United States Patent

Taylor

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[54] **SMOCK OR GOWN WITH ADJUSTABLE BELT**

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[73] Assignee: **The Kendall Company,** Walpole, Mass.

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[52] **U.S. Cl.** **2/114,** 2/DIG. 7

[51] **Int. Cl.** **A41b 9/00**

[58] **Field of Search**.....2/114, 83, 69, 113, 115, 88, 2/89, 93, 96, 105, 49–52, 73–76, 311, 321, 322, 338, DIG. 7; 24/206 R; 206/63.2

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[57] **ABSTRACT**

A gown or smock with an opening extending the length of the garment with an attached adjustable belt partially encircling the waist. The adjustable feature is a series of simple female elements in the belt which individually or severally may engage an outwardly projecting rigid male element to hold marginal portions of the opening in overlapping relationship, closing the opening. A particular embodiment is a rear-opening hospital gown with the male element attached to the gown front. When taken from its sterile packaging the belt is wound in a direction to hold the gown open when the fastening elements are engaged, but when worn the direction of winding is reversed with the belt holding the garment closed when the fastening elements are engaged.

12 Claims, 11 Drawing Figures

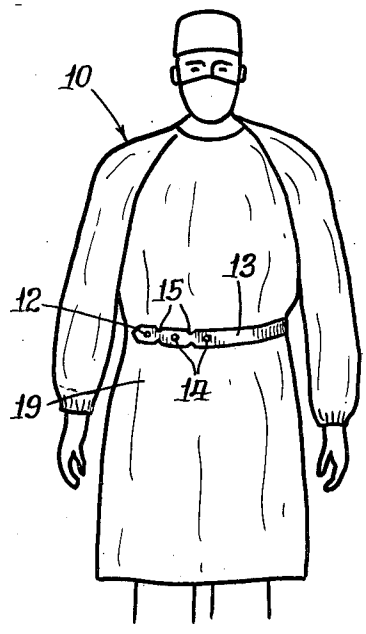


Fig. 1.

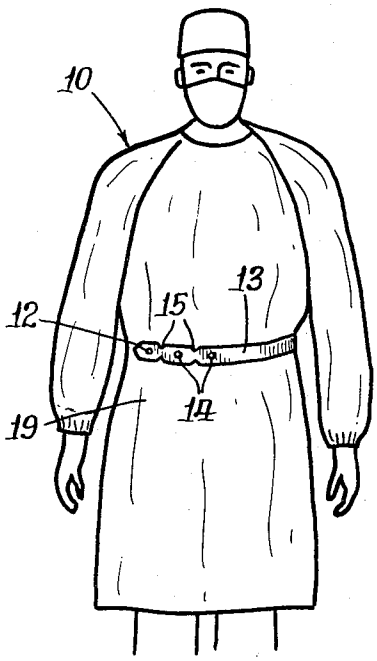


Fig. 2.

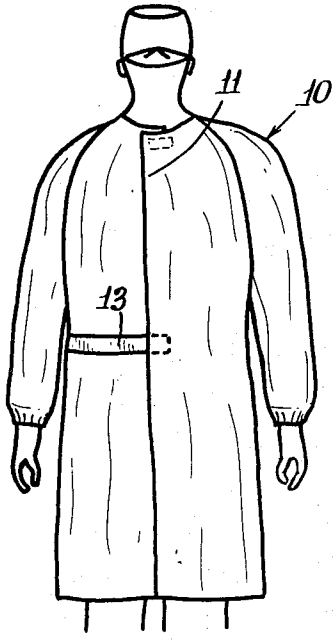


Fig. 5.

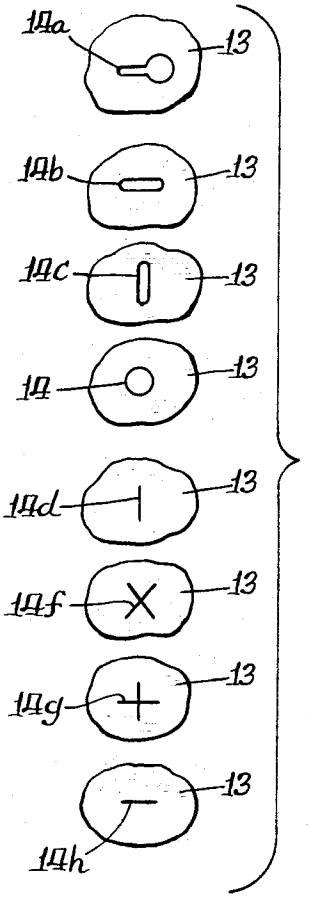


Fig. 3.

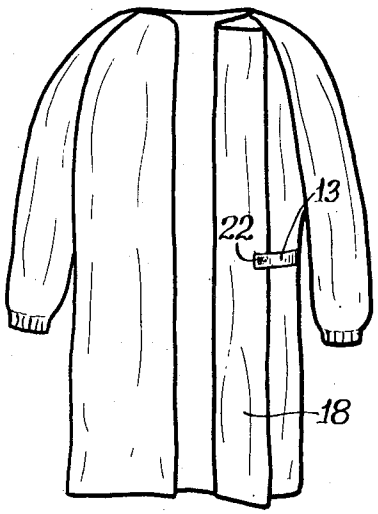
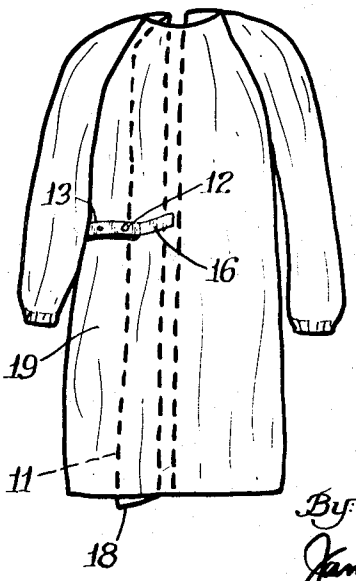


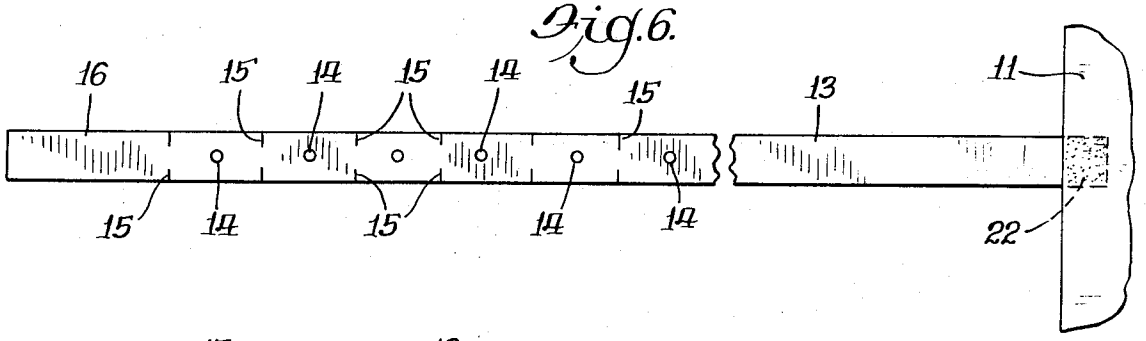
Fig. 4.



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Fig. 6.



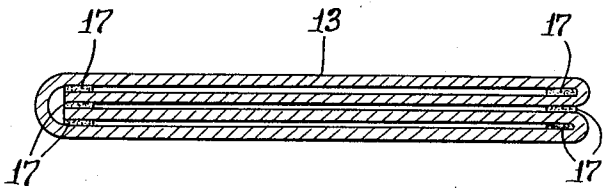


Fig. 7.

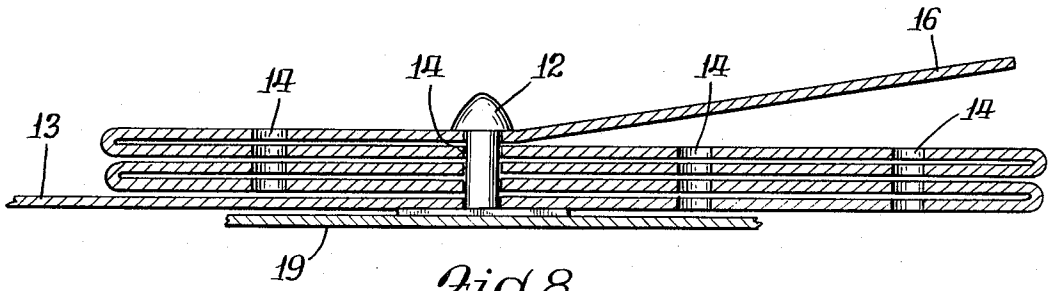


Fig. 8.

Fig. 9.

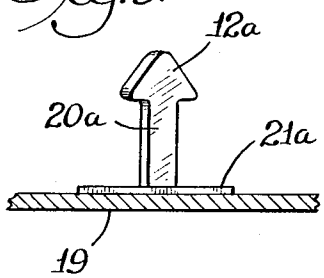


Fig. 10.

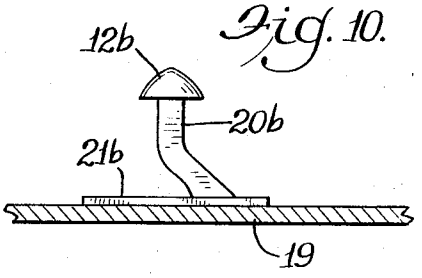
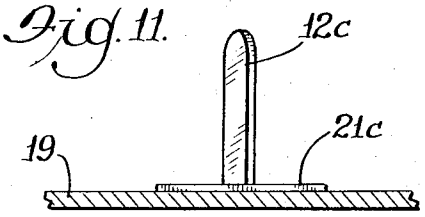


Fig. 11.



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SMOCK OR GOWN WITH ADJUSTABLE BELT

BACKGROUND OF THE INVENTION

Gowns or smocks with full length openings, the marginal portions of which are overlapped and fastened by a closure at the waist, are well known. Frequently, the waist closure on such garments consists of two segments of belting, one of which contains a buckle and the other of which frictionally engages the buckle or has a series of holes one of which engages a tongue of the buckle. Frequently, the belting segments are tied. At times a single segment of belting is threaded through an attached ring or two slits in the garment and tied back upon itself. Surgical gowns, which generally are back opening, present a special problem because of the fact that the gown is sterile whereas the surgeon's scrub clothing and ungloved hands are not. The problem is to get the surgeon into the gown and close it at the neck and waist without contaminating the outside of the gown, particularly in the front and below the neck in the rear. Surgical gowns in some instances have been packed in sterile packages with the opening edge portions folded back to facilitate donning without touching the gown's exterior. Care obviously must be taken in removing such gowns form their packaging. Most surgical gowns provide a belt to aid in the closure of the gown opening. Generally, such belts are fastened intermediate their ends to the back of the gown and the ends are wound around the surgeon's body in opposite directions and tied in a bow in front. One reason for front tying is that the surgeon must generally secure the belt himself and he avoids touching the back of his gown with sterile gloves. The belt ends are generally individually grasped by a sterile instrument and brought around to the front where the surgeon can secure them at the front by typing a non-slip bow knot. Obviously, other means of maintaining the belt sterile may be utilized.

SUMMARY OF THE INVENTION

The primary object of this invention is the provision of a garment such as a smock or gown with an opening extending the length thereof which is normally restricted to closed condition in overlapping relationship at the waist by projection of a rigid male element attached to the gown partially through one or more of a series of female elements in a belt also attached to the gown.

A further object of the invention is the provision of a garment satisfying the primary objective but further characterized by having a belt which readily may be separated into segments and thereby shortened.

A still further object of the invention is the provision of a gown satisfying the primary objective of which the male element may be used to store the free end of the belt.

Another object of the invention is the provision of a surgical gown with a back opening satisfying the primary objective which when the gown is in sterile condition has the belt retained by the male element so as to hold the gown open, facilitating donning without contamination.

The primary object of the invention may be achieved in a garment having an opening extending the length thereof by attaching to one opening marginal edge of the garment at the waist a belt including a simple

female fastening elements, which latter engage individually or severally an outwardly projecting male element attached to the gown when the belt is pulled in a direction to close the gown opening, the male element being beyond the closure overlap in the path of the female elements. The female elements in the belt are preferably aligned longitudinally of the latter and may include respectively one or more score lines, perforated lines, slits or preferably open holes of various shapes.

The further object of providing a belt which may be broken into segments may be accomplished by cutting weakening transverse slits, notches and the like in the belt edges or by providing transverse slits across the belt where separation may be desired. Belts of disposable fabrics and film belts are readily treated in this way, but even woven cloth belts may be similarly treated. Such a belt may accommodate a wide variety of waist sizes, the unwanted end portion being separated to provide the desired length.

Another object of the invention is simply realized by making the male fastening element shaft long enough to accommodate engagement with a plurality of female elements simultaneously. Thus where the belt is a woven cloth material, it may be desirable to store the unused end of the belt without making transverse separation cuts.

The final object of the invention may be achieved by providing a surgeon's back-opening gown with a male fastening element on the gown front preferably on the same side of the garment to which the belt is attached. The gown may be packed and thereafter sterilized with the belt reversed in direction and stored on the male element. In that position the belt, if fastened properly, will hold positively open the side of the gown opening to which it is attached so that the problem of entering the non-sterile surgeon's hand and arm into the sleeve without contaminating the gown's outer surface is facilitated.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** illustrates a front view of a typical gown or smock worn by a surgeon and showing the belt as worn.

FIG. **2** illustrates a rear view of the gown of FIG. **1**.

FIGS. **3** and **4** illustrate respectively the opened rear and the front of the gown of FIGS. **1** and **2**, showing the storage disposition of the belt when removed from the sterile package.

FIG. **5** illustrates schematically a variety of female fastening elements suitable for the belts of the gowns of the invention.

FIG. **6** illustrates a plan view of a typical belt fastened to a gown of the invention showing the location of weakened points and female fastening elements.

FIG. **7** shows the cross section of a typical belt of a gown of the invention before the female elements are made therein.

FIG. **8** illustrates how the male fastening element, for fastening the belt in place when a gown of the invention is worn, also may act as a storage device.

FIGS. **9**, **10** and **11** show typical suitable forms of male belt fastening elements which are attached to the waist of the gown of the invention.

Referring more particularly to the drawings:

FIG. 1 illustrates a front view of a garment **10** of the invention as it is worn by a surgeon. The waist portion of the garment is partially encircled by a belt **13** which contains a plurality of female elements **14**, one or more of which engage a male element **12**. The latter is fastened preferably by a hot melt adhesive to the fabric **19** of the garment in the front. The male element **12** projects partially through the female element **14** of the belt when the latter is properly in place.

FIG. 2 illustrates the back view of the garment of FIG. 1. In this view the belt **13** is shown fastened, again preferably by hot melt adhesive, to the edge portion **11** of the overlying garment closure. A fastening at the neck helps to prevent opening of the closure but the belt **13** provides a secondary retention means when a female element properly engages the male element on the front of the garment.

FIGS. 3 and 4 illustrate the rear and front respectively of the garment of FIGS. 1 and 2, showing the flap **18** folded back and retained there by the belt **13** whose direction is reversed from that it has when the garment is worn. When in the sterile package the belt is folded in zigzag fashion (more clearly shown in FIG. 8) with a number of female elements **14** engaging the male element **12** on the garment front **19**. It is important that the surgeon be able to get into the sterile garment without contaminating the outer garment surfaces with his non-sterile ungloved hands and scrub clothing. The folded back flap **18** is helpful in this respect.

FIG. 5 shows schematically a variety of female elements suitable for the belts **13** of this invention. In FIGS. 1, 4, 6 and 8, circular holes **14** are illustrated but for some purposes other female elements may be preferred. Those female elements **14***d*, **14***f*, **14***g* and **14***h* are preferably cut slits but they may be weakened perforated lines or scores. Female elements **14***a*, which is keyhole shape, **14***b*, which is a horizontal oval, and **14***c*, which is a vertical oval, together with **14** represent holes through the belt material.

FIG. 6 illustrates a typical belt **13** of the invention fastened by hot melt adhesive **22** to the overlying closure edge **11**. Optional features include a series of slits **15**, notches or other weakening elements which permit the belt to be torn off when it is a disposable sterile surgical gown belt. The end portion **16**, which is grasped by the non-sterile circulating nurse, should be removable at least, unless that portion which the non-sterile nurse would touch is provided with a removable non-contaminating cover or a sterile instrument is used.

FIG. 7 shows the cross section of a preferred construction of the belt **13** which is folded to provide four plies of disposable fabric secured to form a belt by hot melt adhesive **17**.

FIG. 8 illustrates how the male element **12** may serve to store the belt **13** in the sterile package at the front of the gown. The relationship of the belt and gown are shown in FIGS. 3 and 4. When stored in this position, the overlapping edge **11** is drawn back, opening the back of the garment so that it may be put on without being contaminated. In this Figure the portion **16** is shown (after the gown is fastened at the neck) ready to be grasped by the non-sterile nurse who pulls gently to disengage the male element **12** from the female elements in succession. The non-sterile nurse then reverses the direction of the belt **13** so that the panel **18** is unfolded and the edge **11** overlaps and closes the back opening. The nurse continues around the surgeon to his left front touching only portion **16** of the belt. The surgeon grasps the belt at the nearest segment adjacent portion **16**, and segment **16** is broken off. The surgeon then fastens the belt by engaging a female element with the male element **12** on the gown front at the waist. He may tear off the excess belt material or store it on the male element.

FIG. 9 illustrates a suitable flat arrowhead shaped male element head **12***a* with a shank **20***a* and a base **21***a*. The base is cemented to the gown front **19** preferably with a hot melt adhesive.

FIG. 10 illustrates another suitable male element mushroom type head **12***b* with a shaft **20***b* which is vertical adjacent the head but inclined near the base **21***b*. The inclination should be towards the approach direction of the belt as worn.

FIG. 11 illustrates still another variation of the male element with a vertical flat shaft **12***c*, preferably malleable metallic, which when bent from the base **21***c* or at any point along the shaft will retain the bend against the relatively light forces exerted by the pull of the belt. This element may have a construction as shown or may be stamped from a flat sheet and bent to the upright position.

DESCRIPTION OF THE PREFERRED EMBODIMENT

A preferred embodiment of the invention is a disposable surgeon's gown made of a laminate of scrim sandwiched between two layers of non-woven fabric. The form of the gown with the belt in place as the garment is worn is shown in FIGS. **1** and **2**. These Figures display a technical inaccuracy, however, in that the sterile gloves actually should cover the sleeve ends. The preferred garment with the belt stored and holding open the back opening of the gown is shown in FIGS. **3** and **4**.

I claim:

1. A garment such as a gown or smock having an opening therein extending the length thereof, said opening being closable by overlapping marginal portions of said garment adjacent said opening, a belt attached to the waist portion of said garment, a series of female fastening elements in said belt extending lengthwise thereof, a substantially rigid male element attached to said gown on the side of the gown opposite the opening after placement of the gown on a wearer and in the path of said series of female elements, said belt extending at least from said overlapping marginal portions and engaging said male element whereby the latter projects partially through a female element on said belt thereby restricting relative movement of said marginal portions at the waist of said garment.

2. The garment of claim **1** wherein the belt is attached adjacent the edge of said overlapping marginal portions.

3. The garment of claim **1** wherein the belt has weakened points at which portions thereof may be readily separated.

4. The garment of claim **2** further characterized as a surgical gown wherein the opening is a rear opening and the male element is attached to the front of the garment.

5. The garment of claim 1 wherein the belt is folded upon itself and the male element projects through at least two female elements of said belt.

6. The surgical gown of claim 4, as taken from its sterile packaging wherein the belt winds partially around the gown in a direction opposite the direction it winds when the gown is worn, said male fastening element engaging a female element in said belt so near the opening edge to which the belt is fastened that the edge portion is retained in a folded back relationship maintaining the gown in open conditions.

7. The garment of claim 1 wherein the portion of the fastening male element which first projects through the female fastening element is greater in cross-sectional area than a male element portion which subsequently partially projects through a female element.

8. The garment of claim 1 wherein the male fastening element has a shank, a head larger than the shank, and a base, all being unitary and substantially relatively immobile.

9. The garment of claim 1 wherein the male fastening element includes a malleable bendable shaft.

10. The garment of claim 1 wherein the male fastening element has a portion immediately adjacent its base which forms an inclined angle with said base.

11. The garment of claim 1 wherein female fastening elements are at least partially opened by projection therethrough of portions of the male element.

12. The garment of claim 1 wherein female fastening elements in said belt include a slit portion.

* * * * *