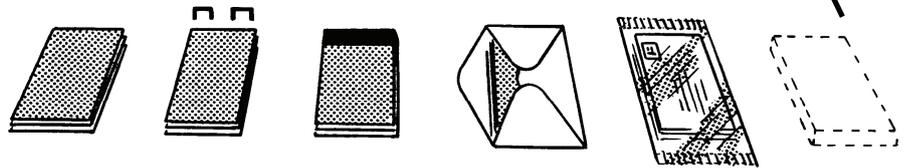


LAWHILL



MODULAR // SYSTEMS // FOR // PAPER // HANDLING

**A COMPREHENSIVE
INFORMATION PACK**



1

Company Overview

2

Systems

- ◆ *Systems for Cut Sheet stationery*
- ◆ *Systems for Column Printed stationery*
- ◆ *Systems for Slalom Printed stationery*

3

Modules

- ◆ *Range Directory*
- ◆ *BAS Module (Book Assembly System)*
- ◆ *Slalom Sequencers*
- ◆ *'Solo' Guillotine Module*
- ◆ *Mini™ Stitcher/Guillotine Module*
- ◆ *AUTOMATE™ Module*
- ◆ *Stitching Modules*
- ◆ *Binding Modules*
- ◆ *Wrapping Modules*
- ◆ *Enveloping Modules (on-line)*
- ◆ *Ancillary Devices*

4

Client List



COMPANY OVERVIEW

COMPLETE PAPER SOLUTIONS LIMITED

Complete Paper Solution Limited is a British Company based in the County of Surrey, and is part of the Lawhill Group of Companies which all specialise in the production of paper handling related products. All aspects of design and manufacture are carried out here by a small team of experts and in association with a number of selected specialist companies.

Established in 1979, design, manufacture, assembly, testing, installation and after sales service are now all fulfilled from our UK base, and since 1982 paper handling has grown to become the major part of our business.

Many systems, built for the security printing industry, have included the mechanical and electrical integration of separate manufacturers' machines, to suit the demands of the project. Lawhill have in recent years concentrated on the burgeoning Electronic Data Processing market where the demands to use innovation in the handling of new forms of printed output are ever increasing, and Direct Marketing where integrity and security in the mailing process is becoming of paramount importance.

It is always the aim of Fletcher Lawhill Limited to provide a complete solution in accordance with customer requirements, and where it is necessary, design bespoke modules, interfaces and add-on devices to achieve that goal.

During the past few years, Lawhill have formed links with many world-wide organisations including Xerox and Pitney Bowes through the Worldwide Xerox Partners Association, Delphax Technologies in the USA, Böwe Systec, Ulma, Eforma in Switzerland, C.P.R. in South Africa and Leigh-Mardon in Australia.

Today, The Lawhill brand of products are sold around the world through our many international links and most recently have teamed up with Delphax Technologies Limited in the UK who are promoting Lawhill products across the Globe. Currently Lawhill equipment is operating in Ireland, France, Venezuela, Egypt, South Africa, the USA, Canada, Kenya, Malaysia, Singapore, Taiwan, Argentina, Malta and of course the UK. In addition, many specialised systems are presently in production which, in time, will become benchmark equipment within the paper handling industry.



SYSTEMS

The Lawhill 'Series 7' range of booklet making machines is descended from a number of bespoke machines, designed and installed around the world for producing booklets for customers who were unable to have their demands met by any of the conventional manufacturers. Due to the wide range of demands and the resulting solutions, Lawhill are now able to offer standard equipment to meet virtually any requirement.

SYSTEMS can be built from an existing range of MODULES which are fully compatible and expandable as the customer's requirements change. For example, if one should wish to produce simple stitched-only booklets from cut sheet, then a Guillotine and Stitcher is all that is required. Alternatively, if the system is to produce a dedicated size of book, then the Series 7 'Mini' is ideally suited to this. If at a later date the user changes production methods from sheet to continuous stationery, then the Guillotine could be replaced with a Forms Cutter, but the Stitching and Taping Modules, etc. could still be used and interfaced as part of the new system.

SYSTEMS can be developed to accommodate automatic feeders, binders, inserters, wrappers etc. to build a more powerful and flexible production unit. Additional modules are simply bolted on, wired into the existing control unit and the computer programme then updated.

The following pages show typical SYSTEMS based around differing print media. Each is built up from the MODULES detailed in the next section and are as follows :-

Systems for **CUT SHEET** stationery

Systems for **COLUMN PRINTED** stationery

Systems for **SLALOM PRINTED** stationery



Systems For Cut Sheet Stationery

With the introduction of non-impact, cut sheet printers using laser, ion deposition or LED technology, the requirement has grown since the mid 1980's for bookmaking systems capable of processing printed output from cut sheet rather than web. The sheets printed with multiple images of 2, 3, 4 or even 5 to view are commonly called FOLIOS; hence the term FOLIO FINISHING.

Cut sheet based systems usually start with the Guillotine Module which cuts the folio sets into separate books; once cut, it is taken away by the next Module where it is jogged neatly into a pack and stitched. A simpler but less flexible system can begin with the 'Mini' which stitches the folio first and then cuts it; in both cases, further modules can be added into the line.

Most systems currently in existence are hand fed by the operator with one separate folio set at a time. This is the most economical arrangement for runs of relatively low volume or for books of very simple format. The disadvantage with this arrangement is that a single operator has to load and unload the machine and cannot physically do both at the same time. If two operators are used, then the one unloading is normally underused and relatively expensive to employ over long periods.

It is this desire to maintain maximum throughput, while utilising minimum staff, that has brought about the **AUTOMATE™** Feeding, Collating and Verification Module. Personalised pages created on the printer are loaded into a bin, which can then be merged with other documents such as covers, advertising and any other information material, before being finished on-line by the other modules.

A number of so called 'Bypass Transports' and 'Set Collectors' have been devised by other manufacturers to enable on-line finishing with the parent printer. When suitable, these devices can be integrated into the production line to allow Lawhill modules to be used in this manner. As electronic printing technology advances to create documents faster on larger sheets, so Lawhill will continue to meet demands by developing more flexible, adaptable devices for handling the output.



Typical production area showing two booklet finishing systems which produce cheque books from cut sheet stock, pre-printed and collated by an older Delphax printer. This is the most commonly chosen modular format in the Lawhill range and is normally referred to as a **CHEKSAFE™** Cut Sheet Folio Finishing System.

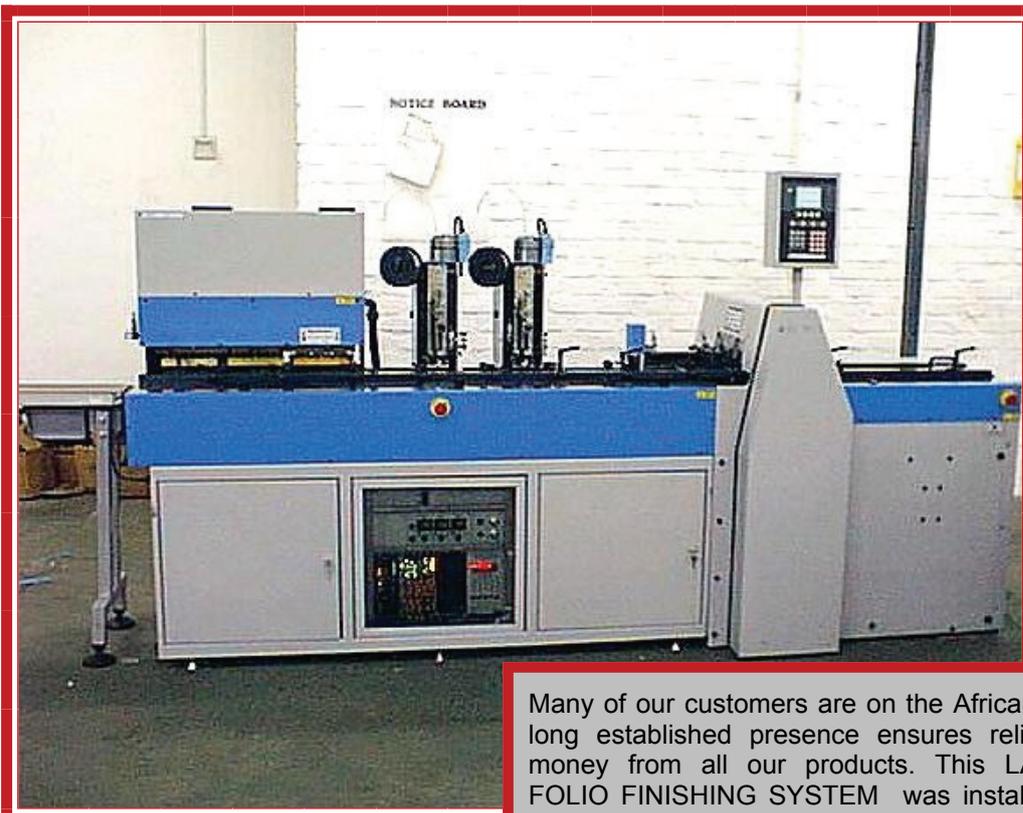


Typical production area showing the processing of 'Prestige' Stamp Booklets. The pre-printed four-to-view folios are first thread sewn in the fully automated Lawhill Sewing Module and are then passed to a **CHEKSAFE™** system for cutting and taping. This unit has been specially adapted to remove a gutter between each book, and to process two folios at the same time for greater productivity.





THE LAWHILL **JUMBO™** FOLIO FINISHING SYSTEM
Automated finishing of booklets up to 10½ inches wide by
7 inches deep and between 1 and 14 mm in thickness,
with processing of both portrait and landscape styles.



Many of our customers are on the African continent where our long established presence ensures reliability and value for money from all our products. This LAWHILL **JUMBO-WT** FOLIO FINISHING SYSTEM was installed in Zimbabwe and processed cheque books and other similar documents.



Systems For Column Printed Stationery

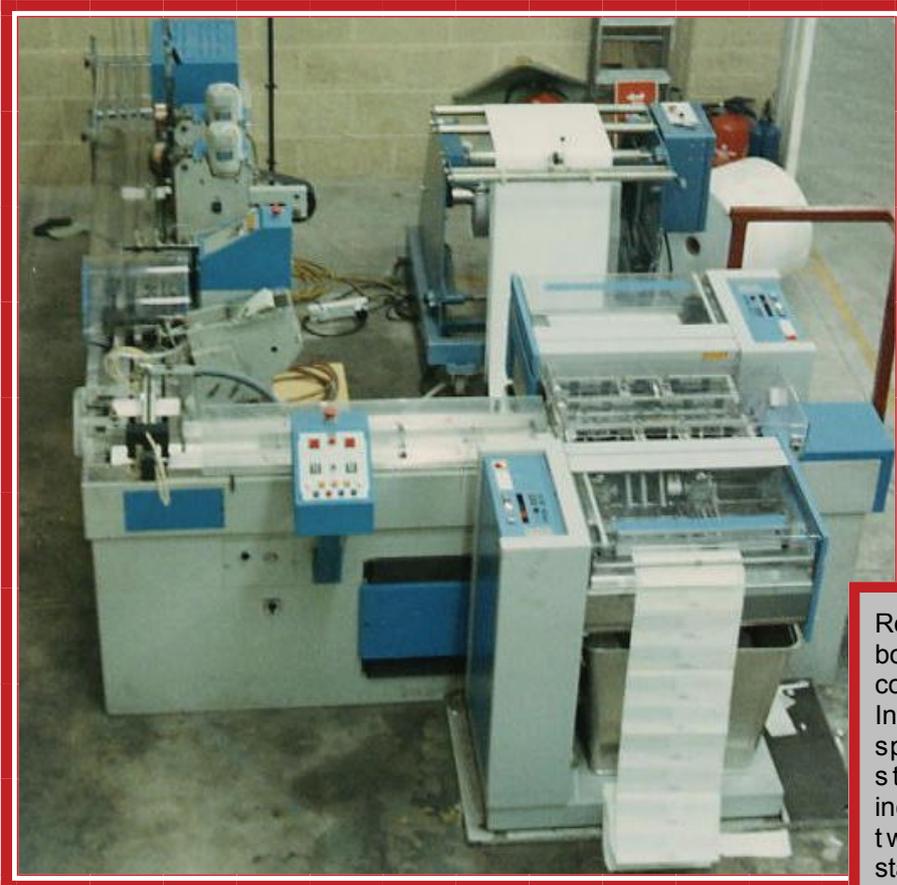
Forms printed on continuous web stationery are arranged in one of two ways, either sequentially one after the other (last or first page first), or in a zig-zag fashion, termed slalom. Both have their advantages and Lawhill provides systems to accommodate both arrangements.

Column printed webs, whether one or two across, are fed into a Forms Cutter which removes the tractor holes and separates the forms into individual pages. The paper can be from a reel on an unwind stand, direct from the printer, or from fanfold format. In either event, Optical Mark Recognition (OMR) codes are used to identify start and end of sets, grouping and matching such that a second (or more) webs can be integrated in the correct sequence.

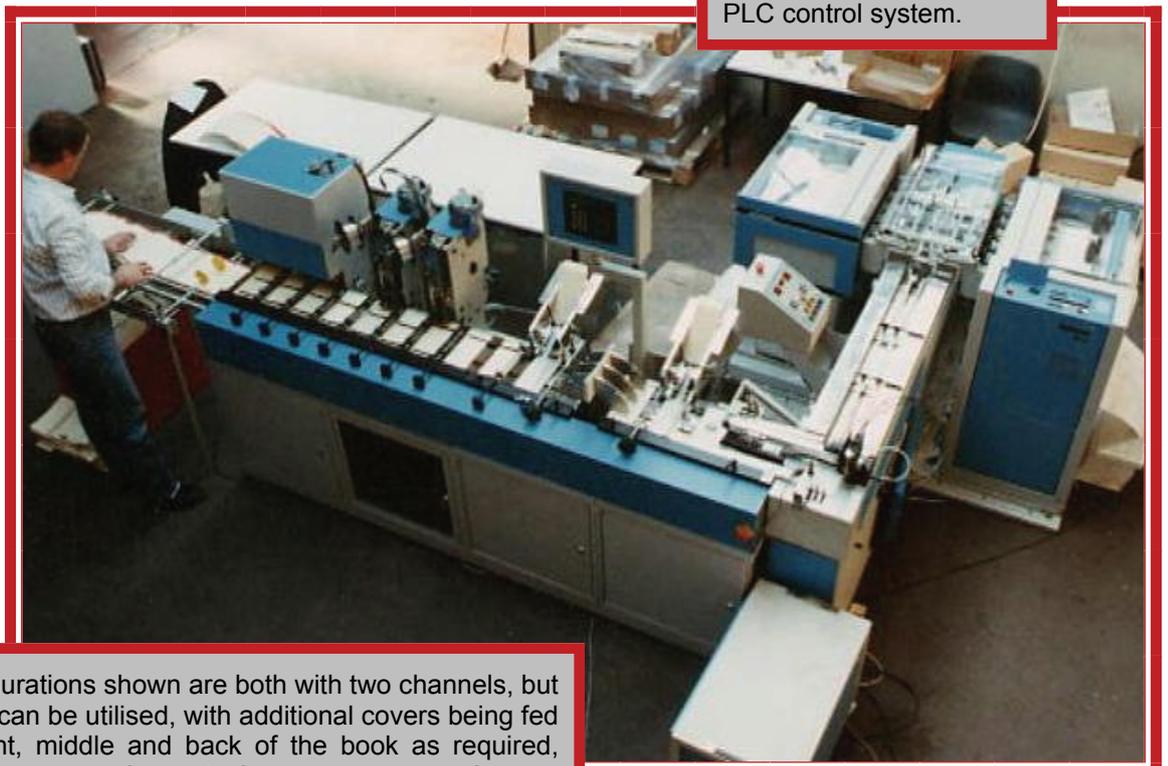
The most common arrangement is to have one or more Forms Cutters mounted on the Lawhill Book Assembly System (BAS Module) such that the individual forms are then taken directly into a central collating area where other pages can be merged. The components of the Book Assembly System are arranged to provide maximum flexibility of format in that pre-cut card covers can also be fed into the collating area at the desired point and so be merged with the webs opposite. The system can also be configured so as to allow compatibility with machines produced by other suppliers, using webs printed toe to head and head to toe, which would otherwise require the use of two completely different machines. Once complete, the collated pages are transferred away from the make-up area onto the next finishing module in the system. The BAS is described in more detail later.

Should the requirement be for handling webs printed in only a single column, then the pages can be fed out of the Forms Cutter directly onto the track of a finishing unit such as a Stitching Module. When complete, the collated pages are moved away from the make-up area, jogged, then stitched, or stitched and taped, etc. as required. This arrangement allows for a very simple cost effective system which can make books composing of up to two webs with covers fed either from one of the webs, or onto the outside of the book from separate feeders.

Both of the above systems can be arranged to handle slalom stationery for added flexibility, but with a reduction in output speed against a purpose built and dedicated system.



Reel or fan-fold fed bookmaking systems for column printed webs. Input is through two high speed cutters, and standard features include, handling one or two channels of stationery, OMR or bar code scanning, strip cut and up to 999 book style recipes stored within the PLC control system.



The configurations shown are both with two channels, but up to four can be utilised, with additional covers being fed to the front, middle and back of the book as required, providing unrivalled flexibility for a wide range of sizes.



Systems For Slalom Printed Stationery

For occasions where the desired format of printing is slalom rather than columnar, a sequencer unit can be fitted after the forms cutter to arrange the pages into the desired order. Three configurations are possible, each of which provides a different format depending upon the cost, speed and flexibility required.

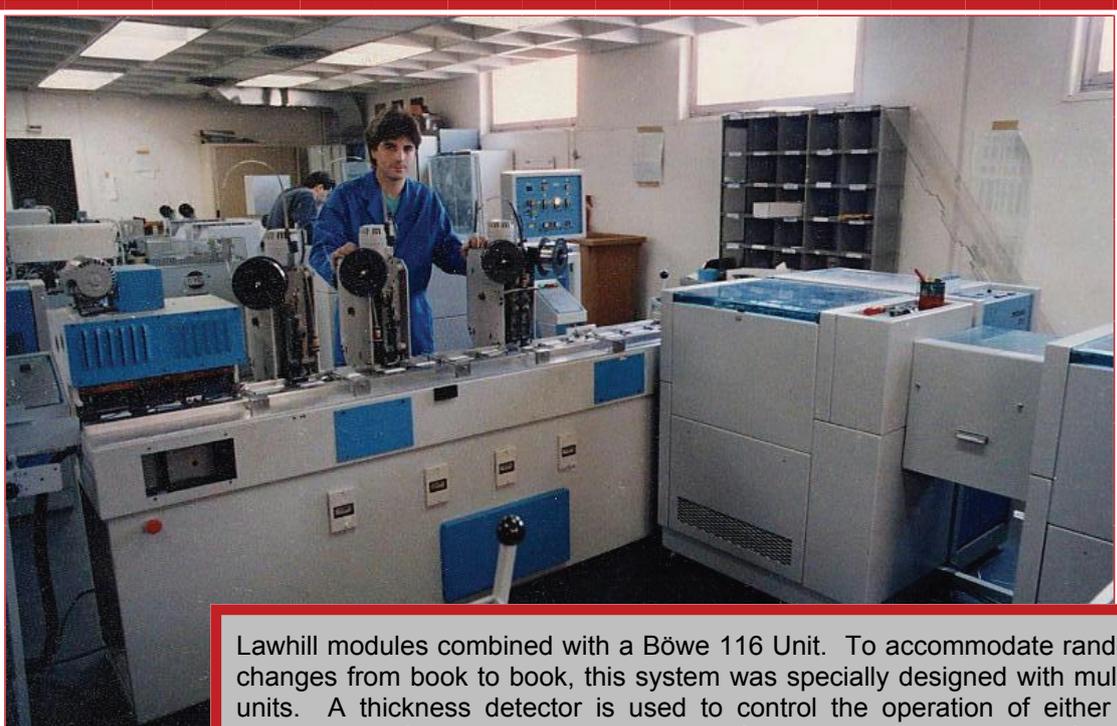
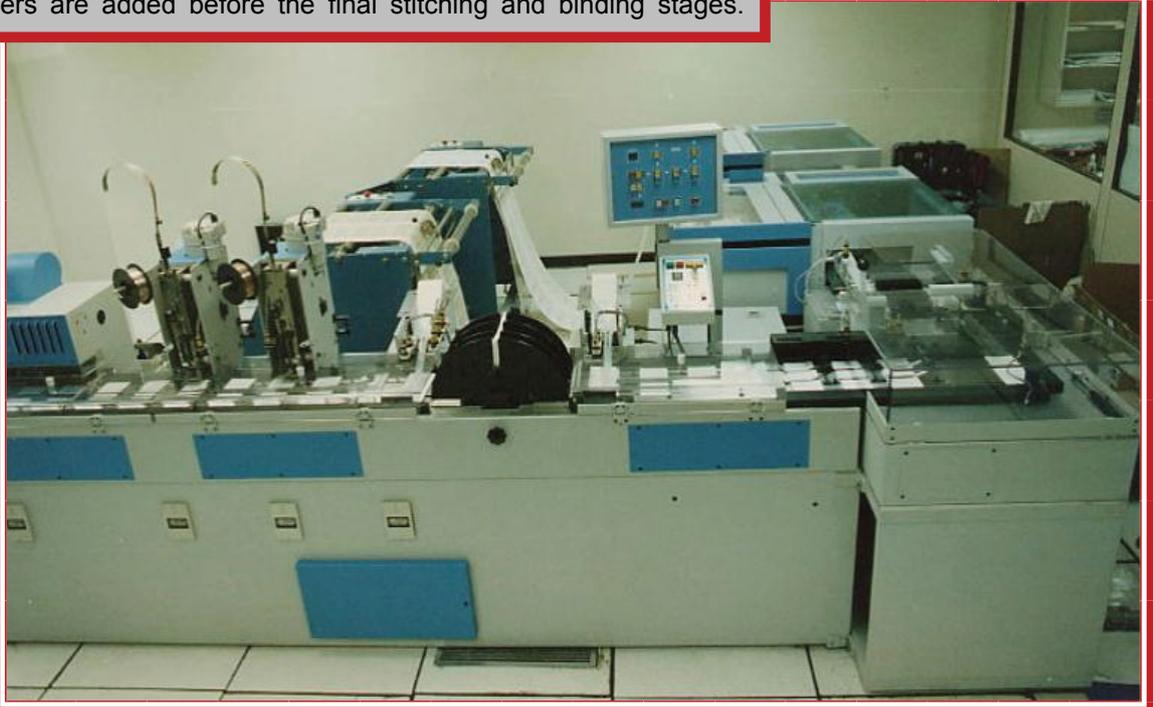
A very simple system can be configured for one or two webs by using a forms cutter (equipped with double tractors if two webs are used) which controls the cutting of the webs and then feeds the cut forms into a sequencing unit which, in turn, arranges each form into the appropriate order. Once complete, the collated sheets are fed forward to be finished by stitching etc.

The same principle can be used in the Book Assembly System normally used for column printed stationery. By withdrawing the forms cutter away from the BAS and slotting the sequencer unit between, slalom printed forms can be collated and fed down the central track to subsequent finishing units. This adaptation is ideal where a conventional column based system already exists and slalom printed runs of short or intermittent demand are necessary. In these cases, the purchase of an additional dedicated system is not cost effective.

The most productive system available is based around the Böwe 106/116 system as featured on the accompanying pages. Certain limitations in the standard Böwe finishing modules has resulted in Lawhill producing a number of systems using the 116 as the front end for cutting and sequencing. The collation and subsequent stitching, etc. is then accommodated by Lawhill modules integrated into the System. To complement the flexibility of the Böwe, devices such as variable tape control, multiple cover feeders, etc. can be added.



System processing two personalised webs of slalom printed stationery on a Böwe 116 unit. The remainder of the modules and integration into one automated unit is all Lawhill. The collated forms are fed from the 116 unit, and then turned for correct presentation to the finishing modules where covers are added before the final stitching and binding stages.



Lawhill modules combined with a Böwe 116 Unit. To accommodate random thickness changes from book to book, this system was specially designed with multiple stitching units. A thickness detector is used to control the operation of either a twin head stitching unit, for thinner books, or a pair of single head stitching units for thicker books.



MODULES

The following pages are intended as an accompaniment to the previous section which described, in general terms, some typical systems which can be created using Lawhill Series 6 Modules. This section describes in detail the type, operating characteristics and specifications for each module available and is arranged as follows :-

Range Directory

BAS Module (Book Assembly System)

Slalom Sequencers

'SOLO' Guillotine Module

MINI™ Stitcher/Guillotine Module

AUTOMATE™ Module

Stitching Modules

Binding Modules

Wrapping Modules

Enveloping Modules (on-line)

Ancillary Devices



Range Directory

Lawhill booklet making systems normally consist of two or more units from the a range of modular machines either as an individual system or linked to other compatible machines through suitable interfaces giving the complete solution to specific finishing requirements.

Web Specific

- BAS - Book Assembly System for utilising up to four, column printed webs
Böwe 116/117 - German assembly system for processing slalom printed webs

Cut Sheet Secific

- 'SOLO' - Guillotine Module for cutting sheet folios
MINI™ - Dedicated Stitcher/Guillotine Module for cut sheet folios
AUTOMATE™ - Feeder/collator for cut sheet based systems, with optional inserters for matching and merging of personalised documents

Finishing

Stitching Modules

- 'TWIN-HEAD' - Compact unit fitted with dual heads for books of up to 6 mm
'STANDARD' - Medium duty for books of up to 13 mm in thickness
'SPECIAL' - Heavy duty for books of up to 16 mm in thickness

Binding Modules (for spine taping)

- 'STANDARD' - max 100 pages x 4" depth
JUMBO™ - max 120 pages x 7" depth
'LARGE FORMAT' - for larger documents i.e. A5 and A4 documents

Wrapping Modules

- 'STANDARD' - an off-line alternative to the enveloping of booklets
'SPECIAL' - for the 'on-line' wrapping of all booklet/pack sizes up to A4

Enveloper

- based around any conventional inserting machine such as Bell & Howell, Pitney Bowes or Böwe

Sheet Feeder

- for the addition of non-personalised covers and forms

Wheel turn-over

- for inverting books to enable stitching from the back and to allow additional documents to be added to the reverse side

Book rotation unit

- for enabling books to be stitched and taped along the long landscape edge



BAS - Book Assembly (System)

The Lawhill BAS is a Module in its own right but is normally a System by the fact that it is nearly always used in conjunction with one or more forms cutters, cover feeders and finishing modules. It is this ability to accommodate sheet feeders which can insert non-personalised covers at any chosen point in the book, that provides this machine with unrivalled flexibility in book make-up.

It is common to find the personalisation printer placed in-line with the system so as to maintain integrity in the production cycle. However, this does limit the machine to running at the speed of the printer. Running the web from fanfold pack or an unwind unit allows more rapid operation. The stock can be printed as single or two across on the web which is passed through the double tractor forms cutter mounted on the side of the BAS. The web is trimmed to remove the sprocket holes and cut to the desired size, a strip cut can be made between forms or a double blade can be fitted to remove the strip in one cut, hence increasing the output speed of the system. The cutter can be controlled to cut in increments of 1/8" or 1/6" as required.

After cutting, the individual pages are assembled according to one of the 999 book make-up recipes which are stored within the control system. Integrity and matching between each channel is maintained with either OMR, bar code laser scanner or camera while paper flow and wreck detection are monitored by photocells. Sheet feeders positioned opposite the forms cutters can be signalled to feed additional forms at any desired point in the sequence, providing more collation versatility within any given book make-up.

An additional useful feature of the BAS is that a two-channel sequencing unit can be placed between the forms cutter and the collation area, thereby accepting slalom printed webs. This adaptation is ideal where a conventional column based system already exists and slalom printed runs are relatively short or infrequent.

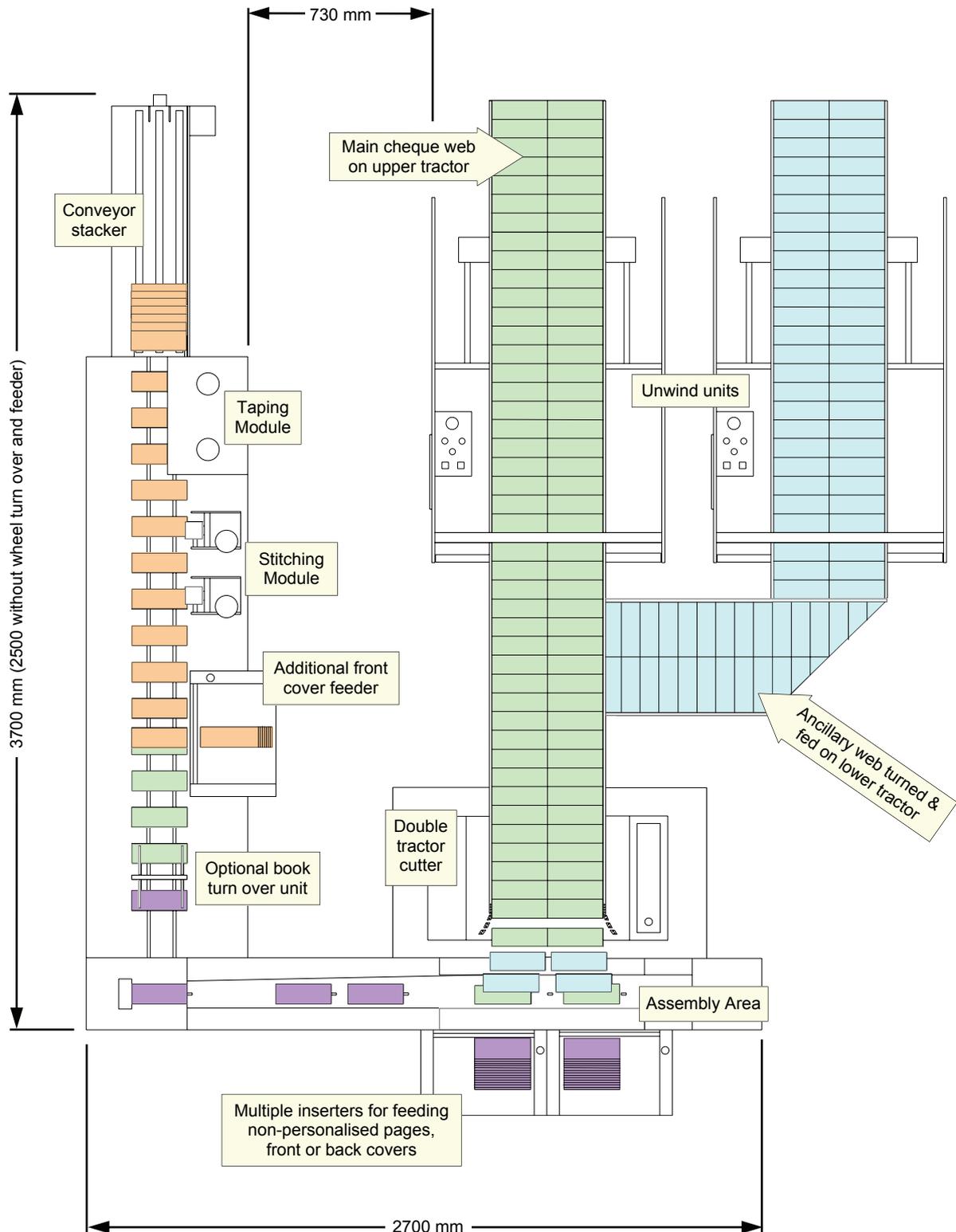
Once collated, the packs are passed down the centre channel of the system to be jogged into neat blocks from where they are ejected onto a subsequent module for further finishing.

Specification

Book Thickness	- Maximum 12 mm (1/2") but can be increased if required
Book Depth :	- Minimum 73 mm (2 1/4") Maximum 102 mm (4")
Book Length :	- Minimum 159 mm (6 1/4") Maximum 242 mm (9 1/2")
Programmes :	- 999 in Flash memory
Power :	- 220/240 Volts, 50 Hz, 30 amps, single phase
Compressed Air	- Dry and clean - 20 litres/minute at 7 Bar



Lawhill 2 Channel Bookmaking System





Slalom Sequencing Devices

Two options are available for merging slalom printed webs into a single book, the choice being largely dependent upon cost, speed and the flexibility required.

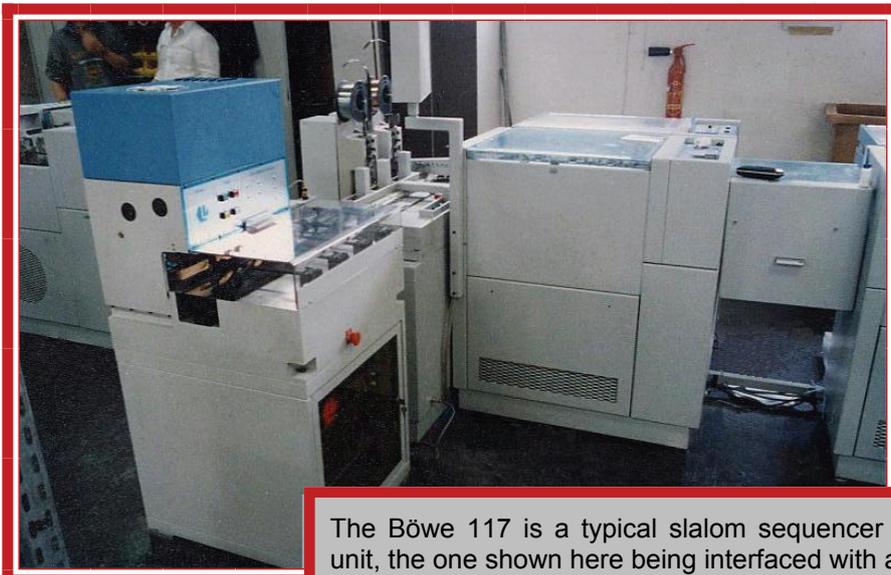
The first is a simple device which is suitable for small systems handling only one or two webs. The web is fed through a forms cutter, equipped with single or double tractors, and is slit and cut into the desired form sizes. As each pair of forms is fed from the cutter they are merged into one stream with grouping and parity controlled from OMR marks or bar codes. Once complete, the finished pack is fed out of the sequencer onto suitable finishing modules.

For a system providing higher output speed, Lawhill modules can be combined with the Böwe 106/116 system. Sequencing, matching and collation is handled by the Böwe which also turns each form upside down and all processes are electronically monitored with OMR used for grouping and parity between webs as necessary. Once the Lawhill Interface Module has removed the completed collation, the cutter continues with the next collation process, while jogging, stitching, taping etc. are handled by subsequent Lawhill modules.

Specification

Specification is dependent upon the type of sequencer used, but is generally :

Number of columns	- 1, 2 or 3
Book Thickness	- Up to 100 pages
Book Depth	- Minimum 76 mm (3") Maximum 115 mm (4½")
Book Length	- Minimum 165 mm (6½") Maximum 242 mm (9½")
Paper Weight	- 70 to 170 gsm



The Böwe 117 is a typical slalom sequencer with an integral stitching unit, the one shown here being interfaced with a Lawhill Binding Module.



'SOLO' Guillotine Module

The Solo Guillotine Module is needed for processing sheets of documents usually referred to as 'folios'. It is a rugged machine capable of cutting through document thicknesses up to 14 mm being powered by an integral hydraulic system operating at approximately 100 bar.

Folios are placed on the in-feed table by hand or on-line from an automatic feeder, and a pneumatically driven arm then pushes the complete folio forward into the cutting area. Once in this position, optical sensors detect the presence of the paper and signal the guillotine cycle to commence. Reciprocating fingers set and register the folio beneath the blade for cutting. As each book is removed from the folio by the cutting action of the knife, it is moved forward onto the adjacent module and the guillotine cycle is repeated.

The registration fingers are mounted on a carriage and are exactly pitched at the book depth so that each cut is accurate and provides identically sized books. Each book depth requires a separate carriage and these are easily replaced by the operator. A Guillotine Module is supplied with two carriages as standard. For example, a Xerox based Council or Bureau may typically use A5 and 1/3 A4 (99 mm) sizes, whereas a Bank or Security Printer may typically use 3" and 3½".

To overcome the inherent problems experienced when cutting documents of varying thicknesses, the Lawhill Guillotine Module incorporates a special 'reverse sprung' mechanism which exerts maximum clamping pressure on thick books as well as tungsten carbide tipped blades for extended life. Since cutting is conducted prior to stitching and taping, the pages are allowed to slide freely away from the blade producing an evenly cut edge for improved positional accuracy of the OCR / MICR line.

Control for the module is from the central processor, while the colour operators panel displays information on machine status, error messages, programme modes and other useful data.

Specification

Length of folio	- Maximum 21" (534 mm)
Cut size of book	- Maximum 8" (203 mm), minimum 2¼" (57 mm)
Width of folio	- Maximum 10½" (267 mm), minimum 6" (152 mm)
Thickness	- Up to ½" (13 mm)



'MINI' Stitcher / Guillotine Module

Lawhill Modular Paper Handling Systems are designed to be as easily adjustable and adaptable as possible and as a result are built around the principle of cutting before the finishing stages such as stitching and taping. These machines are typically used for 3", 3.5", 4", 6", 7", A5, 1/3 A4 and A4 booklets and can therefore be used for a wide range of uses including cheque and credit books, Utility Services, Council Tax payment books, minutes, internal telephone directories, reports, listings etc.

With the demand from small Councils for a more cost effective machine which can produce books of one size only for Council Tax, Lawhill have produced a new variation on the existing proven Guillotine Module. Unlike the standard arrangement of linking the Guillotine Module before the Stitcher Module, the **MINI™** possesses an extended infeed table at the side of which is mounted a Twin Head Stitching Unit. The folio is moved forward pneumatically and then stepped forward into the blade using the same system as with the standard Guillotine Module. However, the folio is stitched before it is cut and as the thickness is relatively small, the quality of cut is not impaired. Once cut, the booklet is either collected directly onto a conveyor or can be passed onto a subsequent Module for Taping or Wrapping for example.

The simplicity of this machine allows for a considerable saving over the conventional separate Guillotine and Stitching Modules but ultimately there is a trade-off between flexibility and economy. Where it is anticipated that the only usage will be for books of one depth and of thickness under 50 pages (6 mm), this is an ideal solution. Production is, if anything, higher than the conventional system, and can be easily maintained at over 1,500 booklets per hour nett.

Advantages of this system are :

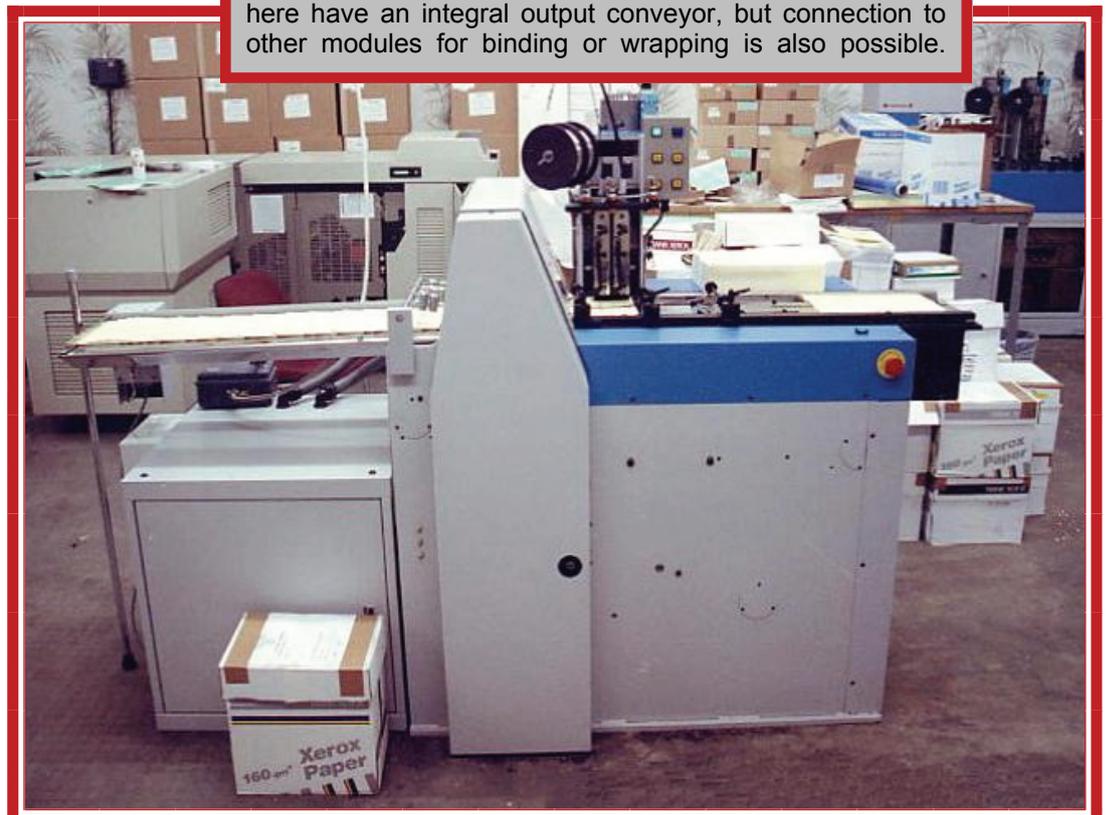
- ◆ Compact size - only 2.3 M long
- ◆ Low price
- ◆ Short delivery period
- ◆ Capable of expansion to include other standard modules
- ◆ Proven reliable design producing quality books
- ◆ Mechanically and electrically safety tested to all necessary standards

Specification

Book Depth	- One size only, typically 99 mm books from A4 folios
Book Width	- Normally one size only, but small variations are possible
Book Thickness	- Maximum 50 pages (6 mm)
Stitches	- One or two only in each book



The MINI™ Stitcher/Guillotine Module for producing fixed size booklets from cut sheet folios. This system was designed specifically for the economic production of simple payment books up to 50 pages thick. Both units shown here have an integral output conveyor, but connection to other modules for binding or wrapping is also possible.





AUTOMATE™ - Automatic Folio Feeder

As an alternative to the manual loading of documents, Lawhill are now able to provide a purpose built module for automatic operation. Although initially intended for cheque applications, its use is also valid for Manuals, Insurance Policy Documents or similar Large Format Books.

In its' simplest form, the AUTOMATE™ consists of a bulk feeding unit which is loaded with the complete folio sets as pre-collated by the printer. The pages are then shingle fed from this into a suction feeder which draws each sheet individually into a collating station. The feeder is capable of handling mixed stocks (pages and covers) in the range 90 to 200 gsm, making it suitable for many booklet applications. A range of reading devices and optical sensors are available to determine missing or blank pages, parity and the start and end of each set, while side and end 'joggers ensure that the collation is re-assembled accurately. Once the last page has been received in the collating station, the complete set is moved to the next station within the system, which could be the Guillotine Module in the case of cheques, or a Stitching Module in the case of a Large Format Booklet Maker.

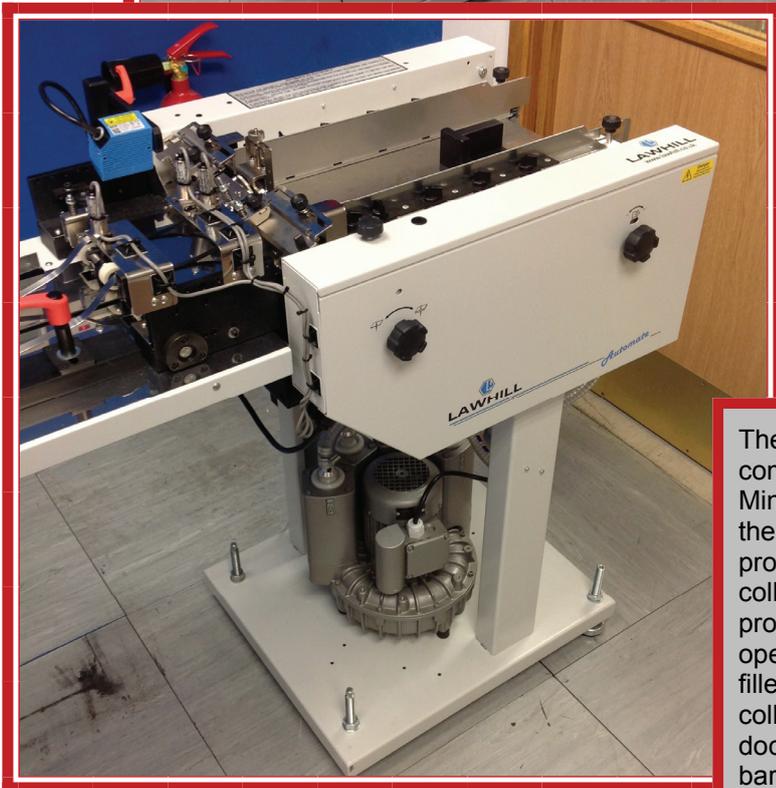
Where additional non-personalised documents are required, a tower feeder above the main suction feeder can be used to insert up to eight at any appropriate point in the collation providing maximum flexibility in format. Further reading devices are used to signal 'togglng' between the appropriate bins to produce the desired makeup. For example, a front cover could be positioned between an outer address sheet and the first document.

As with web-based systems, the make-up time is dependent upon the number of sheets in the set, but with today's high speed feeding technology, this system is well suited for operation in the cut sheet environment.

The checking operation, in its most basic form, can be performed by a simple counting feature triggered by each sheet as it is re-collated, but other more secure integrity devices are available. The AUTOMATE™, used with a laser scanner, can verify bar codes printed on each document and the information gathered can be used:

- ♦ to produce a quality control check record of books processed
- ♦ for complete security and integrity of every checked document
- ♦ for matching personalised documents from the tower feeder (when used)
- ♦ for onward processing in an additional module further down the line,

The barcode can be positioned either somewhere discreetly out of view (say in the side margin under a taped edge) or somewhere it can be used for further processing such as payment receipting, or for examining through the window of an envelope prior to final mailing.

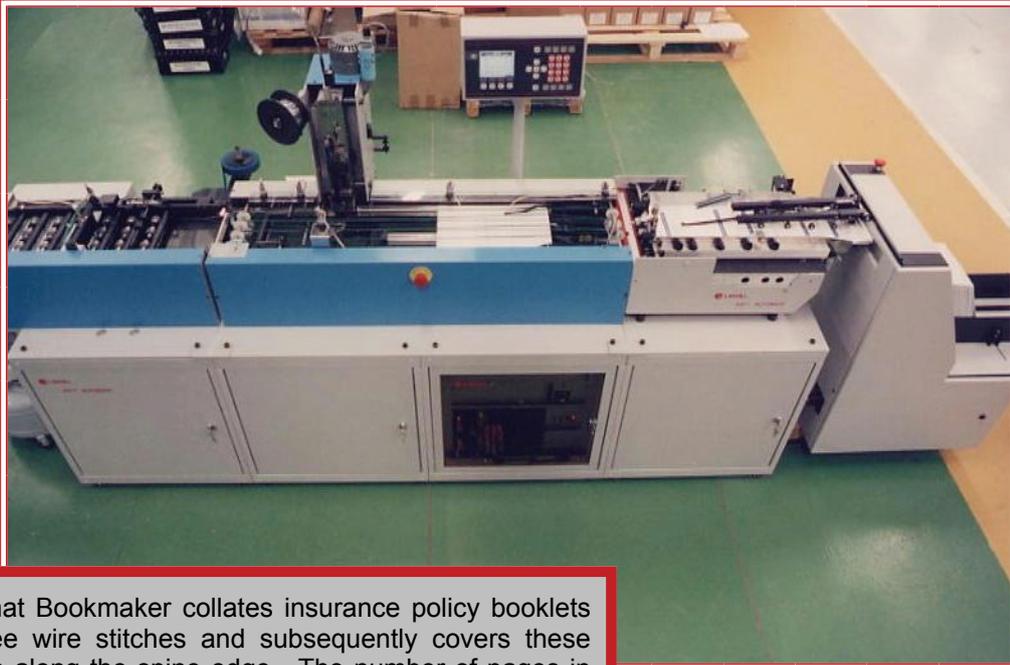


The Lawhill Cheksure™ Folio Finishing System combines either a Cheksafe™, Jumbo™ or Mini™ with the Automate™ Module attached to the infeed side of the Guillotine Module. This provides separation, feeding, verifying and collating of folio sets prior to the finishing process, replacing the need for a dedicated operator. The feeder shown alongside can be filled with up to 20 folios which are then de-collated and re-collated whilst the sequence of documents is verified. In this case, pre-printed barcodes on each sheet, are scanned during the feeding process to verify that the folio set is complete and 100% correct, and that all sheets are on the correct stock, are in the correct folio, are in the correct orientation and order.

Modules



This Large Format Bookmaker uses an **AUTOMATE™** Module for collating and stitching computer hardware manuals. The verification is by both count and checking that the last sheet in each collation has a company logo correctly positioned.



This Large Format Bookmaker collates insurance policy booklets and applies three wire stitches and subsequently covers these with binding tape along the spine edge. The number of pages in each booklet varies randomly, but the laser scanner which reads the bar code printed on each sheet provides 100% verification.



Stitching Modules

Standard/Special Stitching Modules

Two Hohner 70/20 Universal stitching heads, housed in separate units, are used in the 'Standard' Module to provide a book stitching capacity of up to 14 mm. These heads are very reliable and have been tried and tested throughout the finishing industry and now utilise a revolutionary wire cutting device which creates a point on each end of the wire as it is cut to length within the head. The effect of this device ensures that 'soft' stitching wire of a lighter gauge will correctly penetrate even the thickest book. If hard steel wire is preferred then the units can also be fitted with Bostitch G20 heads which are of similar design to the Hohner units but without the special cutting device.

Books normally enter this unit, from a Guillotine Module or from a Book Assembly System. A sensor starts the module's transport and moves the assembled booklet under the first stitching head. After a successful first stitch, the book is moved to the second stitching head where another stitch is inserted. Both heads are adjustable and can be moved to suit the book height and depth and sensors activate the stitching cycle and detect missing stitches or an incomplete stitching cycle. In some instances, one stitching unit can be used to insert two stitches, as in the **Jumbo-WT™** system, where three stitches are normally required in 'top stub' books. Both heads are operator controllable and can be switched off if only a single stitch is required. This is typical of corner and dual stitching for A4 and small booklets.

Twin Headed Stitching Module

This kind of module is particularly suited to the requirements of a user who is producing payment and credit books of 50 pages or less and has no need for corner stitching.

The module has a single stitching unit onto which are mounted two Hohner 43/6 universal stitching heads (smaller than the 70/20 units). They are configured to operate simultaneously and therefore insert both stitches during the same cycle. The principles of operation are exactly the same as the larger unit except that the thickness limitation is 6 mm.

Specifications

	<u>Twin Head</u>	<u>Standard</u>
Thickness (max.)	50 pages (6 mm)	120 pages (14 mm)
Width (max.)	267 mm (10½")	267 mm (10½")
(min.)	152 mm (6")	152 mm (6")
Depth (max.)	102 mm (4")	178 mm (7")*
(min.)	57 mm (2¼")	57 mm (2¼")



Binding Modules

This unit is used to apply hot melt tape to the spine of the booklet, an operation commonly referred to as backstripping. There are two versions of this module, the 'Standard' model is for books of up to 4" depth but for books greater than this a 7" variant, the 'Jumbo' is available. A third taping unit which uses self adhesive tape is available for A5 and A4 style books but is not described here. As with all modules in the range, it is possible to connect the binder unit on line to any system where taping is required for finishing, or where the existing unit is unsatisfactory.

Tape Binding is particularly attractive for the following reasons :

- ◆ The finished book is more aesthetic giving it greater perceived 'quality'.
- ◆ It protects customer and user's fingers from cuts and abrasion from protruding wire produced from unsatisfactory stitches.
- ◆ The tape covers any irregularities in the stitching with the result that it does not have to be kept at an optimum the whole time.
- ◆ The tape enables automatic mailing to be performed as there are no protrusions to snag on the envelope, making this considerably cheaper than hand-enclosing.

Individual sensors control the three different stages of operation. At the first stage the book is detected and is registered in line with the tape feed unit. Tape (of the same depth as the book) is fed from a reel to a fixed position determined by the thickness of the book. The amount of tape is pre-selected by the operator and is simultaneously cut as a heated clamp applies pressure on to the top of the tape to bond it to top surface of the book edge. The book is moved to the second stage where the tape is folded at 90 degrees down the spine and bonded to the end of the sheets by a second heater. At the last stage, a heated wiper bonds the tape to the lower side of the book edge while a second clamp applies pressure from above to complete the process.

Specifications

		<u>Standard</u>	<u>Jumbo</u>
Thickness with covers	(max.)	120 pages or 14 mm	120 pages or 14 mm
	(min.)	5 pages or 1 mm	5 pages or 1 mm
Width	(max.)	267 mm (10½")	267 mm (10½")
	(min.)	152 mm (6")	152 mm (6")
Depth	(max.)	102 mm (4")	178 mm (7")
	(min.)	57 mm (2¼")	76 mm (3")



Wrapping Modules

The Lawhill WM6 is a stand-alone unit which can be operated off-line or as part of a system when coupled with the appropriate interfaces and software. In its' most common form, it is used as part of an on-line mailing system with Lawhill finishing equipment which can be cut sheet or web fed. It is also possible to connect the machine directly to one or a number of cut sheet printers or high volume copiers. For greater flexibility, the unit can always be hand fed in off-line mode while the remainder of the system is used to produce an unrelated job.

The unit has particular advantages over a conventional enveloping machine. Apart from the lower capital cost, it can accommodate a wide range of sizes, has virtually contact free handling of the book and extensive shelf life of the wrapping material with no depreciation in operating characteristics.

Salient Features

- ◆ Stand alone, loose or hard coupled arrangement available.
- ◆ Sheet feeders, wrap perforation and wrap registration can be incorporated.
- ◆ Capable of handling packs of only a few sheets without distortion.
- ◆ Can use a wide variety of paper, foil and plastic based films.
- ◆ Long shelf life of wrapping material.

Machine Specification

The following details will vary according to the application

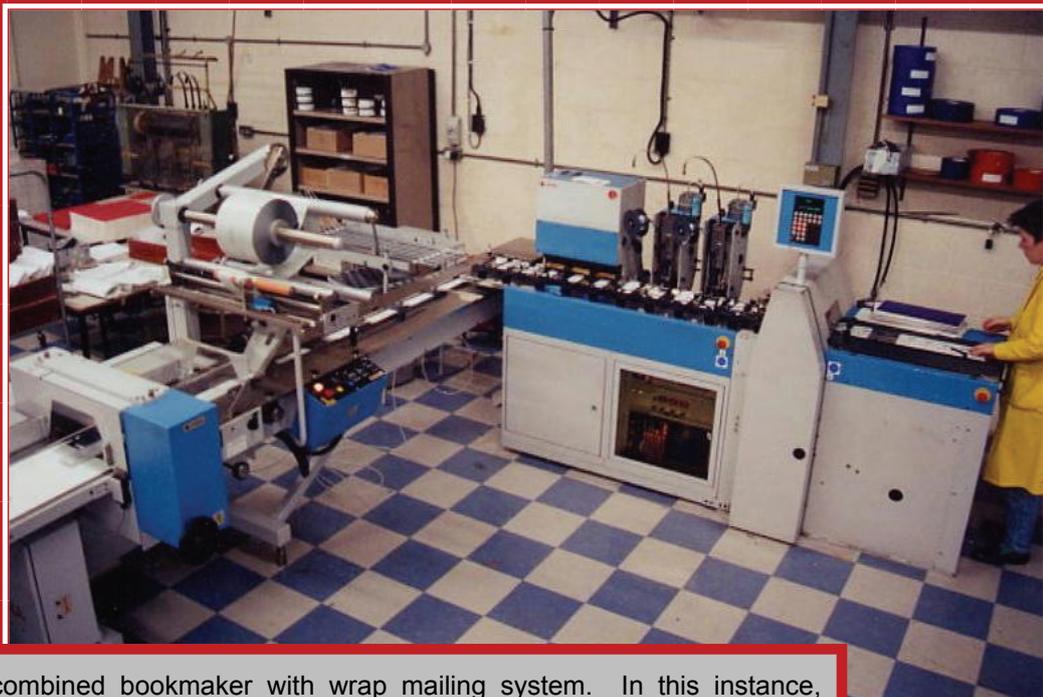
- ◆ Maximum product height up to 4" (100 mm), minimum is from a few sheets
- ◆ Maximum product width up to A4 (210 mm). A3 size on request.
- ◆ On-line speed dependent upon feeding system, off-line speed adjustable from 12 to as much as 120 packs per minute in certain cases.

The WM6 consists of an infeed trough down which the packs are fed by a central finger. Feeding the packs can be by hand or from an on-line source such as finishing equipment or a printer adapted with a suitable set collector. Further documents such as information slips can be added from inserters along the track.

The wrapping film is loaded onto the machine as a single reel, and is fed through straightening rollers, into the folding box which forms a flat tube around the pack. This box can be dedicated to a particular width of pack or adjustable over a range. The finger driving the pack is linked directly to the crimp rollers which pull the film from the reel and form the fin seal on the underside of the pack, while a pair of revolving knives seal the pack at both ends as it is cut to length. The finished pack is finally passed onto a conveyor belt ready for despatch.



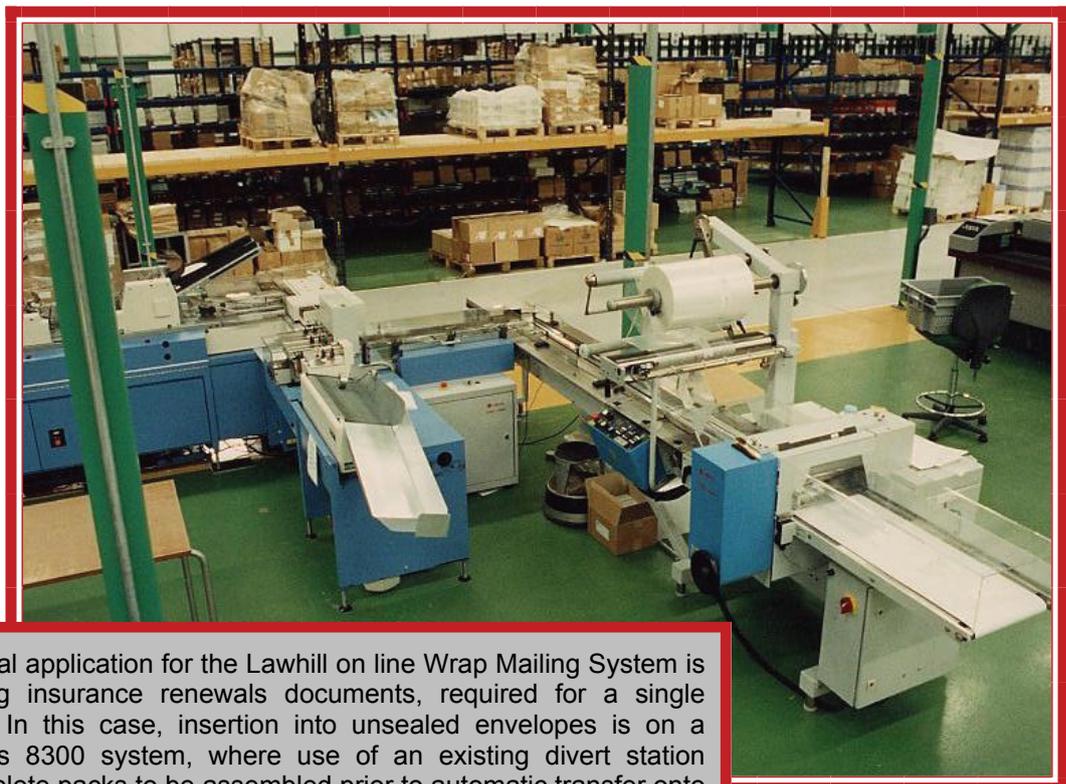
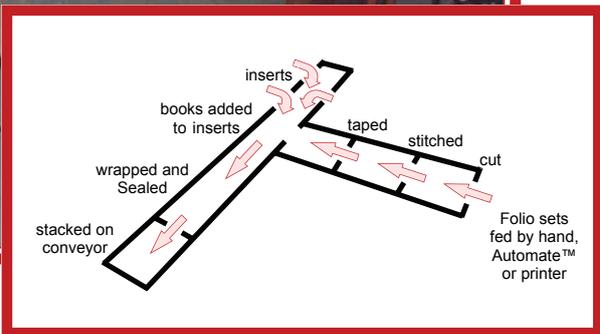
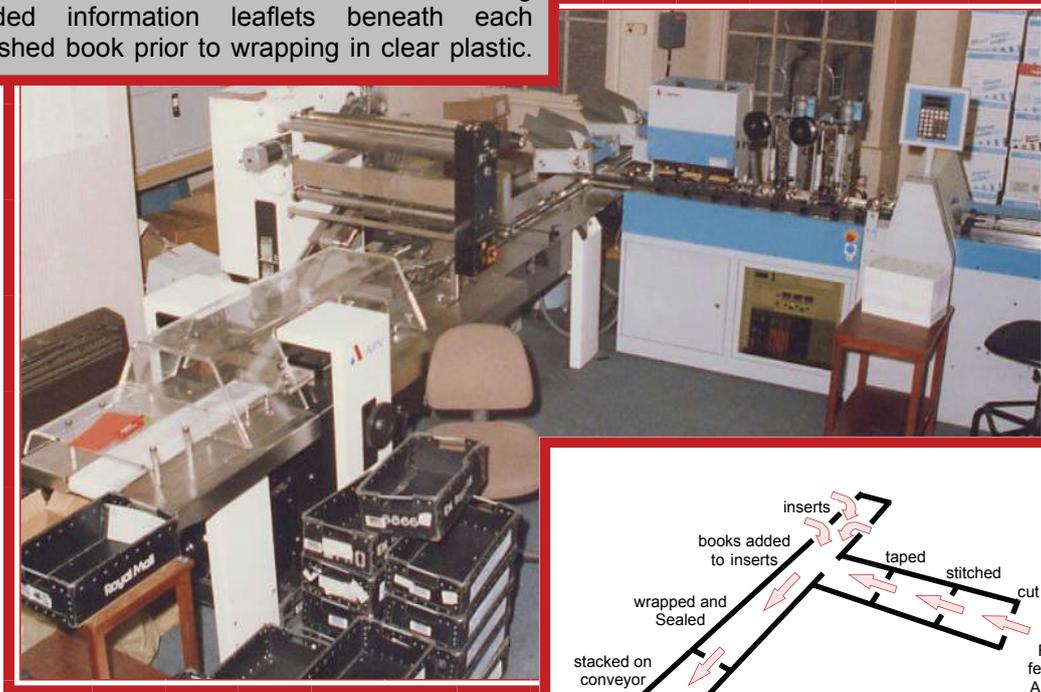
This stand-alone Lawhill WM6 wrapping system packages completed, but unsealed, insurance document sets for brokers or agents. The number of C4 size envelopes in each set is variable up to a maximum thickness of 50 mm and the system processes all sets without adjustment.



The Lawhill combined bookmaker with wrap mailing system. In this instance, cheque books are cut, stitched, taped and wrapped in one automatic process. The cheque books are enveloped in an overprinted opaque plastic with a clear window for the address, registration being maintained by an optical sensing device.



A typical installation for the production of 'Council Tax' booklets. This Wrap Mailing System has three additional inserters for adding folded information leaflets beneath each finished book prior to wrapping in clear plastic.



Another typical application for the Lawhill on line Wrap Mailing System is for packaging insurance renewals documents, required for a single destination. In this case, insertion into unsealed envelopes is on a Pitney Bowes 8300 system, where use of an existing divert station enables complete packs to be assembled prior to automatic transfer onto the wrapping system from where they are mailed in polythene bags.



Enveloper

As an alternative to the wrap based mailing system, a conventional inserter can also be interfaced to most Lawhill Modules. Typical machines are :

Bell & Howell : 'Phillipsburg' or 'Sprinter'
KAS : 'Mailmaster'

CMC : Paper Mail-300
Böwe : 507

TMF : K201

The picture below shows a Lawhill cut sheet system running on-line with a Phillipsburg. Books are processed in the normal manner and once taped, transferred one at a time (face down) onto an open-feed station on the inserter, specially built by Lawhill to accept the normal inserter/wrapper interface.

An sensor confirms when a book is on the Bell & Howell track which then cycles once and awaits the next book. Normal functions such as adding inserts are unaffected and the book is inserted into the envelope and output as normal.

As with the wrap mailing system, the two machines can be run independently if so desired. The inserter can be run off-line at its' normal operating speed while the bookmaker outputs finished books onto a conveyor which bridges the open feed station. This arrangement gives the customer the greatest flexibility in usage, while saving on production time and additional operator costs.



Once finished by the bookmaker, the books are transferred onto the open feed station of the Phillipsburg, which cycles the book forward. Interface control and fault detection are monitored and managed through the Lawhill's PLC and the system has off-line as well as on-line capability. The



Ancillary Devices

Inserters and Sheet Feeders

These devices can be used for adding non-personalized documents such as card covers, forms and slips, advertising media and information booklets.

The items need to be the same size as the books to which they are being added and can be in the form of single slips, folded sheets or saddle stitched booklets. For example, it is common to find these items on the track of the Wrapping Module adding A3 sheets folded in 6 down to 1/3 A4 size. Miss and double feed detection are provided as standard, and individual speed and thickness controls on each unit enable them to be adjusted to suit the item being fed. Control is by the processor in the main system while each feeder can be individually programmed to place a number of items in the same cycle.

Sheet sizes : maximum 356 x 540 mm minimum 50 x 70 mm

Wheel Turn-over Unit

This device is typically placed in a track to invert the book so that it can be stitched from the back which is a requirement with some banks. The wheel is a set of discs with four slots into which a book is fed by the track mechanism, during the back stroke of the track, the book is turned through 90 degrees and on the second stroke is deposited back onto the track upside down.

Sizes accommodated are as per the Stitcher and Binder Modules.

Book Rotation Unit

This device rotates a book from portrait to landscape format to enable 'top stub' stitching and binding along the long edge. A typical position for this unit would be after the Guillotine Module and before the Stitcher/Binder Modules.

When the book is presented to it, a clamp grips the pages together from above and below and rotates it through 90 degrees placing the long edge against the machine datum side. On the next cycle, the book is pushed forward to the next position where it is retained between the datum edge and a separate side guide and moved on in the normal cyclic fashion.

Conveyor/Stacker

A collection conveyor is usually the last unit fitted to any system. As a book exits the system, a sensor activates the conveyor, moving the book forward. When the book has cleared the sensor, the conveyor halts, and awaits the next book which then overlaps the previous one to provide a shingled stack.



SOME EXISTING LAWHILL CUSTOMERS (January 2014)

CUSTOMER

EQUIPMENT

Cut-sheet systems :

BSP First Choice Watford, UK	1	'Cheksafe™-NG' Folio Finishing System for Cheque Books and Credit Books
Boldt S.A. Buenos Aires, Argentina	1	'Cheksafe'™ Folio Finishing System for Cheque / Credit Books
DST Dagenham Essex, UK	1	'Cheksafe'™ Folio Finishing System with on-line Mailing Machine for Holiday Booklets
DST Billing Services Dagenham, Essex, UK	1	'MINI' Folio Finishing System for Council Tax Booklets and Holiday Booklets
De la Rue Smurfit Ltd. Bray, Eire	1 1	'Cheksafe'™ Folio Finishing System for Cheque and Credit Books 'Cheksure'™ Folio Finishing System with Automate™ Verification System and on-line WM5 Wrap Mailing System for Cheque Books
Capita Business Systems Birmingham, UK	1	'Cheksafe'™ Folio Finishing System for Council Tax Booklets and Utility Payment Books
Protect Print SDN. BHD Puchong, Malaysia	1	'Cheksure'™ Folio Finishing System with Automate™ Verification System for Cheque Books.
OTM Limited Leicester, UK	1	'JUMBO'™ Folio Finishing Systems for Council Tax, Utility and Travel Booklets
Communis Security Products Manchester, UK	1	'Cheksafe'™ Folio Finishing System for C/C Cheque Books and Credit / Voucher Booklets
Communis Security Products Lisburn, Northern Ireland	1	'JUMBO'™ Folio Finishing System for Cheque Books, Credit Books and Payment / Voucher Booklets up to 7 Inches Wide
Idube Business Forms Johannesburg, South Africa	2	'JUMBO-WT'™ Folio Finishing System for Landscape and Portrait Style Cheque Books and Payment Books up to 7 Inches Wide
S & G Stradprint Durban, South Africa	1	'JUMBO-WT'™ Folio Finishing System for Landscape and Portrait Style Cheque Books and Payment Books up to 7 Inches Wide
Brithol Michcoma Maputo, Mozambique	1	'Cheksafe'™ Folio Finishing System for Cheque Books and Payment Books up to 4 Inches Wide
De La Rue Currency & Security Print Nairobi, Kenya	1 1	'JUMBO-WT'™ Folio Finishing System for Landscape and Portrait Style Cheque Books and Payment Books up to 7 Inches Wide 'Cheksafe'™ Folio Finishing System for cheque Books
Moorcroft Group Stockport, Cheshire	2	'MINI'™ Folio Finishing System for Payment Booklets
Yuen Foong Paper Company New Taipei City, Taiwan	1	'Cheksafe'™ Folio Finishing System for Cheque Books and small voucher booklets.

**CUSTOMER****EQUIPMENT****Cut-sheet systems (continued) :**

HSBC, Malta	1	'Cheksure'™ Folio Finishing System with Automate™ Verification System for Cheque Books.
Bank Of Valletta Malta	1	'Cheksure'™ Folio Finishing System with Automate™ Verification System for Cheque Books.
Toppan Security Printing Singapore	1	'Cheksafe-WBC'™ Folio Finishing System for Cheque Books.
Brithol Michcoma Luanda, Angola	1	'JUMBO'™ Folio Finishing System for Cheque Books, Credit Books and Payment / Voucher Booklets up to 7 Inches Wide

Special Wrapping Systems :

Royal & Sun Alliance Birkenhead, Liverpool	1	WM5/8300 Wrapping System On-line to Pitney Bowes 8300 Series Inserter for C5 Agents / Brokers Renewals
Zurich Insurance Company Wootton Bassett, Wiltshire	1	WM5 Wrap / Mailing System for C4 Agents / Brokers Renewal Documents
CGNU Insurance Perth, Scotland	1	WM5/8300 Wrapping System On-line to Pitney Bowes 8300 Series Inserter for C5 Agents / Brokers Renewals
Ashton Potter, Buffalo, New York State, U.S.A.	3	WM5/E1 High Speed Wrap System for Wrapping Presentation Special Stamp Packs for the US Postal Service
De La Rue Currency & Security Print, Kenya	1	WM6 Wrap Mailing System for Cheque and Payment Books Books and Payment / Voucher Booklets up to 7 Inches Wide

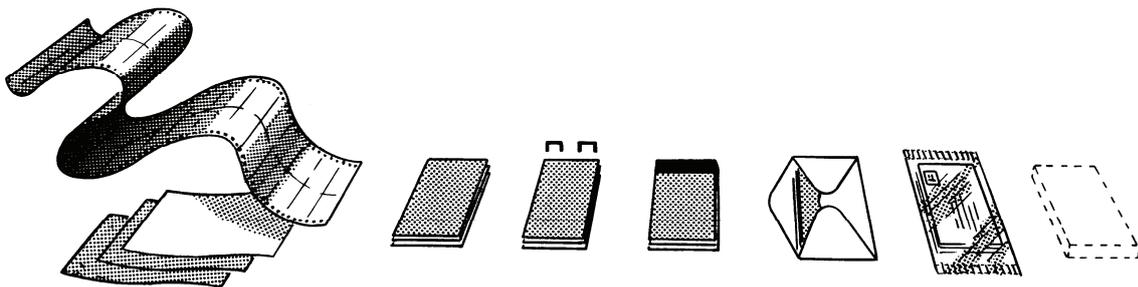
Other Systems :

Flags 4 U Wickwar, Gloucestershire	1 2	Flag Assembly System for Hand Wavers and Paper Flags Automated BAS sewing system for bunting production.
PRIDE Enterprises South Bay, Florida	1	Flag Assembly System for Hand Wavers and Paper Flags Throughout the USA
Flags Out Of Africa Johannesburg, South Africa	1	Flag Assembly System for Hand Wavers and Paper Flags Throughout the African continent
BP Travel Trade Services Ashford, Kent	1	Lawhill MAILBOX ™ System for Mailsort Separation on Magazine 'Flowrap' Lines
CMC Equipment, Northants	4	Lawhill MAILBOX ™ System for all Mailing Applications
First Data Resources Ashford, Kent	8	Lawhill MAILBOX ™ System for Document matching and Selective Inserting
Safeguard Systems Crewe, Cheshire	1	Special Slip Sheet Shingle System for Producing Complete Visitor Pass Sets Automatically and with Numbering



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