

White Paper

Overwrapping machine

By John Henry

4/30/19

Overwrapping machines wrap and fold a paper, foil or plastic film over a product. Instead of welded edges as in a shrink or flow wrapper, all edges are folded. Generally, the film used is not heat shrinkable, resulting in a bit of looseness. Occasionally a shrinkable film will be used to create a tighter, conformal, wrap.

The end result of the folds and corners is a neat protective and/or decorative covering presenting a hand-wrapped, gift-like appearance. Some products use overwrapping specifically as a marketing tool to create this feeling in the consumer's mind. Common products using folded overwrap include perfumes and cosmetics, CDs and DVDs, playing cards, cigars and cigarettes, bar soap, paper reams and more.



Many shrink wrap bundlers leave the ends of the bundle partially open in a “bullseye” which may be considered unsightly. Bundlers that provide a 6 sided, closed end, seal are available but even these are not hermetic. Shrink wrapped packages need to allow air to escape during shrinking to avoid a pillow effect. If there is no bullseye, the film needs to be perforated to allow air to escape.

Overwrapping can provide a completely hermetic seal. This is advantageous with products that have a pronounced scent such as tea, candles or soap. It can also be advantageous in preventing the product from absorbing other odors or humidity from the storage environment.

Shrink film, in shrinking, can develop considerable force. This can deform or damage delicate products. Paper reams are usually overwrapped rather than shrink wrapped for this reason. Another issue with paper is that it can absorb or give up moisture depending on the ambient humidity. A sealed overwrap prevents this. Since the overwrap is a bit loose, in the event that the paper does absorb moisture and swell, the overwrap can handle it without the warpage that a tight shrink wrap might cause.

Overwrappers can use unprinted or continuous printed film with no registration. Unlike most shrink wrappers, they can also run printed film in register. If registered film is required, the overwrapper will need to be suitably equipped for this.

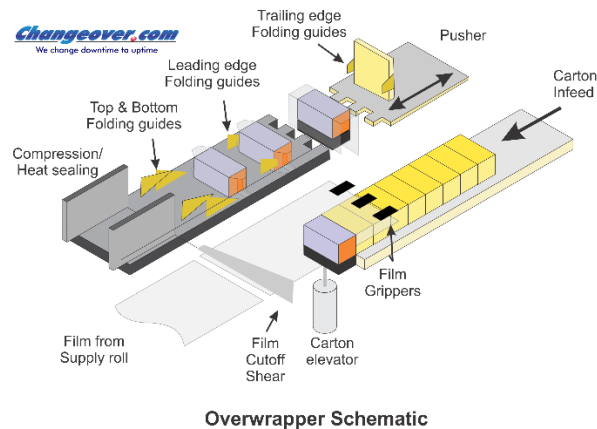
Neither overwrappers or shrink wrappers consume much energy by themselves. The shrink wrapper requires a heat tunnel which does. The shrink wrapping system, wrapper and tunnel combined, consumes about 10 times as much as a comparable overwrapping system. The lack of a shrink tunnel makes overwrappers significantly cheaper to operate from an energy standpoint.

On the downside, the overwrapper machine is mechanically more complex than a shrink wrapper of similar capacity. This means, among other things, longer changeover times. Remember 10W-40. Wasting 10 minutes of downtime daily (10W) results in the loss of more than 40 annual hours of production (10 minutes times 250 days). This loss will be

greater in a multi-shift operation. The additional complexity means that technicians charged with changeover, maintenance and repair of the overwrapper will need to be better trained and more highly skilled.

Overwrappers, by their nature, always form the wrap into a square or rectangular shape. To do this, they use the product as a forming mandrel. Overwrapping will not work well with other bundle shapes such as a 6 pack of round bottles with no well-defined edges and corners.

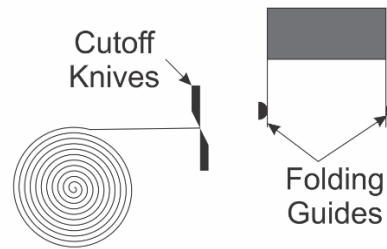
This schematic shows a common style of overwrapper.



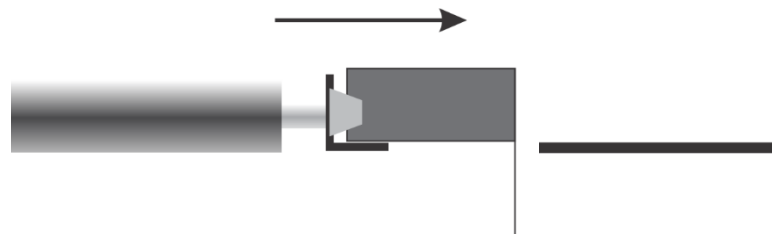
The process is explained step by stem below:

1. Product, in this case an individual carton, is fed into the machine via conveyor. If multiple packages are to be wrapped in a bundle, a collator prior to the infeed will arrange them into the proper configuration. Other than the need to maintain the product group integrity, the wrapping process is the same.
2. The wrapping material or film is supplied to the overwrapping machine on a roll and fed through unwind brake and dancer (not shown) to maintain proper film tension. An appropriate length of film is fed forward and cut. Grippers pull the film sheet and hold it in position over the wrapping area.

3. Backpressure at the carton infeed forces the carton into position over the carton elevator.
4. The elevator pushes the carton up and into the film. As it does, the grippers release. The elevator (not shown) continues to lift the carton. Guides fold the film down the front and back.

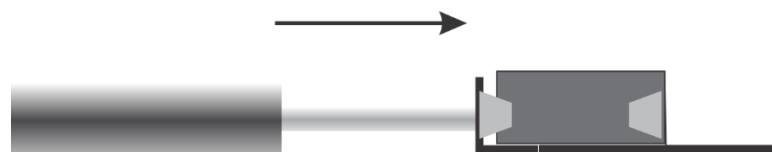


5. Next, a horizontal pusher pushes the carton forward, off of the elevator. A leading lip on the pusher plate initially folds the trailing edge of the film under, against the carton.

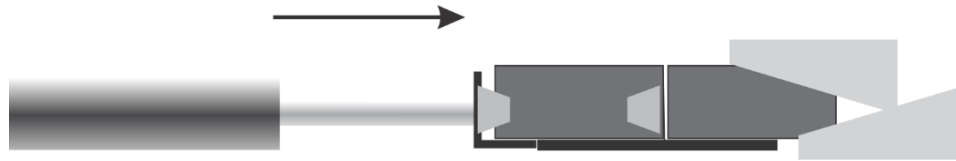


As the push continues, a plate folds the film under the leading edge of the carton and on top of the trailing fold. This plate is usually heated which seals the leading and trailing film overlap together.

6. The pusher also has 2 side folding tabs. As the pusher plate moves forward, these tabs form the trailing minor fold.
7. As the pusher continues to move forward, the carton is pushed past a 2nd pair of side folding tabs. These form the leading minor folds on each side.



8. After the trailing and leading minor folds are formed, a pair of stationary guides form the major folds on each side.



9. The carton, with all folds complete, is lightly compressed between 2 heated side plates or belts. These set the fold creases and seal the folds together for permanence.
10. In the case of a paper or other non-heatsealable material, glue may be applied just before the final fold is made. Non-heated side plates or belts provide compression.
11. Other alternatives include glue applied in the seal area at the film converter. This is a dry adhesive applied in a pattern in the seal area. The adhesive is activated by the heated compression plates or conveyor. Another alternative is to use a pressure sensitive label over the folds to hold them closed.

The style of wrapper described above will run at speeds from about 40 to 100 ppm depending on product and overwrap film.

When higher speeds are required, a different style of machine may be used. These machines are almost, though not quite, continuous motion. Speeds to 300-400 wrapped packages per minute are possible in some cases.

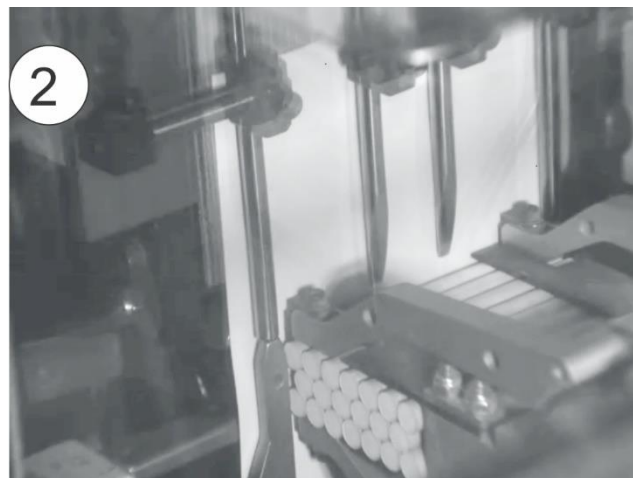
The machine infeed is similar with individual or groups of product fed by conveyor. The machine has a vertical rotating turret with pockets sized for the product to be wrapped.

1. In picture #1 we see the wrapper ready for the next wrap cycle. The film feeds down in front of the turret forming a curtain and is cut to length. The product, in this case 20 cigarettes is collated and held in a reciprocating arm.



Courtesy 2020hindsight.com

2. In picture #2 the feeding arm has been lowered into a fully horizontal position. The cut film piece is positioned between product and turret pocket.



Courtesy 2020hindsight.com

3. When film and product are fully in position, a pusher pushes the product into the film and product and film into the turret pocket. As it does, the film folds around the product in a “C” shape with the outer edge open.



Courtesy 2020hindsight.com

4. In picture #4 we see the pusher retracting and a folding plate coming down from the top to make one of the side folds. At the same time fingers are moved in from each side to make the end minor folds and one of the end major folds.



Courtesy 2020hindsight.com

5. As the turret rotates, down in this case, stationary guides complete the side and end major folds.
6. In subsequent turret indexes heated side plates seal the ends.
7. After completing 180 degrees of rotation, the final wrapped product is pushed out of the turret and onto the discharge conveyor.

If desired, a tear strip can be added for ease of opening. This narrow, @1/8" wide, strip of plastic film is supplied to the machine on a roll with the roll mounted near the main

film roll. As film feeds into the machine and around the package, the tear strip adheres and feeds with it. A small notch may be cut in the film under the tear strip by the cutoff blade to facilitate tearing. A printed logo on the tear strip can provide an additional level of counterfeit and tamper protection.



Overwrapping provides an attractive way of sealing and protecting your product. The gift-like appearance helps the end user think, consciously or subconsciously, that the product looks like a gift. Only the most curmudgeonly among us do not like gifts. That we paid for it ourselves does not completely override this impression.

Machines are available to run at low to high speeds. A seemingly infinite selection of films and foils, plain or decorated, is available to meet any need.

What's not to like?

Frain has a wide selection of overwrapping machines in stock and available for quick delivery. No matter what your overwrapping project, give them a call today at 630-283-

8980, visit them online at www.fraingroup.com or, best of all visit their plant in Carol
Stream Illinois, minutes from Chicago's O'Hare Airport.