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(54) Title: SADDLE CURVED-SURFACE TRANSITION-BASED STEPLESS BIDIRECTIONAL STRETCHING METHOD AND DEVICE FOR FILM

(54) 发明名称: 基于鞍形曲面过渡的薄膜无级双向拉伸方法及装置

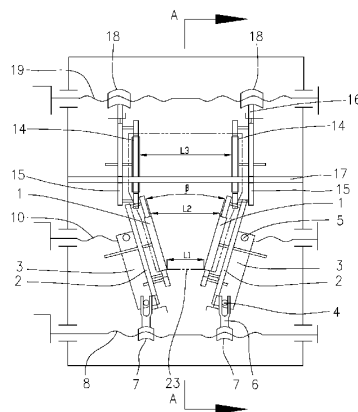


图 1

(57) Abstract: Disclosed are a saddle curved-surface transition-based stepless bidirectional stretching method and device for a film. A film is smoothly transitioned from a narrow plane to a saddle curved-surface and to a wide plane in a three-dimensional space by means of a transversely-stretching force and a longitudinally-stretching force that act on different tangent planes in a bidirectionally-stretching process of a curved surface of the film, and the thickness uniformity of the bidirectionally-stretched film is adjusted and controlled by controlling the shape of the saddle curved-surface. The device comprises a herringbone wheel unit and a parallel wheel unit. An adjustable included angle is formed between two transversely-stretching wheels in the herringbone wheel unit. Two longitudinally-stretching wheels in the parallel wheel unit are disposed in parallel. The film is transversely stretched under the driving of the rotation of the transversely-stretching wheels and is longitudinally stretched by means of a linear velocity differences between the transversely-stretching wheels and the longitudinally-stretching wheels. In the present invention, by using a bound wheel structure, a bowing phenomenon is effectively adjusted and controlled by means of the saddle curved-surface; in addition, the contact surface between the film and a stretching element is reduced, and the damage to surface performance caused by frictions is avoided, which helps to improve the thickness uniformity of a film product.

(57) 摘要:

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本国际公布:

— 包括国际检索报告(条约第 21 条(3))。

本发明公开一种基于鞍形曲面过渡的薄膜无级双向拉伸方法及装置, 薄膜曲面双向拉伸过程中, 利用横向拉伸力与纵向拉伸力作用在不同切平面上, 使薄膜在三维空间内由窄平面经鞍形曲面平滑过渡到宽平面, 通过控制鞍形曲面的形状实现双向拉伸薄膜厚度均匀性的调控; 其装置包括人字轮单元和平行轮单元, 人字轮单元中的两个横向拉伸轮之间设有可调的夹角, 平行轮单元中的两个纵向拉伸轮平行设置; 横向拉伸轮的转动带动薄膜进行横向拉伸, 横向拉伸轮与纵向拉伸轮之间的线速度差值带动薄膜进行纵向拉伸。本发明采用捆绑轮式结构, 有效利用鞍形曲面调控弓曲现象, 同时减小薄膜与拉伸元件的接触面, 避免了摩擦损伤表面性能, 有利于提高薄膜制品厚度的均匀性。