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Design and Fabrication of Fabric Folding Machine

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Abstract

Control of the machine carriage at a steady speed is crucial when one wants to advance the state-of-the-art with higher productivity and efficiency for fabric folding machine systems. Three steps are necessary. First, a good design-based model of the plant needs to be developed. Second, a good, realizable actuator, sensor, and controller must exist. Third, the system output should be modified using knowledge of the system's dynamic response. This project presents a complete control strategy for a fabric folding machine system. In Part I, we illustrate the system's mathematical modeling, dynamic analysis, linearization, and controller design. A very realizable actuator and sensor, which uses a motor and an encoder, are applied to design the control system. The computer simulation results for linear and nonlinear system models indicate that the system's steady-state errors for this designed controller can be eliminated and that a good tracking property can be achieved as well.

Keywords

Fabric folding machine Dynamic response Mathematical modeling

Introduction:

With high speed and efficiency, this unit of Fabric Doubling and Folding Machine used in textile dye factory is suitable for suiting and plain weaving fabric. Fabrics will be rolled up after folding. Fabrics will be discharged automatically after they are rolled up. Fast and convenient for operation as well as saving time. There is a table or bed of smooth hard wood or of metal, having at each side a curb of similar material. Between the uprights of the machine are supported two rolls, say of hard wood, their journals being raised to rise in boxes, pressing against elastic bearings compressed, per contra, by set-screws to any necessary extent, a common device unnecessary to show; roll in contact, except when material to be plaited is interposed. It would be better that these two rolls should be geared together, the exterior of the cog-teeth upon them being designated by the dotted circles around them, and the inner full-line circle, struck

around the same center, indicating their own relative diameter rises perhaps one-sixty-fourth or one thirty-second of an inch above the level of the table outs through, which, at the point of juxtaposition with the rolls, is formed to suit their curvature with very slight clearance. To sustain the two parts of in level with each other they are mutually supported by curved braces spanning and also by posts is a hand-lever, by which the machine is operated, and whose fulcrum is on a cross-shaft at whose opposite end is fixed another and parallel lever, but without a handle. From these two levers extend parallel connecting-rods to a cross-bar or blade (say of steel) of peculiar construction, which is to feed the fabric to be plaited. A portion of is shown in plan and cross section is a long thick steel loop on the side of, having a lip at projecting outward from the former, and serving as a stop to the backward motion of the lever and a gauge to the width of the plate. When at its greatest reach it is stopped by a guide-pin, at lesser reaches it is gripped and held by a nut on another fixed guide-pin, projecting from the side.

Working of folding machine:

The invention relates to a machine for folding supplied from a trouser press laundry (z. B. of cushion covers, napkins, Bidettüchern or towels) in longitudinal and transverse directions, a frame structure, a transport belt-conveyor for feeding, stopping, and the other feed of the laundry items, two parallel to the conveying direction of the conveyor belts arranged Schwenkvor directions (longitudinal folding devices) for performing the longitudinal folding of the laundry items, a first and second transversely arranged to the conveying direction and in opposite Rich lines pivotable tilting device (Querfaltungsvorrich lines) for carrying out the cross-folds, and a controller for the time-sequential control of the pivoting means comprises.

A known machine of this type (DE-OS 19 63 490) is adapted to fold laundry, whose size varies in ver relatively narrow limits. The items of laundry are not much larger than the area of a pivoting device, so they may use be at most folded on two edges. If the laundry is smaller than the area of a pivot device, it can even be laid taken only one fold.

Furthermore, with such prior art devices is the problem that they have to work very quickly to fold large amounts of laundry. Since the laundry rest loosely on the work surfaces, a clean folding not be reached. This is because that is easy to partially shift the laundry in the folding in the folding edges, so that one does not get clean folding more here.

The object of the invention is to provide a machine for the transverse and longitudinal wrinkles from laundry items, which allows a fast and reliable folding also of different sized laundry articles, wherein clean folding edges can be obtained.

The solution according to the invention is that between the first and the second transverse folding device a third transverse folding device is arranged, with the small pieces of laundry are in particular foldable, and in that both along the transverse folding lines and also along the longitudinal fold lines adjacent the pivot devices in the frame structure suction openings for holding the laundry items are arranged during the folding operations and are associated with the suction means for selectively driving, through which the suction optionally in a suction zone (A), the processing area the Fal corresponding to the first and third Querfaltungsvorrich device, and a suction zone (B) corresponding to the Faltungsbereich corresponds to the second cross-folding device, is the fourth acting.

Intake, although at folding devices known (DE-OS 19 64 228). These prior art suction openings are but evenly over almost the entire table on which the fold is to be distributed by the table is formed more or less like a sieve. This unnecessarily sucked a lot of air. The invention is, however, based on the realization that the garments do not have to be held over a large area, but that only the region of the folded edges is particularly critical. Are provided by less intake, on the one hand be drawn with a powerful vacuum, without providing particularly high pump powers. On the other hand, is quicker because of the small air volumes of the vacuum at the beginning and at the end of the aspiration of the same are degraded faster.

Fusing Machine Operating Procedure:

Fusing machine for garments is very much important to maintain the quality of the products. Fusing press machine for garments is very much important to maintain the quality of the products. The press machine carries out fusing by holding the fabric & the interlining between the conveyor belts while heating. The pieces are then pressed by rollers at the outlet. The required fusing temperature is achieved by bringing the belt into contact with the heating elements. After a fabric reaches the receiving area it automatically fold by using folding machine.

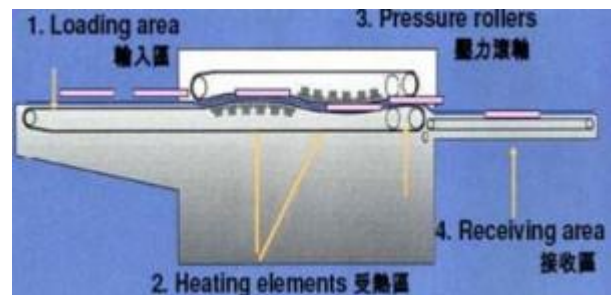


Figure no. : 1

- Each day before start of production, the pressure on the left, right and center of the rollers shall be checked by means of the lightweight woven fabric strips. One of the strip shall be passed through the fusing press and while holding the other end tight. When the end passes out of the press, the strip will be pull to feel the pressure of the rollers.
- The Fusing machine will be set to conditions recommended for Fusing of the fabric type.
- The conveyor belts shall be checked. If there is any adhesive residue contaminating the belts, it will rub off with a soft cloth.
- The cover of the cleaning bars will be Turn or changed, depending on how dirty they are. The scraper blades will be cleaned with a cloth.
- Once the Fusing machine is ready for operation, the inter-lining will be set in proper position of the fabric, the appropriate time will be set and a test run through the machine will be made.

Features:

- End detector
- Uniform tension control
- Edge guider at in put
- Full forward &reverse
- Electronic length counter meter

Methods of Folding the Fabric:

Fabric can be folded in a variety of ways before pattern pieces are positioned for cutting.

The type of fold used depends on

- The number of pattern pieces that must be placed on a folded edge
 - The fold that results in the most economic use of the fabric
 - The width of the fabric
 - The pattern size
- Pattern companies have already taken these factors into consideration for you. Therefore, you should fold your fabric as shown in the diagram found on your pattern instruction sheet.

Lengthwise fold:

Most fabric is folded lengthwise on the bolt. Pattern instructions generally show a lengthwise fold with fabric folded in half lengthwise so that selvages match. However, Lengthwise folds can also be partial folds leaving some of the fabric extended as a single layer.

Crosswise fold:

For a crosswise fold, fabric is usually folded so the cut ends match. However, a crosswise fold can also be a partial fold. A crosswise fold is often used when pattern pieces are too wide to fit on fabric folded lengthwise.

Double fold:

When making a double fold, be sure the full length of each folded side is the same width. Measure as shown. This will ensure that the folded edges are straight with the grain. You may use a double fold when you cannot press the original fold line out of the fabric. You may also use it when several pattern pieces are to be cut on a fold.

1 Working Width	1800mm~2400mm
2 Main Motor	inverter 3HP*4P*1set
3 Speed for Rolling Cloth	30~120yards/min.
4 Motor for discharge	1/2HP
5 Dimensions	2350mm(L)*2250mm(W)*2600mm(H) (1800mm)

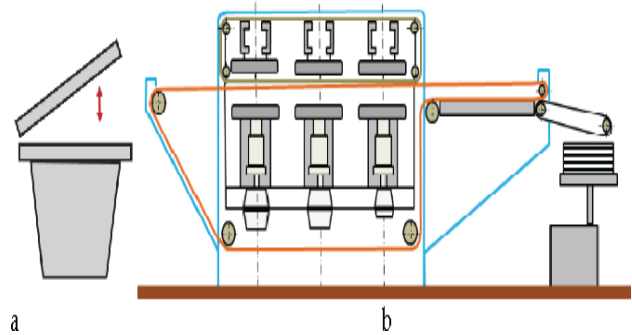


Figure no. : 2

Advantage:

- Low power consumption for this type of textile machinery during checking of textile fabrics
- High efficiency
- Textile machinery is made by steel sheets by welding and edge folding.
- Easy to use, low maintenance, durability and long service life.

CONCLUSION

Based on testing and evaluation that has been completed by the team members, it has been addressed that different material choices would greatly improve the results. This is true particularly with the paddle and moveable plates that are made from high density polyethylene. When machining, these parts had a tendency to bow and warp slightly due to the pressure from the tie-down clamps and the high cutting forces. This initially caused a loading issue because the tolerances were designed for a tight fit so that the newspapers could only slide through the paddle. Any gaps between the paddle and plates allow the newspaper to load over or under the paddle rather than through it. Aluminum or some other ridged and light metal material would be less likely to bow and therefore allow for tighter tolerances and hence increase loading efficiency. Overall the prototype was able to achieve our goals and complete the task at hand and we are very pleased with the result.

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