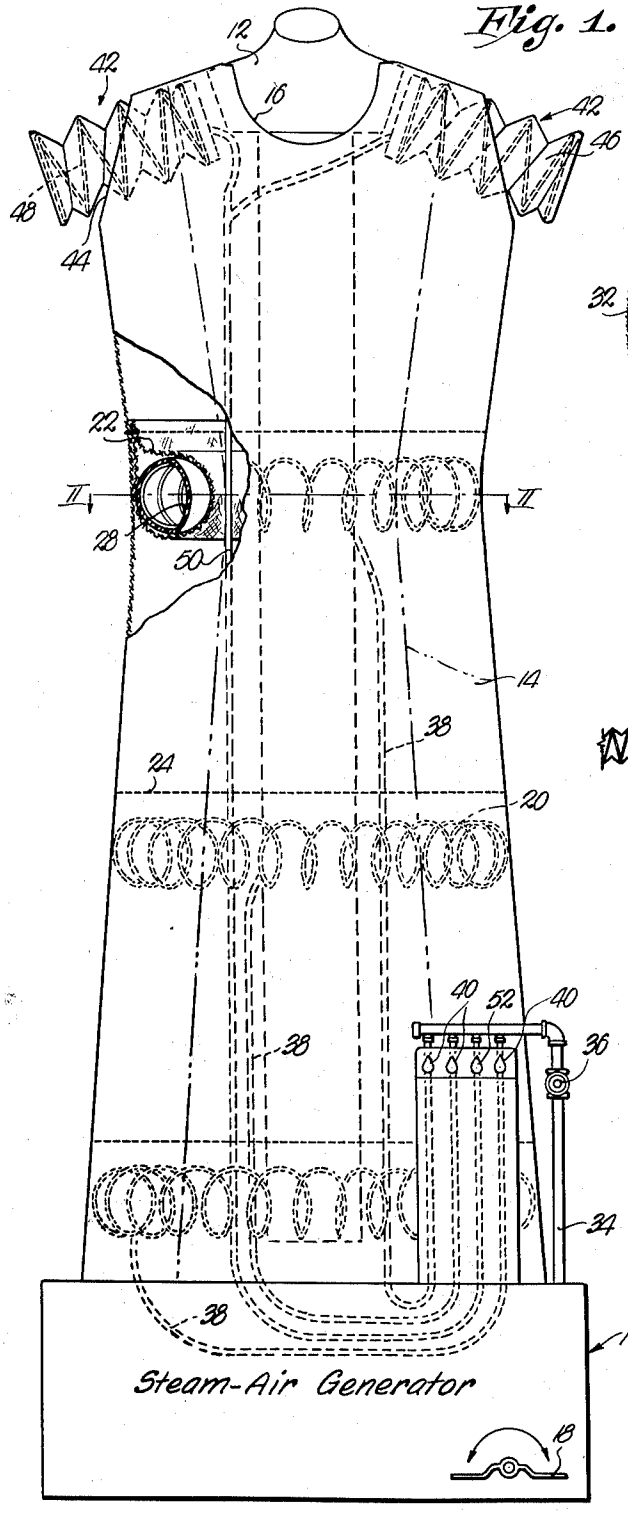
Oct. 11, 1955 N. C. JACKSON 2,720,347

ADJUSTABLE FORMING BAG FOR GARMENT FINISHING MACHINES

Filed March 4, 1954

Fig. 1.



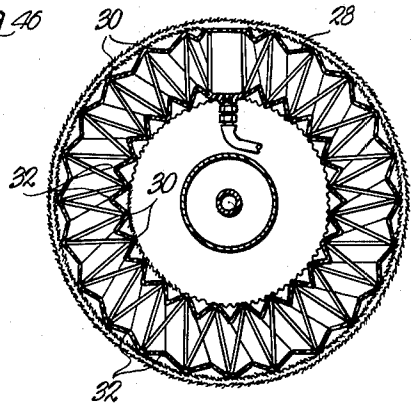


Fig. 2.

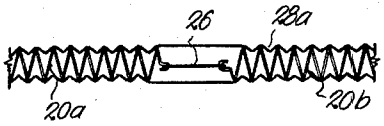


Fig. 3.

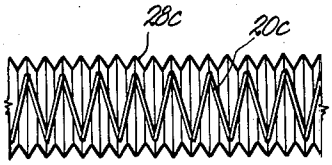


Fig. 4.

INVENTOR.
Nolan C. Jackson

BY

ATTORNEY.

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ADJUSTABLE FORMING BAG FOR GARMENT FINISHING MACHINES

Nolan C. Jackson, Wichita, Kans., assignor to Wichita Precision Tool Company, Inc., Wichita, Kans., a corporation of Kansas

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11 Claims. (Cl. 223—67)

This invention relates to improvements in garment finishing machines and particularly to that class of equipment adapted for use in cleaning establishments that includes a flexible garment-receiving bag inflatable with fluid pressure, the primary object being to provide novel means to selectively vary the diameter of the bag.

It is the most important object of the present invention to provide in a garment finishing machine having an inflatable bag as a part thereof, one or more expansible loops secured to the bag in such manner as to control the diameter of the bag and therefore, the extent of ballooning thereof when fluid pressure is directed into the bag, all as determined by the resistance of the expansible loops to the fluid pressure.

Another important object of the present invention is to provide in structure as just above set forth, means for directing fluid pressure into conduits containing the expansible loops to increase the diameters of the loops to pre-selected limits, thereby placing the entire machine under the control of the operator.

As will hereinafter appear, the present invention contemplates the provision of one or more continuous pleated conduits or bellows of rubber, plastic or the like within the forming bag of finishing machine and attached thereto in coaxial relationship with the bag. The conduits, which are therefore, of themselves inflatable, each contain an expansible loop such as a continuous coil spring. Accordingly, when the forming and supporting bag is inflated and ballooned, the springs will tend to resist expansion and, therefore, control the diameter of the bag adjacent the conduits and their spring loops. However, it is desirable to permit operator control of the ballooning and therefore, means is provided to direct fluid pressure into the conduits to inflate the latter and thereby expand the coil springs to the desired diameter.

Such principles and important features of the present invention can be more clearly understood from the following specification when referring to the accompanying drawing, wherein:

Figure 1 is an elevational view of an adjustable forming bag for garment finishing machines embodying the concepts of the present invention.

Fig. 2 is a transverse, cross-sectional view taken on line II—II of Fig. 1.

Fig. 3 is a schematic view of a modified form of the invention, showing a portion of an inflatable conduit with a pair of interconnected springs therein; and

Fig. 4 is a schematic view illustrating another modified arrangement of a controlling spring within an expansible conduit.

The utilization of forming bags in garment finishing machines upon which the garment is draped, is today a universally accepted practice. Such bags are placed in communication at one end thereof with a source of fluid pressure such as air and/or steam which, when released into the bag, causes ballooning usually to the full extent of the size of the garment placed on the bag.

It has heretofore been recognized that such practice is not entirely satisfactory since the diameter of the bag should be controlled at various points throughout the length thereof in rather accurate proportions to the various diameters of the garment being finished. So far as I am aware, no means has heretofore been proposed that is entirely satisfactory because the various circumferences of the bag cannot be accurate controlled by the operator. These difficulties and others, are overcome through use of the improvements forming the subject matter of this invention as clearly illustrated in the aforementioned drawing.

The particular type of machine with which the improvements about to be described are used, is of no particular consequence and, therefore, there is illustrated in Figure 1, a hollow base broadly designated by the numeral **10** having upstanding framework (not shown) operably carried thereby and which terminates in a neck element **12** carrying an elongated, flexible bag **14** of any suitable permeable material such as fabric.

Manifestly, bag **14** has a neck opening **16** receiving the element **12** and the open, lowermost end of the bag **14** is attached to the base **10** in any suitable manner so as to close the bag **14** and place it in direct communication with fluid pressure emanating from the base **10**. The hot air and steam sources within and/or communicating with the base **10** may take any suitable form and have not, therefore, been illustrated in the drawing. It is sufficient to point out that by manipulation of a foot pedal **18**, the bag **14** may be inflated or ballooned with the air/or steam pressure. By virtue of the porosity of the material from which bag **14** is made, such fluid is directed outwardly through the garment being finished and which is draped over the bag **14**.

It is now apparent that, in absence of any control whatsoever, the bag **14** is free to balloon to its fullest extent when the fluid pressure is directed thereinto, limited only by the garment that is placed thereon. In absence of any means to control the ballooning of bag **14**, the pressure placed on the garment may tend to stretch the latter and thereby increase its size in an undesirable manner. More particularly, it is manifest that when such pressure is placed on the garment, the dimensions of the latter will vary according to the weakest and strongest areas therein, resulting oftentimes in adversely effecting the relative proportions of the entire garment.

By way of example, the garment finishing industry is constantly confronted with complaints from its customers because of the fact that, after the garment is finished through use of machines having bags as illustrated at **14**, the diameter of the waist of the garment may have increased, whereas the diameters of the remaining portions thereof remain the same. Through use of the novel structure of the present invention, all of the initial relative proportions of the garment will remain the same after finishing as they were prior to the initial cleaning operations.

Accordingly, as shown in Fig. 1 of the drawing, there is provided a number of resilient loops **20** for the bag **14** spaced appropriately throughout the length thereof and by way of example, there is included a loop **20** at the waist, at the hips and adjacent the lowermost end of the bag **14**. Suitable means is provided for mounting each of the loops **20** upon the bag **14** and in the form chosen for illustration, such mounting means includes a continuous flexible tube **22** for each loop **20** respectively.

It is to be preferred that the tubes **22** and their contained loops **20**, be disposed within the bag **14** and secured directly to the latter. Tubes **22** are completely closed and the fastening means illustrated consists of a continuous line of stitching **24** circumscribing the bag **14**.

The tubes **22**, in addition to being flexible, should be expansible to a predetermined diameter. A suitable

fabric is suggested therefore, and the maximum circumference of each tube **22** should be as great as the circumference of the bag **14** adjacent the corresponding tube **22**. In other words, inasmuch as the circumferences of the bag **14** differ, the maximum circumferences of the tubes **22** will vary accordingly. The waist of the bag **14** is of a slightly less diameter than the diameter of bag **14** adjacent its lowermost end, and, therefore, the maximum diameter of the lowermost tube **22** is greater than the maximum diameter of the tube **22** adjacent the waist of the bag **14**.

On the other hand, the normal diameters of the loops **20** within the tubes **22**, are appreciably less than the corresponding diameters of the bag **14** when the latter is inflated and, therefore, ballooned. Each loop **20** may, in the form of the invention illustrated in Figs. 1 and 2, consist of a continuous coil spring of predetermined resiliency. Or, as shown in Fig. 3, the loops may consist of a pair of springs **20***a* and **20***b* and have their ends joined by suitable connecting elements **26**.

The spring loops **20** are each contained in a continuous inflatable conduit **28** made from rubber, plastic or other expandable material, the conduits **28** being in turn contained within the tubes **22** or fastened to the bag **14** therewithin in any other suitable manner.

As is best seen in Fig. 2 of the drawing, the conduits **28** are pleated or in the nature of a bellows. There is provided therefore, an outwardly extending pleat **30** for each convolution respectively of the spring loop **20** and alternate, inwardly extending pleats **32** in the conduit **28** disposed between the convolutions of the spring loops **20**.

The resiliency of the spring loops **20** or the extent to which the same are capable of resisting expansion, may of course, be pre-selected. It is suggested however, considering the porosity of the material from which bag **14** is made and the nature of the garments to be processed thereon, that the force of the fluid pressure directed to the bag **14** therewithin, be normally insufficient to expand any of the coil springs **20**. Thus, in absence of any inflation of the conduits **28** and therefore, expansion of the springs **20**, the various diameters of the bag **14** adjacent the springs **20** or more particularly, at the lines of stitching **24**, will remain fixed as determined by the diameters or circumferences of the loops **20** even when the bag **14** is fully ballooned by the force of fluid pressure directed thereinto.

Consequently, when any of the diameters of the bag **14** adjacent the lines of stitching **24**, are too small to properly form the bag **14** in accordance with the shape, size and configuration of the garment being processed thereon, it becomes necessary to expand the coil spring loops **20** and in order to do this, the conduits **28** must be inflated and, therefore, expanded.

This may be accomplished by use of any fluid pressure such as air entering by way of pipe **34** provided with a control valve **36**. A hose **38** or other air passage is provided for each conduit **28** respectively, and extending downwardly therefrom within the bag **14** to a point of connection with the supply pipe **34**. Each hole **38** is in turn provided with a control valve **40**. The hoses **38** are coupled directly with the conduits **28** as shown in Fig. 2 of the drawing.

It is important to note therefore, that by virtue of a hose **38** and a valve **40** for each conduit **28** respectively, the operator may control the extent of expansion of the springs **20** individually, and thereby vary the diameter of the bag **14** at selected points thereon, all depending upon the nature of the garment being finished. When air or other fluid pressure is directed into a conduit **28** by opening the appropriate valve **40**, the conduit **28** is expanded or inflated to increase its overall diameter and thereby the diameter of the bag **14** adjacent thereto.

By virtue of the interleaved pleats **30** and **32** in the conduits **28**, both along the inner and along the outer circumferences thereof, the springs **20** will be automatically expanded as shown in Fig. 2 of the drawing, whenever air pressure is directed into the conduits **28** to inflate the latter. As soon as the air pressure is exhausted from the conduits **28** by manipulation of valves **40**, the inherent resiliency of the springs **20** will contract the conduits **28**. A similar conduit arrangement is provided for the springs **20***a* and **20***b* in Fig. 3 and designated broadly by the numeral **28***a*.

In the modification illustrated in Fig. 4 of the drawing, there is provided a continuous coil spring loop **20***c* comparable to the spring loops **20**, but of appreciably lesser diameter than inflatable bellows or conduit **28***c* within which the spring **20***c* is contained.

In this modification, spring **20***c* is normally in an expanded condition as shown in Fig. 4, and when the conduit **28***c* is deflated, it will contract and thereby contract the spring **20***c* therewithin. In other words, in the modification shown in Fig. 4 of the drawing, the nature of the material from which the inflatable conduit **28***c* is made, is such as to normally be contracted and have sufficient force to hold the spring **20***c* in a contracted condition. When air pressure is directed into the conduit **28***c* to inflate the same, spring **20***c* will be permitted to expand to its normal maximum diameter. It is unnecessary therefore, to utilize the pleats in the conduit **28***c* to actuate the spring **20***c*.

As shown in Fig. 1 of the drawing, the same arrangement may be utilized to provide sleeves for the bag **14** which extend through sleeve openings **44** in the bag **14**. Each of the sleeves **42** is made up of an elongated, inflatable conduit **46** in the nature of a bellows as in the case of the conduits **28** and each contains an elongated coil spring **48**. Springs **48** are fitted within the conduits **46** in the same manner as above described with respect to springs **20** and their conduits **28**.

Here again, there is provided a hose or other passageway **50** within the bag **14** common to the two conduits **46** and coupled with the pressure supply pipe **34**. Hose **50** is likewise provided with a valve **52** for controlling the flow of air pressure to and from the conduits **46**. Manipulation of the valve **52** controls the diameter and lengths of the sleeves **42** in the same manner as manipulation of the valves **40** control the effective diameters of the conduits **28**.

Summarizing the principle of operation of the present invention, it is again pointed out that springs **20** normally hold the bag **14** against ballooning adjacent their line of disposition or attachment to the bag even after air pressure is directed thereinto. If the bag **14** is then properly shaped or formed to accommodate a garment to be finished, it is unnecessary to increase the diameters of the conduits **28** by manipulation of valves **40**. If however, the extent of ballooning of the bag **14** is to be increased at any points of joinder of the conduits **28** to the bag **14** through the tubes **22**, it is but necessary to direct air pressure into the particular conduit **28** that is to be inflated.

In one preferred embodiment of the instant invention, an ordinary blower (not shown) may be housed within the base **10** to provide the source of air pressure for bag **14**, and a separate source of pressure such as an air compressor (not shown) may be provided for supplying fluid to the pipe **34**, so that the pressure furnished to hoses **38** and **50** is greater than that directed to bag **14** either as air, steam or other fluid.

Many details of construction, particularly with respect to the way in which the inflatable conduits are attached to the bag and the way in which the conduits are yieldably held against inflation or expansion, may be varied within the spirit of this invention, and it is, therefore, desired to be limited only by the scope of the appended claims.

Having thus described the invention what is claimed as new and desired to be secured by Letters Patent is:

1. In a garment finishing machine, the combination

of a support, a flexible, inflatable bag carried by the support, means retaining the bag on the support upon release of fluid under pressure into the bag to balloon the same, means for controlling the extent of ballooning of the bag, including an expansible loop, a continuous, inflatable conduit having means securing the same to the bag and containing the loop for attaching the loop to the bag in substantial coaxial relationship thereto; and means for directing fluid under pressure into the bag to inflate the latter and expand the loop.

2. In a garment finishing machine, the combination of a support, a flexible, inflatable bag carried by the support, means retaining the bag on the support upon release of fluid under pressure into the bag to balloon the same, means for controlling the extent of ballooning of the bag, including an expansible loop of resilient material, a continuous, inflatable conduit containing the loop, a continuous, expansible tube of fabric material secured to the bag and containing the conduit for attaching the conduit and the loop to the bag in substantial coaxial relationship thereto; and means for directing fluid under pressure into the bag to inflate the latter and expand the loop.

3. In a garment finishing machine, the combination of a hollow base, an upstanding support mounted on the base, a flexible, inflatable bag carried by the base, means closing the lowermost end of the bag in communication with the base, means for controlling the diameter of the bag intermediate the ends thereof upon release of fluid thereinto under pressure from said base, including a continuous, horizontal, inflatable conduit having a normal contracted diameter less than the diameter of the bag when fully ballooned under force of fluid pressure within the bag, and means attaching the conduit to the bag intermediate the uppermost and lowermost ends thereof, said conduit being expansible to a predetermined diameter under force of fluid pressure in the conduit.

4. In a garment finishing machine, the combination of a hollow base, an upstanding support mounted on the base, a flexible, inflatable bag carried by the base, means closing the lowermost end of the bag in communication with the base, means for controlling the diameter of the bag intermediate the ends thereof upon release of fluid thereinto under pressure from said base, including a continuous, horizontal, flexible conduit having a normal contracted diameter less than the diameter of the bag when fully ballooned under force of fluid pressure within the bag, means attaching the conduit to the bag intermediate the uppermost and lowermost ends thereof, and resilient means for yieldably holding the conduit contracted, said yieldable means having a predetermined resistance to expansion under force of fluid pressure in the bag.

5. In a garment finishing machine having a hollow base, an upstanding support mounted on the base, a flexible bag carried by the base, and means closing the lowermost end of the bag in communication with the base, means for controlling the diameter of the bag intermediate the ends thereof upon release of fluid thereinto under pressure from said base, including a continuous, horizontal, flexible conduit; a continuous spring in the conduit having a normal diameter less than the diameter of the bag when fully ballooned under force of fluid pressure within the bag; and means securing the conduit to the bag intermediate the uppermost and lowermost ends thereof, said spring having a predetermined resistance to expansion under force of fluid pressure in the bag.

6. In a garment finishing machine having a hollow base, an upstanding support mounted on the base, a flexible bag carried by the base, and means closing the lowermost end of the bag in communication with the base, means for controlling the diameter of the bag intermediate the ends thereof upon release of fluid thereinto under pressure from said base, including a continuous, horizontal, expansible tube; a continuous spring in the tube having a normal diameter less than the diameter of the bag when fully ballooned under force of fluid pressure within the bag; means securing the tube to the bag intermediate the uppermost and lowermost ends thereof, said spring having a predetermined resistance to expansion under force of fluid pressure in the bag; and means for directing fluid under pressure into the tube to expand the spring and the tube.

7. In a garment finishing machine having a hollow base, an upstanding support mounted on the base, a flexible bag carried by the base, and means closing the lowermost end of the bag in communication with the base, means for controlling the diameter of the bag intermediate the ends thereof upon release of fluid thereinto under pressure from said base, including a continuous, horizontal, expansible tube; a continuous, inflatable conduit in the tube; a continuous spring in the conduit, said spring and said conduit having normal contracted diameters less than the diameter of the bag when fully ballooned under force of fluid pressure within the bag; means securing the tube to the bag therewithin intermediate the uppermost and lowermost ends thereof, said spring having a predetermined resistance to expansion under force of fluid pressure in the bag; and means for directing fluid under pressure into the conduit to inflate the latter and expand the spring.

8. In a garment finishing machine having a hollow base, an upstanding support mounted on the base, a flexible bag carried by the base, and means closing the lowermost end of the bag in communication with the base, means for controlling the diameter of the bag intermediate the ends thereof upon release of fluid thereinto under pressure from said base, including a continuous, horizontal, expansible, tubular bellows; a continuous spring in the bellows having a normal diameter less than the diameter of the bag when fully ballooned under force of fluid pressure within the bag; means securing the bellows to the bag therewithin intermediate the uppermost and lowermost ends thereof, said spring having a predetermined resistance to expansion under force of fluid pressure in the bag; and means for directing fluid under pressure into the bellows to expand the spring and the bellows.

9. In a garment finishing machine having a hollow base, an upstanding support mounted on the base, a flexible bag carried by the base, and means closing the lowermost end of the bag in communication with the base, means for controlling the diameter of the bag intermediate the ends thereof upon release of fluid thereinto under pressure from said base, including a continuous, horizontal, expansible, tubular bellows; a continuous coil spring in the bellows having a normal diameter less than the diameter of the bag when fully ballooned under force of fluid pressure within the bag; means securing the bellows to the bag therewithin intermediate the uppermost and lowermost ends thereof, said spring having a predetermined resistance to expansion under force of fluid pressure in the bag; and means for directing fluid under pressure into the bellows to expand the spring and the bellows.

10. In a garment finishing machine having a hollow base, an upstanding support mounted on the base, a flexible bag carried by the base, means closing the lowermost end of the bag in communication with the base, a first source of fluid under pressure and a second source of fluid under pressure, means for controlling the diameter of the bag intermediate the ends thereof upon release of fluid from first source into the bag from said base, including a continuous, horizontal, expansible, tubular bellows; a continuous coil spring in the bellows having a normal diameter less than the diameter of the bag when fully ballooned under force of fluid pressure within the bag; means securing the bellows to the bag therewithin intermediate the uppermost and lowermost ends thereof, said spring having a predetermined resistance to expan-

sion under force of said fluid pressure in the bag; means for directing fluid from said second source and into the bellows to expand the spring and the bellows; a pair of opposed tubular sleeves at said uppermost end of the bag; and means for directing fluid from said second source into the sleeves to balloon the same.

11. In a garment finishing machine having a hollow base, an upstanding support mounted on the base, a flexible bag carried by the base, and means closing the lowermost end of the bag in communication with the base, means for controlling the diameter of the bag intermediate the ends thereof upon release of fluid under pressure thereinto from said base, including a continuous, horizontal, expansible tube; a continuous spring in the tube having a normal diameter less than the diameter of the bag when fully ballooned under force of fluid pressure within the bag; means securing the tube to the bag therewithin intermediate the uppermost and lowermost ends

thereof, said spring having a predetermined resistance to expansion under force of fluid pressure in the bag; means for directing fluid under pressure into the tube to expand the spring and the tube, said bag having a pair of opposed openings at said uppermost end thereof; an expansible, closed, tubular bellows in each opening respectively; a coil spring in each bellows respectively; and means for directing fluid under pressure into the bellows to expand the same.

References Cited in the file of this patent

UNITED STATES PATENTS

643,543	Schrader	Feb. 12, 1900
2,319,434	Pungar	May 18, 1943
2,410,485	Du Nah	Nov. 5, 1946

FOREIGN PATENTS

356,210	France	Nov. 23, 1905