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NOW ROTATING DIES CAN PRODUCE FILM AND ROLLS AS GOOD AS STATIONARY DIES WITH REVERSING NIPS !

PATENT PENDING

Any blown film (tube, bubble) carries the pattern of the die by which it was produced. The most obvious part of that pattern is produced by the die's portlines, which are equally spaced holes at the bottom of the die's spiral mandrel (the cylinder in which the upward winding spirals are cut) through which the melt is pushed from a central pipe that has channels similar to the spokes of a wheel leading to the ports. The memory of these channels and ports creates a petal type pattern if you looked at a crosscut of a bubble.

Most automatic gauge controls do not have enough resolution to address these portlines (except Addex's). By reducing the oscillation of the die to the angle given by the distance between two adjacent portlines, we take the two "humps" that these ports create and distribute them over the surface of the roll, which results in a very cylindrical roll (rather than one with hills and valleys).

Up to this point we have not addressed the film's gauge variation. The blown film's thickness variation is influenced also by other factors beside the portlines, like the uncontrolled ambient air in the plant or an offset die or air ring lip. These variations manifest themselves in bigger sine waves that most automatic gauge control systems can address (including ours, of course). Therefore we use our gauge control system to address these variations and reduce them to zero or close to zero. On a 360 degree oscillating die this could be only partially done. By reducing the oscillation to a fraction of the full 360 degrees we can address most of the sine wave type variations leaving out only the port line variations that would create a problem in achieving a cylindrical roll if we didn't randomize them as pointed out before.

The combination of reducing the gauge variations by at least 40% and randomizing the remaining port line variations results in a roll quality that until now was achievable only with an oscillating haul-off and a film's gauge variation that until now was achievable only on stationary dies.

This invention has the described general benefits for rotating dies, but also has a very special benefit for stretch film lines. In stretch film many rolls are wound on the same core (6,8 or more up). Certain oscillating haul-offs have difficulty handling the

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sticky stretch film (Addex's is an exception, but, that again is not relevant in this context) or because stretch film producers, being in a very competitive market, can't afford the cost of an oscillating haul-off, a good portion of the stretch film today is produced with rotating dies. Rotating dies randomize the portlines and other die imperfections, but don't address the film thickness variations caused by all the stationary components of the equipment or the plant's ambient air. Therefore the weight of the rolls wound on the same core can vary by as much as 10-15%. The Addex invention reduces this roll weight variation to several percentage points (we call this application ARC=Addex Roll Control). Therefore the cost of an Addex automatic thickness control system takes care of both the film's thickness variations and the roll weight variations, which without the invention would require the additional cost of an oscillating haul-off.