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LAUNDRY FOLDING MACHINES

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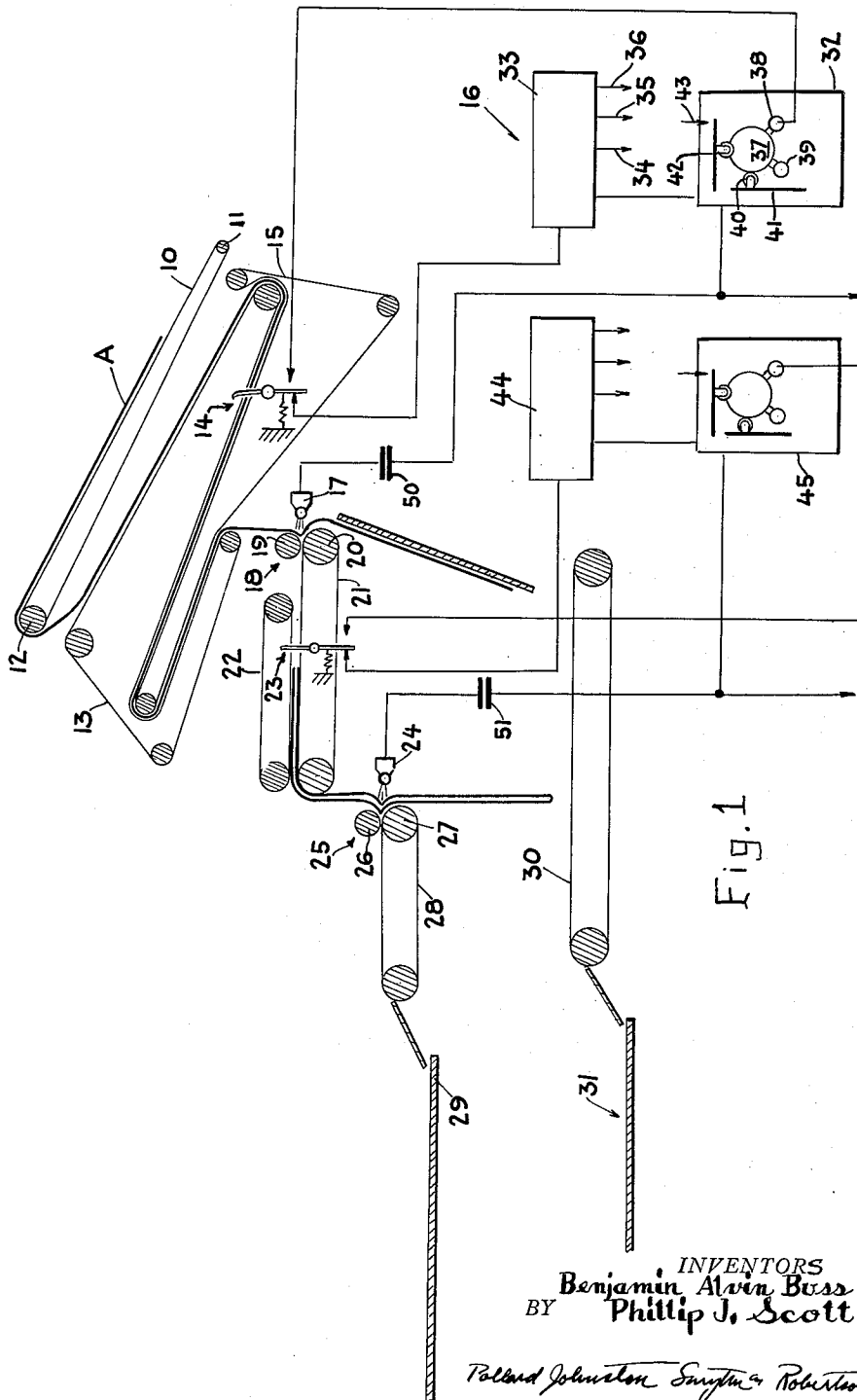


Fig. 1

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1

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LAUNDRY FOLDING MACHINES

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3 Claims. (Cl. 270-69)

This invention relates to a control arrangement for article processing machines and particularly to one employed for folding bed sheets, towels and the like.

It frequently is necessary to perform a timed or spaced folding operation upon articles fed into laundry machines after the articles have been washed and ironed. Sheet folding apparatus normally employ a control system arranged to make successive folds on a sheet or article, the folds being made at a point proportionately spaced relative to the length thereof, the length of the sheets usually varying in length. In some instances, it is desirable to make this fold with considerable accuracy and the motors and other parts may cause difficulty in attaining such.

One of the objects of the invention is to provide an improved control system for laundry folding machines which will fold the articles with accuracy and in such a manner when two folds are to be made, any error in the first measurement or fold can be corrected in the second measurement for the next fold.

In one aspect of the invention, a folding machine is used having a first and second conveying means. An article length measuring or sensing means finger is provided in conjunction with the first measuring means and the folding device associated therewith and a separate measuring or sensing means is provided in conjunction with the second conveyor means. A first fold is placed in the article before it is conveyed to the second conveyor means, the folded article being measured by a second switch or means which operates in conjunction with the second conveying means. The second measuring device actuates a second folding means at the appropriate time to place a second fold in the article in the desired location. As a further aspect, the control apparatus can be arranged so that the second or first folding means can be disabled and the article transported to a separate conveyor under the machine unfolded or having only one fold.

These and other objects, advantages and features of the invention will become apparent from the following description and drawings which are merely exemplary.

In the drawing, FIG. 1 shows a schematic view of one form of the apparatus employing the described invention.

Sheet A can be deposited on endless belt 10 from the previous processing machine, such as an ironing machine. Belt 10 may be of the conventional ribbon type carried by rolls 11, 12. Endless belt 13 receives sheet A from belt 10 and carries it in a path in the first conveying means past a sheet measuring or sensing switch means 14. Endless belt 15 cooperates with belt 13 to guide the sheet in its movement past the first measuring station. As will be explained hereafter, sensing switch 14 is depressed as the sheet passes thereover, such serving to actuate the measuring and timing mechanism shown generally at 16, the details of such being shown in copending application Serial No. 545,872, filed November 9, 1955, now Patent No. 2,858,129, issued October 28, 1958. The timing and measuring means are arranged so that as a pulse or signal is fed to the air blast or folding means 17, such will move the sheet sideways so as to cause it to be grasped between folding roll means 18. The roll means as illustrated comprises

2

a roller 19 and roller 20. It should be evident that other types of roll means or folding means can be employed.

The once folded sheet then is carried on endless belt 21 and is gripped between it and endless belt 22, such serving as a second conveying means in the folding. The second or separate sensing switch means 23 is actuated by the sheet as it passes thereover so as to provide a pulse at the second folding means 24 at the correct time as the sheet passes in front thereof. Upon energization of the second folding means, the sheet will be blown or moved sidewise so as to be gripped by roll or folding means 25. The roll means may comprise mating rollers 26 and 27. Endless belt 28 then receives the folded sheet and delivers it to a delivery table or suitable point 29.

In the event that it is desired to disable either of the folding means, suitable switches can be provided so that the sheet may be dropped upon a bypass conveyor belt 30 which will deliver the single folded or unfolded sheet to a delivery table 31.

The details of the measuring and sequence control are shown in said Patent No. 2,858,129. Describing only a part thereof, the first timing means can include a plurality of timing mechanisms such as illustrated schematically at 32, there only being one sub-timing means because only one folding means is actuated thereby. The timing mechanisms for the first folding means are selected by sequence controller shown by box 33, there being timing mechanisms similar to 32 connected to lines 34, 35 and 36 as described in the aforementioned copending application.

Cam 37 may be driven by a low speed motor 38 and a high speed motor 39, each of these motors being connected through suitable slip clutches to cam 37.

When an article depresses or actuates switch 14, low speed motor 38 will be activated so as to drive the cam at low speed. After the article passes over the sensing switch the high speed motor 39 will be actuated so as to rotate the cam until follower 40 permits switch 41 to close and actuate the folding mechanism 17.

Cam 37 will continue to operate until switch 42 breaks the contact with 43 which is arranged to permit timing mechanism 32 to stop.

After the once folded article passes sensing switch 23 corresponding second sequence control 44 is set so as to activate the second timing mechanism 45. The second folding means 24 then will be activated in a manner similar to the first measuring and timing mechanism so as to actuate folding means 24 at the appropriate time to provide the desired fold therein.

As mentioned, either or both of the folding means can be disabled by opening normally closed switch means 50, 51. The unfolded or once folded sheet then will fall onto conveyor 30.

It should be apparent that the details of construction can be varied and that other types of sequence operators and switches can be employed without departing from the invention except as defined in the appended claims.

What is claimed is:

1. In a unitary textile sheet folding machine having a conveying means extending therethrough for carrying sheets of varying length along a path through said machine and past folding means along said path, the combination including a first conveyor portion of said conveying means, first sheet measuring and timing means in the path of movement of sheets on said first portion of said conveying means, first sheet folding means adjacent said path and the exit end of said first portion toward which the sheets are conveyed and connected to said first sheet measuring and timing means, said first sheet folding means being operable when actuated to fold a sheet passing thereby in a fractional fold, a second conveyor portion of said conveying means receiving sheets from

said first sheet folding means being activated, second sheet measuring and timing means in the path of movement of sheets on said second portion after they have passed said first sheet folding means, second sheet folding means adjacent said path and the exit end of said second portion toward which the sheets are conveyed and connected to said second sheet measuring and timing means, said second sheet folding means being operable when actuated to fold a sheet passing thereby in a second fractional fold, means operating said conveying means, and means for selectively disabling one or both of said folding means, whereby the path of travel of the sheet through the machine terminates at the exit end of the conveyor portion where the folding means is disabled.

2. In a unitary textile sheet folding machine having a conveying means extending therethrough for carrying sheets of varying length along a path through said machine and past folding means along said path, the combination including a first conveyor portion of said conveying means, first sheet measuring and timing means in the path of movement of sheets on said first portion of said conveying means, first sheet folding means adjacent said path and the exit end of said first portion and connected to said first sheet measuring and timing means, said first sheet folding means being operable when actuated to fold a sheet passing thereby in a fractional fold, a second conveyor portion of said conveying means receiving sheets from said first sheet folding means being activated, second sheet measuring and timing means in the path of movement of sheets on said second portion after they have passed said first sheet folding means, second sheet folding means adjacent said path and the exit end of said second portion toward which the sheets are conveyed and connected to said second sheet measuring and timing means, said second sheet folding means being operable when actuated to fold a sheet passing thereby in a second fractional fold, means operating said conveying means, means for selectively disabling one or both of said folding means, and means adjacent said conveying means for receiving sheets treated a less number of times than the number of folding means when said means for selectively disabling is activated.

3. In a unitary textile sheet folding machine having a conveying means extending therethrough for carrying sheets of varying length along a path through said machine and past folding means along said path, the combination including a first conveyor portion of said conveying means, first sheet measuring and timing means in the path of movement of sheets on said first portion of said conveying means, first sheet folding means adjacent said path and the exit end of said first portion toward which the sheets are conveyed and connected to said first sheet measuring and timing means, said first sheet folding means being operable when actuated to fold a sheet passing thereby in a fractional fold, a second conveyor portion of said conveying means receiving sheets from said first sheet folding means being activated, second sheet measuring and timing means in the path of movement of sheets on said second portion after they have passed said first sheet folding means, second sheet folding means adjacent said path and the exit end of said second portion and connected to said second sheet measuring and timing means, said second sheet folding means being operable when actuated to fold a sheet passing thereby in a second fractional fold, means operating said conveying means, means for selectively disabling one or both of said folding means, and discharge conveyor means disposed adjacent said first and said second sheet folding means for receiving sheets treated a less number of times than the number of folding means when said means for selectively disabling is activated.

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