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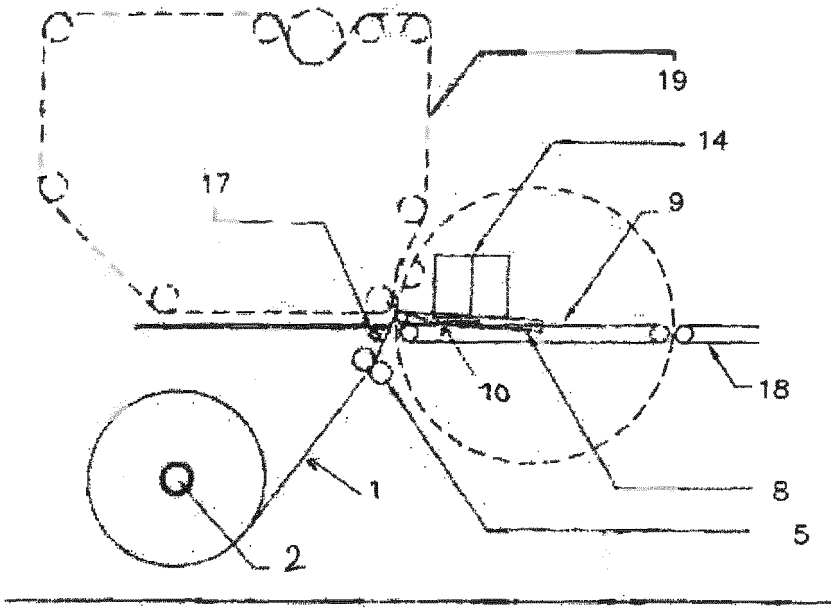
(54) **CUTTING WRAPPING FILM ON A LAP SEAL MACHINE**

(57) In a lap seal machine there is a need to provide a predetermined length of film for wrapping a product. This is accomplished by cutting a predetermined length of film while wrapping an article with the film. The wrapping is done by a fly bar (8) that stops after a predetermined length of the film (1) is pulled. The stopped film is then cut by a knife (17).

FIGURE 3



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Description

FIELD OF INVENTION

[0001] This invention relates to cutting wrapping film to a predetermined length of film for wrapping an article on a Lap Seal machine. The cutting takes place after the fly bar begins film wrapping the product.

SUMMARY OF THE INVENTION

[0002] The objective of this invention is to replace the need for a shear and vacuum belt or separation rollers used in feeding a predetermined length of film in a lap seal machine. This is accomplished by cutting a predetermined length of film while wrapping an article with the film. The term article is used to define a single article or a bundle of articles. These changes result in substantial economic savings in the construction of the machine.

BACKGROUND OF THE INVENTION

[0003] Figure 1 is a conventional lap seal machine. A roll of film 2 is usually provided with printed sections spaced apart so the film can be cut without having to cut through the printed sections. Film 1 is pulled of a roll 2 by film feed rollers 5 and is fed through a dancing roll 3. From the dancing roll 3 the film goes past a sensor 4. The sensor 4 detects the location of the print or a detectable mark on the film so that a shear 6 can cut the film to a predetermined length without cutting through the printed portion of the film. From the sensor 4 the film goes to a film feed rollers 5. Feed rollers 5 push the film through the shear 6 on to vacuum belt conveyor 7. Conveyor 7 moves the film so that a flap 10 of the film is on conveyor 9. The conveyor 7 stops and waits for the next cycle. During this time the shear cuts the film 1 to predetermine length. An article moves on top of the flap on conveyor 9. Afterward fly bar 8 picks up the film from underneath the conveyor 9 to wrap the article as it moving on the conveyor with the predetermined length of film.

[0004] Figure 2 is similar to figure 1 except the vacuum conveyor and the shear has been replaced by a separation rollers and a film that has perforations lines (made by a perforation machine 12) across the width of the film. This application incorporates by reference, in the entirety, US Patent 7,836,670, filed November 23, 2010 by the same inventor which describes the invention shown in figure 2.

[0005] The apparatus in figure 2 of US Patent 7,836,670, can be used with a film that already has perforation lines or where the perforation means is part of the apparatus. The film is perforated so that the film can be mechanically separated into predetermined lengths by applying a sufficient force to tear the film along a perforation line. The location of the perforation line determines the length of film to be used for wrapping an article.

[0006] The film can be provided on a roll with perforations lines corresponding to a predetermined length for wrapping an article. In the alternative a perforation machine or a shear having a serrated blade to form perforations can be inserted prior to the feed roller lines to from the perforation lines.

[0007] The means for sensing where the perforation line should be located covers two situations. First, the sensor detects a mark or indicator on a perforated film to locate the perforation line. In the alternative the sensor detects a mark or indicator on a non perforated film where the film should be perforated. Once the location of perforation is determined the location of the separation point 15 can be determined by conventional means.

[0008] In the normal operation of a film having perforation lines the separation rollers and the film feed rollers are moving at the same speed. The separation rollers 11 and feed mean rollers 5 are spaced as close possible. The film 1 is pulled off the roll 2 and a flap 10 of the film is pushed onto belt conveyor 7. While the film is being pulled off the roll 2, a conventional sensor can be used to detect the location of the perforation line. Usually the film is pre marked so that the sensor can detect the location of the perforation line. The packaging bar code can be used as the mark. When the perforation line moves to a position between film feed rollers 4 and separation rollers 11, the film feed rollers slows down. The separation roller maintains its speed. This difference in speed of the rollers causes a force that mechanically separates the film along the perforation line at separation point 15. The feed rollers after the film separation continue to push the film between the separation rollers.

[0009] The means for driving the feeder rollers 5 can be a motor such as a servo motor. The separator rollers 11 can be driven by a separate motor or attached by a pulley and drive belt to the motor driving the feeder rollers. The separation roller has a free idle wheel so by inertia the separation rollers will try to maintain its original speed when the motor slows down the feeder rolls. Conventional motor controls are used to control the motors and movement of the film and the lap seal machine.

[0010] When the fly bar 8 lifts the film to wrap the article the film feed roller resumes the same speed as the separation roller and the operation is repeated to wrap the article with the predetermined length of film.

[0011] If the film is not perforated, a perforation means such as a shear with a serrated blade to form the perforations can be can be inserted before film feed roller 5. The perforation line is located on the film according to the length of film needed.

[0012] In a preferred embodiment a perforation means 12 comprising a shear with a serrated blade is used to form the perforated lines. A means to adjust the length of the film for wrapping is placed between the shear where the film is perforated and where the film is separated. The means to adjust the length of the film is a member such as a roller 13. By moving the roller 13 the film path can be changed to provide different predetermine lengths of film between the perforated line and the

separation point 15.

[0013] To separate the film, there are means for stopping the feed rollers 5 when the perforation line reaches point 15. These means is usually by stopping a servo motor that drives the feed rollers causing the film to stop and the film to separate. The separation rollers will continue to spin freely on its free wheel causing the film to separate and to push the remaining film toward conveyor 9. After separation the end of the film "pushed" by the film rollers 5 enters the separation rollers 11.

[0014] On the figure 2, the separation rollers and the film feed rollers act to separate the film along the perforation line. The separation rollers 11 and feed mean rollers 5 are spaced as close possible. The film 1 is pulled off the roll 2 and a flap 10 of the film is pushed onto belt conveyor 7. While the film is being pulled off the roll 2, a conventional sensor as used in figure 1 can be used to detect the location of the perforation line. Usually the film is pre marked so that the sensor can detect the location of the perforation line. When the perforation line moves to a position between film feed rollers 4 and separation rollers 11, the film feed rollers slows down. The separation roller maintains its speed. This difference in speed of the rollers causes a force that mechanically separates the film along the perforation line at separation point 15. The feed rollers after the film separation continue to push the film between the separation rollers so a flap of the film rests on the transfer belt of a conveyor 9. The conveyor 9 transfers the article to another conveyor. The flybar 8 pulls the film into a slot between the conveyors causing the film to be overlapped when the product is transferred to the other conveyor.

BRIEF DESCRIPTION OF THE INVENTION

[0015]

Figure 1 shows film wrapping using a vacuum belt.
Figure 2 shows using separation rollers to separate perforated film.
Figure 3 shows a cutting knife positioned after the film feed rollers
Figure 4 shows cutting a film to a predetermined length after stopping the film.
Figure 5 shows overlapping the film by transferring that article to another conveyor.

DETAILED DESCRIPTION OF THE INVENTION.

[0016] Figure 3 shows a film 1 pulled from film roll 2 by film feed rollers 5. The film feed rollers 5 pushes the film so a flap 10 rest on a first conveyor 9 that transfers the article to a second conveyor 18. Usually the second conveyor 18 is a heat shrink conveyor that transfers the article through a heat shrink tunnel.

[0017] After the flap 10 is placed on conveyor 9, flight bar conveyor 19 pushes the article 14 onto flap 10. Figure 4 shows fly bar 8 picking up the film from behind the product and over the top of the product. Fly bar 8 and feed rollers 5 pull the film to a predetermined length sufficient to wrap the article. After the predetermined length has been pulled, the feed rollers 5, fly bar 8 and conveyor 9 stop. This causes the film to stop moving. Film cutting blade 17 cuts the stopped film. Figure 5 shows that after the film is cut, fly bar 8 and first conveyor 9 start to move to wrap the article. Fly bar 8 pushes the film through a slot between the first and second conveyers. Feed roller 5 pushes a flap on the first conveyor 9 and stops. The feed rollers 5 wait for another article to be place on the flap 10 to repeat the wrapping cycle for another article.

[0018] The predetermined length can be established by relying on a timer or an encoder or a sensing mark to indicate the length of material needed to wrap the article. This is usually done by controlling the final position of the fly bar 8 before stopping fly bar 8.

Claims

1. An apparatus for film wrapping an article comprising

   - means (5) for pushing a flap (10) of the film (1) onto a first conveyor (9),
   - a second conveyor (18),
   - means (19) for placing an article (14) on the flap,
   - means (8) for picking up the film from behind the article and moving the film over the article,
   - means for stopping the movement of the film over the article when a predetermined length has been pulled,
   - means (17) for cutting the predetermined length of film needed to wrap said article after the film has stopped,
   - means for continuing the movement of the film over the article whereby the film is pushed into slot, between the first conveyor and the second conveyor, and
   - means for heat shrinking the film around the article.

2. An apparatus according to claim 1 wherein the means for pushing the flap of the film onto the first conveyor are feed rollers

3. An apparatus according to claim 1 or 2 wherein the means for picking up the film from behind the article and moving the film over the article is a fly bar

4. An apparatus according to any one of the preceding claims wherein the means for stopping the movement of the film includes means for stopping the feed roller, fly bar and first conveyor

5. An apparatus according to any one of the preceding claims including means for overlapping the film

around the article by transferring the article from the first conveyor to the second conveyor.

6. A process for film wrapping an article comprising

- pushing a flap (10) of the film (1) onto a first conveyor (9),
- positioning a second conveyor (18) next to the first conveyor to form a slot,
- placing an article (14) on the flap,
- picking up the film from behind the article and moving the film over the article,
- stopping the movement of the film over the article,
- cutting the stopped film to providing a predetermined length of film needed to wrap said article,
- continuing the movement of the film over the article and into the slot between the first conveyor and the second conveyor, and
- heat shrinking the film

7. A process according to claim 6 wherein the film is overlapped by transferring the article form the first conveyor to the second conveyor.

8. A process according to claim 6 or 7 where the film is picked up by a fly bar (8).

9. A process according to claim 8 wherein the first conveyor and fly bar and feed rollers (5) are stopped to prevent the movement of the film.

10. A process according to claim 8 wherein the first conveyor and the fly bar start moving to continue the movement of the stopped film.

FIGURE 1

PRIOR ART

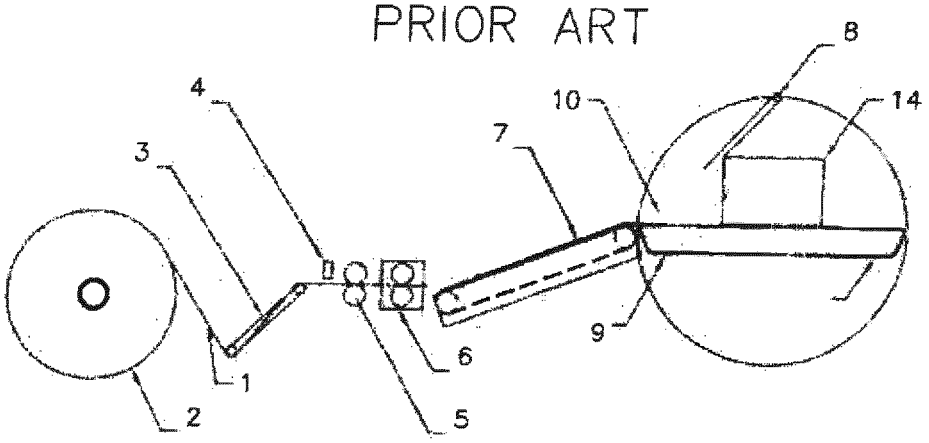


FIGURE 2

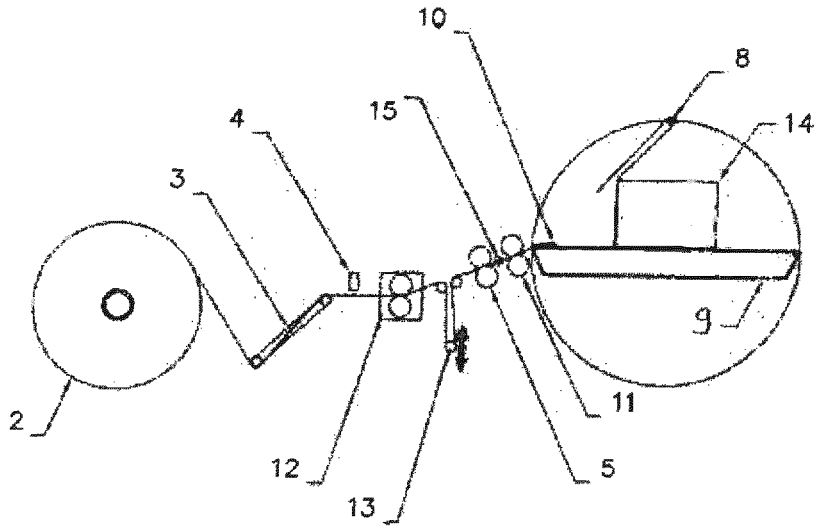


FIGURE 3

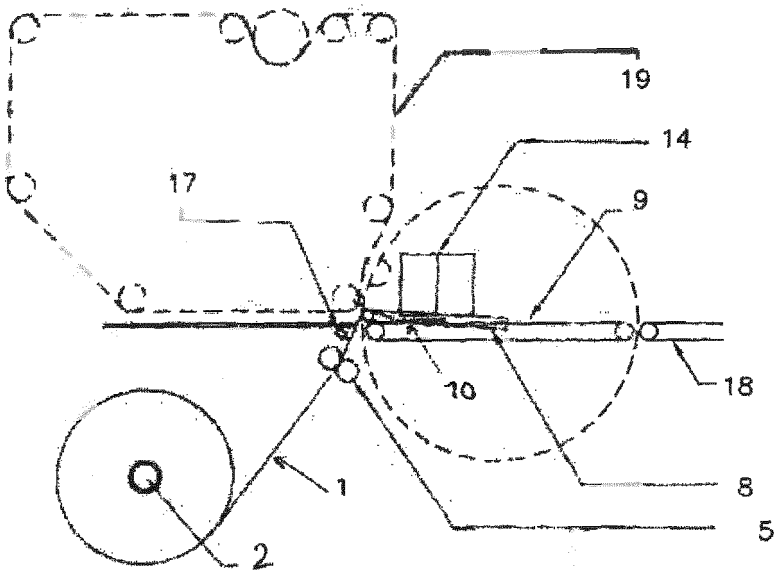


FIGURE 4

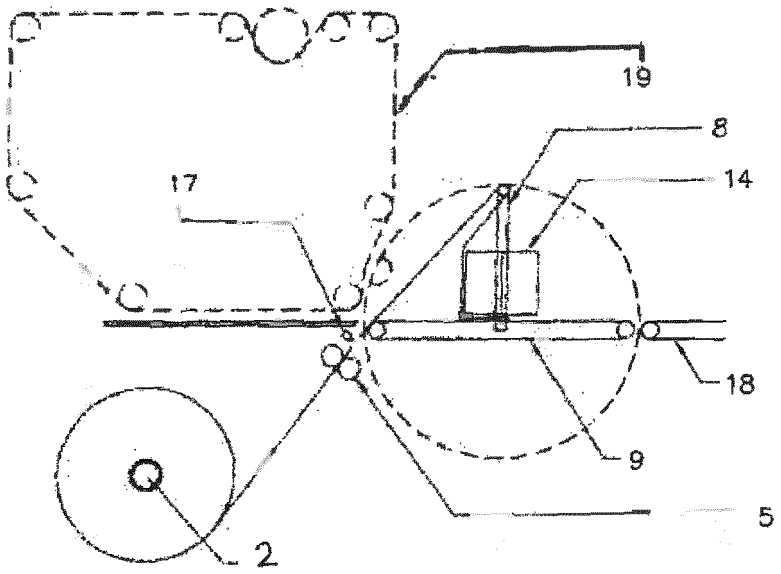
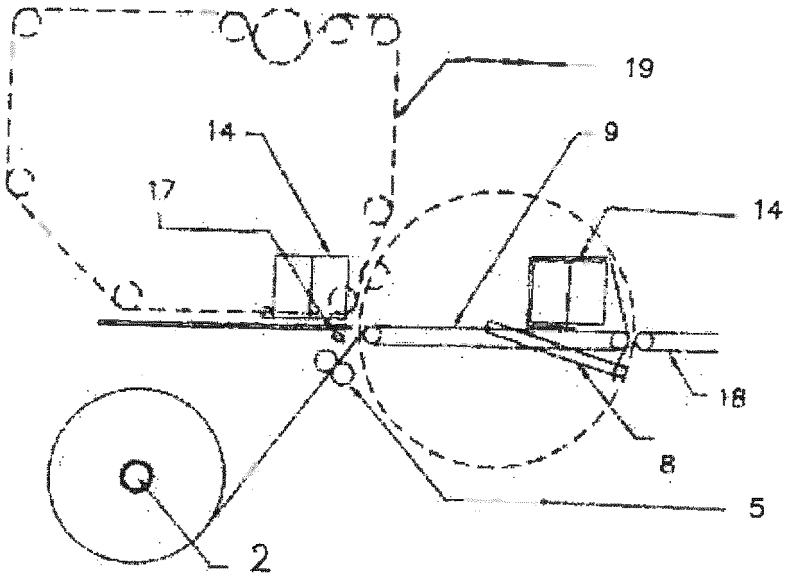


FIGURE 5



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EUROPEAN SEARCH REPORT

Application Number
EP 16 16 9422

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 0 949 145 A1 (BAUMER SRL [IT]) 13 October 1999 (1999-10-13) * column 0028 - column 0030 * -----	1-10	INV. B65B59/00 B65B11/10
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			TECHNICAL FIELDS SEARCHED (IPC) B65B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	9 September 2016	Ungureanu, Mirela

CATEGORY OF CITED DOCUMENTS

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REFERENCES CITED IN THE DESCRIPTION

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