April 21, 1970 E. F. KAMBERG ET AL 3,508,242

QUALITY CONTROL CIRCUIT HAVING TIMER CONTROLLED SIGNALS

Filed Nov. 24, 1967 2 Sheets-Sheet 1

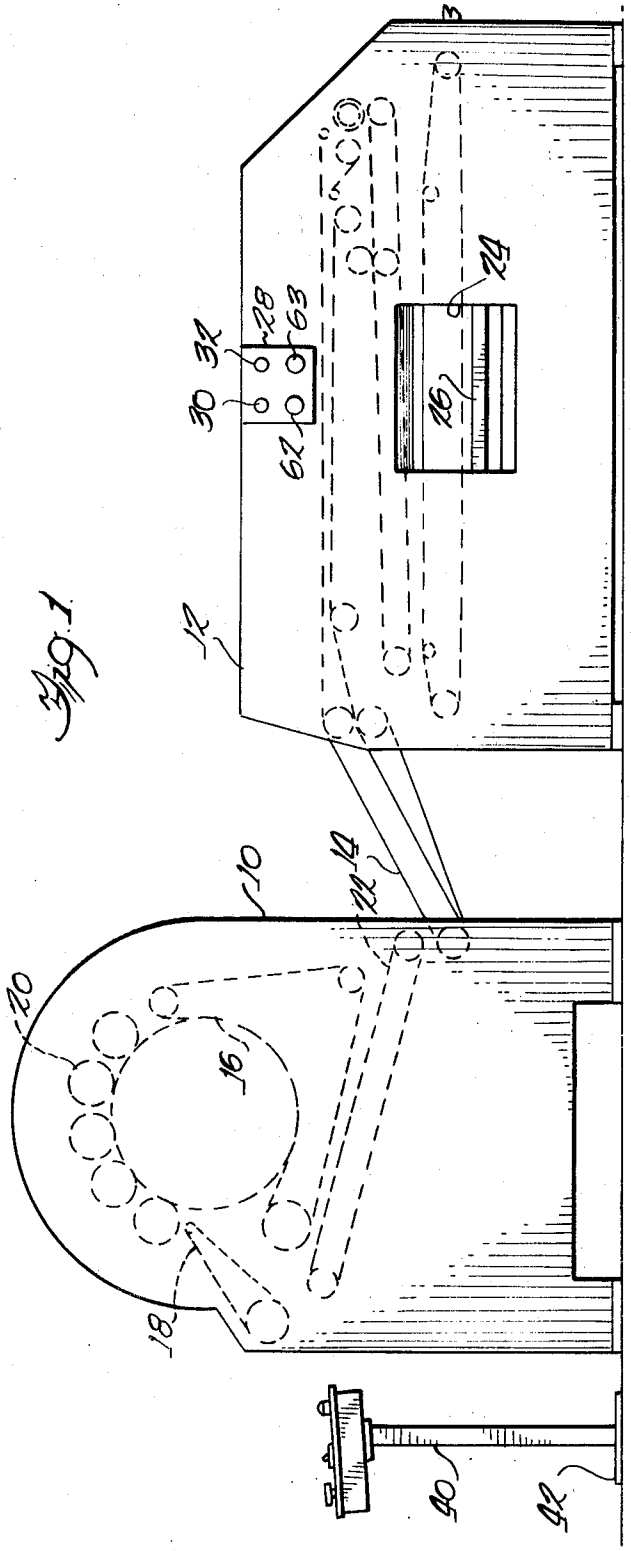


Fig. 1

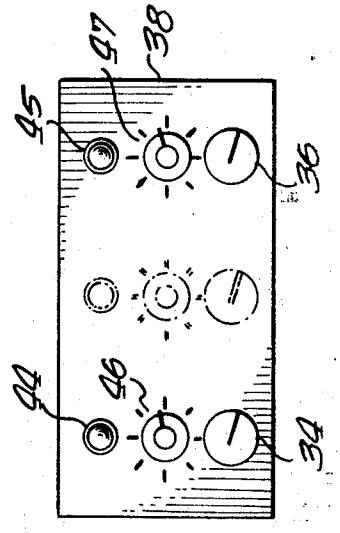


Fig. 2

Inventors
Edward F. Kamberg
Richard J. Roberts
Pendleton, Neuman
Seibold & Williams
Attys

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Filed Nov. 24, 1967 2 Sheets-Sheet 2

Fig. 3

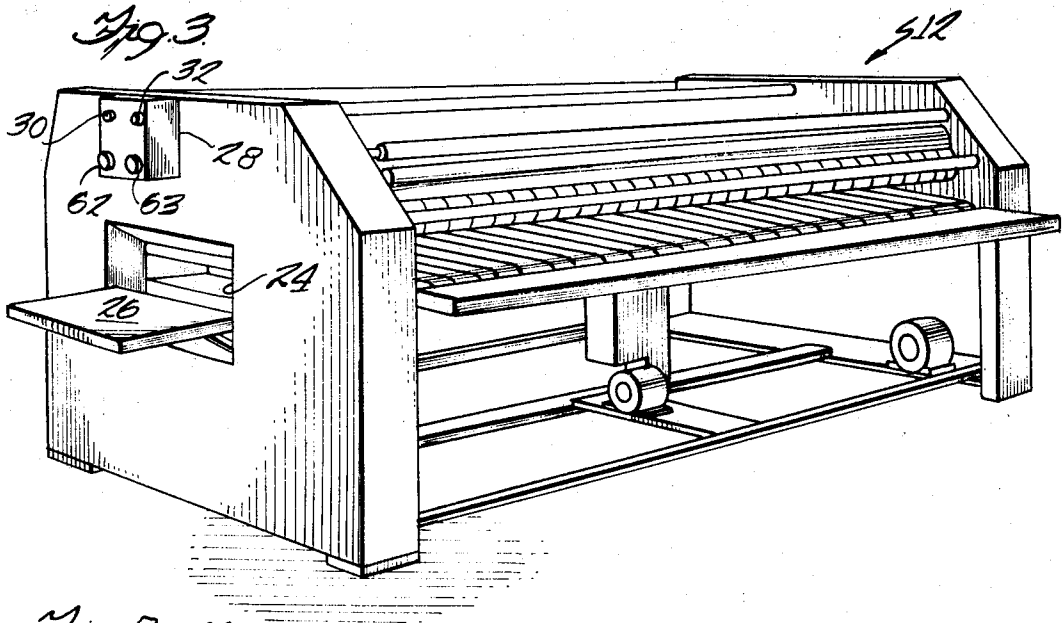


Fig. 4

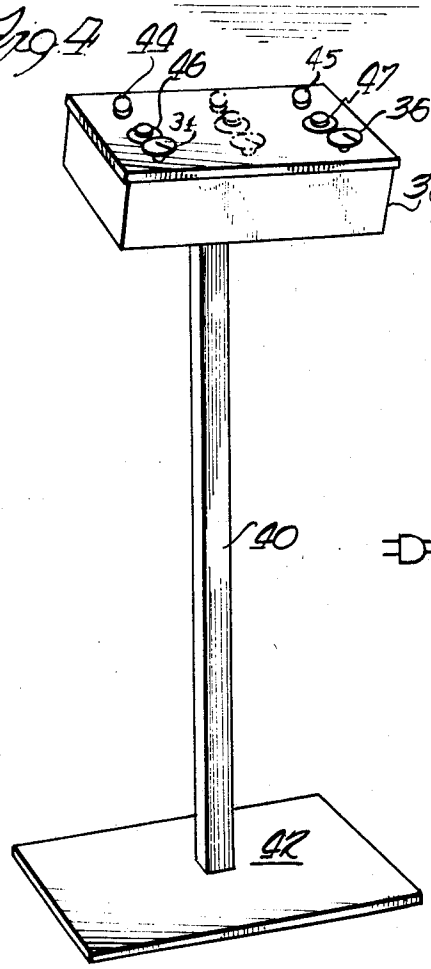
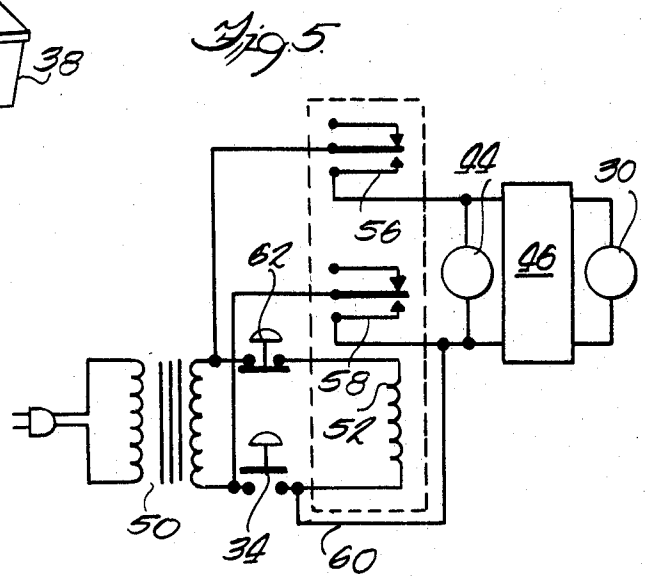


Fig. 5



Inventors
Edward F. Kamberg
Richard J. Roberts
Pendleton, Neuman, Seibold & Williams
Attys

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QUALITY CONTROL CIRCUIT HAVING TIMER CONTROLLED SIGNALS

Eduard F. Kamberg and Richard J. Roberts, Deerfield, Ill., assignors to Chicago Dryer Company, Chicago, Ill., a corporation of Illinois

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U.S. Cl. 340—309.1 2 Claims

ABSTRACT OF THE DISCLOSURE

Two spaced stations are employed with an ironer-folder combination for processing washed sheets or the like. Either of two buttons of a sending station disposed at the feed end of the ironer is actuated by the attendant feeding the sheet. When a torn or stained sheet is noted in the course of feeding the same into the ironer, a time delay relay is energized by a button and is adapted to close a circuit energizing a signal light disposed in a receiving station disposed at the discharge opening of the folder. The signal light is energized at the precise instant that the defective sheet is exiting the folder.

An attendant disposed at the folder exit, upon seeing the lit signal light, will discard the then exiting sheet into an appropriate stack dictated by the particular signal light which has been actuated. A cancel button on the receiving station is actuated by the attendant thereat, breaking the circuit which energizes the signal light, and readying the time delay relay for a subsequent actuation.

BACKGROUND OF THE INVENTION

Field of the invention

This invention relates to laundry processing equipment, and more specifically to a quality control device which enables defective sheets fed into automatic laundry apparatus to be discarded from the normal laundry cycle for said sheets by means of a signal sent from a sending station disposed at the apparatus feed end, and received at a spaced-apart exit end of such apparatus.

Description of the prior art

The prior art has continuously improved the design of automatic laundry processing equipment to the extent that institutional laundry may now be washed, ironed and folded in an efficient manner by mechanical units in the presence of a few attendants who regulate and oversee the apparatus. In view of the increasing automation and decreasing number of persons in attendance, defective laundry items such as torn sheets or the like are often completely processed and forwarded from the laundry to the place of use. The art is lacking in simple quality control apparatus which assures the discarding of defective sheets from the laundry cycle thereby preventing the forwarding of such defective items to a user.

SUMMARY

It is an object of this invention to provide a quality control particularly adapted for use with high-speed automatic laundry equipment which enables a minimum number of attending personnel to efficiently remove defective laundry items from the laundry cycle for repair or discard.

It is another object of this invention to provide a quality control which is flexible enough to be employed with a variety of automatic laundry machinery without the necessity of significant adjustment of any kind.

The provided control is also composed of a minimum of basic parts which are individually easily obtainable and readily placed in use with existing, operating laundry apparatus.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side elevational view illustrating the control of this invention in combination with a laundry ironer and folder schematically illustrated;

FIG. 2 is a top plan view of a sending station comprising a part of the control of this invention;

FIG. 3 is a perspective view of the folder illustrated in FIG. 1 viewed from the discharge side and illustrating a receiving unit of the control of this invention mounted in place thereon;

FIG. 4 is a perspective view of the sending unit illustrated in FIG. 2; and

FIG. 5 is a schematic wiring diagram illustrating circuitry employed in the control of this invention.

THE INVENTION

Referring now to FIG. 1, a commercial ironer **10** and folder **12** are illustrated in adjacent relationship whereby a sheet which is fed into the ironer **10** may be processed thereby and discharged onto feed ribbons **14** of the folder **12**.

The ironer **10** is of a common commercial type which is readily available. The ironers may be heated by gas, steam or electricity, and the profile of the ironer **10** of FIG. 1 is that possessed by ironer Model GA 36, manufactured by the Chicago Dryer Company of Chicago, Ill. The ironer **10** comprises a centrally heated roll **16** against which a sheet is fed by feed ribbons **18**. The sheet or other laundry item is urged against the roll **16** by padded compression rolls **20** and fed onto discharge conveyor **22** which will discharge the ironed sheet onto the feed ribbons **14** of the folder **12**.

The folder **12** is of a type manufactured by the Chicago Dryer Company and is available under model designations MLC and SLC. The folder **12** is adapted to fold the ironed sheet fed onto the feed ribbons **14** a plurality of times by folding such sheet transversely to the longitudinal sheet axis and is also adapted to cross fold the sheet transversely along an axis disposed parallel to such longitudinal sheet axis. The folded sheet is then discharged from discharge opening **24** most clearly seen in FIG. 3 of the drawing. The latter figure is a perspective view of folding machine **12** showing the position of the discharge opening **24** and receiving table **26** arranged on the right side of the machine **12**. Folders are available under model designations MLC and SLC from the Chicago Dryer Company having discharge openings on the opposite folder side to accommodate existing laundry facilities.

The attendant or attendants feeding washed sheets to be ironed onto the feed ribbons **18** of the ironer **10** will normally notice a defect in the sheet after the lead, or initial, portion of the sheet has already become engaged between the main ironing roll **16** and compression rolls **20**. It then becomes substantially impossible to remove the sheet from the ironing and folding cycles before the sheet has been discharged onto table **26** of the folder **12**. Inasmuch as the discharged sheet has now been folded at least three times, any defect which may have been noticed by the attendant at the feed side of the ironer **10** will now normally be inwardly disposed, hidden in a fold of the ironed and folded sheet. Since the ironer such as ironer **10** may have as many as nine sheets in contact with the various parts thereof at the same instant, the problem of identifying the defective sheet for removal becomes apparent.

It is the purpose of the control provided by this invention to enable an attendant disposed at the discharge table **26** of the folder **12** to be notified of the defective sheets as the same reach such table. Such notification is

given by means of a receiving unit **28** disposed above the folder discharge table **26**, see FIGS. 1 and 3, and contains a plurality of signal lights such as lights **30** and **32**.

The control of this invention functions as follows:

Upon noticing a defect in a sheet being fed into the ironer, the attendant at the ironer feed end punches a button such as button **34** or **36** disposed in sending station **38**, see FIGS. 2 and 4; the button is preferably punched as the terminal sheet portion engages feed ribbons **18** since by this time the attendants will have had an opportunity to examine the entire sheet and thus a signal may be sent as each defective sheet reaches a similar position in the ironer, regardless of the specific location of the defect in the sheet. Sending station **38** may be mounted on a vertical support **40** which is secured at its lower end to a movable base **42**. Immediately upon hitting a button **34**, a light **44** will be energized at sending station **38**. Simultaneously a time delay relay **46** of a type manufactured by Air-O-Tronics Products Incorporated of Morrisville, N.Y. and identified by Model No. TDR–3060–Al, will be energized and will complete a circuit energizing light **30** disposed in receiving station **28** mounted on the folder **12**. The light **30** will become lit after the time delay relay has completed a time cycle comprising the amount of time that is necessary by the passage of the sheet from the feed end of the ironer to the discharge table of the folder.

An attendant sitting at the discharge table of the folder upon noting the lit condition of the signal light **30** will take the sheet then being discharged and, instead of stacking the sheet for transport to a place of use, will place the same in a receptacle containing the torn, or stained, or otherwise defective sheets. It will also be noted from FIG. 2 of the drawing that the sending station **38** has a second light **45** in addition to light **44** which will be of a different color. Similarly light **32** mounted in receiving station **28** will have a different color than light **30**.

The attendant feeding the sheets into the ironer will punch the appropriate button for the particular defect being noted. Normally the two main sheet defects are tears and stains or other discolorations. Lights **44** and **30** may comprise red lights indicating a torn sheet. Lights **45** and **32** disposed in the sending station and receiving station respectively, may be green lights indicating stained sheets. Obviously, more than two lights may be employed in each station as indicated in FIG. 2. The third light may indicate still another defect in the sheet which is signaled by the feeding attendant to the attendant disposed at the discharge table of the folder.

FIG. 5 is a schematic wiring diagram which will be employed for each set of two lights of a common color disposed in the sending and receiving station of the control above described. Upon supplying power to transformer **50** by pushing button **34**, relay coil **52** will become energized, closing normally open contacts **56** and **58**. Inasmuch as button **34** (as well as button **36**) is spring loaded into the open position hold-in-line **60** will retain coil **52** in an energized condition after push button **34** has resumed the open condition.

The closed contacts **56** and **58** will immediately result in energization of light **44** at the sending station and energize time delay relay **46** also disposed at such station. Upon expiration of the time required to close relay **46**, the red light **30** disposed at the receiving station **28** is energized just as the defective sheet which occasioned the punching of button **34** emerges onto discharge table **26**. The attendant disposed at the discharge table will

then punch cancel button **62** de-energizing the lights **44** and **30** as well as the time delay relay **46**. As is apparent from the calibrations shown in FIG. 2, time delay relay **46** may be readily set by hand to regulate the time interval between the punching of button **34** and the energization of signal light **30** disposed at the receiving station **28**. Such ready adjustability provides for flexibility of operation enabling the ironer and folder speeds to be modified for most efficient operation as volume of work and other conditions vary.

The provided control comprising the sending station and receiving station may be readily incorporated with any operating laundry equipment similar to the ironer **10** and folder **12** illustrated in FIG. 1. To commence functioning in a desired manner, the time for a laundry item to pass through a laundry cycle from the feed to discharge end must be ascertained. The time delay relay **46** and time delay relay **47** will then be set accordingly. After the relays have been set for the appropriate time interval, the control will function in an efficient manner as above described.

Although FIG. 5 has been described as specific to the electrical circuit energizing the signal lights **44** and **30**, it is believed apparent that the same system is utilized in the operation of the signal lights **45** and **32** disposed in the sending and receiving stations respectively. Cancellation button **63** functions similarly to button **62** in the receiving station to deactivate the electric circuit energizing the signal lights and timer, and prepare the control for a subsequent actuation when the attendant at the feed end of the apparatus again notes a defective sheet.

We claim:

1. In a quality control substantially as described, the combination comprising a signal-sending station and a spaced signal-receiving station; said sending station comprising a manually actuatable switch means biased into an open position, said signal-sending station also having a first signal means and a timer relay means both of which are initially energized when said switch means is actuated into the closed position; a holding circuit means for maintaining said sending station signal means and said timer relay means in the energized condition after said switch means has opened; said timer relay means being adapted to close a second-signal actuating circuit after expiration of a preselected period of time after energization; said receiving station having a second signal means in electrical communication with said sending station which is energized when said timer relay means closes said signal actuating circuit; said receiving station also having a manually actuatable de-energizing means for simultaneously de-energizing said timer relay means and the circuit closed thereby and both of said signal means.

2. The quality control of claim **1** in which said timer relay means may be manually set to said desired preset period of time.

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HAROLD I. PITTS, Primary Examiner

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