syarikat mengalami masalah dalam proses penghasilan serbuk dadih iaitu mesin yang digunakan berskala kecil dan bahan mentah yang dimasukkan akan terkeluar semasa operasi semasa pemésinan dijalankan. Dadih segera tidak tahan lama hanya mampu bertahan selama 2 minggu. Syarikat juga memerlukan satu produk inovasi yang boleh memanjangkan jangka hayat dadih segar sekurang – kurangnya satu bulan dan jangka hayat serbuk dadih sekurang – kurangnya satu tahun. Bagi memenuhi kehendak syarikat kumpulan penyelidik dapat menyelesaikan permasalahan syarikat ini dengan menghasilkan mesin yang mampu memasukkan serbuk dadih kedalam bungkus dan mengatasi masalah bahan mentah terkeluar semasa mesin beroperasi. Pembangunan inovasi ini memberi implikasi dalam aspek produktiviti dan kualiti produk seterusnya membantu usahawan untuk mengoptimumkan pengeluaran.



Improvement of Process and Shelf Life for Dadih Powder/Instant

FULLY AUTOMATED SYSTEM FOR 'KUAH ROJAK' PRODUCTION

MOHD TAUFIK REZZA MOHD FOUZDI, AHMAD RAZIMI MAT LAZIM,
MOHD NAZRULAZLAN ABD RASID & HAIRUL AZAM MOHD MOKHTAR
POLITEKNIK NILAI
taufik.f.poli@1gov.gov.my

This project is proposed a fully automated system for the production of 'Kuah rojak'. The machine is to cook 'Kuah rojak' with the capacity of 500 litres using an electric heater equipped with temperature control and pressure will be designed for the cooking station. In order to avoid contamination to the product during transfer to a cooling station, piping system and pump will be used. The cooling station will cool the 'Kuah rojak' to enable the bottling process to be done where it will be designed according to the requirement of the company. Two methods will be used to cool the 'Kuah rojak' that is the chiller and the cooling vacuum to shorten the cooling time. The existing machine will be used at the bottling station where it will be upgraded using the latest PLC that can be controlled centrally using the DCS system that is developed by the researcher. Labelling station will be developed to print the manufacturing batch and expiry date where production data will be recorded to comply with GMP, HACCP, and Halal Certificate JAKIM. This project is able to upgrade the cooling tank system by reducing the cooling time process and able to upgrade the bottling system from the available system the accurate weight content uniformly.



Fully Automated System for 'Kuah Rojak'
Production

IMPROVEMENT OF SHELF LIFE FOR FROZEN PRODUCT

MUHAMAD HAFIZUDDIN RAZLI & MOHD FAHMI MAT ZIN
POLITEKNIK TUN SYED NASIR SYED ISMAIL
apis.nas@gmail.com

Sarimah Food Frozen Enterprise started in the middle of 2010. The company focuses on the food processing and more specifically in the food frozen product. The company is committed to improving the quality of the food frozen product by sharing their problem regarding its inefficient product shelf life. Therefore, the company needs a technology to extend the shelf life of the frozen product. There are several techniques and method that can solve the problems. Shelf life analysis is carried out using microbiological and chemical test to make sure better quality and prolong shelf life. The method is reducing temperature technology to extend the shelf life of the product. Other than that is using a new type of packaging which can eliminate moisture loss and also protect the product from contamination. With our expertise, knowledge and skills in the Food Technology field, it has become our huge responsibility to solve the problem faced by the company so that they able to produce a healthy product and marketable product in the industry.

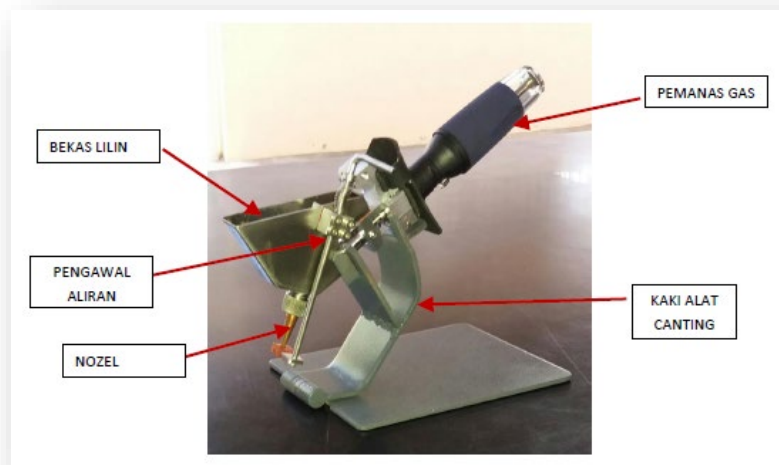


Improvement of Shelf Life for Frozen Product

DESIGN AND DEVELOPMENT OF GAS CANTING TOOL

ROSLAN HASHIM, MOHD FAIZULLAH ABD KARIM, KHAIRUL AKMAL NUSI,
ROSEDI CHE ROSE & MOHD NAZRIN NAHAR
POLITEKNIK UNGKU OMAR
lanshim@puo.edu.my

The gas canting tool is aimed to design and develop a tool to maintain the temperature of batik's wax. This product has a lot of difference between the original canting tools that can ease the users to make the batik. The original canting tool takes more time to make a design of batik. This gas canting tool is specially designed for the users that are new in batik maker. The design is small and comfortable for users to hold and easy to use. Wax container is a wax are placed, the design concept for a wax container is the important part for gas canting tools. They are made from stainless steel and mounted with copper at the top of the wax container. The designed based on the symmetrical shape that is used in engineering. According to the present invention, a device for batik canting comprising; a container; a spout connected to one side of said container; a handle connected to one side off said container; characterized in that a detachable means between said spout and said container; a stopper lever connected to the container; the said stopper lever having a resilient device acting on the stopper lever to allow the lever to actuate and retract; a lid connected to the stopper lever to intercept the said spout; and a heating element connected to said container. Preferably, the heating element connected to the gas burner.



Design and Development of Gas Canting Tool

COFFEE SACHET PACKAGING MACHINE

ANNAFAEDZATUL, ROHANIZA M. ZALI, NURUL AKMAR K & NORLIA GHAZALI
POLITEKNIK SULTAN SALAHUDDIN ABDUL AZIZ SHAH
annafaedzatul@psa.edu.my

This project was conducted to assist the small and medium industries (SMEs) in Malaysia, especially for the related coffee manufacturing industry to overcome a problem in packaging processes. A coffee packaging has a specific requirement to preserve the freshness of coffee contents as well as to attract the consumer with the design and graphics. Due to that, the development and enhancement of insertion feeder for coffee sachet pads to aluminium foil packaging was developed for this particular industry. The important element in this design is that the coffee pads should drop one by one from insertion feeder through forming part before an auto sealing process. This insertion feeder was developed by using the chain conveyor that carried the 16 containers with a total length of 96 cm with an adjustable speed motion controlled by PLC that can go up to 100 drops per minute. This machine is capable to produce up to 12,000 packagings in 2 hours if compared to the conventional method with the increment production of 233%.



Coffee Sachet Packaging Machine

PPRN
50

SOLID FERTILIZER DISPENSING MACHINE

CHOONG CHEE GUAN, SAW CHUN LIN, SYED AMEAR SYED ARIFFIN,
YEOH POH SEE & SALVINDER SINGH KARAM SINGH
POLITEKNIK TUANKU SYED SIRAJUDDIN, POLITEKNIK UNGKU OMAR &
UNIVERSITI KEBANGSAAN MALAYSIA
dr.choong@ptss.edu.my

The concept of this project is based on the current phenomenal of fertilization methods used in today's agricultural field. The amount of fertilizer required to fertilize the plants is the key element for the plant to grow healthy. Such equipment for the exact amount of fertilizer pellets to be dispensed is needed. The machine dispenser consists of a cup which can contain 20 grams of fertilizer pellets. The cup is attached to a mechanism below the storage tank, which a trigger is fabricated to perform the dispensing action of the fertilizer pellets. Hence, fertilizer pellets which had been dispensed travel through a flexible hose and into a metal pipe, which is made to pierce the soil with ease so the fertilizer pellets can be dispensed easily into the soil. The end of the metal pipe consists of a cone like sharp pointy edge which helps agricultural workers to pierce the soil with ease. With the aid of this equipment, it can minimize the time required to perform fertilizing of the plants in the agricultural ecosystem and industry. Lightweight materials such as aluminium and plastic will be used to construct the fertilizer storage compartment and the injector to minimize effort.



Solid Fertilizer Dispensing Machine

MESIN PENGUPAS SELAPUT KACANG TANAH

MUFFILI MAHADI, AZAHAR MOHD NOOR, MOHD ZAHRI JAAFAR & MOHD FAIZAL AHMAD
POLITEKNIK SULTAN ABDUL HALIM MUADZAM SHAH
qadr5805@gmail.com

Mesin Pengupas Selaput Kacang Tanah merupakan sebuah mesin yang dibangunkan untuk syarikat Noor Cookies Sdn. Bhd. Mesin separa automatik yang berfungsi sebagai pengupas selaput kacang tanah dan pada masa yang sama memecahkan kacang tanah kepada saiz yang sesuai bagi produk kacang potong. Kaedah manual yang digunakan sebelum ini menyebabkan kadar pengeluaran produk tidak dapat ditingkatkan kerana proses ini mengambil masa sehari bagi 50 kg kacang tanah. Ini menyebabkan masa melahu (idle time) berlarian sehingga tempoh 2 hingga 3 hari bagi kitaran proses berikutnya. Selain daripada itu, pengoperasian secara manual bagi proses mengupas kulit kacang, memerlukan dua tenaga kerja. Hasil daripada penggunaan mesin ini, proses mengupas selaput kacang dapat dikurangkan kepada 100 hingga 150 kg/hari dengan hanya penggunaan seorang tenaga kerja. Disamping itu mesin ini boleh meminimumkan interaksi pekerja dengan produk secara terus bagi meningkatkan kualiti. Dengan adanya mesin ini, beban pengusaha produk kacang potong akan dapat diatasi dengan mudah dan berkesan kerana menggunakan tenaga kerja yang kurang serta menjimatkan masa untuk mengupas selaput kacang dan menghasilkan saiz kacang yang dikehendaki.

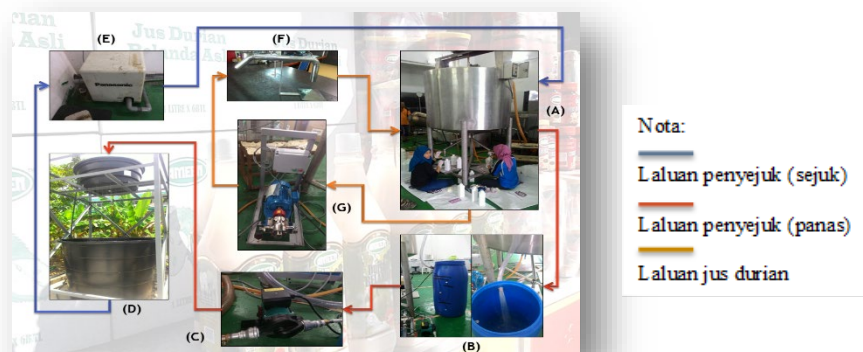


Mesin Pengupas Selaput Kacang Tanah

SISTEM PENYEJUKAN JUS DURIAN BELANDA

MOHD ZAHRI JAAFAR, AZAHAR MOHD NOOR, MUFFILI MAHADI & MOHD FAIZAL AHMAD
POLITEKNIK SULTAN ABDUL HALIM MUADZAM SHAH
zahri.poli@1govuc.gov.my

Penyelidik daripada Politeknik Sultan Abdul Halim Mu'adzam Shah (POLIMAS) telah berjaya menyelesaikan masalah proses penyejukan jus durian belanda Qurba Food Manufacturing Sdn. Bhd. (QFM) sebelum dibotol dan dipasarkan. QFM memiliki sistem penyejukan yang sedia ada, namun memerlukan masa untuk menyejukkan satu tan jus. Tambahan pula, sistem penyejukan yang digunakan tidak mempunyai pengawasan dan secara terbuka. Ini menyebabkan pembaziran bahan penyejuk (air) yang banyak tetapi menyingkarkan haba yang sedikit. Kesan daripada itu, pihak QFM perlu menanggung beban kos tenaga buruh dan kos utiliti (air). Sekiranya proses penyejukan dapat dipercepatkan, lebih banyak jus boleh dikeluarkan. Ini sekaligus dapat mempertingkatkan produktiviti kilang. Justeru objektif pembangunan Sistem Penyejukan Jus Durian Belanda adalah untuk menyejukkan jus durian belanda dengan lebih cepat dan seterusnya meningkatkan produktiviti pengeluaran jus. Sistem penyejukan yang telah dibangunkan ini adalah menggunakan konsep sistem tertutup untuk menyejukkan jus durian belanda selepas melalui proses memasak jus. Hasil daripada pembangunan sistem ini berjaya mempercepatkan penyejukan jus kepada sekitar 1 jam.



Sistem Penyejukan Jus Durian Belanda

RAPID MANUFACTURING FOR LAYER CAKE

HELMİ ABD HALİM, MOHD HANAPI JUSOH, AMEERUZ KAMAL AB WAHID &
MOHD NAZRI MOHD SABRI
POLITEKNIK SULTAN AZLAN SHAH
cikmie8802@gmail.com

Kek Lapis is a multilayer cake. The current method to produce Kek Lapis is difficult and taken two hours to produce only one layer of Kek Lapis. To produce a complete Kek Lapis is time consuming since several layers have to be cooking separately then glueing or bonding together before finally recooked again. At the time being, it is a problem for the company to produce a large quantity of Kek Lapis. Hence, Rapid Manufacturing for Layer Cake (RMLC) is a machine built to solve the production of a large quantity of Kek Lapis in a specific time frame. RMLC is also user friendly, hygiene, easy to maintain and using semi-automation manufacturing system. RMLC applied the same conventional baking process using liquid petroleum gas (LPG) to maintain the taste quality. The novelty of RMLC is the tray moved by conveyor for the baking process. Each layer of cake can be filled into the tray by using differences hopper. 16 trays can be placed in one production line. The results showed RMLC is able to produce about 16 pieces of 10 layers Kek Lapis in one hour. Production rate increases more than 30 times compared to manual process method. Workers tiredness and fatigue can be reduced by introducing the new semi-automation process to improve the worker productivity thus improving the production productivity.



Rapid Manufacturing for Layer Cake

CARVING MOULD FOR LABU SAYONG

SHALIZA SHAHRUDIN, NORAINI HUSSIN & SITI NAZWIN IZANI SULAIMAN
KOLEJ KOMUNITI CHENDEROH
shalizashahrudin15@gmail.com

Barangan seramik yang mempunyai permintaan yang tinggi adalah bekas cenderahati yang bercorak tebuk tembus. Ini bermakna corak pada labu ini bukan sahaja secara ukiran diluar badannya tetapi mempunyai ukiran kerawang yang memerlukan labu itu ditebuk. Teknik ini dinamakan tebuk tembus. Masalah yang dihadapi adalah teknik ini hanya mampu dilakukan secara manual iaitu ukiran dibuat pada produk sebiji demi sebiji dan perlu seragam. Tempahan untuk cenderahati kebiasaannya perlu dibuat dalam kuantiti yang banyak. Oleh itu ukiran secara manual memakan masa yang panjang untuk disiapkan. Guided Decorative Mould for Labu Sayong merupakan acuan untuk seramik industri. Mould ini terdiri daripada master mould dan mould produk. Mould ini membantu menjimatkan masa untuk membuat dekorasi pada permukaan produk seramik yang banyak. Selain itu produk ini dapat meningkatkan produktiviti dan mengoptimumkan pengeluaran. Penggunaan mould ini dapat menjimatkan kos pihak syarikat tanpa perlu mengupah pekerja yang ramai dalam membuat dekorasi dan menghasilkan mould.



Carving Mould for Labu Sayong

AUTOMATIC EGGS WASHING MACHINE

MOHD SYUKUR, MAIZATUL AQMAM, MOHD SHAHRIL &
CHE ROGAYAH, KHAIRUL ANWAR, AHMAD SOBRI
KOLEJ KOMUNITI BANDAR DARULAMAN
syukur12345@gmail.com

Projek Automatic Eggs Washing Machine ini direkabentuk untuk menyelesaikan permasalahan pemprosesan makanan di industri umumnya. Secara amnya, mesin ini adalah dikhaskan kepada Syarikat Ambitious Strategy Enterprise yang menghasilkan pelbagai produk makanan sejuk beku, kek dan roti. Syarikat memerlukan kuantiti telur sebanyak 500 sehingga 1000 biji sehari. Proses mencuci kulit telur daripada kotoran biasanya mengambil masa yang lama dan kurang efisien menggunakan tenaga manusia. Oleh sebab itu, mesin ini direkabentuk untuk membantu mempercepatkan proses penghasilan produk mengikut kitaran masa yang telah ditetapkan dan mencapai kuantiti yang maksimum. Mesin ini dapat meminimumkan masa mencuci kulit telur dan kualiti serta kebersihan telur juga terpelihara. Rekabentuk mesin ini adalah menerapkan penggunaan mesin secara automatic, mencuci dan mengering. Telur yang akan dicuci diletakkan ke dalam tray yang disediakan. Penggunaan konsep graviti membolehkan pergerakan telur melalui lorong yang disediakan dengan berus industri yang berfungsi mencuci telur sehingga bersih sebelum ditolak ke bahagian pengeringan. Air adalah entiti utama yang diperlukan sepanjang proses cucian ini dan air yang sedikit sahaja sentiasa dialirkan sehingga ke hujung proses. Di penghujung proses, telur akan dikeringkan menggunakan pengering (blower). Mesin ini sepenuhnya direkabentuk menggunakan besi tahan karat (stainless steel) supaya ia dapat digunakan dalam jangka masa yang lama dan bersesuaian dengan industri yang berkaitan.



Automatic Eggs Washing Machine

CORN SILK REMOVAL MACHINE

MAHADI SUDIN, ABDUL AZIM YUSOF, HUZAIMAH HASHIM,
HASLIZAWATI JAAFAR & NUR IZDIHA SULAIMAN
KOLEJ KOMUNITI REMBAU
mahadikkrb@gmail.com

Konsep pelaksanaan projek ini adalah berdasarkan keperluan dan permasalahan yang wujud pada salah satu bahagian pemprosesan industri pengeluaran biji jagung lerai. Masalah yang dialami industri adalah semasa aktiviti pengasingan bulu jagung (corn silk) dan jagung lerai. Sehingga kini kaedah pengasingan yang dilakukan adalah secara manual yang meleraikan isi jagung untuk diangkat dan ditampi dihadapan kipas angin yang berputar. Semasa pemerhatian dibuat, anggaran 50 kg bijian jagung lerai dapat diproses dalam masa 1 jam. Jagung lerai yang ditampi di hadapan kipas menyebabkan kualiti bijian jagung lerai tersebut menurun kerana proses dilakukan berulang kali. Dengan menggunakan kaedah manual banyak pembaziran serta mendatangkan masalah dari aspek kebersihan dan keselamatan kawasan kerja. Setelah meneliti punca masalah, kumpulan penyelidik menghasilkan sebuah mesin untuk mengasingkan bulu jagung (corn silk). Mesin ini mempunyai ciri-ciri yang dapat meningkatkan kecekapan masa, pengurangan tenaga kerja, kebersihan, keselamatan tempat kerja serta pengurangan pembaziran.



Corn Silk Removal Machine

AUTOMATIC BATIK EFFLUENT TREATMENT SYSTEM (AutoBETS)

MOHD FITRI AB RASID, AZLAN MUHARAM, FAROUL RAFIQ ROMLI & NOR KHAIRI MOHAMAD ALI
KOLEJ KOMUNITI MASJID TANAH
fitri@kkmt.edu.my

Automatic Batik Effluent Treatment System (AutoBETS) merupakan sistem rawatan effluen batik secara sistematik dan efisien terdiri daripada pengumpulan air sisa, penapisan peringkat pertama, tangki pengudaraan, pengawalan pH, penapisan peringkat kedua dan penapisan karbon aktif pemeringkatan dua kali sebelum dilepaskan ke saliran atau longkang-longkang berdekatan. Sistem ini diaplikasikan secara automatik dengan semua fungsi kawalan dilakukan secara Programmable Logic Control (PLC). Selain daripada itu, fungsi tambahan iaitu penerimaan Short Message Service (SMS) sekiranya kawalan sistem mempunyai masalah ataupun terputus bekalan kuasa ketika sistem sedang beroperasi. AutoBETS mampu merawat sehingga 200 liter effluen batik dalam satu masa dan mengambil tempoh kira-kira 2 jam 45 minit sebelum effluen terawat disalurkan. AutoBETS dijalankan secara automatik berbanding sistem sebelum ini yang memerlukan pekerja untuk mengendalikan sistem rawatan. Keputusan effluen terawat yang telah melalui ujian makmal menunjukkan AutoBETS berjaya memenuhi spesifikasi Jadual Kelima Pelepasan Effluen Industri Mengikut Piawaian B Akta Kualiti Alam Sekitar dengan julat pH 6-9 selain beberapa parameter yang mengikut piawaian sebelum dilepaskan. AutoBETS berjaya mengurangkan kesan-kesan pencemaran alam sekitar dengan merawat effluen batik sebelum dilepaskan, menjimatkan kos dari segi penggunaan tenaga kerja manusia dan mengurangkan risiko ketika pengendalian bahan kimia berbahaya.



Automatic Batik Effluent Treatment System (AutoBETS)

PROJEK



2017

PROJEK PUBLIC PRIVATE RESEARCH NETWORK (PPRN) 2017

Politeknik dan Kolej Komuniti Malaysia

BIL	PRODUK	INSTITUSI	M/S
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2	MARUKU OIL DRYER MACHINE	POLITEKNIK BANTING	82
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PINEAPPLE PEELING AND SLICING MACHINE

MUHD MUSLIM ABU BAKAR & KHAIRUL AZHAR ABD AZIZ
POLITEKNIK SEBERANG PERAI
muslim@psp.edu.my

Pneumatic Pineapple Cutter Machine is a project to speed up the cutting process. This is intended to fulfill the demand from the SME sector. This resulting chilli sauce of Kampung Nanas is in high demand. 2000 bottles of the product have used 400 pieces of Moris pineapple fruit. Skin peeling process, removing pineapple eyes, separating pineapple creams and cutting pineapple contents to make cubes/slices done manually where it takes about 5 minutes for a pineapple. The company needs pineapple peeling machine technology to save time and fulfill the product's production capacity. The objective is to develop a mechanism for pineapple peeling with optimum depth and also to develop a cutting system to cut the pineapple into desirable pieces. The present device discloses a device for peeling outer skin pineapple comprising a rotatable fruit holder attached on the power rotated headstock at first part to hold and rotate the pineapple and the second part hold at another end by inserting a spike rod holder, detachable round divider blade cutter for cutting and dividing connected at the centre end of a tailstock. The peeling motion characterized by a saw blade peeler embedded into the outer peeling skin and peel on the surface according to the tension of a spring attached on the peeler blade moving frame moving on the rail parallel with the rotated pineapple. The embedded saw blade peeler determines the appropriate thickness of the pineapple skin. The divided pineapple flesh will pass through the perforated platform into the slicer to be sliced into various shapes and slide into a tray. This project has successfully achieved the goal with pineapple skin peeling process reduced from 5 minutes to 1 minute for a pineapple. Additionally, pineapple skin can be peeled with optimum depth by using the innovative cutting mechanism hence increased the production of the chilli sauce.



Pineapple Peeling and Slicing Machine

MARUKU OIL DRYER MACHINE

MOHD KHAZAREN KUSAINI & AHMAD SALLEH BUANG
POLITEKNIK BANTING
khazaren@polibanting.edu.my

These projects are proposed to fulfill the Demand-Driven Innovation Project by Public-Private Research Network (PPRN) for List of Technologies for August 2016. This project is an initiative spearheaded by the Ministry of Higher Education Malaysia; as one of the strategies to close the technological knowledge gap, increase productivity and strengthen Malaysian economic development through innovation and commercialization programs. The project is based on the problems that rise by IRASH TRADING which located at Pengkalan Chepa and Maruku as the main product. The main problems faced by the company caused by the quality of the product (maruku) are affected due to the excess oil of the product in the packaging and the product also affected by the surrounding during the manual oil drain processes. This project proposed a machine concept based on spinning to solve the excess oil in the packaging and isolate surrounding for faster oil drying without affected by the surrounding. This project covered the research area in manufacturing and food science technology.



Maruku Oil Dryer Machine

COOKIES MACHINE PSS

NORSUHAILIZAH SAZALI, NORASMAH KAMARUZAMAN & TONY ONTOK
POLITEKNIK SANDAKAN
norsuhailizah@pss.edu.my

Cookies Machine PSS adalah mesin yang direka khas untuk Syarikat Nurqis Trading bagi mencetak biskut secara automatik. Teknik pencetakan biskut yang dilakukan oleh pengusaha masih menggunakan cara tradisional iaitu menggunakan cetakan tangan. Ramuan biskut yang dihasilkan oleh Syarikat Nurqis Trading adalah berasaskan nestum, koko dan oat. Tekstur biskut adalah sangat rapuh dan mudah berderai. Oleh yang demikian, tujuan utama pembuatan Cookies Machine PSS adalah untuk menggantikan cetakan secara manual sekaligus meningkatkan produktiviti syarikat. Terdapat tiga langkah utama bagi pembuatan Cookies Machine PSS iaitu merekabentuk mesin, membina mesin, seterusnya menguji kecekapan mesin secara automatik. Terdapat beberapa komponen penting yang diperlukan untuk penghasilan mesin iaitu motor AC, kerangka mesin yang diperbuat daripada keluli tahan karat, penggerak (actuator), dan unit kotak kawalan (control box unit). Cookies Machine PSS mampu mencetak adunan biskut satu persatu mengikut bentuk dan tekstur yang dikehendaki. Dalam satu minit, mesin mampu menghasilkan biskut sebanyak 50-70 biji.



Cookies Machine Pss

BITTER GOURD SLICING AND DRYING MACHINE

ADIB RIDHWAN ADENAN, MOHD ASMADI IDRIS, YUSUF ISMAIL &
HAMIDAH NOOR MD YUSOH, HANIZA EWANDI JONG
POLITEKNIK MERLIMAU MELAKA
adib_ridhwan@pmm.edu.my

Nyata Mampu Enterprise merupakan sebuah syarikat Bumiputera yang menjual Sambal Peria. Permintaan terhadap sambal peria ini semakin hari semakin bertambah. Syarikat Nyata Mampu Enterprise ini perlu menyediakan 50kg peria sehari untuk memenuhi permintaan pelanggan. Pemotongan dan penyagatan peria adalah dilakukan secara manual dan mengambil masa 7-8 jam untuk memotong 50kg peria. Selain itu peria yang telah dipotong perlu dikeringkan secara manual selama 5-6 jam. Tenaga pekerja yang ramai dan masa yang lama diperlukan. Justeru satu kaedah penyelesaian telah dikenalpasti penyelidik dengan merekabentuk sebuah mesin pemotong peria yang mesra pengguna. Mesin tersebut dapat membantu mempercepatkan proses pemotongan peria dan juga sebuah mesin pengeringan peria yang bersesuaian untuk kegunaan syarikat. Mesin ini direka untuk memenuhi keperluan sekaligus meningkatkan produktiviti syarikat.



Bitter Gourd Slicing and Drying Machine

PPRN
5

PROSES “LEAN” BAGI PEMBUATAN KEROPOK LEKOR BEBOLA

AHMAD SABRI MOHAMED & MOHAMAD HAFALIF MURAD
POLITEKNIK SEBERANG PERAI
sabri@psp.edu.my

Keropok lekor adalah satu makanan ringan yang menjadi kegemaran masyarakat di Malaysia. Proses pembuatan keropok lekor ini memerlukan tenaga kerja yang ramai, masa proses yang lama dan kaedah yang tidak teratur. Hal demikian berlaku kerana beberapa faktor iaitu masalah inventori bahan-bahan keropok lekor, susun atur mesin yang tidak teratur, dan kaedah kerja yang meletihkan pekerja. Oleh itu, dengan mengguna pakai proses “Lean” bagi pembuatan keropok lekor bebola ini dapat mengatasi masalah tersebut. Permasalahan yang timbul adalah dalam aspek inventori bagi proses “Lean” kerana dapat menjimatkan, teratur dan isu kualiti secara sistematik. Dengan menggunakan salah satu kaedah “*Lean Process*”, proses aliran kerja untuk produksi berjalan dengan lancar tanpa kekangan atau bebanan. Mesin keropok lekor bebola dapat mengatasi masalah seperti simpanan inventori, masa menunggu dan kaedah perpindahan dari satu proses ke satu proses. Kesan daripada pembangunan produk ini proses “Lean- Continuous Flow” masa dan tenaga kerja yang dilakukan dapat menjimat masa sekaligus meningkatkan produktiviti. Konveyor bertingkat juga membantu pekerja untuk mengurangkan beban kerja sebanyak 20 kg.



Proses “Lean” Bagi Pembuatan Keropok Lekor Bebola

PPRN

6

COTTON-WOOLLY DECOMPRESSION MACHINE WITH CUSTOM-MADE RAKING BLADE OPERATED BY ELECTRICAL MOTOR

TENGKU AZMAN TENGKU MOHD, RADIAH CHE SU & MAZUKI SALIM, SUZANA MOHD ALI
POLITEKNIK KUALA TERENGGANU
tgazman@pkt.edu.my

In textile small-medium enterprises and micro companies that run a business of production and supplying mattresses, synthetic cotton (cotton-woolly) is a better alternative instead of organic cotton in order to reduce the cost. However, in certain conditions, the company needs to additionally process the cotton-woolies in order to attain the fluffy property, suitable for mattress substance. A case study in NMH Production & Creation verified that the company managed to decompress only 20% of their per-day-capacity of mattress production (2-3 mattresses per-day) by using a modified cow-food crusher machine. A specific decompression machine; Cotton-Woolly Decompression Machine was proposed by Politeknik Kuala Terengganu researchers with custom-made raking blade and operated by 7.5 Hp electrical motor which was estimated to be completely developed within six months. This machine is expected to daily produce 250 to 300 kg of processed cotton-woolies (10-15 mattresses per-day) which exceeds the company per-day requirement. The safety and efficiency of the machine were also been considered in the design by including a closed-body frame to avoid direct contact to the blades and a control panel with labels.



Cotton-Woolly Decompression Machine with Custom-Made Raking Blade Operated by Electrical Motor

PROJEK



2018

PROJEK PUBLIC PRIVATE RESEARCH NETWORK (PPRN) 2018

Politeknik dan Kolej Komuniti Malaysia

BIL	PRODUK	INSTITUSI	M/S
1	AUTOMATIC CARTON FODING MACHINE	POLITEKNIK SU	89
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3	SEMI-AUTOMATIC MIXER & LOW PRESSURE STEAM GENERATOR FOR MUSHROOM PRODUCTION	POLITEKNIK SULTAN HAJI AHMAD SHAH	91
4	AUTOMATIC COFFEE PACKING MACHINE	POLITEKNIK NILAI	92

AUTOMATIC CARTON FODING MACHINE

AZRUL MAHFURDZ
POLITEKNIK SULTAN HAJI AHMAD SHAH
azrulabm@polisas.edu.my

The company is a humidifier manufacturer that has been used in the hospital. This process or product is water treatment, plastic blowing, filling, closing and sterilization. Currently, the company produces 3000 units a day. The Company needs a machine that can pack and seal health products within 12 seconds per carton. The previous method involves manual packaging by the workers completely; this process causes non-compliance in ISO because it is not guaranteed hygiene. In addition, it also takes a lot of space in its packaging area. The Automatic Carton Folding Machine proposed by Polytechnic Sultan Hajj Ahmad Shah will be fully controlled using PLC controls that include motor movements and conveyors. The machine is designed to accept several carton sizes and is not limited to one carton size only. The machine is capable of sealing the boxes at the top and bottom using two carton sealing heads. The main frame of the machine uses stainless steel material and durable. This is to ensure the quality of hygiene and also extend the life of the machine. This machine also does not require a skilled worker to handle and is easy to maintain. It is hoped that the development of automatic carton folding machine will help companies compete more competitively



Automatic Carton Foding Machine

PREMIX FLOUR WIGHING MACHINE

MOHD SYAFARIM MD ISHAK & ZULY ASYRAF ZULKIFLI
POLITEKNIK SULTAN HAJI AHMAD SHAH
syafarim@gmail.com

Noraini Cookies Worldwide Sdn Bhd merupakan sebuah syarikat pengeluaran makanan yang bertempat di Shah Alam. Produk syarikat ini boleh didapati di pasaran tempatan dan antarabangsa. Syarikat ini juga menghasilkan tepung pra campuran dan rempah dengan kapasiti pengeluaran maksimum 2,100 unit sehari. Produk inovasi Premix flour weighing machine memfokuskan kepada rekabentuk, penciptaan dan fabrikasi yang dapat mengekalkan kualiti tepung pra campuran yang dihasilkan, mempercepatkan proses menyukat dan membungkus dan operator selesai menggunakan mesin yang lebih ergonomik. Produk ini juga dibangunkan bertujuan menyukat maksimum sehingga 2 kg tepung dan meningkatkan pengeluaran syarikat kepada 30 – 70 bag seminit. Secara keseluruhan produk ini boleh membantu usahawan perniagaan untuk dikembangkan pengoperasian seterusnya dapat membuka ruang dan peluang kepada perusahaan kecil dan sederhana.



Filing Machine

SEMI-AUTOMATIC MIXER & LOW PRESSURE STEAM GENERATOR

AIDA HARYATI MUDA & TENGKU BESARUDDIN SHAH TG. YAAKOB
POLITEKNIK SULTAN HAJI AHMAD SHAH
aida@polisas.edu.my

Mesin pengurai kapas dihasilkan bagi membantu pengusaha meningkatkan kadar pengeluaran dan mengurangkan kos. Semi-automatic mixer & low pressure steam generator dihasilkan bagi meningkatkan kapasiti pengeluaran dua kali ganda daripada hasil sedia ada. Selain daripada itu, mesin ini direkabentuk bagi menampung kapasiti habuk kayu sebanyak 200 kg, merekabentuk sistem kawalan kemasukan air secara automatic, Merekabentuk dan menghasilkan mesin yang dapat menjimatkan masa operasi sebanyak 50%. Mesin ini direkacipta berkonsepkan ringkas, mudah alih, mudah diselenggara, memiliki ciri ergonomik dan memenuhi piawaian keselamatan yang ditetapkan. Rekabentuk mesin adalah berdasarkan sembilan (9) spesifikasi utama iaitu fungsi, rekabentuk, ergonomik, kaedah pembinaan, ketahanan, kesesuaian bahan, keselamatan, nilai komersial dan jaminan kualiti. Mesin ini juga direkabentuk bagi menghasilkan 'Low Pressure Steam Generator' yang dapat mempercepatkan proses penghasilan stim bersuhu 98°C dan merekabentuk 'piping system' yang menyambungkan 'Low Pressure Steam Generator' dengan pengukus sedia ada. Secara keseluruhannya, mesin ini berperanan dalam meningkatkan produktiviti dan kualiti pengeluaran.



Semi-Automatic Mixer & Low Pressure Steam Generator

AUTOMATIC COFFEE PACKING MACHINE

MOHD TAUFIK REZZA MOHD FOUZDI, DR AHMAD RAZIMI MAT LAZIM &
MOHD NAZRULAZLAN ABD RASID
POLITEKNIK NILAI, NEGERI SEMBILAN
taufikreza@gmail.com

Produk makanan dan minuman merupakan produk yang sedang berkembang dan mempunyai potensi untuk dikomersialkan sejajar dengan dasar kerajaan mewujudkan hub halal. Produk inovasi automatic coffee packing machine dibangunkan bagi menaiktaraf mesin pembungkusan kopi sedia ada yang menggunakan mesin separa automatik dan manual. Mesin ini mempunyai ciri kawalan dan pemantauan melalui web server menggunakan telefon pintar dan komputer. Selain daripada itu mesin ini juga boleh memantau suhu proses penghasilan produk kopi serta kuantiti bungkusan mengikut piawaian yang ditetapkan. Mesin ini memberi impak yang positif kepada pengusaha industri kopi dalam aspek pengurangan masa pembungkusan, penjimatan tenaga kerja, kualiti produk yang tinggi dan mengurangkan kos pengoperasian.



Rajah 1: Sistem Kawalan Jauh melalui capaian Smartphone



Rajah 2: Mesin Pembungkusan yang dihasilkan

Automatic Coffee Packing Machine

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