

[54] **DISPOSABLE ATHLETIC SUPPORTER**
[72] Inventor: **Brenda B. Gelston**, Woodbark Lane,
Phoenix, Md. 21131
[22] Filed: **Nov. 5, 1969**
[21] Appl. No.: **874,339**

[52] **U.S. Cl.**.....128/158
[51] **Int. Cl.**.....A61f 5/40
[58] **Field of Search**.....128/155, 156, 158, 159, 160,
128/169, 170; 2/224 A, 224 R, 78; 24/16

[56] **References Cited**
UNITED STATES PATENTS

R23,334 1/1951 Montmarquet.....128/158
3,488,778 1/1970 Goujon et al.2/224 A

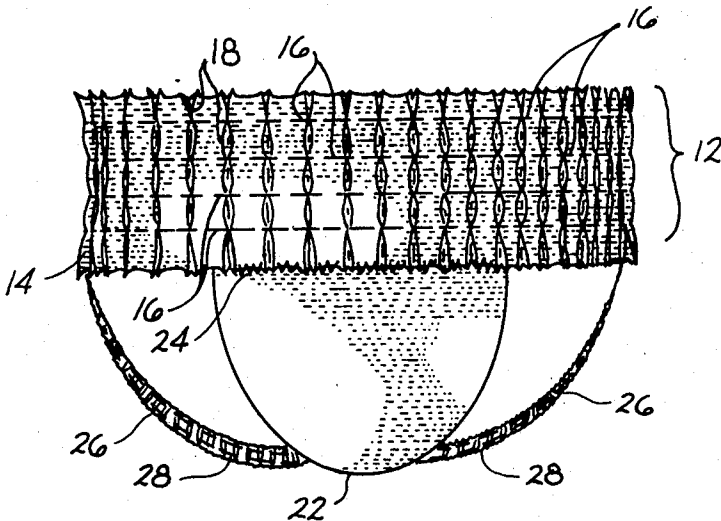
1,845,630 2/1932 Scholl.....128/155
2,676,327 4/1954 Terry.....2/224
3,441,022 4/1969 Severson et al.....128/159

Primary Examiner—Robert W. Michell
Attorney—John F. McClellan, Sr.

[57] **ABSTRACT**

Wear-and-discard athletic supporters of non-woven material which has preferential directions of strength and resilience at right angles, are described, the circumference of the athletic supporter waistband being the strength-oriented direction of the material, which is also gathered into pleats by circumferential elastic stitching, and the direction of resilience of the material being the suspensory direction; ventilated double waistbands and integral pouch and waistband construction further characterize embodiments of the invention.

7 Claims, 6 Drawing Figures



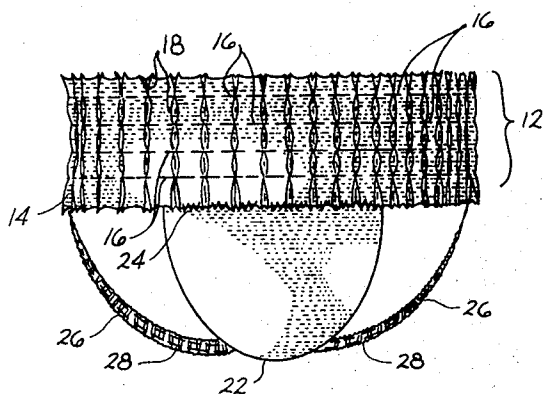


FIG. 1

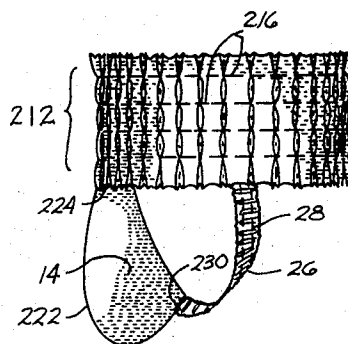


FIG. 2

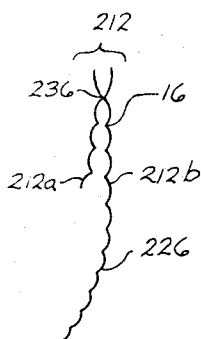


FIG. 3

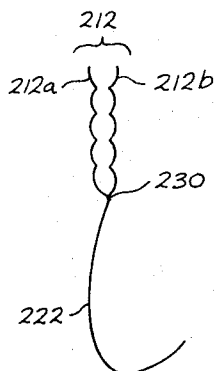


FIG. 4

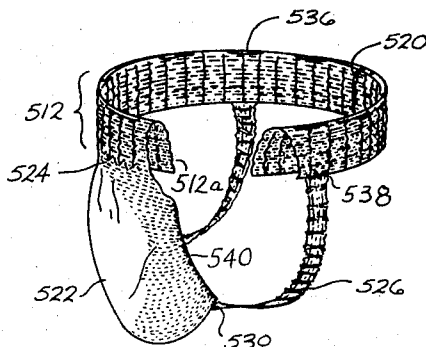


FIG. 5

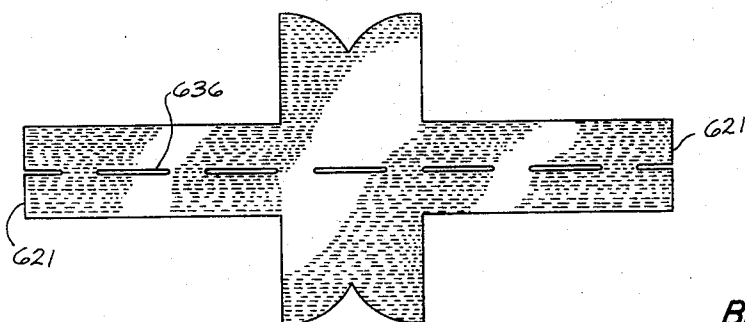


FIG. 6

INVENTOR
BRENDA B. GELSTON
BY John F. McClellan Sr.
ATTORNEY

DISPOSABLE ATHLETIC SUPPORTER

This invention relates generally to special purpose apparel for men, and specifically to athletic supporters.

Athletic supporters have evolved through various stages of woven-material structures, passing from the surgical bandage through the drawstring-fitted harness and pouch to the present day cloth and rubber elastic weave devices. There has been no substantial change in design or material for many years, although several shortcomings of supporters presently available quickly become apparent on use.

As the name, "athletic supporter" implies, athletic teams constitute the largest markets for such devices.

Presently available athletic supporters are heavy rubber-and-cloth garments which are too expensive for single use and discard, and which must therefore be stored between uses. To prevent danger of perpetuation of infection in individual wearers, or of transfer of infection through accidental exchange or pilfering, the supporters must be laundered after use.

However, high-temperature laundering sufficient to disinfect, or repeated machine launderings of any nature, destroy resiliency of the interwoven rubber component, and stretch the supporters.

Stretched supporters are not supportive, are uncomfortable, and can become unsightly, as for example by sagging below uniform shorts and the like.

Increasing weight of accumulating sweat causes progressively greater sagging of presently available supporters during the course of athletic events. In addition to the non-evaporative or rubber-sheet effect of the rubber-woven material commonly used, there is insulative blanketing by the thick material which further aggravates the problem. For these reasons, it is the rule rather than the exception for athletic supporter users to find that initially flat legbands and waistbands "roll" and lose adhesion to the skin.

Last but not least, presently available supporters require accountability; after initial issuance there are reinventories of returns for misfits, laundering, and wear, often revealing losses through pilfering or carelessness.

My comprehensive objective therefore, is to provide economical single-use-and discard athletic supporters having the advantages of presently available supporters without the disadvantages, and having additional advantages never before attainable.

I include in my objective the reduction of infection, reduction of pilfering, elimination of accountability after issuance, and ease of disposal.

I further include the objective of affording wearers cooler and better positioning supporters, with continually renewed fit, at less than the cost of wearing presently available supporters.

I advance these objectives by providing athletic supporters of non-woven material, taking design advantage of the peculiar evaporative, stretch, strength, frictional, and cost characteristics of the material, while overcoming the weaknesses of the material.

These and other objects of my invention will be more readily understood on examination of the following description and the drawings in which:

FIG. 1 is a front elevation of an embodiment of my invention;

FIG. 2 is a side elevation of another embodiment of my invention;

FIG. 3 is a vertical section of a portion of FIG. 2;

FIG. 4 is a vertical section of another portion of FIG. 2;

FIG. 5 is a perspective view, partly in section, of another embodiment; and

FIG. 6 is a detail of a pattern of a further embodiment.

In the Figures, for better exposition, the supporters are shown in the conformation of wear rather than collapsed.

All embodiments of the novel athletic supporter of this invention are made of paper-like non-woven material of the general type presently manufactured by the Colgate-Palmolive Company and sold under the trademark "Handi-

Wipes." The material is supplied characteristically in sheets of matted rayon fibre the fibres being substantially parallel in the direction of greater strength of the material.

The material has staggered trains of parallel slit-like openings parallel with the fibres. These openings impart greater stretch in the direction of less strength (perpendicular to the openings) and provide other advantages which will be seen later, when used according to this invention.

The FIG. 1 embodiment of the novel athletic supporter of my invention shows the use of this non-woven material in all parts of the supporter. Waistband 12 is a closed loop of non-woven material. The stronger or fibre-oriented direction of the material in the waistband is made circumferential, as indicated by the direction of the slit-like openings 14. Plural rows of rubber 16, stitched in parallel, encircle the waistband and draw the material into vertical pleating 18. The waistband connective seam, is, as will be seen, preferably to the rear. Pouch 22, of the same non-woven material, is affixed to the lower portion of the waistband, as by zigzag stitching 24.

In the FIG. 1 embodiment, the direction of greater strength in the pouch is parallel to that in the waistband and the direction of stretch is vertical, as denoted by the direction of openings 14.

Legbands 26, affixed by zigzag stitching attach the lower portion of the pouch to the rear of the waistband. The direction of strength of the non-woven material in the legbands is parallel to the length of the legbands. Rubber stitchings 28 provide elasticity in the direction of stretch in the legbands.

The following discussion indicates ways in which this invention adapts non-woven material to the specific design requirements of my improved athletic supporters. Waistbands are discussed first.

Non-woven material has little elasticity but great strength in the fibre direction. According to my invention, elasticity in the direction of the fibres is provided by the rubber stitching, and stretch at right angles to this is derived from the material itself, as will be seen.

Non-woven material is relatively easy to fold or roll transverse to the fibre direction, however, it becomes stiff in that direction and resists rolling when gathered or pleated transversely to the fibres, as at 18, FIG. 1. According to this provision, therefore, the waistbands and legbands are made to resist rolling.

It can be seen on inspection that the coefficient of friction between the non-woven material and a textured surface, such as skin, is substantially greater across the fibres, than parallel with them, as is characteristic of most parallel grained materials. There are few vertical wrinkles at the human waist. The aligned fibres of the waistband of this supporter are positioned to lie in, and engage, the circumferential wrinkles characteristic of the waist. The frictional engagement is increased by the parallel rows of slit-like openings in the material which also deform around the somewhat larger irregularities of the skin between wrinkles.

Altogether, these provisions assure that the supporter will cling better than if vertical stitches were present to bridge the wrinkles and skid the waistband down over minute irregularities.

Similar design characteristics tend to prevent migration of the legbands.

The fibre and apertures of the pouch 22, FIG. 1, are so aligned as to afford vertical cushioning by elastic stretch of the non-woven material transverse to the slit-like openings. At the same time, greatest strength and resistance to transverse distortion is provided in the direction of pull of the legbands, and in the direction of pull of the waistband on expansion of the wearer's waist during exertion.

Opening and closing of the slit-like openings in the material under changing loading promotes pumping of air through the pouch and bands, cooling the wearer and lightening the weight of the supporter by hastening sweat evaporation. For example, expansion of the wearer's waist tends to close the waistband openings and contraction has the opposite effect.

The capacity of "Handi-Wipes," and other non-woven material of similar nature, to absorb quantities of fluid and to be dried quickly in air because of the large exposed surface area of the array of matted fibres, is well known. Between parallel fibres, surface tension distributes fluid over greater areas for evaporation than between crossed fibres. Even though the material is relatively weak in tension across the fibres, the inherent advantages of high absorption and evaporation rates are made available by the design features discussed without sacrifice of necessary strength in the article.

However, non-woven material of this type is not adapted for anchoring large quantities of rubber stitching, even if this were allowable in view of the heat-transfer and evaporative considerations discussed.

For this reason, I provide also a double waistband embodiment of the invention, with each of two overlaid waistbands carrying a complement of rubber stitching. The effect of this feature of the invention is to preserve the high evaporative rate, the strength, and to considerably extend the efficient heat transfer of non-woven material sparsely stitched with rubber, while at the same time providing a tighter gripping and stronger waistband.

FIGS. 2, 3 and 4 illustrate this double waistband embodiment, in contrast with the single waistband embodiment illustrated in FIG. 1.

FIG. 2, a side view, shows a detail which is similar in both the FIG. 1 and FIG. 2 embodiments, the attachment of the legbands to the pouch 222 by zigzag stitching 230. However, the FIG. 2 embodiment has a substantial difference from that of FIG. 1, as will be seen from FIGS. 3 and 4, which are sectional views of FIG. 2.

Waistband 12 of FIG. 1 is of single layer construction, having rubber stitches 16 as indicated.

In contrast, waistband 212, of FIGS. 2, 3 and 4, is double, both the outer band 212a and the inner band 212b being similar to waistband 12 of FIG. 1 and having plural rows of rubber stitching 216. The upper zones of the inner and outer bands 212a and 212b of waistband 212 are tacked together at intervals of a few inches, preferably elastically, as at 236, FIG. 3.

FIG. 4 shows independence of bands 212a and 212b along the upper zone between tackings. In the area of the pouch, both bands of the waistband may be joined to the pouch as at 230, for greater security of the pouch.

Greater security of the pouch is also provided by other features of my invention which reside in modified pouch design.

I have discovered that the first points of failure in the FIG. 1 and FIG. 2 embodiments are at the upper corners of the pouch, where the stitches tend to rip loose. This limits the useful life of the supports, which otherwise can be washed and reworn twice or more.

To prevent this failure while preserving the other features of the invention, I provide a simplified and stronger embodiment which is also designed for more economical manufacture.

FIG. 5 shows the simplified embodiment, in which the pouch 522 and the double waistband 512 are made of a continuous piece of material, only the legbands being sewed-on. In this embodiment the waistband is folded over at the top and the folded-over portion 512a is zigzag stitched to the pouch at 524. Legbands 526 are constructed and attached in the manner previously described, at 530 and 538. Waistband seam 520 is preferably in the rear.

Slots 536 are cut in the top of the waistband to minimize bulk at the waist and to promote air flow. The expense of hemming the edges of the slots is saved by using this material, since, unlike woven material, it will not ravel when flexed and chafed.

The slots are an optional feature simulating the loose attachment of the two independent waistbands of the earlier described embodiments.

The lower edges of the doubled waistband are preferably joined only at the legband attachments and pouch to allow greater air flow also. A gathering stitch is preferably employed around the pouch opening, as at 540.

The lower edge of the inner waistband, being more flexible than the lower edge of a double-thickness waistband, tends to conform and cling better. For this reason gripping tends to be improved if the waistband is folded to the inside of the circumference rather than the outside. This also shields the spans of elastic stitching, which in the preferred embodiment, are back-to-back inside the fold. The re-curved waistband embodiments have a remarkably smoother appearance than the other embodiments, and the smoothness is even more pronounced when the waistband is folded to the inside.

FIG. 6 shows the pattern for a double-pouch embodiment which is otherwise like that of FIG. 5.

To assemble this embodiment, rows of elastic thread are stitched on either side of the row of slots, the ends 621 of the waistband are joined, the waistband is folded over at the row of slots 636, the pouches are congruently fitted and sewn together around the edges, and legbands are added as in other embodiments. Note that the waistband seam is concealed and protected by this sequence.

In the FIG. 5 and 6 embodiments the direction of material, and other features not differently described, are like the same features in the prior embodiments.

For example, with the material described, and other similar to it, which are between five and ten one thousandths of an inch thick, it has been found that two to four rows per inch of elastic stitching such as number 171 "STAYLASTIC" are optimum. "STAYLASTIC" is a trademark of the continental Elastic Corporation, New Bedford, Massachusetts. Number 171 designates a twenty thousandths of an inch diameter (approximately) thread, one-third rubber, one-third cotton, and one-third "Nylon" (Nylon being a Du Pont trademark). Much closer rows of stitching, or rows of heavy stitching, can cause unexpected failures in use, since the material tends to be weakened by the perforations and ruptured by the elastic stitching. A machine setting of four-threads-up top tension, number four bottom tension, and stitch length setting of seven to eight has been found satisfactory for the embodiments described.

Although I have set forth aspects of my invention in considerable detail, restriction narrower than the scope of the invention is not intended, and variations may be included in the light of these teachings without departure from the spirit of my invention.

I claim:

1. A wear-and-discard athletic supporter comprising a waistband gathered into a plurality of vertical pleats by plural circumferential rows of elastic stitching, said waistband having coincident inner and outer waistband portions joined at spaced intervals near the top edges of said waistband portions, a pouch pendant from the waistband, and legbands attached at one end of the pouch and at the other end to the waistband; all said waistband, pouch and legbands being of non-woven fibrous material having greater strength in the fibre direction and greater resilience transverse thereto and having a plurality of openings, said openings being elongate in the direction of greater strength; said fibres being oriented in the circumferential direction in the waistband and in the direction transverse to said pendency in the pouch, and said fibres being oriented in the direction of length in the legbands, thereby providing greater gripping and strength in the waistband and legband and greater cushioning resilience in the pouch.

2. A wear-and-discard athletic supporter as recited in claim 1, wherein the pouch is joined to the lower edge of the waistband by fastening means.

3. A wear-and-discard athletic supporter as recited in claim 1, wherein the waistband and pouch are comprised of a continuous piece of the fibrous material.

4. A wear-and-discard athletic supporter as recited in claim 3 wherein the waistband is recurved downwardly forming said inner and outer waistband portions.

5. A wear-and-discard athletic supporter as recited in claim 4, and additionally, said pouch being double walled, the first wall pendant from the inner waistband portion and the second

5

wall pendant from the outer waistband portion, the first and second said pouch walls being congruently secured along an edge thereof.

6. A wear-and-discard athletic supporter as recited in claim 5 wherein the legband means have longitudinal elastic stitching gathering the legband means into transverse pleats,

6

and wherein said pouch has elastic stitching along an edge thereof.

7. A wear-and-discard athletic supporter as recited in claim 1 wherein the pouch is pendant from the outer waistband portion.

* * * * *

10

15

20

25

30

35

40

45

50

55

60

65

70

75