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Surgical gown and tie assembly.

Disclosed herein is a surgical gown (10) and tie assembly (30) which, due to the nature of its construction, has high resistance to tearing. Conventional surgical and hospital gowns often use one or more pairs of ties to close and/or secure the garment about the body of the wearer. Generally, these ties are each attached to the gown at one end so that when the ties are extended away from the surgical gown, the tie forms a "L" configuration with the short length of the "L" being the portion of the tie attached to the surgical gown and the longer length of the "L" being the portion used to tie or secure the gown about the wearer. Such "L"-shaped configurations of ties tend to tear at the juncture of the long and short lengths of the "L" thereby creating a hole in the surgical gown which shortens its useful life and compromises the sometimes sterile nature of the gown. The gown and tie assembly of the present invention employs a generally "T"-shaped tie that distributes the pulling forces more

uniformly across the short section of the "T" when forces are applied to the longer portion of the tie.

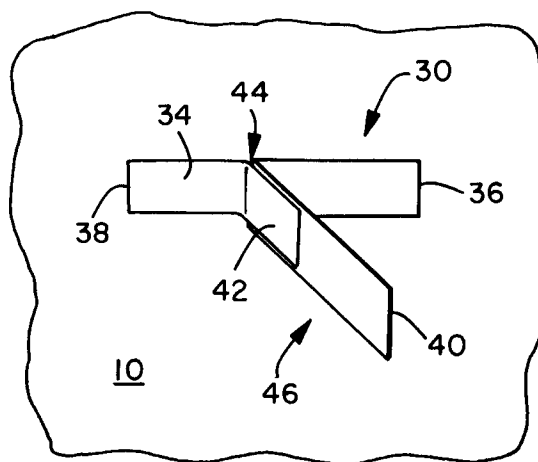


FIG. 2

The present invention is directed to a surgical gown and tie assembly.

Surgical and other related covergowns are rapidly being used in greater numbers of areas and for longer durations in the health care field. One reason for these increases in types of use and duration of use is the risk and related fear of contamination of either the patient or hospital employees/staff member due to contact with certain bacteria and viruses commonly transmitted through liquid media. At one time surgical gowns and covers were primarily only worn in the operating room during a surgical procedure. Now, it is not uncommon for virtually all hospital staff to wear such gowns at least during some part of their workday. With this increased usage, the surgical gowns are being used in different ways as compared to the past. As an example, in intensive care units it is often the practice that a surgical gown must be worn during the insertion and removal of certain types of equipment into the patient. Given the hectic pace in such a unit, the nurse will often quickly don the gown for the procedure and once the procedure has been completed, the gown will be quickly removed and discarded. As a result, the degree of care in donning and removing such a garment is not the same as with procedures customarily used for surgical room applications. One problem that has arisen is with the tie assemblies on such gowns which, heretofore, have been typically attached simply by securing one end of the gown tie to the surgical gown such that when the tie is held perpendicularly from the face of the covergown the tie forms a "L"-shaped with the shorter length of the "L" being the point of attachment to the gown. It has been found that if care is not taken, this "L"-shaped configuration will often tear at the juncture between the short and long lengths of the "L". Once a tear has begun, it is not uncommon for that tear to quickly propagate resulting in the possible detachment of the tie from the surgical gown and the compromising the sterile nature and barrier properties of the gown itself.

While quick and often rough procedures in donning and removing surgical gowns is one example of a situation in which increased tie separation is possible, tie separation also becomes a problem due to the time that a gown is worn. Here again the length of time that a gown is worn is rapidly increasing due to the constant need for protection while performing functions within the hospital. As a result, the tie assemblies are placed under stress or experience stress cycles which are much greater in frequency than in the past. As a result, a new opportunity arises for tearing and possible detachment of the tie from the surgical gown.

It is therefore an object of the present invention to provide a tie assembly which is more perma-

nently affixed to the surface of a surgical or covergown for hospital room use.

It is a further object of the present invention to provide stronger securement of such a tie assembly to a gown through the combination of the design of the tie assembly itself and the means by which it is attached to the gown material.

These objects are solved by the surgical gown and tie assembly of any one of independent claims 1, 3, 5, 7 or 9. Further advantageous features, aspects and details of the gown and tie assembly are evident from the dependent claims, the description and the drawings. The claims are intended to be understood as a first non-limiting approach of defining the invention in general terms.

The invention according to a specific aspect provides a surgical gown and tie assembly with ultrasonically bonded T-bar ties.

According to a further aspect, the invention provides a surgical gown with a tie assembly which has a reduced propensity for tearing away from the main body of the surgical gown when placed under stress.

These and other aspects of the present invention will become more apparent upon a further review of the following specification, claims and drawings.

According to one aspect of the invention there is provided a surgical gown and tie assembly which has improved strength over conventional surgical gown tie assemblies due to the nature of the attachment of the tie assembly to the gown. Conventional surgical gowns have ties with one end which is affixed to the gown in some form or fashion as by sewing, stitching, gluing or bonding. When the unattached portion of the tie is extended away from the gown, the tie has a general "L" shape with the short end of the "L" being the portion of the tie which is attached to the gown. With sufficient force or prolonged use, such ties will tend to fail at the juncture between the short and long lengths of the "L" and the area of the gown to which this juncture is attached. The present invention overcomes this problem through the use of a generally "T"-shaped tie assembly in which the top or short portion of the "T" is attached across its entire width to the surgical gown so as to more evenly distribute the pulling forces from the longer portion of the "T" design.

The surgical gown and tie assembly of the present invention is achieved via at least five embodiments. In the first embodiment the tie assembly has a first tie member and a second tie member with the first tie member having a first length and the second tie member having a second length with the first length being greater than the second length. Each of the tie members also has a first end and a second end. The second end of the

second member is joined to the first member intermediate the first and second ends of the first member to form a generally "T"-shaped tie assembly with the first ends of the first and second members forming the shorter portion of the T-shaped design and at least the second end of the first tie member and a portion of the first tie member adjacent the second end of the first tie member forming the longer portion of the "T"-shaped tie. The shorter portion including the first ends of the first and second members are attached to the gown such that the longer portion of the "T"-shaped tie can be extended away from the gown from a point intermediate the first ends of the first and second members thereby enabling the user to grasp and tie the longer portion to another tie with reduced risk of separation of the tie from the surgical gown.

A second embodiment of the invention also employs a first tie member and a second tie member with the first tie member again having a length which is greater than the length of the second tie member and with both the first and second tie members each having respective first ends and second ends. In this configuration the first ends of the first and second tie members are joined to one another to form a generally "T"-shaped tie with at least the second tie member forming a shorter portion of the "T"-shaped tie and at least the second end of the first tie member along with the portion of the first tie member adjacent the second end of the first tie member forming a longer portion of the "T"-shaped tie. The shorter portion including the second tie member is bonded to the gown such that the longer portion of the "T"-shaped tie can be extended away from the gown at a point intermediate the first and second ends of the second tie member to permit tying of the tie and securement of the gown.

A third embodiment of a surgical gown and tie assembly according to the present invention uses not two but three separate tie members all of which have a first end and a second end with the first tie member having a length greater than either of the second and third tie members. In this configuration the first end of the first tie member is joined to the second ends of the second and third tie members to form a generally "T"-shaped tie with at least the first ends of the second and third tie members forming a shorter portion of the "T"-shaped tie and at least the second end of the first tie member and a portion of the first tie member adjacent the second end of the first tie member forming a longer portion of the T-shaped tie. The shorter portion of the tie including the first ends of the second and third tie members are bonded to the gown such that the longer portion of the T-shaped tie can be extended away from the gown from a point inter-

mediate the first ends of the second and third tie members for subsequent use in tying the gown.

The fourth embodiment of the surgical gown and tie assembly according to the present invention employs just one tie member to form the generally "T"-shaped tie assembly. In this configuration, the first tie member has a first end and a second end with a first fold and a second fold between the first and second ends with the first fold and second fold defining a first portion therebetween and a second portion being defined between the second fold and the first end of the first tie member. The first and second folds are made much closer to the first end than the second end of the first tie member and the second portion overlaps the first portion with the second portion having a greater length than the first portion, generally about twice the length of the first portion. The first portion is joined to the second portion at least at the point of contact of the first and second portions adjacent the first fold. A stronger tie can be made by completing joining the first and second portions to one another along the entire length of the first portion from the first fold to the second fold. The second portion along with the overlapping first portion form the shorter portion of a generally "T"-shaped tie while the second end of the first tie member along with a portion of the first tie member adjacent the second end of the first tie member form the longer portion of the "T"-shaped tie. To attach this tie to the gown, the shorter portion of the tie is attached to the gown such that the longer portion of the "T"-shaped tie can be extended away from the gown from a point intermediate the first end and the second fold of the first tie member thereby permitting tying of the gown.

The fifth embodiment of the surgical gown and tie assembly according to the present invention again employs just one tie member to form the generally "T"-shaped tie assembly. In this configuration, the first tie member has a first end and a second end and a total of four folds inbetween the first and second ends including a first, second, third and fourth fold. The portion of the first tie member between the first and second folds defines the first portion, the portion of the first tie member between the second and third folds defines the second portion, the portion of the first tie member between the third and fourth folds defines the third portion and the portion of the first tie member between the fourth fold and the first end defines the fourth portion. The second portion of the first tie member is longer than either of the first or third portions with the second portion overlapping the first and third portions. The first portion is joined to the second portion at least adjacent the first fold and third portion is joined to the second portion at least adjacent the fourth fold to form a generally

"T"-shaped tie. The shorter portion of the "T"-shaped tie is formed by the second portion of the first tie member and at least the second end of the first tie member and a portion of the first tie member adjacent the second end of the first tie member forms the longer portion of the "T"-shaped tie. The shorter portion including the second portion of the first tie member is attached to the gown such that the longer portion of the "T"-shaped tie can be extended away from the gown from a point intermediate the second and third folds so as to permit tying of the gown, generally in conjunction with another tie assembly.

The object of each of the five embodiments is to form a tie which has two tabs joined to the gown and extending in opposite directions from the longer portion of the "T"-shaped design such that the pulling forces are distributed over a wider area of the gown and in opposite directions when the pulling force is generally perpendicular to the plane of the gown at the point of attachment.

Figure 1 is a perspective view of a surgical gown and several tie assemblies according to the present invention.

Figure 2 is a partial perspective view of a surgical gown and tie assembly according to the present invention.

Figure 3 is a partial side view of the surgical gown and tie assembly shown in Figure 2 of the drawings.

Figure 4 is a partial side view of a second embodiment of a surgical gown and tie assembly according to the present invention.

Figure 5 is a partial side view of a third embodiment of a surgical gown and tie assembly according to the present invention.

Figure 6 is a partial side view of a fourth embodiment of a surgical gown and tie assembly according to the present invention.

Figure 7 is a partial side view of a fifth embodiment of a surgical gown and tie assembly according to the present invention.

Disclosed herein is a surgical gown and tie assembly wherein each of the ties has a general "T"-shape with the shorter portion of the "T" secured to a surface of the gown and the longer portion of the "T" used to engage the longer portion of a second tie so as to secure the gown about the wearer. Due to the general "T"-shape of the tie assembly, the ties do not tear away from the gown as readily as conventional "L"-shaped ties.

Referring to Figure 1, there is shown a perspective view of a surgical gown and tie assembly according to the present invention. The gown 10 is a normal surgical gown which typically includes a front portion 12, a pair of side portions 14 and 16, a neck opening 18 and a pair of sleeves 20 and 22. It should be noted that this is just one typical con-

figuration of a surgical gown and it is, therefore, not meant to limit the scope of gown configurations which can be used in conjunction with the present invention. As can be seen from Figure 1, tie assemblies 30 can be used at a number of locations on the surgical gown for securement purposes. For example, the tie assemblies 30 can be used on the side portions 14 and 16 to close the back of the gown or such tie assemblies 30 can be used on the front of the gown where they can wrap around and behind the wearer to secure the gown 10 in a closed position. Here again, the location of the tie assemblies 30 is illustrative only and is not meant to limit the scope of the present invention.

Referring to Figures 2 through 7, there are shown at least five embodiments of the gown and tie assembly according to the present invention. In Figures 2 and 3 there is shown in partial perspective and side views respectively one embodiment of a surgical gown and tie assembly according to the present invention. In Figures 4 through 7 there are shown four other embodiments of a gown and tie assembly according to the present invention once again in partial side view.

Turning to Figure 2, which shows a portion of a gown 10 with a tie assembly 30 attached thereto. In this embodiment the tie assembly 30 includes a first tie member 32 and a second tie member 34. As can be seen from Figures 2 and 3, the first tie member 32 has a first length and the second tie member has a second length with the first length being greater than second length. Each of the first and second tie members 32 and 34 has a first end 36 and 38 respectively and a second end 40 and 42 respectively. The second end 42 of the second member 34 is joined to the first member 32 intermediate the first and second ends 36 and 40 of first tie member 32 to form a generally "T"-shaped tie 30 with the first ends 36 and 38 respectively of the first and second members 32 and 34 forming a shorter portion 44 of the "T"-shape tie 30 and at least the second end 40 of first member 32 and the portion of the first tie member 32 adjacent its second end 40 forming a longer portion 46 of the "T"-shaped tie 30.

The shorter portion 44 including the first ends 36 and 38 of the first and second members 32 and 34 are attached to the gown 10 such that the longer portion 46 of the "T"-shape tie 30 can be extended away from the gown 10 from a point intermediate the first ends 36 and 38 of the first and second members 32 and 34. As a result, when pulling forces are exerted on the longer portion 46 of the tie assembly 30, the force is distributed in two directions due to the attachment of the tie by the shorter portion 44 of the tie 30. This in turn reduces the tendency of the tie to tear when pulled upon.

Surgical gowns and their ties can be made from any number of materials including woven fabrics, fibrous nonwoven webs and films as well as combinations of the foregoing. Reusable surgical gowns tend to be made from cotton cloth so that they are durable enough to withstand multiple washings. When attaching the shorter portion of a cloth tie to a cloth gown, generally the most advantageous means of attaching the tie 30 to the gown 10 will be by stitching though it is also possible to use adhesives. With disposable garments, such as those made from nonwoven materials and films, attachment of the ties 30 to the gown 10 can be by stitching, adhesives, thermal bonding, and ultrasonic bonding. Most of the disposable surgical gowns made by the assignee of record, Kimberly-Clark Corporation of Neenah, Wisconsin, employ polyolefin-based materials and, in particular, polypropylene-based nonwoven materials for both the gown and the ties. When such materials are being used, it has been found most advantageous to use ultrasonic bonding equipment to bond the tie assemblies 30 to the surgical gown 10. Such ultrasonic bonding equipment is well known and readily available for use.

Turning to Figure 4, there is shown a second embodiment of a surgical gown and tie assembly according to the present invention in partial side view. In this embodiment there is again a first tie member 432 and a second tie member 434 with the first tie member 432 having a first length and the second tie member 434 having a second length with the first length being greater than the second length. The first tie member 432 and the second tie member 434 each have respective first ends 436 and 438 and second end 440 and 442. As can be seen from the cross-sectional view in Figure 4, the first ends 436 and 438 of first tie member 432 and second tie member 434 respectively are overlapped with one another and joined together to form a generally "T"-shaped tie assembly 430 with at least the second tie member 434 forming a shorter portion 444 of the "T"-shaped tie 30 and at least the second end 440 of the first tie member 432 and a portion of the first tie member 432 adjacent the second end 440 of the first tie member 432 forming a longer portion 446 of the "T"-shaped tie 30.

The shorter portion 444 including the second tie member 434 is bonded to the gown 410 such that the longer portion 446 of the tie 30 can be extended away from the gown 410 from a point which is intermediate the first end 438 and the second end 442 of the second tie member 434.

A third embodiment of a surgical gown and tie assembly according to the present invention is shown in partial side view in Figure 5. In this configuration, three separate members are used to

create a "T"-shaped tie 530. Referring to Figure 5, there is shown a portion of a gown 510, a first tie member 532, a second tie member 534 and a third tie member 535. As with the other embodiments, the first tie member 532 has a first length, the second tie member 534 has a second length and the third tie member 535 has a third length with the first length being greater than either of the second and third lengths. The first tie member 532, second tie member 534 and third tie member 535 each have respectively a first ends 536, 538 and 539 and respective second ends 540, 542 and 543.

The first end 536 of the first tie member 532 is joined to the second end 542 of the second tie member 534 and the second end 543 of the third tie member 535 to form a generally "T"-shaped tie 530 with at least the first end 538 of the second tie member 534 and the first end 539 of the third tie member 535 forming a shorter portion 544 of the "T"-shaped tie 530. As shown in Figure 5, the first end 536 of first tie member 532 is positioned between the respective second ends 542 and 543 of the second and third tie members 534 and 535 respectively. It is also possible, however, to place the first end 536 of first tie member 532 outside of and adjacent to either the second end 538 of the second tie member 534 or the second end 543 of the third tie member 535.

At least the second end 540 of the first tie member 532 and a portion of the first tie member 532 adjacent the second end 540 of the first tie member 532 form the larger portion of 546 of the "T"-shaped tie 530. The shorter portion 544 including the first ends 538 and 539 of the second and third tie members 534 and 535 are attached to the gown 510 such that the longer portion 546 of the "T"-shaped tie 530 can be extended away from the gown 510 from a point intermediate the first ends 538 and 539 of the second and third tie members 534 and 535.

The fourth embodiment of a surgical gown and tie assembly according to the present invention is shown in partial side view in Figure 6 of the drawings. Attached to the gown 610 is a tie assembly 630 including a first member 632 folded so as to achieve a "T"-shape. The first tie member 632 has a first end 636 and a second end 640. The first tie member 632 has a first fold 660 and a second fold 662 which define a first portion 664 therebetween and a second portion 666 between said second fold 662 and said first end 636. As can be seen in Figure 6, the second portion 666 is longer than the first portion 664 with the second portion 666 overlapping the juxtaposed first portion 664. The first portion 664 is joined to the second portion 666 at least adjacent to the first fold 660 and, for a more secure configuration, the entire first portion 664 can be joined to the second portion 666 so as to form a

shorter portion 644 of the generally "T"-shaped tie 630. At least the second end 640 of the first tie member 632 and a portion of first tie member 632 adjacent the second end 640 of the first tie member 632 form a longer portion 646 of the generally "T"-shaped tie. The shorter portion 644 including the second portion 666 is bonded or attached to the gown 610 such that the longer portion 646 of the "T"-shaped tie 630 can be extended away from the gown 610 from a point intermediate the first end 636 and the second fold 662 of the first tie member 632. This embodiment of the surgical gown and tie assembly of the present invention has the added advantage that the tie 630 can be formed from a single strip of tie material as opposed to two or three pieces of material as shown in Figures 4 and 5.

The fifth embodiment of a surgical gown and tie assembly according to the present invention is shown in partial side view Figure 7 of the drawings. Attached to the gown 710 is a tie assembly 730 including a first tie member 732 folded so as to achieve a "T"-shape. The first tie member 732 has a first end 736 and a second end 740. The first tie member 732 has a first fold 760, a second fold 762, a third fold 763, and a forth fold 765. The first fold 760 is basically at right angles to the gown 710 as shown in Figure 7, however, due to the flexible nature of the material used for the tie assembly 730, this fold can pivot through 180 degrees. The portion of the first tie member 732 between the first fold and the second fold defines a first portion 764 and the portion of the first tie member 732 between the second fold 762 and the third fold 763 defines a second portion 766. The second fold 762, between the first 764 and second 762 portions, folds the tie material completely back on itself in an overlapping fashion such that the first and second portions 764 and 766 are in overlapping juxtaposition with respect to one another. A third portion 767 is defined between the third fold 763 and the forth fold 765. Here again, the nature of the third fold 763 causes the second portion 766 and the third portion 767 to be in overlapping juxtaposition with one another. The portion of the first tie member 732 between the forth fold and the first end 736 of the first tie member 732 defines a forth portion 768. Here again, the angle of the forth fold 765 is basically at right angles to the second portion 766 when the tie is extended away from the gown 710, however, the tie may be pivoted through an angle of 180 degrees.

The first portion 764 is joined to the second portion 766 at least adjacent to the first fold 760 and preferably along the entire interface of the first and second portions 764 and 766 between the first fold 760 and the second fold 762. In like fashion, the third portion 767 is joined to the second portion

766 at least adjacent to the forth fold 765 and more desirably, along the entire interface between the second portion 766 and the third portion 767 between the third fold 763 and the forth 765. Once the above-described portions of the tie member 732 have been joined to one another, there is formed a generally "T"-shaped tie 730 with at least the second portion 766 forming a shorter portion 744 of the "T"-shaped tie 730 and at least the second end 740 of the first tie member 732 and a portion of the first tie member 732 adjacent to the second end 740 of the first tie member forming a longer portion 746 of the "T"-shaped tie. As with the embodiment in Figure 6, the second portion 766 is longer than either of the first or third portions 764 and 767 respectively.

Attachment of the tie assembly 732 to the gown 710 is via the shorter portion 744, which includes the second portion 766. This shorter portion 744 can be joined to the surface of the surgical gown 710 in any number of ways including stitching, bonding and gluing, with ultrasonic bonding being a more desirable method of attachment when polyolefin-based materials are being used. Once the tie assembly 730 has been joined to the gown 710, the longer portion 746 can be extended away from the gown 710 from a point intermediate the second fold 762 and the third fold 763 to provide a means for securing the gown 710 about the wearer.

Claims

1. A surgical gown (10) and tie assembly (30) comprising:
 - a gown (10),
 - a first tie member (32) and a second tie member (34), said first tie member (32) having a first length and said second tie member (34) having a second length, said first length being greater than said second length, each of said tie members having a first end (36,38) and a second end (40,42),
 - said second end (42) of said second member (34) being joined to said first member (32) at a location intermediate said first (36) and second (40) ends of said first member (32) to form a generally "T"-shaped tie with said first ends (36,38) of said first (32) and second (34) members forming a shorter portion (44) of said "T"-shaped tie and at least said second end (40) of said first member (32) and a portion of said first member (32) adjacent said second end (40) of said first members (32) forming a longer portion (46) of said "T"-shaped tie,
 - said shorter portion (44) including said first ends (36,38) of said first (32) and second (34) members being attached to said gown (10) such that said longer portion (46) of said "T"-

shaped tie can be extended away from said gown (10) from a point intermediate said first ends (36,38) of said first (32) and second (34) members.

2. The surgical gown and tie assembly of claim 1 wherein said shorter portion (44) of said "T"-shaped tie is ultrasonically attached to said gown (10).
3. A surgical gown (410) and tie assembly (430) comprising:
 - a gown (410),
 - a first tie member (432) and a second tie member (434), said first tie member (432) having a first length and said second tie member (434) having a second length, said first length being greater than said second length, each of said tie members (432,434) having a first end (436,438) and a second end (440,442), said first ends (436,438) of said first (432) and second (434) tie members being joined to one another to form a generally "T"-shaped tie with at least said second tie member (434) forming a shorter portion (444) of said "T"-shaped tie and at least said second end (440) of said first tie member (432) and a portion of said first tie member (432) adjacent said second end (440) of said first tie member (432) forming a longer portion (446) of said "T"-shaped tie, said shorter portion (444) including said second tie member (434) being attached to said gown (410) such that said longer portion (446) of said "T"-shaped tie can be extended away from said gown (410) from a point intermediate said first (438) and second (440) ends of said second tie member (434).
4. The surgical gown and tie assembly of claim 3 wherein said shorter portion (444) of said "T"-shaped tie is ultrasonically attached to said gown.
5. A surgical gown (510) and tie assembly (530) comprising:
 - a gown (510),
 - a first tie member (532), a second tie member (534) and a third tie member (535), said first tie member (532) having a first length, said second tie member (534) having a second length and said third tie member (535) having a third length, said first length being greater than either of said second and third lengths, each of said tie members (532,534,535) having a first end (536,538,539) and a second end (540,542,543), said first end (536) of said first tie member (532) being joined to said second ends

(542,543) of said second (534) and third (535) tie members to form a generally "T"-shaped tie with at least said first ends (538,539) of said second (534) and third (535) tie members forming a shorter portion (544) of said "T"-shaped tie and at least said second end (540) of said first tie member (532) and a portion of said first tie member adjacent said second end (540) of said first tie member (532) forming a longer portion (546) of said "T"-shaped tie, said shorter portion (544) including said first ends (538,539) of said second (534) and third (535) tie members being attached to said gown (510) such that said longer portion (546) of said "T"-shaped tie can be extended away from said gown (510) from a point intermediate said first ends (538,539) of said second (534) and third (535) tie members.

6. The surgical gown and tie assembly of claim 5 wherein said shorter portion (544) of said "T"-shaped tie is ultrasonically attached to said gown (510).
7. A surgical gown (610) and tie assembly (630) comprising:
 - a gown (610) and a first tie member (632), said first tie member having a first end (636) and a second end (640),
 - said first tie member (632) having a first fold (660) and a second fold (662) with the portion of said first tie member (632) between said first and second folds (660,662) defining a first portion (664) and the portion of said first tie member (632) between said second fold (662) and said first end (636) defining a second portion (666), said second portion (666) being longer than said first portion (664) and said second portion (666) overlapping said first portion (664) with said first portion being joined to said second portion at least adjacent to said first fold (660) to form a generally "T"-shaped tie with said second portion (666) forming a shorter portion (644) of said "T"-shaped tie and at least said second end (640) of said first tie member (632) and a portion of said first tie member adjacent said second end (640) of said first tie member (632) forming a longer portion (646) of said "T"-shaped tie, said shorter portion (644) including said second portion (666) being attached to said gown (610) such that said longer portion (646) of said "T"-shaped tie can be extended away from said gown (610) from a point intermediate said first end (636) and said second fold (662).
8. The surgical gown and tie assembly of claim 7 wherein said shorter portion (644) of said "T"-

shaped tie is ultrasonically attached to said gown (610).

9. A surgical gown (710) and tie assembly (730) comprising a gown (710) and a first tie member (732), said first tie member (732) having a first end (736) and a second end (740), said first tie member (732) having a first fold (760), a second fold (762), a third fold (763) and a fourth fold (765) with the portion of said first tie member between said first (760) and second (768) folds defining a first portion (764), the portion of said first tie member between said second (762) and third (763) folds defining a second portion (766), the portion of said first tie member between said third (763) and fourth (765) folds defining a third portion (767) and the portion of said first tie member between said fourth fold (765) and said first end (736) defining a forth portion (768), said second portion (766) being longer than either of said first (764) and third (767) portions with said second portion (766) overlapping said first (764) and third (767) portions, said first portion (764) being joined to said second portion (766) at least adjacent to said first fold (760) and said third portion (767) being joined to said second portion (766) at least adjacent to said fourth fold (765) to form a generally "T"-shaped tie with at least said second portion (766) forming a shorter portion (744) of said "T"-shaped tie and at least said second end (740) of said first tie member (732) and a portion of said first tie member adjacent said second end (740) of said first tie member (732) forming a longer portion (746) of said "T"-shaped tie, said shorter portion (744) including said second portion (766) being attached to said gown (710) such that said longer portion (746) of said "T"-shaped tie can be extended away from said gown (710) from a point intermediate said second fold (762) and said third fold (763).
10. The surgical gown and tie assembly of claim 9 wherein said shorter portion (744) of said "T"-shaped tie is ultrasonically attached to said gown (710).

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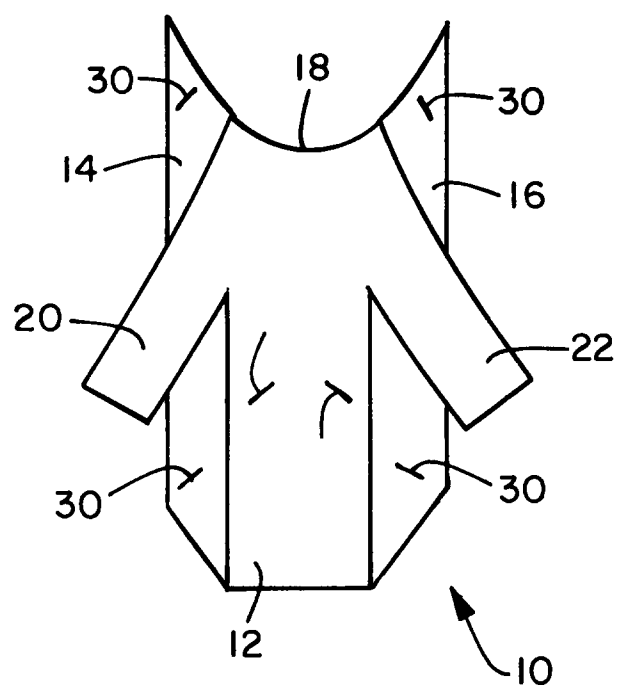


FIG. 1

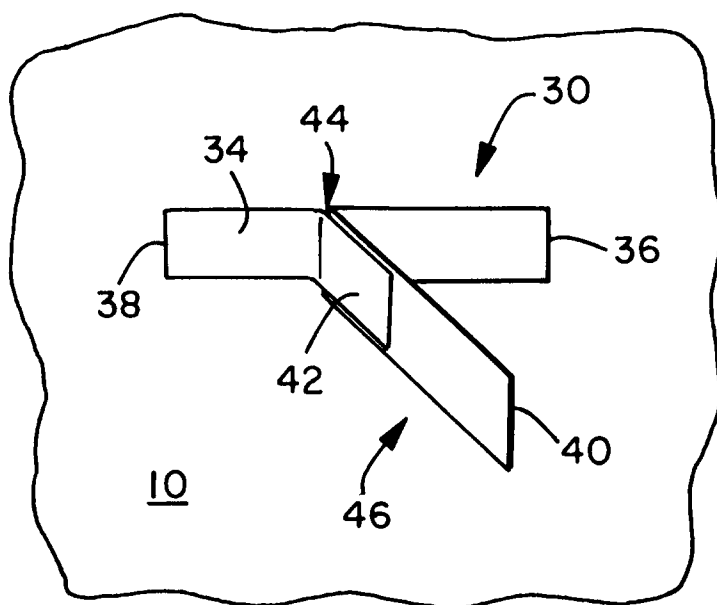


FIG. 2

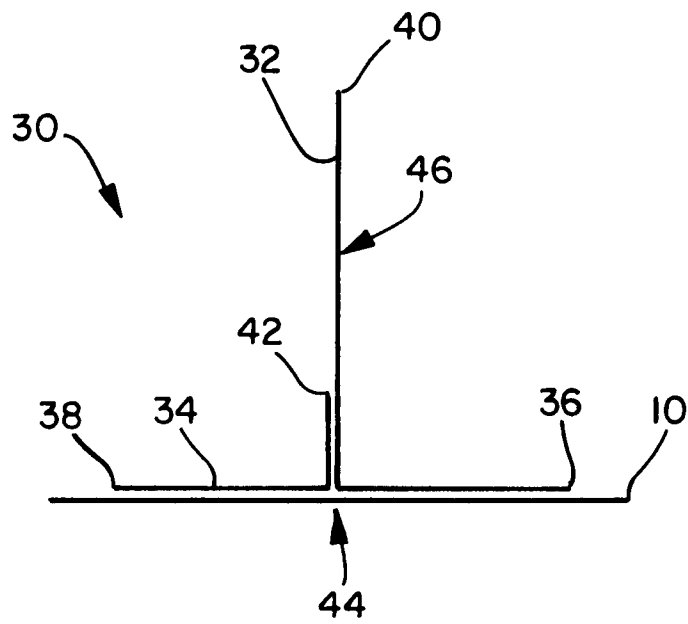


FIG. 3

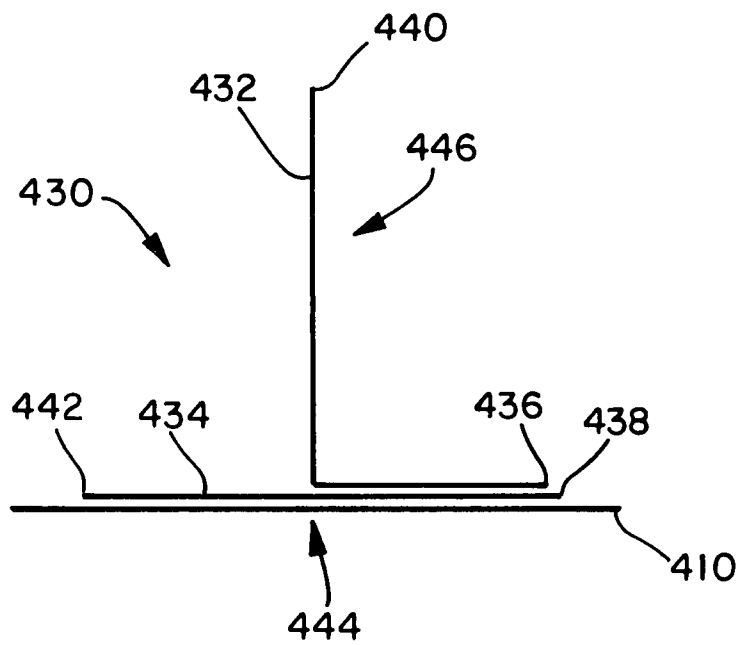


FIG. 4

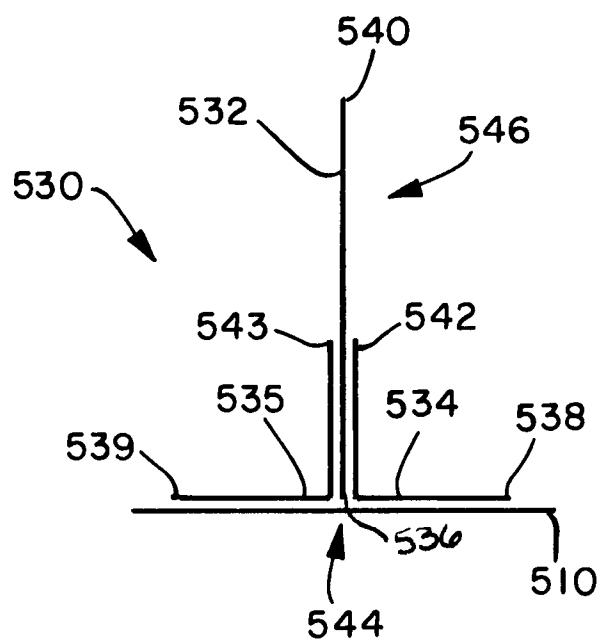


FIG. 5

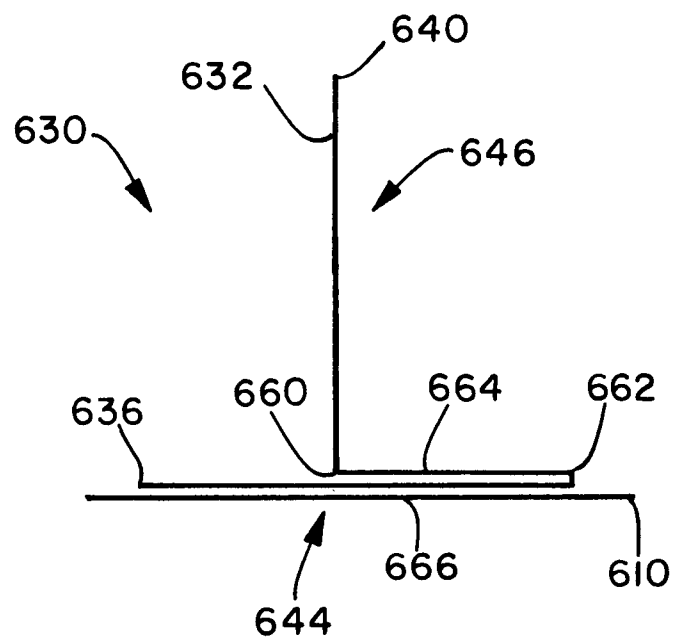


FIG. 6

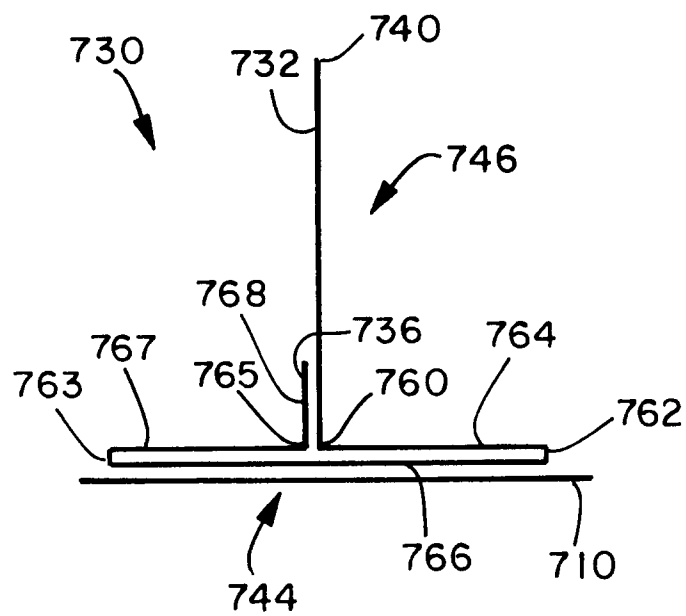


FIG. 7



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 93 12 0437

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.5)
A	DE-A-40 11 126 (WORK WEAR CORP., INC.) * column 3, line 32 - line 36; figure 3 * ---	1,2	A41D13/12 A41H43/00
A	US-A-4 255 818 (D. J. CROWLEY ET AL.) * column 2, line 11 - line 19; figure 2 * ---	1	
A	US-A-4 674 132 (S. STEIN ET AL.) * column 2, line 39 - line 45; figures 2,9,10 * ---	1	
A	US-A-4 558 468 (A. D. LANDRY) * column 4, line 6 - line 17 * * column 5, line 7 - line 16; figures 1,3 * -----	1	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.5)
			A41D A41F A41H
Place of search THE HAGUE		Date of completion of the search 14 April 1994	Examiner Fairbanks, S
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