final report

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SmartShape/SmartStretch Commercialisation – Stage 1

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Executive Summary

To commence the project it was necessary for the project team to be familiar with the progress made to date by Arthur Pitt (NZ) and to develop a good understanding of the technology behind the development.

To this end visits were made to Cargill in Wagga Wagga and several visits to Fix-All Services in Hamilton, NZ to view the prototype in operation and talk with the engineers and production staff involved. Numerous meetings were held with MLA staff, and the project team took part in industry demonstrations and met with potential end users of the machine and end users of the product from the machine.

A thorough review of the SmartShape/SmartStretch patents was undertaken to understand the scope of the protection in place.

A number of concept design reviews were held to develop ideas for machine construction that would overcome the limitations of the current prototype in respect of throughput and package presentation.

A horizontal design was put forward utilizing the flow through principal to speed up production rates and two methods of feeding this horizontal version were developed.

One feed system used a “spoon” type feeder to place the meat portions into the compression rubber, the other used a continuous belt feeder to transport the portions into the compression rubber.

A horizontal system was built and fitted with each of the above feed systems.

After a number of trials, it was decided that the belt feed system provided the best option to allow throughput rates and practicality of operation to be achieved.

Much effort and time was spent on devising a method of presenting the packaging material to the machine. A number of specialist packaging companies were approached to assist in the development of a solution but, of the 4 companies approached, only one proposed a suitable feed system. However, the system was complex and expensive, and as a result was not progressed.

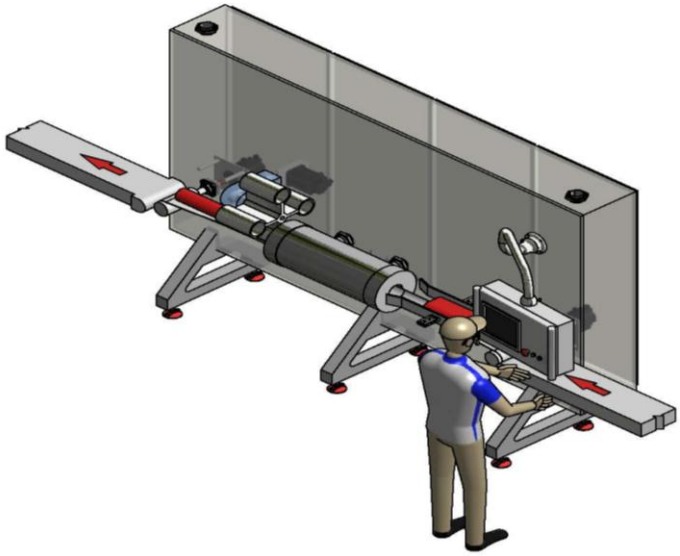
We were unsuccessful in solving this aspect of the machine design and currently only have hand loading of the packaging material as a solution.

The original machine designer, Arthur Pitt, has however a packaging solution under development which has the potential to resolve this aspect of the machine design.

Contents

1 Milestone 4 – Machine Costing

The testing program is at a stage where a design for a commercial machine is now possible – this design has been done and a concept drawing has been produced with sufficient detail to allow a cost estimate to be made.



The design incorporates:

- A horizontal compression chamber with continuous belt feed system such that product enters one end of the chamber and exits into the packaging bag at the other end of the chamber giving a flow through design.
- Feed mechanism and packaging index mechanism driven by servo-drives (all same size) with accurately controlled movement, acceleration and positioning.
- High speed vacuum system incorporating a vacuum reservoir and continuous running vane vacuum pump. Large piping and valves for rapid air movement.
- High volume rate compressed air system with air reservoir and high rate air dump valves.
- Face plate frame design to isolate meat handling functions from mechanical and electrical and control systems. Comprising a single large s/s plate one side of which is mounted the processing equipment, the reverse side has all electro/mechanical systems in a s/s enclosure (IP66 rated). This allows processing and cleaning activities to be isolated from electro/mechanical systems. Easy clean operation and easy maintenance.
- Packaging film loading by hand until Fix All Systems operational.
- P.L.C. operation with HMI touch screen, fault diagnosis, emergency stops.

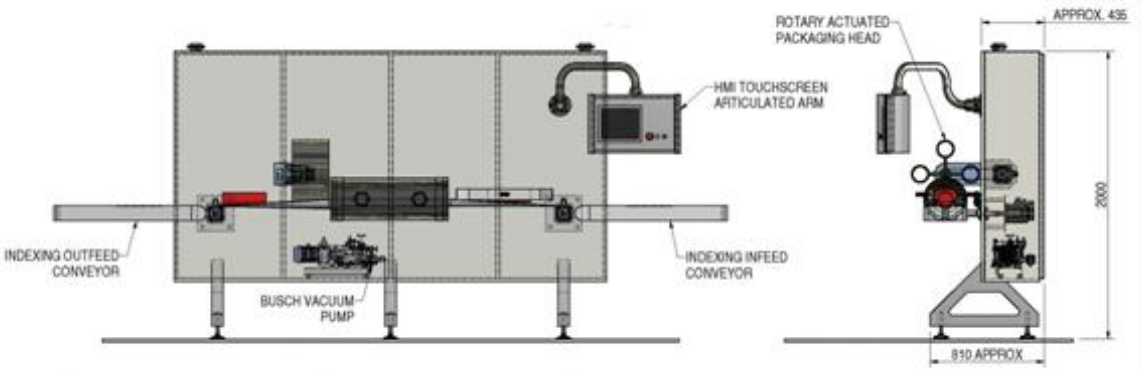
- C.I.P. (Clean in Place) provision.
- OH&S compliant.
- Australian Standard compliant.
- Approx dimensions – 3000 long x 850 wide x 1200 high.
- Machine rate – 4-5 units/minute (packaging feed dependant).

1.1 Machine Limitations and Unknowns

The capacity of the machine to handle various sizes of meat cuts is limited by the maximum size to which the “white lady” rubber sleeve will open to. So for any given sleeve size, there will be a maximum meat portion and this will be determined in practice. Should larger portion size be required to be handled, it would require a larger white lady rubber sleeve.

The process control software will almost certainly require modification and adjustment as the commissioning process occurs.

Due to the relatively small number of components in the machine, the control system will be able to be manipulated to handle all circumstances envisaged.



2 Marketing Approach

2.1 Identify Potential Market

A large amount of introductory work has been undertaken by MLA and the industry reaction to the technology will be well understood by the MLA staff.

This is a valuable source of information to identify those producers and processors in the Australian market who ‘could’ use the technology to advantage.

The development of this potential customer list could be used to identify those who would benefit most from the technology and therefore would be most likely to commit to install the first commercial unit.

2.2 Marketing Process

Develop a sales brochure of the commercial machine backed up by trial results of the Fix All machine and video footage of the commercial machine undergoing trials. Strong emphasis on the “advantages” of SmartShape technology.

Prepare, in conjunction with MLA, a cost model covering increased returns from product sales – cost of machine operation and thus determining the likely ROI for various producer throughputs.

Approach several likely processors with a proposition for trial/buy basis with a discount for the first machine.

Construct the commercial machine – the funding costs for this would need to be investigated – subsequent machines do not have this problem as they are self-funded by way of deposit and progressive payments.

Aim to sell the first 2 or 3 machines directly by FPE. During that period approach several of the major Australian machinery agents to handle the sales and marketing of SmartShape to allow FPE to focus on manufacture and development of machines and machine design.

Continue to advertise and demonstrate the benefits of SmartShape focusing on the end user market for the product.

Participate in trade shows, i.e. FoodPro and in industry technical forums to demonstrate and promote the technology.

Appoint a SmartShape sales/engineer to promote and service the customers and technology. Our Project Engineer, Glenn De Silva, would be well positioned to work in this role.

3 Conclusion

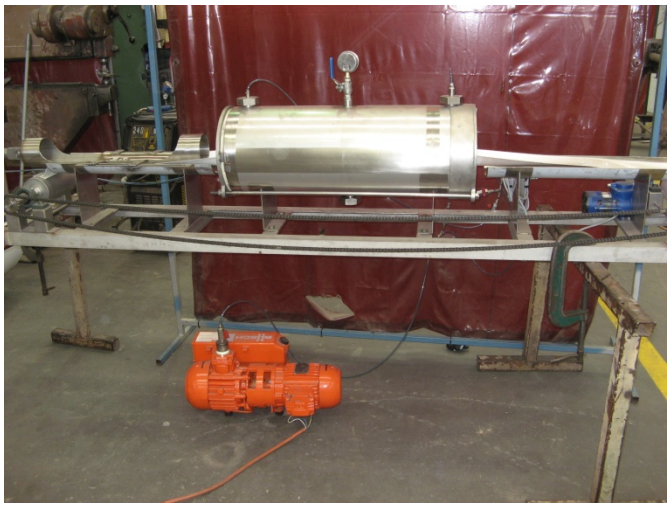
The project has come to a successful conclusion with the exception that we have failed to find an effective solution to an automated bag feeder.

The automated bag feeder is the key to achieving the higher throughput rates required and the developments being undertaken by Fix-All Services, will allow the higher rates to be achieved.

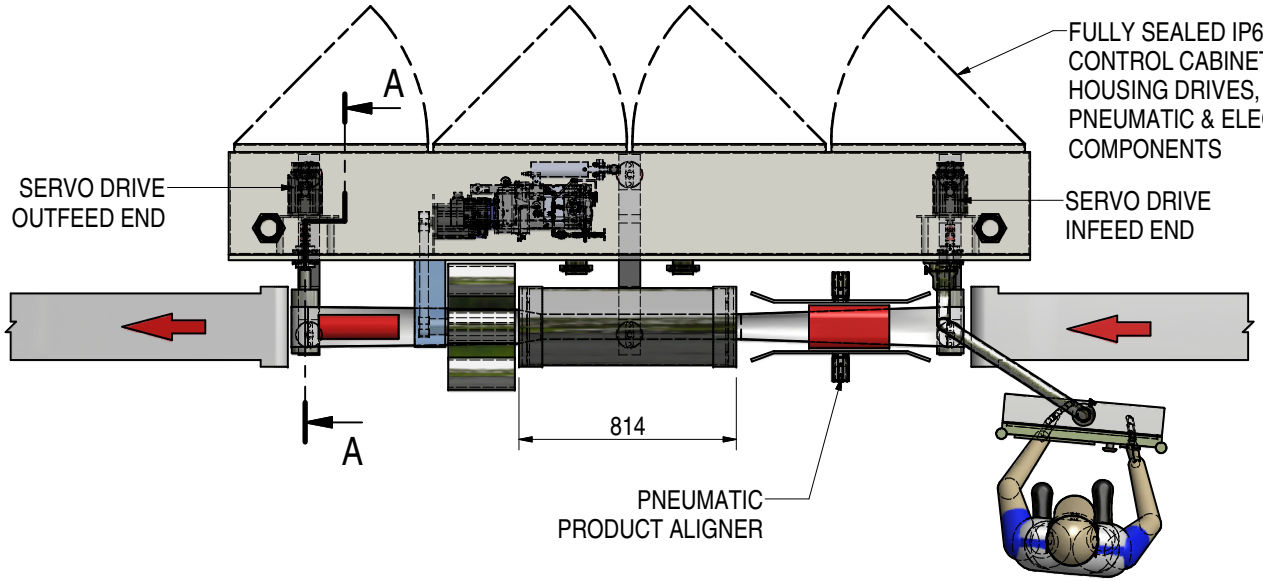
We have enjoyed working on this project and our sincere thanks go to the staff at MLA and in particular to Mr. George Waldthausen for providing information, assistance and encouragement in reaching our success so far.

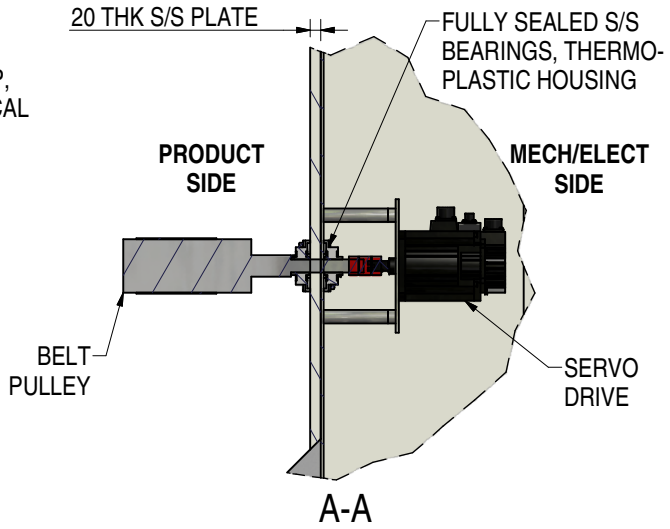
B.H. Ham
Food Process Engineering Pty Ltd

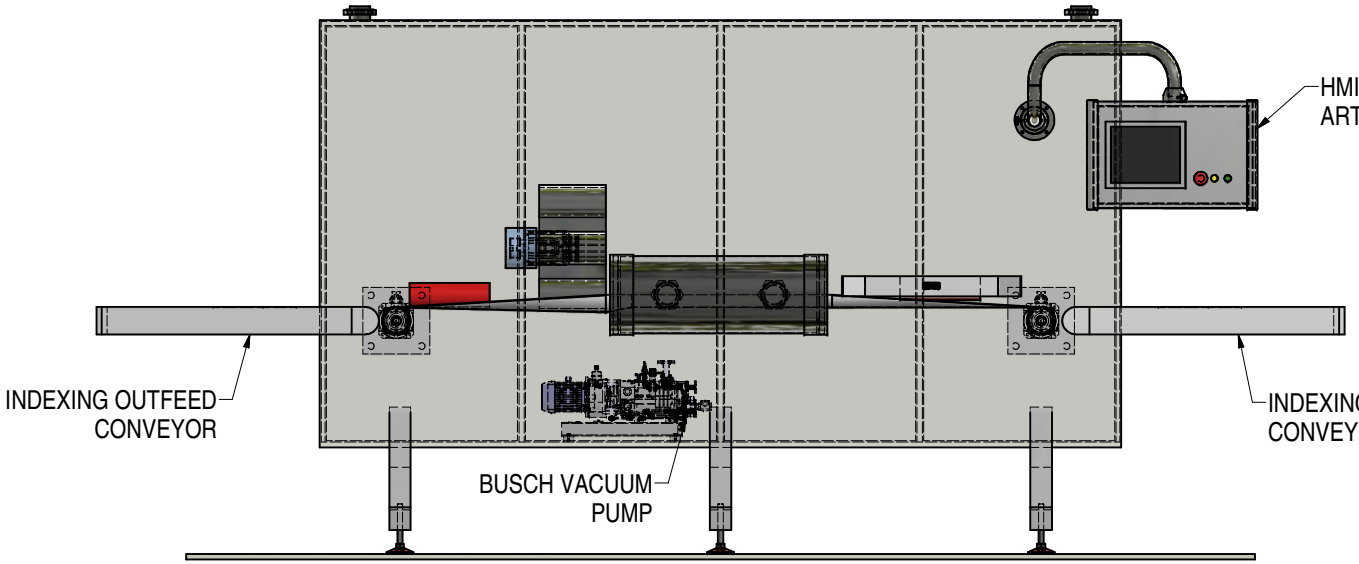
Belt Feed System

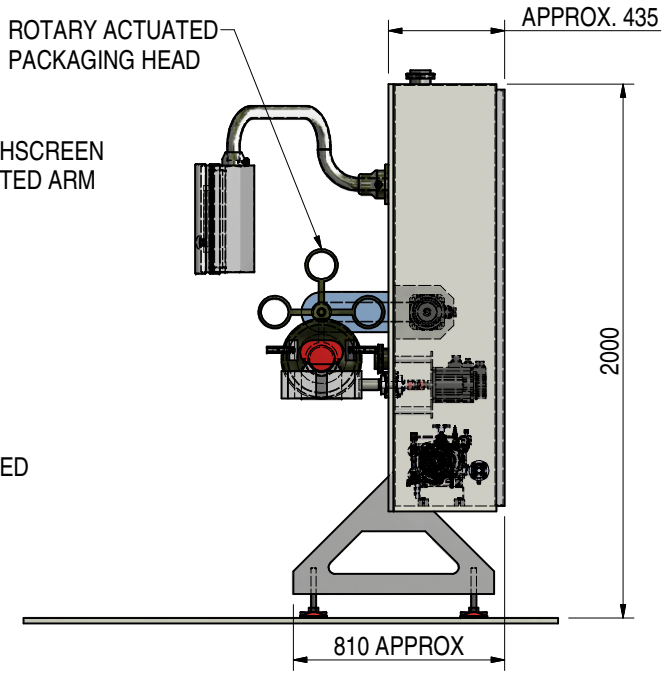


Spoon Feed System









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A	ISSUED FOR INFORMATION	10.08.12	F.RIGAZZI

DESIGN REVIEW
2.
1.

NOTE: UNLESS OTHERWISE SPECIFIED:
TOLERANCES FOR STRUCTURAL DIM'S:
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TOLERANCES FOR MACHINED DIM'S: 00.0±0.25
TOLERANCES FOR ANGULAR DIM'S: ±0.5°
ALL CORNERS 0.5 C/R

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SMARTSTRETCH CONCEPT
DESIGN - VERSION 3
MLA

Drawn	F.RIGAZZI	9/08/2012	
Checked			
Approved			
Scale	NTS	A3	

DRG. NO. **K255-01**

ISSUE **A**

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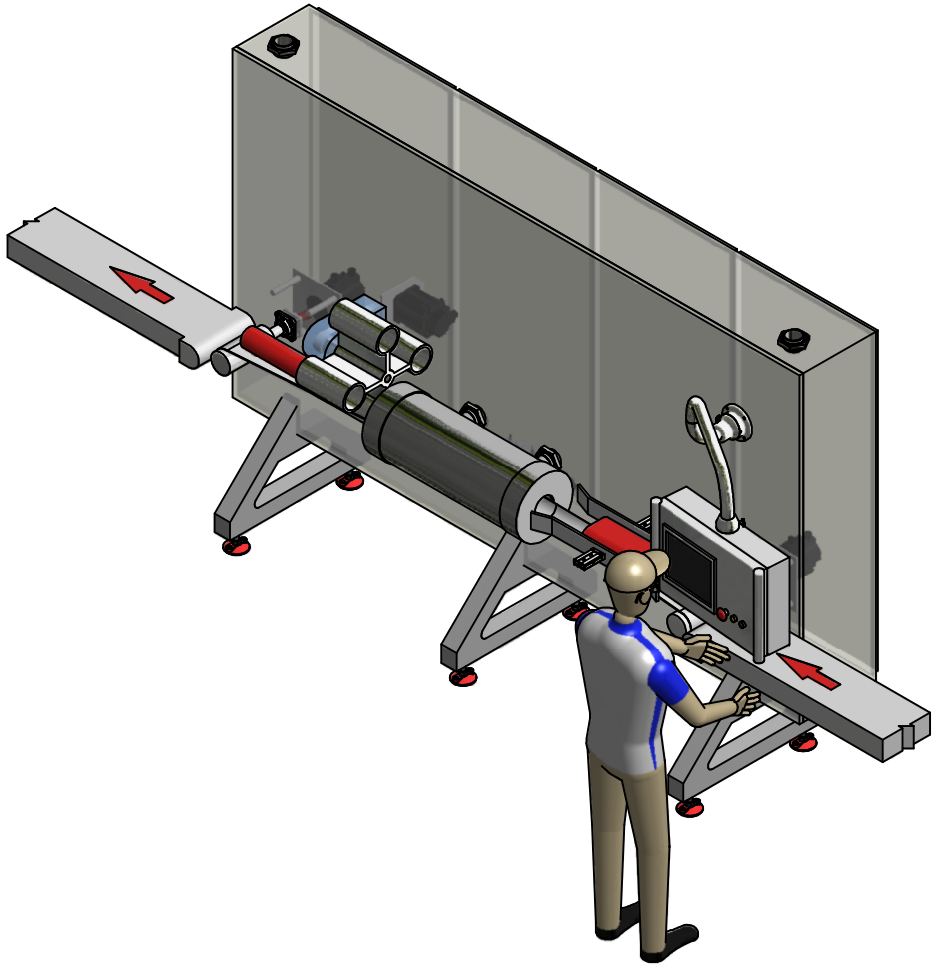

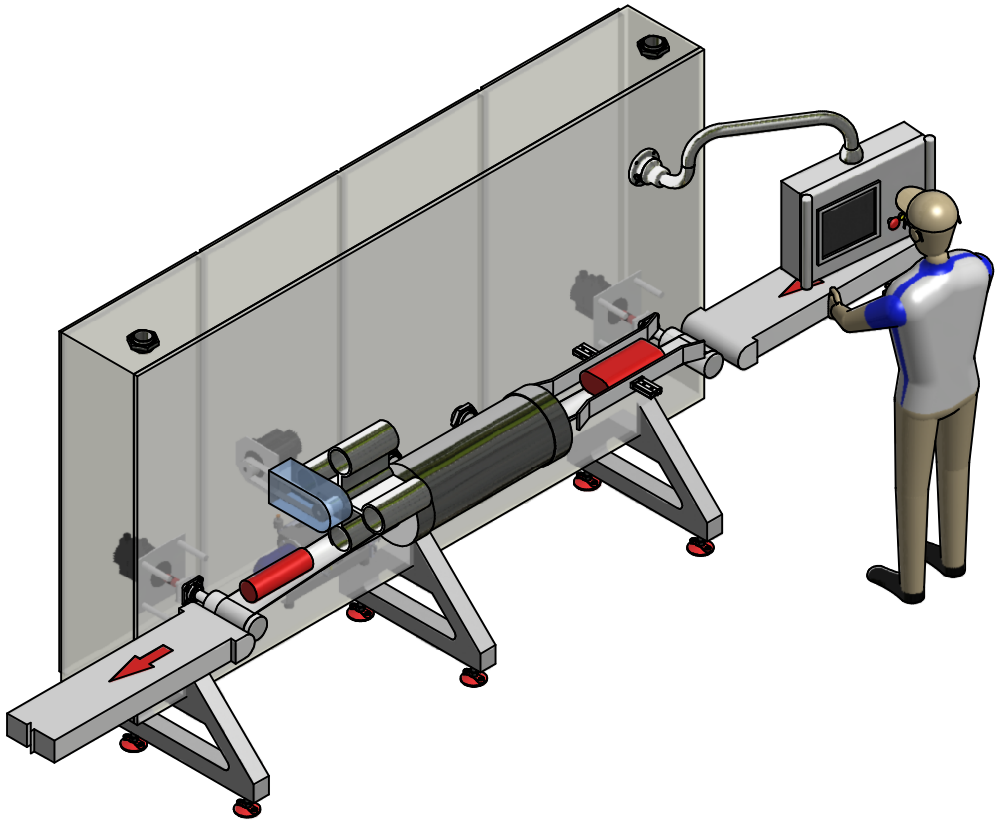

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SMARTSTRETCH CONCEPT
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